PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSIVE ILLNESS IN PATIENTS WITH TUBERCULOSIS IN MULAGO HOSPITAL

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A dissertation submitted in partial fulfillment of the requirements for the award of the degree of Masters of Medicine (Psychiatry) of Makerere University

June 2018
DECLARATION

I hereby declare that all the work submitted is original except where otherwise stated. This work has not been presented to any other university for a degree nor has it been submitted anywhere for publication.

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DEDICATION

This work is dedicated to my husband; Mr. Horeb Rukiri, my son; Timothy Rukiri and my dear mother; Ms Harriet Nyamahunge who endured long periods of my absence during the preparation of this work.
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My humble appreciation goes to the patients of tuberculosis who gave us their time to interact with us during the study. These patients suffer from a double burden of depression and tuberculosis and yet unrecognized by many who care for them.
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OPERATIONAL DEFINITIONS

**Depressive illness:** this includes major depression and dysthymia according to the Mini Neuropsychiatric Interview (MINI).

**Major depression:** five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either depressed mood or loss of interest or pleasure and other symptoms include; weight loss or weight gain, decrease or increase in appetite, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or excessive or inappropriate guilt, diminished ability to think or concentrate, suicidal behavior (APA 2013).

**Dysthymia:** at least 2 year history of depressive symptoms with no more than 2 months of no symptoms (APA 2013).

**Tuberculosis treatment success rate:** is the percentage of all new TB cases (or new and relapses) registered under a national tuberculosis control programme in a given year that successfully completed treatment with or without bacteriological evidence of success.

**Tuberculosis case:** a patient with tuberculosis diagnosed clinically, by laboratory or radiological investigation.
**LIST OF ABBREVIATIONS AND ACRONYMS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome</td>
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<td>ART</td>
<td>Antiretroviral Therapy</td>
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<tr>
<td>CIDI</td>
<td>Composite International Diagnostic Interview</td>
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<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
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<td>DALYs</td>
<td>Disability Adjusted Life Years</td>
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<td>DOT</td>
<td>Directly Observed Therapy</td>
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<tr>
<td>DSM</td>
<td>Diagnostic and Statistical Manual for Mental Disorders</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>ICD</td>
<td>International Classification of Diseases</td>
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<tr>
<td>MDR-TB</td>
<td>Multidrug Resistant Tuberculosis</td>
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<tr>
<td>MINI</td>
<td>Mini-International Neuropsychiatric Interview</td>
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<tr>
<td>NTLP</td>
<td>National Tuberculosis and Leprosy Programme</td>
</tr>
<tr>
<td>PHQ</td>
<td>Patient Health Questionnaire</td>
</tr>
<tr>
<td>SCID-P</td>
<td>Structured Clinical Interview for DSM-III-R Patients</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
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<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>YLDs</td>
<td>Years Lived with Disability</td>
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<td>ZN</td>
<td>Ziehl-Neelsen</td>
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ABSTRACT

Background: Depression is a major cause of the global disease burden and globally affects 350-400 million persons making it the largest contributor to years lived with disability. Among patients with chronic physical illnesses like tuberculosis (TB) especially in developing countries, depression can affect up to 25-33% of patients. More than 1.5 million tuberculosis cases occur in Sub Saharan Africa yearly. Uganda is one of the world’s high TB/Human Immunodeficiency Virus (HIV)- burden countries with a 2015 prevalence of all TB cases in Uganda found at 202 per 100,000. The treatment success rate was 75% for new and relapse cases and 73% for HIV-positive TB cases.

Objective: To determine the prevalence and factors associated with depressive illness in patients with tuberculosis in Mulago Hospital.

Methods: This was a cross sectional study involving participants aged 18 years and above diagnosed with tuberculosis attending the tuberculosis clinic in Mulago Hospital. Consecutive sampling was done until the sample size of 308 participants was achieved. Participants had the following instruments administered to them; the Socio-demographic questionnaire, the Mini Neuropsychiatric Interview (MINI) to diagnose depressive illness and the Patient Health Questionnaire-9 for rating the severity of depression. Data was entered using Epi-Data. Descriptive, bivariate and multivariate analyses were done with SPSS.

Results: The prevalence of depressive illness was 23.7% (95% confidence interval 19.32 -28.89) as diagnosed by the MINI. Depressive illness was independently associated with low education level (p= 0.003), being in the intensive phase of TB treatment (OR=2.344, p=0.007) and family history of depressive illness (OR=5.422, p=0.001).

Conclusion: The prevalence of depressive illness in patients with TB is high and is associated with low education level, being in the intensive phase of TB treatment and family history of depressive illness. Depressive illnesses should be screened and managed among patients with TB.
CHAPTER ONE: INTRODUCTION

1.1 Background

Depression is a major cause of the global disease burden, affecting an estimated 350-400 million persons worldwide. This makes depression the largest contributor to years lived with disability globally (Marcus et al. 2012). Depressive disorders are the second leading cause of years lived with disability (YLDs) and Major Depressive Disorder accounts for 8.2% (5.9%–10.8%) of global YLDs in 2010 and dysthymia for 1.4% (0.9%–2.0%) (Murray et al. 2013, WHO, 2001). Furthermore, in 2010, depression was estimated to cost at least US$ 800 billion in lost economic output and this sum is expected to more than double by 2030 (WHO, 2008). A research carried out by the World Health Organization (WHO) in 2012 in 17 countries revealed that one in 20 people reported depression (Marcus et al. 2012). At its worst, depression can lead to suicide and about 800,000 to 1 million people commit suicide annually (Marcus et al. 2012). Major Depressive Disorder explained 16 million suicide Disability Adjusted Life Years (DALYs) (Murray et al. 2013). Among patients with chronic physical illnesses like, Human Immuno-deficiency Virus/ Acquired Immuno-deficiency Syndrome (HIV/AIDS), hypertension, diabetes, cancers and tuberculosis (TB) the prevalence of depression is between 10-20% (Katon et al. 2007). Depression and TB are an important public health concern that contributed 2.5 and 2% respectively of DALYs worldwide in 2010 (Murray et al. 2013). Depression is three to six times more common in patients with tuberculosis compared with tuberculosis negative patients (Sweetland et al. 2014).

Tuberculosis is a global health problem and in 2014, 9.6 million people developed TB and 3.3% were multi-drug resistant tuberculosis (MDR-TB) cases. More than 1.5 million TB cases occur in Sub Saharan Africa each year (Zumla et al. 2015, Mweemba et al 2008). It is also worth noting that the prevalence of TB in Uganda in 2013 was 159 per 100,000 with 1400 new cases of MDR-TB and a treatment failure rate of 25% (Zumla et al. 2015). The current prevalence of depression among patients receiving TB treatment has a wide range from 11.3% to 80.2% with a mean weighted prevalence of 48.9% (Sweetland et al. 2014). This wide range could be explained by use of different methods in these studies with some using brief screening instruments and others using clinical diagnostic interviews. Evidence from cross sectional studies done in African hospitals indicate a very high prevalence of comorbid depression among patients with TB ranging between 10 and 52% with the one study in Nigeria reporting it at 27.7% (Deribew et al. 2010).
As with psychiatric illnesses, tuberculosis also carries social stigma the world over. A proportion of society also considers tuberculosis to be incurable hence the patients endure neglect and psychological trauma once diagnosed. It is highly probable that this trauma may predispose them to psychiatric disorders (Basu et al. 2012). The relationship between depression and chronic physical illness is bidirectional (Katon, 2011). Patients with TB may develop depression due to chronic infection or related psychosocial stressors or as a result of effects of drug like isoniazid (Mitnick et al. 2008, Mikkelsen et al. 2004). The compromised immunity and reduced self-care associated with depression could also predispose an individual to contracting TB directly (Mikkelsen et al. 2004). Depression also predisposes to risky behavior with resultant contraction of HIV which lowers immunity hence one easily gets tuberculosis as well (McFarlane et al. 2014, Prince et al. 2007). This comorbidity is associated with a range of adverse outcomes including functional impairment, increased medical costs, poor adherence to medication, community transmission, increased medical symptom and pill burden hence increased mortality (Katon, 2011). Individuals who are depressed with TB are less likely to seek care promptly and while in care are less likely to consistently and completely take their medication, yet poor adherence to anti-TB medications is recognized as a significant cause of treatment failure (Pachi et al. 2013, Namukwaya et al. 2011). Inconsistent and incomplete treatment of TB results in treatment which is significantly more expensive, takes about four times longer duration, and produces acute physical and psychiatric side effects which makes treatment adherence and completion a much bigger challenge (Aamir, 2010, Sweetland et al. 2014). Adherence is especially important in MDR-TB patients as this is most times the last treatment option and failure to complete this treatment may lead to high rates of fatality in addition to ongoing transmission of highly resistant drug strains (Sweetland et al. 2014). Therefore, early diagnosis and timely intervention of depression in patients with TB may improve adherence to anti-TB medication (Sweetland et al. 2014, Aamir, 2010).

HIV has also been noted as a driving force behind the global burden of TB. In 2000, about 11.5 million people with HIV were co-infected with TB and 70% of these were in sub-Saharan Africa (WHO, 2004). Both TB and HIV are chronic physical illnesses that have psychological effects on the sufferers due to the diseases themselves, medications and stigma associated with both conditions (Deribew et al. 2010). In addition, people with depression are also noted to be at an increased risk of contracting HIV/AIDS (Prince et al. 2007). Patients co-infected with TB and HIV
are most times subject to potentially toxic treatments which may cause debilitation, stress and demotivation (Isaakidis et al. 2013). Discrimination as a result of the dual diagnosis, dependence on family for support and financial problems also affect the patients’ mental wellbeing with resultant psychiatric disorders (Ownby et al. 2010). In Uganda depression in HIV positive patients is estimated to range between to 47% to 60% (Singh et al. 2008, Kaharuza et al. 2006). Depression in HIV positive patient is estimated at 2-3 times than in the general population and this population also has more severe degrees and symptoms of depression (Nakasujja et al. 2010, Akena et al. 2010, Sherbourne et al. 2000).

Uganda is one of the world’s 41 high TB/HIV- burden countries. These are countries with the highest estimated numbers of incident TB cases that account for 97% of the global TB burden. They also have the highest burden of TB in terms of per capita expenditure (WHO, 2015). The prevalence of all TB cases in Uganda in 2015 was 202 per 100,000 with the incidence of MDR-TB at 4.9 per 100,000 and of TB/HIV at 66 per 100,000. In 2015, Uganda had a treatment success rate of 75% for new and relapse cases and 73% for HIV-positive TB cases (WHO, 2015). About 29.4% of people with TB are also infected with HIV and this comorbidity is known to be associated with psychiatric illness due the stigma, chronicity and psychological distress of the illnesses (Ali et al. 2016).

A study done in Uganda at Mulago Hospital on the prevalence of depressive symptoms among medically ill patients found that 25% of the patients had chest infections including pulmonary TB and 35% of the medically ill patients had depressive illness (Katorogo, 2006). This study however had only a sample size of 60 patients and the prevalence of major depression among patients with TB specifically was not reported. Furthermore, there is limited data on the prevalence and factors associated with depressive illness in patients with TB in the Ugandan setting. Therefore, this study sought to determine the prevalence of depressive illness in patients with TB attending the TB clinic in Mulago Hospital and also find out the biological and psychosocial factors that may be associated with the two conditions.

1.2 Problem Statement

Tuberculosis is associated with psychiatric morbidity, particularly depressive disorder, which has been recognized as a cause of poor compliance with resultant treatment failure and emergence of drug resistant TB strains (Issa et al. 2009).
Despite the knowledge that the comorbidity of depression with TB is common, little effort has been made to the identification of depression among TB patients. Indeed, there is little evidence of programs for TB care that have mental health as an option. A number of factors have been shown to be associated with depression among patients with TB and these include: severe symptoms of TB, type of TB, presence of HIV/AIDS, being single, divorced or widowed, age, being unemployed, long duration of illness and category of TB treatment (Kehbila et al. 2016, Pachi et al. 2013, Erhabor et al. 2000).

Without addressing the burden of depressive illness among TB patients, adherence and prevention of disease transmission is bound to remain an enormous challenge in our setting. This study set out to determine the prevalence and associated factors of depressive illness in patients with TB attending the TB clinic in Mulago Hospital, hence provided important information for management and policy formation.

1.3 Significance

Studies about the comorbidity of depressive illness and TB have been done in India, Nigeria, Cameroon, Ethiopia and Tanzania. A study done in Uganda focused mainly on depression in medical conditions generally. There is limited data on the association between depressive illness and TB infection in our country. This study contributes to our understanding of a growing public health problem, which is the double burden of TB and depression. The results of the study provide information on prevalence and factors associated with depression among patients with TB. This information therefore provides a basis for integration of psychiatric management in patients with tuberculosis and as such will improve the quality of care of these patients and possibly result in improved TB treatment outcomes.
1.4 Research Questions

What is the prevalence of depressive illness in patients with tuberculosis in Mulago Hospital?
What are the factors associated with depressive illness in patients with tuberculosis in Mulago Hospital?

1.5 Objectives

1.5.1 General objective

To determine the prevalence and factors associated with depressive illness in patients with TB in Mulago Hospital.

1.5.2 Specific objectives

1. To determine the prevalence of depressive illness in patients with TB in Mulago Hospital.
2. To determine the biological and psychosocial factors associated with depressive illness in patients with TB in Mulago Hospital.
1.6 Conceptual Framework

This conceptual framework is based on the bio-psychosocial model (Borrell-Carrió et al. 2004). According to this model, disease is a result of an interaction between biological, psychological and social factors.

Figure 1: a conceptual framework how different factors are associated with depressive illness in patients with TB

The above conceptual framework highlights factors associated with depressive illness in patients with tuberculosis. However, this study majorly focused on the social factors like: age, sex, employment status, education level, marital status. It also focused on biological/clinical factors like; type of TB, category of treatment, phase of TB treatment, family history of depression, substance use, and HIV/AIDS. We did not assess any psychological factors.
CHAPTER TWO: LITERATURE REVIEW

2.1 Depression in patients with chronic medical illnesses

Psychiatry problems are more common among patients with general medical conditions compared to the general population (Patten 2001). Depressive illness is the commonest of all psychiatric illnesses among the medically ill accounting for about 50% of all cases. Depression in these patients is rarely detected and inadequately treated resulting in poor treatment outcomes, increased symptom burden and poor quality of life (Katon et al. 2007).

Depression is a common and severe mental disorder characterized by a two week history of the following symptoms; loss of interest in pleasurable activities, low energy, low sleep or appetite, feelings of sadness, feelings of guilt or worthlessness, poor concentration, insomnia or hypersomnia and suicidal or homicidal behaviors (Karthik et al. 2016, APA, 2013, Marcus et al. 2012).

The prevalence of depressive illness in this population depends on the questionnaire used whether it was patient administered or researcher administered numbers have been higher in patient administered questionnaires. The prevalence also depends on whether a screening or diagnostic instrument is used.

The relationship between depression and medical illness is bi-direction and complex more like the story of a chicken and an egg (Katon 2003, Scott et al. 2009). Having a physical illness increases chances of getting depressive illness and at the same time depression can predispose to or worsen a physical illness. The symptoms of medical illnesses and the associated functional impairment may precipitate or worsen depressive illness. Development of depression may be associated with adverse behaviors like sedentary life style, smoking, poor diet and alcohol use (Katon 2011). These behaviors contribute to biological factors like high cortisol levels, increased pro-inflammatory factors which are risk factors for development of physical illness in addition to worsening depression (Scott et al. 2009).

Depression increases the level of impairment in patients with chronic physical illness especially in their daily roles (Wells et al. 1989). This deterioration can be explained by the fact that depression may:

a) magnify one’s reaction to the somatic symptoms of the physical illness,

b) reduce the individual’s morale to care for the medical illness

c) result into maladaptive physiological effects on the somatic symptoms
d) decrease one’s capacity to cope with the physical illness

It has been shown that depressive illness in these patients is associated with decreased motivation to care for the physical illness (DiMatteo et al. 2000), increased utilization of health care services though with more missed appointments as well (Simon GE et al. 1995), more severe medical symptoms and complications (Akena et al. 2010). This results into poor treatment outcomes, poor adherence, poor quality of life, loss of productive time and increased mortality (Van Melle et al. 2004)

2.2 Depression in patients with tuberculosis

Depression in patients with tuberculosis arises from a complex interaction of biological/clinical, psychological and social factors (Borrell-Carrió et al. 2004). Biological factors include the medical illness like tuberculosis, abnormalities in the biogenic amines, other neurotransmitters and genetic predisposition. The psychosocial factors provide evidence that environmental stressors and other adverse life events are contributors to development of depressive illness (Katon, 2011). There is increasing evidence from research for a strong association between mental health problems especially depression and chronic physical illnesses like TB (Buberwa, 2013).

The pathways for the association between TB and depression are complex, multidirectional and bio-psychosoical in interaction. However, the individual extent of contribution of each disorder to the burden of this comorbidity is currently unclear (Mitnick et al. 2008). It has been suggested that patients with TB may develop depression due to the presence of the chronic infection or related psychosocial stressors or as a result of effects of drug like isoniazid (Mitnick et al. 2008, Mikkelsen et al. 2004). Serious medical illness is a significant psychological stressor in that it affects the individual’s body image, self-esteem, capacity to maintain family and social relationships, and causes a sense of loss to the person in various spheres of life (Mikkelsen et al. 2004).

The compromised immunity, lack of interest and motivation, tiredness and reduced self-care associated with depression could also predispose an individual to contracting TB (McFarlane et al. 2014). The association between depression and the severity of TB symptoms could also be because depression increases the severity of symptoms of physical illness (APA, 2013). It has also been noted that these two comorbidities may share risk factors like depressed immunity in presence of other chronic infections like diabetes and HIV/AIDS (Kiecolt-Glaser et al. 2002).
Immunologically chronic infections lead to overproduction of inflammatory cytokines like interleukin 6, resulting in endocrine reactions like increased cortisol levels that cause depressive symptoms (Kiecolt-Glaser et al. 2002). Depression also enhances the production of inflammatory cytokines which down-regulate the patients’ immunity making them more susceptible to TB and other chronic medical illnesses (Sweetland et al. 2014, Kiecolt-Glaser et al. 2002). More so chronic diseases like TB are associated with weight loss, fatigue, psychological and social losses and these may trigger depressive reactions (Mikkelsen et al. 2004). Research has shown that individuals who have chronic diseases and comorbid depression can benefit from treatments for depression, including use of antidepressants and psychotherapy in addition to the treatment of the medical condition (Doherty et al. 2013, Rayner et al. 2010, Simon et al. 2005).

Studies have been done in Asia and some parts of Africa on the comorbidity of depression and tuberculosis as highlighted below;

A prospective study conducted at a tertiary care hospital in South India from March 2014 to June 2015 involving 147 patients registered in the Directly Observed Therapy (DOT) clinic revealed that 84% of patients who were currently on anti-TB drugs for at least one-month duration had some degree of depression on the Patient Health Questionnaire-9 (PHQ-9). Moderate depression was the most common in this study occurring among the unmarried, patients experiencing side effects, persistent coughing and weight gain at the time of the study (Rahul 2015).

Another study carried out at a DOT Centre in Nigeria to assess depression comorbidity among patients with tuberculosis in a university teaching hospital found the prevalence of depression to be 27.7% of which 21.5% had mild depression and 6.2% had moderate depression. The clinical factor of persistent cough was significantly associated with depression on the PHQ-9 (p=0.04) among 65 patients in that study (Issa et al. 2009).

A cross sectional study carried out in a district and regional hospital in Cameroon in 2015 on 265 patients with pulmonary tuberculosis using the PHQ-9 found a prevalence of depression of 61.1 % (95 % CI: 55.1–66.8); a significant proportion (36.6 %) had mild depression and 24.5 % had moderate depression. This study included both in and out-patients (Kehbila et al. 2016). In another cross sectional study carried out in South Ethiopia using the Hospital Anxiety and Depression Scale on 417 patients at a University Hospital and a Health Center, prevalence of depression was found at 43.4 % (Duko et al. 2015).
In yet another study conducted in Tanzania on 390 participants using the same instrument, PHQ-9, the prevalence of depression in TB patients who were HIV negative was found to be 46.9% with 33.6% having mild depression and 13.3% having moderate depression. This study also found that being in the intensive phase of treatment was associated with mild and moderate depression. However, this study excluded patients with HIV/AIDS (Buberwa, 2013).

2.3 Factors associated with depression in patients with tuberculosis

**Biological / clinical factors**

Clinical factors like phase of TB treatment and category of treatment are associated with depressive illness in patients with tuberculosis (Kehbila et al. 2016). A study conducted in Turkey to assess comorbidity of depression / anxiety in 157 male in-patients with TB or COPD using the CIDI showed the following prevalence of depression; 19% for recently diagnosed TB patients, 21.6% for TB patients who defaulted treatment, 25.6% for those who had multidrug-resistant TB and 47.3% in patients with chronic obstructive pulmonary disease (COPD) (Aydin et al. 2001). Family history of mental illness was also found to be independently associated with depressive illness in this population. Patients with family history are about 2.5 times more likely to be depressed than those without family history (Kehbila et al. 2016). This could be due to the fact that depression has genetic predisposition in its etiology. Twin studies have pointed to the fact that genetics explain about 50-70% of the etiology of mood disorders like depression (Saddock and Saddock 2011).

TB/HIV co-infection lowers the patients’ quality of life in social, economic and physical domains hence also contributing to these patients developing psychological distress and other psychiatric disorders like depression and poor physical health generally. Khebila et al in a study done in Southwest region of Cameroon and Deribew et al in a study conducted in Ethiopia showed that the comorbidity of TB and HIV increases the odds of developing common mental disorders like depression by 1.7 compared to patients with HIV alone and by 2.5 as compared to those with tuberculosis alone (Kehbila et al. 2016, Deribew et al. 2010). TB/HIV co-infected patients can be at higher risk of common mental disorders as a result of stigma and discrimination by the society (Duko et al. 2015). Some disease processes like HIV and tuberculosis directly affect the
brain and can cause brain damage leading to cognitive impairment and mood disorders like depressive illnesses. (Prince et al. 2007).

**Psychological factors**
An increase in the number of tuberculosis symptoms reported by the patients, illness appraisal and feeling of loss of independence over one’s health are some psychological factors that are associated with depression in patients with tuberculosis. A Pakistan study among 108 patients with TB showed that raised depression and anxiety scores were associated with the above mentioned factors (Husain et al. 2008). In a study done in South Ethiopia, patients with perceived stigma as a result of having tuberculosis were more likely to have low self-image and be socially withdrawn making them about 11 times more prone to depressive illness than their counter parts without perceived stigma (Duko et al. 2015). Chronic diseases like tuberculosis create a psychological burden due to factors like the acute trauma of the diagnosis, difficulty of living with the disease, fear of infecting one’s immediate contacts, threat of decline in function and shortened life-span in addition to the complicated therapeutic regimens (Prince et al. 2007).

**Social factors**
Socio-demographic factors like being a widow(er) or single, unemployment, being accompanied to hospital for treatment and a clinical factor (persistent cough) also increase the comorbidity of TB and depression as shown by a prevalence study in Nigeria amongst 105 TB patients (Issa et al. 2009, Aniebue et al. 2007). Increasing age was reported as a significant factor in developing depressive illness. A study in south Ethiopia showed that for every 14 years increase in age, the risk of having depression increased by 19.0% (95%CI = 1.06, 1.33) (Ambaw et al. 2017). Being female was also shown to be associated with a higher prevalence of depressive illness in patients with TB (38.5% vs. 22.6%). This has been attributed to the association between female hormonal factors and depression (Ambaw et al. 2017, Kehbila et al. 2016). Poor social support among patients with tuberculosis was independently associated with depressive illness in a study done in South Ethiopia (Ambaw et al. 2017, Duko et al. 2015). Patients with TB voluntarily separate themselves from their family for fear and guilt of spreading infection to other members. The impact of stigma reported has led to divorce, cancellation of impending marriages, breakdown of family
relationships and also isolation within the family. Stigma also negatively impacts the patient in accessing healthcare facilities in their neighborhood (Thomas et al. 2016).

The level of education also has significant bearing on the comorbidity because through education one can have access to a wide range of health advancing resources, like higher incomes (better jobs), higher prestige, hence better (mental) health outcomes (Ambaw et al. 2017, Berchick et al. 2012).

2.4 Effect of this comorbidity on TB treatment

Mental disorders like depression can delay help-seeking, reduce the likelihood of detection and diagnosis of other health conditions like TB (Rukundo, 2016). This results in patients with depression to have diminished health related quality of life (Rapaport et al. 2005). Mental disorders especially depression cause long term disability and dependency and this affects how these patients will adhere to their medications for tuberculosis treatment (Prince et al. 2007).

A multicenter study carried out in South Africa, Zimbabwe, Zambia and Tanzania to determine psychological distress in 1502 patients using the Kessler-10 revealed that patients who had been coughing for at least two weeks prior to presenting to the clinic (n = 1402) and are hence likely to have transmitted more disease experienced a delay in seeking care. These patients had higher psychological distress than those who had not had a cough for at least two weeks (n = 100) [K-10 score of 22 (15–29) vs. 13 (11.75–17.25); p = 0.0002] (Theron et al. 2015). In South Africa, another study done among 166 TB patients showed psychosocial factors that had a negative influence on adherence to the Directly Observed Therapy (DOT) program were feelings of helplessness (10.9%), depression (64.3%), and inadequate social support (Naidoo et al. 2010).

HIV-infection and heavy alcohol usage were also associated with a delay in seeking care especially amongst patients with culture-confirmed TB. These patients were more likely to experience social marginalization and have side effects from their anti-TB medication which may further worsen non-adherence (Theron et al. 2015). Many of these patients turn to alcohol as a way of coping with the psychological effects of tuberculosis like depression, stigma and anxiety only to end up with poor treatment outcomes (Thomas et al. 2016).
A systematic review done in South Africa showed that adherence in patients with tuberculosis is also affected by family pressure, insufficient social support, a fear of disclosure which are all present in patients with a dual diagnosis of tuberculosis and depressive illnesses (Kastien-Hilka et al. 2016). Non-adherence was related to poverty, HIV co-infection, stigmatization, an unsupportive social and work environment, and feelings of helplessness and hopelessness (Naidoo et al. 2009).

Some drugs used in treatment of especially MDRTB like Cycloserine, Ethambutol, Isoniazid and Ethionamide are associated with psychiatric side effects like depression, psychosis and anxiety which adds on the psychological distress of these patients and further worsens their adherence to medication and hence treatment outcome (Thomas et al. 2016).
CHAPTER THREE: METHODS

3.1 Study design

This was a cross-sectional study.

3.2 Study site and setting

The study was carried out at the TB clinic also known as the National Tuberculosis and Leprosy Programme (NTLP) clinic at Mulago Hospital in Kampala. The NTLP clinic at Mulago Hospital serves as both the national referral center (approximately one-third of patients are referred) and the largest TB treatment clinic in Kampala, the capital city of Uganda. This is a predominantly urban area with 25% of all TB cases that are reported to the NTLP each year. The clinic has an average of 400 patients per quarter of a year and it runs five working days. The clinic runs from 7:00am to about 3:00 pm. Monday, Wednesday and Thursday are for handling susceptible (not drug resistant) TB cases. Tuesday is for MDR-TB cases and Friday deals with TB/HIV comorbid patients. On average per day there are 30-40 susceptible cases, 30-40 MDR-TB cases and 40-50 TB/HIV cases on the respective clinic days.

3.3 Study participants

Target population; these were patients with TB in Uganda.

Accessible population; these were patients with TB attending the TB clinic during the study period.

Study sample population; these were patients with TB attending the TB clinic during the study period who met the eligibility criteria.

Study unit; this was an individual patient who fulfilled the eligibility criteria and consented to participate in the study.

3.4 Selection criteria

- **Inclusion criteria**
  
  All patients aged 18 years and above with TB attending TB clinic and who had consented to participant in the study.
  
  TB cases by clinical diagnosis, sputum analysis using Ziehl Neelsen (ZN) stain or Genexpert, abdominal ultrasound, x-ray and tissue biopsy.

- **Exclusion criteria**
  
  We excluded two participants because we were unable to communicate effectively with them.
3.5 Sample size estimation

The sample size for objective one was calculated using the Leslie Kish formula for cross-sectional studies (Leslie Kish, 1965) as follows:

\[ n = \frac{Z^2 \times (p)(1-p)}{e^2} \]

Where; \( n \) = sample size.

\( Z \) is a factor to guarantee distribution that is 1.96
\( e \) is sampling error.

\( p \) is a prevalence from a previous study closest to this setting.

The closest to this setting was 27.7% (Issa et al. 2009) from a study conducted at an outpatient clinic at a teaching hospital in Nigeria on depression comorbidity among patients with tuberculosis.

\( N = 308 \) participants.

The sample size for the second objective was calculated using the A-priori formula (Hulley et al. 2013) for associated factors as follows;

\[ N = \left\lfloor \frac{\left\{ Z_\alpha \sqrt{P(1-P)(1/q_1 \cdot 1/q_2)} \right\} \cdot \left\{ Z_\beta \sqrt{P_1(1-P_1)1/q_1 \cdot P_2(1-P_2)1/q_2} \right\}^2 }{ (P_1-P_2)^2 } \right\rfloor \]

\( P = p_1q_1 \cdot p_2q_2 \)

Using a study by Kehbila et al. 2016 done in Southwest region of Cameroon. Treatment status was used for the calculation.

\( P_1 \) is proportion of new TB cases with depression; 55.4%
\( P_2 \) is proportion of retreatment cases with depression; 36.1%
\( q_1 \) is proportion of new cases in the study; 63.6%
\( q_2 \) is proportion of retreatment cases in the study

\( Z_\alpha \) is a factor to guarantee distribution; 1.96
\( Z_\beta \) is the power of the study; 0.84

\( N = 223 \)

Hence I used the sample size of 308 which was bigger than 223 to capture an appropriate sample for both study objectives.

3.6 Sampling method

Participants for the study were recruited using the consecutive sampling method where every accessible participant who met the selection criteria was included in the study. Data was collected from an average of 10 participants per day for the 5 days that the clinic runs and this was done over a period of 6 weeks.
3.7 Study variables

**Dependent variable:** depressive illness in patients with TB as assessed with the PHQ-9 and the Mini Neuropsychiatric Interview (MINI) 6.0.0.

**Independent variables:** socio-demographic factors included; age, sex, employment status, education level, marital status, and biological/clinical factors included; type of TB, category of treatment, phase of TB treatment, family history of depression, substance use and HIV/AIDS.

3.8 Research instruments

**Socio demographic questionnaire**
A researcher-designed questionnaire was administered to record information on participants’ age, sex, educational level, marital status, and employment status. The following Tuberculosis disease characteristics were assessed; phase of TB treatment (e.g. intensive or continuation phase), TB treatment category (category I which included all non-drug resistant TB cases regardless of previous treatment outcome and category II which included drug resistant TB cases), HIV status, Antiretroviral Therapy (ART) regimen and type of TB (pulmonary or extra pulmonary or both). Patients’ TB cards and medical files were also used to obtain some of this information. Family history of mental illness and substance use history in the past three months were also assessed.

**The Mini Neuropsychiatric Interview (MINI)**
Depressive morbidity was measured using the MINI which is a short structured diagnostic interview which was developed for the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) and International Classification of Diseases (ICD) by psychiatrists and clinicians in the United States and Europe. Its average administration time is 15 minutes. It had a specificity of 0.88 and a sensitivity of 0.96 for major depressive episode when tested against the Structured Clinical Interview for DSM-III-R Patients (SCID-P) for a study done in Paris and Florida (Sheehan et al 1997). The MINI has been used in various studies in Uganda including a study by Abbo et al. (2009) which assessed the prevalence and severity of mental illness handled by traditional healers in two districts in Uganda. It was also used by Kinyanda et al. (2016) in the study on incidence and persistence of depression in HIV in Uganda.

**The Patient Health Questionnaire-9 (PHQ-9)**
The PHQ-9 was administered to all patients to rate the severity of their depressive symptoms. The PHQ-9 was developed by Spitzer et al. (1999). It is a questionnaire for primary care and
developed according to DSM-IV diagnostic criteria based on the 9 depressive symptoms (Bian et al. 2011). It has been validated in the African setting for instance, when used in Nigeria on university students the internal consistency (Cronbach’s α coefficient) of each item in the PHQ-9 was 0.85, and it had a good test-retest reliability over a one month interval (P < 0.001) (Adewuya et al. 2006). It has also been validated in the Ugandan setting as a screening instrument in 368 persons living with HIV/AIDS. In this study, the PHQ-9 had a sensitivity of 91.6% and specificity of 81.2% using the MINI as the gold standard (Akena et al. 2013).

3.9 Study procedure

With the help of the two research assistants, on a given day the participants’ TB cards were reviewed to see whether a given patient met the inclusion criteria of the study. The participant would then be approached and the purpose of the study explained to him/her. Written informed consent would be sought from the participant by the PI or research assistants. In a private room with adequate aeration, a participant who consented to the study would have the questionnaires administered to her/him by the Principal Investigator or the Research Assistants. The sociodemographic questionnaire was administered first followed by the MINI which was used to diagnose depressive illness. Then the participant would have the PHQ-9 administered to them to rate the severity of depressive illness. All participants had the 3 questionnaires administered to them. The interview for a given participant would be halted in case that participant’s turn for a service at the clinic reached before the interview was completed. The interview would resume after that patient received that service and was waiting for the next service at the clinic. The medical records (TB cards and files) of the patient would be reviewed for more information. The patient would be thanked for their time and helped to get their next service for the visit.

3.10 Data management and analysis

Data was entered using Epi-Data and analyzed using the statistical package for social sciences (SPSS). Data was analyzed in three phases. First, descriptive analysis was done for the associated factors which included demographic factors like age, sex, employment status, education level, marital status and clinical plus psychosocial factors. Secondly simple logistic regression analysis was done to determine bi-variate association between the predictor variables and depressive illness and thirdly multivariate logistic regression was done to determine the independent predictors of depressive illness in patients with TB.
3.11 Quality control

- Internal validity was ensured through training of the research assistants who were psychiatric nurses. The training focused on the purpose of the study, familiarization with data collection tools and practical skills sessions on how to administer the study instrument. The research assistants were trained for one week.
- The questionnaires were translated from English to Luganda language by a linguistic scholar.
- The questionnaires were pre-tested at the study site on a sample of 10 participants who were not part of the main sample and subsequent modifications were made.
- Clinical notes and referral letters were also reviewed to confirm the details given by patients.
- A statistician was consulted throughout the study including proposal development.
- Infection control was taught to the research assistants and N-95 respirators were provided for them and the PI by the staff of the TB unit.

3.12 Data safety

All data collection was confidential with strict observance and respect of participants’ privacy. Unique study identification numbers were used in place of the participants’ names. Each completed questionnaire was examined for completeness by the Principal Investigator. An electronic data base was created from the raw data for easier accessibility and safe storage of the data. Double entry was conducted to minimize entry errors. All collected data was stored under lock and key at the study site. The data in the computer was secured with a password only known to the Principal Investigator.

3.13 Ethics

Ethical approval was sought from Mulago Hospital Research and Ethics Committee, the School of Medicine Research and Ethics Committee at Makerere University and the Uganda National Council of Science and Technology.

Written informed consent was obtained from every study participant. The consent forms were translated into Luganda the spoken local language of many participants. The consent forms were read to subjects who could not read in the presence of a witness. The witness was the caretaker of the patient who was able to read and write.
All consenting participants signed the consent forms and individuals who were illiterate would signify consent by use of a thumb print, witnessed by a relative or caregiver of that participant. Participants who declined consent were not prejudicially treated and all their care was uninterrupted.

Participants with depressive illness obtained psychiatric management by the Principal Investigator or were referred to the mental health unit at Mulago Hospital.

3.14 Utility and dissemination
The results of this study have been prepared in a report to be submitted as a dissertation for the award of Master of Medicine degree in Psychiatry. A copy will be kept at the Department of Psychiatry library, Mulago Hospital Tuberculosis Clinic, College of Health Sciences Makerere University Albert Cook Library, Uganda National Council of Science and Technology as well as the Ministry of Health. Papers will be prepared for presentation at conferences. A manuscript will also be prepared from this research for publication in a peer reviewed journal.
CHAPTER FOUR: RESULTS

4.1 Socio-demographic characteristics of the study participants

We collected data from a total of 308 participants aged 18 years and above with TB. Most of the participants were male (61.24%). The mean age of the participants was 36 (SD±10.8). One hundred and thirty-seven (44.63%) were either married or cohabiting and more than half (58.63%) were residents of Kampala. Other characteristics of the study participants are summarized in Table 1(below).
Table 1: Socio-demographic characteristics of the study participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (n=308)</th>
<th>Proportions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>188</td>
<td>61.24</td>
</tr>
<tr>
<td>Female</td>
<td>120</td>
<td>38.76</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;30</td>
<td>97</td>
<td>31.27</td>
</tr>
<tr>
<td>30-50</td>
<td>183</td>
<td>59.61</td>
</tr>
<tr>
<td>&gt;50</td>
<td>28</td>
<td>9.12</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/ Co-habiting</td>
<td>137</td>
<td>44.48</td>
</tr>
<tr>
<td>Never married</td>
<td>73</td>
<td>23.7</td>
</tr>
<tr>
<td>Widowed</td>
<td>20</td>
<td>6.49</td>
</tr>
<tr>
<td>Separated/ divorced</td>
<td>78</td>
<td>25.32</td>
</tr>
<tr>
<td><strong>District of Residence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kampala</td>
<td>181</td>
<td>58.63</td>
</tr>
<tr>
<td>Wakiso</td>
<td>77</td>
<td>25.08</td>
</tr>
<tr>
<td>Others</td>
<td>50</td>
<td>16.29</td>
</tr>
<tr>
<td><strong>Tribe</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muganda</td>
<td>181</td>
<td>58.63</td>
</tr>
<tr>
<td>Munyankole</td>
<td>30</td>
<td>9.77</td>
</tr>
<tr>
<td>Musoga</td>
<td>13</td>
<td>4.23</td>
</tr>
<tr>
<td>Other</td>
<td>84</td>
<td>27.36</td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>14</td>
<td>4.56</td>
</tr>
<tr>
<td>Primary</td>
<td>135</td>
<td>43.97</td>
</tr>
<tr>
<td>Secondary</td>
<td>123</td>
<td>39.74</td>
</tr>
<tr>
<td>University/Technical</td>
<td>36</td>
<td>11.73</td>
</tr>
<tr>
<td><strong>Employment Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>185</td>
<td>60.26</td>
</tr>
<tr>
<td>No formal employment</td>
<td>49</td>
<td>15.64</td>
</tr>
<tr>
<td>Unemployed</td>
<td>74</td>
<td>24.10</td>
</tr>
</tbody>
</table>

The *no formal employment* category included housewives and casual laborers.

The *unemployed* category included students and all those who did any unpaid work at home.
4.2 Biological/ clinical characteristics of study participants.

Out of the 178 participants who were HIV sero positive, 172 (96.6%) were on ART and 6 (3.4%) were on cotrimoxazole only. One hundred fifty (86.71%) were on Lamivudine/ Tenofovir/ Efavirenz (3TC/TDF/EFV) while the remainder were on other combinations. These and other biological / clinical characteristics are presented in Table 2 (below).

**Table 2: Biological/ clinical characteristics of the study participants**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency (n=308)</th>
<th>Proportions (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>126</td>
<td>40.91</td>
</tr>
<tr>
<td>Positive</td>
<td>178</td>
<td>57.79</td>
</tr>
<tr>
<td>Unknown</td>
<td>4</td>
<td>1.30</td>
</tr>
<tr>
<td>Type of TB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra-pulmonary</td>
<td>55</td>
<td>17.92</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>244</td>
<td>79.15</td>
</tr>
<tr>
<td>Both</td>
<td>9</td>
<td>2.93</td>
</tr>
<tr>
<td>Category of TB treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; line</td>
<td>244</td>
<td>79.15</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; line</td>
<td>64</td>
<td>20.85</td>
</tr>
<tr>
<td>Phase of TB treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuation phase</td>
<td>227</td>
<td>73.94</td>
</tr>
<tr>
<td>Intensive phase</td>
<td>81</td>
<td>26.06</td>
</tr>
<tr>
<td>Ever missed Anti-TB medication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>233</td>
<td>75.65</td>
</tr>
<tr>
<td>≤ 1 Week</td>
<td>49</td>
<td>15.91</td>
</tr>
<tr>
<td>&gt;1 Week</td>
<td>26</td>
<td>8.44</td>
</tr>
<tr>
<td>Family history of depression</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>286</td>
<td>92.83</td>
</tr>
<tr>
<td>Yes</td>
<td>22</td>
<td>7.17</td>
</tr>
<tr>
<td>Used any drug of abuse/substance in the last 3 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>272</td>
<td>88.31</td>
</tr>
<tr>
<td>Alcohol</td>
<td>31</td>
<td>10.06</td>
</tr>
<tr>
<td>Alcohol, Marijuana</td>
<td>1</td>
<td>0.32</td>
</tr>
<tr>
<td>Alcohol, Cigarettes</td>
<td>2</td>
<td>0.65</td>
</tr>
<tr>
<td>Cigarettes</td>
<td>1</td>
<td>0.32</td>
</tr>
<tr>
<td>Tobacco</td>
<td>1</td>
<td>0.32</td>
</tr>
</tbody>
</table>
4.3 Prevalence of depressive illness

The prevalence of depressive illness was 23.7% (95% confidence interval 19.32 - 28.89) using the MINI. On the PHQ-9, the prevalence of depressive illness was 34.4% (95% confidence interval 29.29-39.93).

Out of the 73 participants who had current depressive disorder, 14 (19.18%) (95% confidence interval 11.56-30.12) had recurrent depressive episodes.

The severity of depressive illness for participants who were diagnosed with the MINI was rated on the PHQ-9 and found as shown in figure 1 below.

Figure 2: Severity of depression among the participants who had depressive illness on the MINI
4.4 Factors associated with the depressive illness among participants with TB in bivariate analysis.

4.4.1 Social factors

Among the social factors; sex, age, marital status, employment and education level were associated with the major depressive disorder as shown in Table 3(below).

**Table 3: Social factors associated with depressive illness among participants with TB**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Normal (n=235)</th>
<th>Depressed (n=73)</th>
<th>OR (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>152(64.96)</td>
<td>36(49.32)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>83(35.04)</td>
<td>37(50.68)</td>
<td>1.91(1.11-3.24)</td>
<td>0.017</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;50</td>
<td>15(6.41)</td>
<td>13(17.81)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>30-50</td>
<td>147(62.82)</td>
<td>36(49.32)</td>
<td>0.28(0.12-0.64)</td>
<td>0.003</td>
</tr>
<tr>
<td>&lt;30</td>
<td>73(30.77)</td>
<td>24(32.88)</td>
<td>0.38(0.16-0.92)</td>
<td>0.32</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/Cohabiting</td>
<td>112(47.86)</td>
<td>25(34.25)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Separated/Divorced/Widowed/single</td>
<td>123(52.14)</td>
<td>48(65.75)</td>
<td>1.76(1.02-3.05)</td>
<td>0.042</td>
</tr>
<tr>
<td><strong>Education Level</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None/ Primary</td>
<td>103(44.02)</td>
<td>46(63.01)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Secondary/University/Technical</td>
<td>132(55.98)</td>
<td>27(36.99)</td>
<td>0.46(0.27-0.79)</td>
<td>0.005</td>
</tr>
<tr>
<td><strong>Employment Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>149(63.68)</td>
<td>36(49.32)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>No Formal Employment</td>
<td>33(13.68)</td>
<td>16(21.92)</td>
<td>2.06(1.03-4.18)</td>
<td>0.042</td>
</tr>
<tr>
<td>Unemployed</td>
<td>53(22.65)</td>
<td>21(28.77)</td>
<td>1.63(0.88-3.05)</td>
<td>0.120</td>
</tr>
</tbody>
</table>
4.4.2 Biological/ clinical factors

Among the biological/ clinical characteristics; phase of TB treatment and family history of depression were associated with depressive illness among patients with TB as shown in Table 4(below).

Table 4: Biological/ clinical characteristics associated with depressive illness among patients with TB

<table>
<thead>
<tr>
<th>Variables</th>
<th>Normal (n=235)</th>
<th>Depressed (n=73)</th>
<th>OR(95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>98(41.88)</td>
<td>28(38.26)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>134(56.84)</td>
<td>44(60.27)</td>
<td>1.16(0.67-1.99)</td>
<td>0.595</td>
</tr>
<tr>
<td>Unknown</td>
<td>3(1.28)</td>
<td>1(1.37)</td>
<td>1.17(0.11-11.66)</td>
<td>0.896</td>
</tr>
<tr>
<td>Type of TB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra-pulmonary</td>
<td>39(16.67)</td>
<td>16(21.92)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pulmonary</td>
<td>187(79.49)</td>
<td>57(78.08)</td>
<td>0.74(0.38-1.42)</td>
<td>0.373</td>
</tr>
<tr>
<td>Both</td>
<td>9(3.85)</td>
<td>0(0)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Category of TB treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st line</td>
<td>190(80.77)</td>
<td>54(73.97)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2nd line</td>
<td>45(19.23)</td>
<td>19(26.03)</td>
<td>1.47(0.79-2.73)</td>
<td>0.214</td>
</tr>
<tr>
<td>Phase of TB treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuation phase</td>
<td>181(77.35)</td>
<td>46(63.01)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Intensive phase</td>
<td>54(22.65)</td>
<td>27(36.99)</td>
<td>2.00(1.13-3.53)</td>
<td>0.016</td>
</tr>
<tr>
<td>Ever missed your Anti-TB medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NO</td>
<td>177(75.32)</td>
<td>56(76.71)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>≤ 1 Week</td>
<td>39(16.60)</td>
<td>10(13.70)</td>
<td>0.81(0.38-1.73)</td>
<td>0.586</td>
</tr>
<tr>
<td>&gt; 1 Week</td>
<td>19(8.09)</td>
<td>7(9.59)</td>
<td>1.16(0.49-2.91)</td>
<td>0.745</td>
</tr>
<tr>
<td>Family history of depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>224(95.30)</td>
<td>62(84.93)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11(4.70)</td>
<td>11(15.07)</td>
<td>3.60(1.49-8.68)</td>
<td>0.004</td>
</tr>
<tr>
<td>Drug abuse/substance in the last 3 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>209(88.89)</td>
<td>63(86.30)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>26(11.11)</td>
<td>10(13.70)</td>
<td>1.26(0.58-2.77)</td>
<td>0.549</td>
</tr>
</tbody>
</table>
4.5 Multivariate analysis for the factors associated with depressive illness among patients with TB

All factors which had a p-value less than 0.2 in bivariate analysis were considered for the multivariate analysis.

Level of education, phase of TB treatment and Family history of Depression were significantly associated with depressive illness among patients with TB as shown in Table 5 (below).

### Table 5: multivariate logistic regression analysis for the factors associated with depressive illness among the patients with TB

<table>
<thead>
<tr>
<th>Variables</th>
<th>Adjusted Odds Ratio</th>
<th>[95% CI]</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>1.692</td>
<td>(0.93-3.09)</td>
<td>0.083</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;50</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-50</td>
<td>0.527</td>
<td>(0.26-1.09)</td>
<td>0.063</td>
</tr>
<tr>
<td>&lt;30</td>
<td>1.739</td>
<td>0.38(0.64-4.98)</td>
<td>0.260</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married/Cohabiting</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated/Divorced/Widowed/single</td>
<td>1.466</td>
<td>(0.81-2.67)</td>
<td>0.210</td>
</tr>
<tr>
<td>Education Level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None/ Primary</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary/ University/Technical</td>
<td>0.391</td>
<td>(0.21-0.72)</td>
<td>0.003</td>
</tr>
<tr>
<td>Phase of TB treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuation phase</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensive phase</td>
<td>2.344</td>
<td>(1.26-4.33)</td>
<td>0.007</td>
</tr>
<tr>
<td>Family history of depression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>5.422</td>
<td>(2.02-14.54)</td>
<td>0.001</td>
</tr>
</tbody>
</table>
Patients whose education level was secondary or tertiary were less likely to have depressive illness as compared with those whose education level was none or primary (AOR: 0.391, 95% CI: 0.21-0.72, P-value=0.003). Patients in Intensive Phase of TB treatment were more likely to have depressive illness as compared with those on the Continuation phase of TB treatment (AOR: 2.344, 95% CI: 1.26-4.33, P-value=0.007). Those with Family history of depression were more likely to have depressive illness as compared with those without Family history of depression (AOR: 5.422, 95% CI: 2.02-14.54, P-value=0.001).
CHAPTER FIVE: DISCUSSION

5.1 The prevalence of depressive illness among patients with TB

This study set out to determine the prevalence of depressive illness among patients with TB in Mulago Hospital as well as the demographic, social and clinical factors that are associated with depressive illness in these patients. The prevalence of depressive illness was found to be 23.7%. This suggests a high burden of depressive illness among patients with TB as compared to a prevalence of 5.2 – 12.9% in the general population (Grace Y.Lim 2018, Ohayon 2006). This figure includes patients with major depressive episodes and patients with dysthymia. This prevalence was lower than many other studies like in the study by Duko et al (2015) in South Ethiopia which found a prevalence of 43.4%. This is possibly due to the use of a diagnostic tool (MINI) in this study as compared to screening tools (PHQ-9 and the hospital anxiety and depression scale) used in other studies. For instance the following studies screened for depression using the PHQ-9 and the Hospital Anxiety and Depression Scale respectively and found the following figures; 61.1 % (95 % CI: 55.1–66.8) in Cameroon (Kehbila et al 2016), 43.4 % in South Ethiopia (Duko et al 2015).

5.2 Factors associated with depressive illness among patients with TB.

Depressive illness was more prevalent among female participants. Females were almost twice more likely to be depressed than males. Similar findings are reflected in a study by Khebila et al in 2016 where females were three times more likely to be depressed than males. In another study in South Ethiopia by Duko et al (2015), females were 72 % more likely to be depressed. The association between depressive illness and females could possibly be due to female hormones like estrogen and also social roles of women in society (Ahuja 2011, Prince et al 2007). Older age is often associated with more depression as was found in this study. Being above 50 years was associated with more depressive illness compared to being aged between 30-50 years which was protective for depressive illness. These results are in agreement with those from a study at a DOT centre in India by Basu et al (2012) and from a study by Ige et al (2011) at a tertiary care hospital in Nigeria which showed that the elderly were more likely to be depressed. Research has shown that for every 14 years increase in age, one’s risk of having depression increases by 19.0 % (95%CI=1.06, 1.33). However reasons for this are not clear (Ambaw et al 2017).
Being separated, divorced or widowed showed two times higher chances of having depressive illness. This is similar to results from a study by Ige et al (2011) in Nigeria which showed that unmarried participants were more likely to be depressed. This could be due to reduced social support in the face of a chronic illness like tuberculosis (Duko et al 2015).

Participants with lower level of education were more likely to have depressive illness than their counterparts with higher education. This is in agreement with results from a study by Khebila et al (2016) in the Southwest region of Cameroon which showed that depression was more common among people with low education attainment. Higher level of education leads to better income and access to a wide range of health services, hence better (mental) health outcomes (Ambaw et al 2017, Berchick et al 2012). Level of education was independently associated with depressive illness even at multivariate analysis.

Participants with no formal employment were twice more likely to have depressive illness than those with employment and unemployed. Unemployment affects one’s socio-economic status and this increases the individual’s risk of having depressive illness. Similar findings are reflected in the study carried out by Issa et al (2009) at a University teaching hospital outpatient clinic in Nigeria. Low socio-economic status has been implicated in many studies as a risk factor for depression (Aghanwa & Erhabor 1998).

In this study, patients with a family history of depression were about four times more likely to be depressed at the bivariate analysis. At the multivariate analysis, family history of depressive illness was associated with depressive illness. This agrees with findings from Kehbila et al (2016) in a study in Southwest region of Cameroon where family history of mental illness increased chances of being depressed in TB patients. This could be attributed to the association between genetics and depressive illness (Ahuja 2011, Akhtar-Danesh et al 2007). These findings also support the possible bi-direction relationship between depressive illness and TB. The psychological distress of having TB affects the individual’s body image, self-esteem, and relationships, and causes a sense of loss to the person in various spheres of life (Mikkelsen et al. 2004). Depression also increases the severity of symptoms of physical illness (APA, 2013).

Being in the intensive phase of treatment doubled the chances of a person having depressive illness. This association was statistically significant even at multivariate analysis. This could be due to the fact that the symptoms of tuberculosis tend to be prominent in the intensive phase compared to the continuation phase of TB treatment (Mikkelsen et al. 2004). It is probable that the coughing, chest
pain, night sweats and fevers affect an individual’s quality of life in terms of sleep, appetite and self-esteem hence more chances of one being depressed. However depression can also increase the severity of physical symptoms of TB (APA 2013, Ambaw et al 2017).

Co-morbidity with HIV/AIDS was not significantly associated with depressive illness in contrast to studies by Kehbila et al (2016), Duko et al (2015) and Ambaw et al (2017) which have all shown a significant association between TB and HIV/AIDS comorbidity with depressive illness. In the Uganda setting where we have a high TB load within the population as evidenced by the fact that about 41% of our patients with TB were HIV sero-negative, one does not necessarily have to be HIV sero-positive to contract TB. Studies that have reported a significant association between the TB/HIV coinfection and depression had a relatively low percentage of patients without HIV compared to those with HIV. A study by Duko et al (2015) had 11.8% HIV positive compared to 88.2% HIV negative, while in that by Ambaw et al (2017) only 11.4% were HIV positive compared to 74.4% negative and 12.2% unknown. The high number of HIV negative participants could have resulted in the TB/HIV comorbidity not being significantly associated with depressive illness in this study.

5.3 Limitations of the study
This study was cross-sectional in design; therefore, directionality of causation between depressive illness and TB could not be determined. Further longitudinal studies are required to examine directions of causality in associations between TB and Depressive illness.

This was a hospital based sample which is not representative of the community hence the results may not be generalized to the community population.

Data was collected over a short period of only six weeks hence the study participants were not well distributed across the calendar year.

5.4 Conclusion
The prevalence of depressive illness in patients with TB is high and is associated with low education level, being in the intensive phase of TB treatment and family history of depressive illness.
5.5 Recommendations
Mental illnesses like depression should be routinely screened and managed among patients with chronic physical illnesses like TB. This can be achieved through regular training of hospital staff about common mental illnesses like depression to enable them screen for these disorders and manage the minor cases but refer the severe ones.
REFERENCES


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Patten, S.B. (2001). Long-term medical conditions and major depression in a Canadian population study at waves 1 and 2. *Journal of Affective Disorders*, 63(1-3), 35-41


APPENDICES

APPENDIX I: INFORMED CONSENT FORM

PREVALENCE AND FACTORS ASSOCIATED WITH DEPRESSIVE ILLNESS IN PATIENTS WITH TUBERCULOSIS IN MULAGO HOSPITAL.

I am representing Dr. Alinaitwe Racheal MMED (psychiatry) who is conducting a study to determine prevalence and factors associated with depressive illness in patients with tuberculosis in Mulago Hospital.

You are being asked to be part of the study because having tuberculosis puts at risk of developing emotional problems like depression.

**Study procedure**

On accepting to participate, you will be asked questions about your illness, the duration of symptoms and the medication you are on. The interview will take about 40 minutes and your responses will be recorded on the questionnaires and information kept confidential. No unauthorized person will access it. After the interview you will be aided in getting your remaining services at the clinic.

The findings of this study will help policy makers in the Ministry of Health to plan better strategies for management including developing interventions aimed at reducing the burden of depression in patients with tuberculosis.

There is no potential health risk to you except for a little of your time which will be utilized to answer the questions and any concerns you have will be handled accordingly.

Participation in the study is voluntary and you are free not to take part or to opt out of the study at any point in time. Your refusal will not alter your treatment in this or any other hospital. If you accept to take part in this study, you will be required to sign or thumbprint on the form.

If you have any questions concerning the study please contact Dr. Alinaitwe Racheal, 0752154527/0775644944,rarukiri@gmail.com, Makerere University College of Health Sciences, Department of Psychiatry OR send information through the in-charge of the TB clinic, OR contact the Ethical Committee chairperson of the School of Medicine Research and Ethics Committee, Makerere University, Associate Professor Ponsiano Ocama on 0772421190/0414533541.
STATEMENT OF CONSENT

……………………………………has described to me what is going to be done, the risks and benefits involved and my rights regarding this study. I understand that my decision to participate in this study will not alter my usual medical care. In the use of this information, my identity will be concealed. I am aware that I may withdraw at any time. I understand that by signing this form I do not waive any of my legal rights but merely indicate that I have been informed about the study in which I am voluntarily agreeing to participate. A copy of this form will be provided to me.

Name……………………………….. Signature of participant ………………. Date ……………..
Name……………………………….. Signature of interviewer ……………….. Date …………

[Stamp: Makerere University School of Medicine, Research & Ethics Committee, Approved until 12 Apr 2018]
SOCIODEMOGRAPHIC QUESTIONNAIRE

1. Study number
2. Sex a) Male  b) Female
3. Age in years
4. Address, village and district
5. Tribe
6. Education level; i) No formal education  ii) P1-P7  iii) S1-S6  iv) Technical  v) University
8. Employment status; i) employed (specify) ii) retired iii) peasant farmer iv) housewife v) student vi) unemployed v) other (specify)
9. What is your HIV status; a) Negative  b) Positive  c) unknown
10. If POSITIVE, are you on ARVs; a) Yes  b) No
11. If YES, which combination and for how long
12. Confirmation of TB; a) x-ray  b) Z N test  c) Genexpert d) abdominal ultrasound  e) tissue biopsy  f) clinical
13. Type of TB;  a) Pulmonary  b) Extra-pulmonary  c) Both
14. Category of TB treatment; a) Category I  b) Category II  c) Category III  d) Category IV
15. Which phase of TB treatment is the patient? a) intensive phase  b) continuation phase
16. Anti-TB medication currently used
17. For how long have you been on these Anti-TB medications?
18. Have you ever missed your Anti-TB medication; a) No  b) Yes
19. If YES, for how long
20. Any one in your family who has ever suffered from depression? a) No  b) Yes
21. Have you used any drug of abuse/substance in the last 3 months? a) No  b) Yes
22. If YES, specify
APPENDIX II: STUDY INSTRUMENTS

The MINI

GENERAL INSTRUCTIONS

The M.I.N.I. was designed as a brief structured interview for the major Axis I psychiatric disorders in DSM-IV and ICD-10.

Validation and reliability studies have been done comparing the M.I.N.I. to the SCID-P for DSM-III-R and the CIDI (a structured interview developed by the World Health Organization for lay interviewers for ICD-10). The results of these studies show that the M.I.N.I. has acceptably high validation and reliability scores, but can be administered in a much shorter period of time (mean 18.7 ± 11.6 minutes, median 15 minutes) than the above referenced instruments. It can be used by clinicians, after a brief training session. Lay interviewers require more extensive training.

A. MAJOR DEPRESSIVE EPISODE

A1. Have you been consistently depressed or down, most of the day, nearly every day, for the past two weeks? NO YES

A2. In the past two weeks, have you been much less interested in most things or much less able to enjoy the things you used to enjoy most of the time? NO YES

IS A1 OR A2 CODED YES? NO YES

If NO to either A1 or A2, then move to the diagnosis section and tick NO.

A3 Over the past two weeks, when you felt depressed or uninterested:

a) Was your appetite decreased or increased nearly every day? Did your weight decrease or increase without trying intentionally (i.e., by ±5% of body weight or ±3.5 kgs for a 70 kg. person in a month)? NO YES

IF YES TO EITHER, CODE YES.
b) Did you have trouble sleeping nearly every night (difficulty falling asleep, waking up in the middle of the night, early morning wakening or sleeping excessively)? NO YES

c) Did you talk or move more slowly than normal or were you fidgety, restless or having trouble sitting still almost every day? NO YES

d) Did you feel tired or without energy almost every day? NO YES

e) Did you feel worthless or guilty almost every day? NO YES

f) Did you have difficulty concentrating or making decisions almost every day? NO YES

g) Did you repeatedly consider hurting yourself, feel suicidal, or wish that you were dead? NO YES

ARE 5 OR MORE ANSWERS (A1-A3) CODED YES? NO YES

A4. Did these problems cause significant problems at home, at work, socially, school or in some other important way? NO YES

A5. In between two episodes of depression did you ever have an interval of at least 2 months without any significant depression or any significant loss of interest? NO YES

**Diagnosis of major depressive episode** NO YES
B. DYSTHYMIA

B1. Have you felt sad, low or depressed most of the time for the last two years?  NO  YES

B2. Was this period interrupted by your feeling OK for two months or more?  NO  YES
If NO, to B1 or YES to B2, move to the diagnostic box and tick NO

B3. During this period of feeling depressed most of the time:
   a) Did your appetite change significantly?  NO  YES
   b) Did you have trouble sleeping or sleep excessively?  NO  YES
   c) Did you feel tired or without energy?  NO  YES
   d) Did you lose your self-confidence?  NO  YES
   e) Did you have trouble concentrating or making decisions?  NO  YES
   f) Did you feel hopeless?  NO  YES

ARE 2 OR MORE B3 ANSWERS CODED YES?  NO  YES
If NO, then tick NO in the diagnosis section

B4. Did the symptoms of depression cause you significant distress or impair your ability to function at work, socially, or in some other important way?

Diagnosis of dysthymia  NO  YES
PATIENT HEALTH QUESTIONNAIRE-9

PHQ-9 is a multipurpose instrument for screening, diagnosing, monitoring and measuring severity of depression. It incorporates DSM-IV depression diagnostic criteria. The tool rates the frequency of symptoms which factors into the scoring severity index. Question 9 screens for presence and duration of suicide ideation. A follow up non-scored question screens and assigns weight to the degree to which depressive problems have affected the patient’s level of function. The grading is as follows:

<table>
<thead>
<tr>
<th>PHQ-9 score</th>
<th>Provisional diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-9</td>
<td>Minimal symptoms</td>
</tr>
<tr>
<td>10-14</td>
<td>Minor depression</td>
</tr>
<tr>
<td></td>
<td>Dysthymia</td>
</tr>
<tr>
<td></td>
<td>Major depression mild</td>
</tr>
<tr>
<td>15-19</td>
<td>Major depression, moderately severe</td>
</tr>
<tr>
<td>&gt;20</td>
<td>Major depression, severe</td>
</tr>
</tbody>
</table>
Over the last 2 weeks, how often have you been bothered by any of the following problems?
(Use “✓” to indicate your answer)

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Little interest or pleasure in doing things</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Feeling down, depressed, or hopeless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. Trouble falling or staying asleep, or sleeping too much</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. Feeling tired or having little energy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. Poor appetite or overeating</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. Trouble concentrating on things, such as reading the newspaper or watching television</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. Thoughts that you would be better off dead or of hurting yourself in some way</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

For office coding: 0 + __ + __ + __ = Total Score: __

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

- [ ] Not difficult at all
- [ ] Somewhat difficult
- [ ] Very difficult
- [ ] Extremely difficult
OLUPAPULA OKULI EBIBUZO EBIKWATAGANA NEMBERA ZO

1. Enamba y'omusomo ..............................................................

2. Ekikula kye
   a) Musajja b) mukazi

3. Emyaka gye........................................................................

4. Endagiriro, Ekyalo ne district................................................

5. Egwanga lye........................................................................

6. Okusoma kwe
   i) Teyasoma ii) P1 - P7 iii) S1 - S6 iv) Tekiniko v) Univasite

7. Ebyebufumbo
   i) Mufumbo/alina gwabera naye ii) tafumbirwangako iii) Namwandu iv)
      Bayawukana/ bagatulurwa

8. Omulimu: i)akozesebwa (nyonyola)........................................ ii) yawumula iii) Mulimi
   iv) Mukyala mufumbo v) Musomi vi) talina mulimu viii) Ekirala (nyonyola)........

9. Embeera yo nobulwadde bwa sirimu;
   a) Talina ii) alina akawuka c) tamanyi

10. BWABA NGA ALINA AKAWUKA KA SIRIMU, oli ku ARVs
    a) Yee b) Nedda c) seputuriini yeeka

11. BWEKIBA NTI YEE, ddagala lyabikka kki era amaze bang a kki

12. Okukasa akafuba: a) X-ray b) Z N test c) Genexpertd (abdominal ultrasound)
    d) tissue biopsy e) Clinical

13. Ekkika kya kafuba: a) Pulmonary b) Extra-pulmonary c) Byona

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14. Ekikka ky'obujjanjabi bwakafuba:  
   a) Ekikka I  
   b) Ekikka II  
   c) Ekikka III  
   d) Ekikka IV

15. Omulwadde ali kubujjanjambi bwa mutendera kki?  
   a) intensive phase  
   b) Continuation phase

16. Eddagala lya kafuba lyakozesa kaati

17. Eddagala lyakafuba lino alimazeko bang a kki?

18. Wali omaze ebbanga nga tomira ddagala lya kafuba lino:  
   a) Nedda  
   b) Yee

19. BWAKIBA NTI YEE, okumala bang a kki

20. Waliwo omuntu yena mumakka gyobera eyali afunye obulwadde bw'okweralikira?  
   a) Nedda  
   b) Yee  
   c) tamanyi

21. Okezesezako ebiragala mu myezzi 3 egiyise?  
   a) Nedda  
   b) Yee

22. BWEKIBA NTI YEE, nyonyola
The MINI Luganda version

EBIRINA OKUGOBERERWA


Emisomo egikakasiddwa nga era gyesigika gikoleddwa nga gigereganya M.I.N.I ku SCID-P ku DSM-III-R ne ku CIDI (okunonyereza okulimu ebibuzo ebisengekedwa ebyakolebwa ekitongole kya World Health Organization kulwa bantu abatali bakugu abakola okunonyereza ku ICD-10). Ebiva mu misomo gino biraga nti M.I.N.I. ekirizibamu, ekakasibwa era ebivamu byesigika, era esobola okukozesebwa mu kiseera ekitono (Mean 18.7 ± 11.6 minutes, median 15 minutes) okusinga eyo eyogeddwako wagulu. Esobola okukozesebwa n'abasawo abatendeke [clinician], oluvanyuma lwokutendekebwa okwangungu. Abanonyereza abatali bakugu betaga okutendekebwa okwamanyi.

A. EMBEERA YOKWENYAMIRA OKWAMANYI

A1. Obadde mumbeera y’okwenyamira okumala ekiseera, ebiseera ebisinga obungi mu lunaku, kumpi buli lunaku, mu bangla era sabiti bbiri eriyisewo?

Nedda  Yee

A2. Mu bangla era sabiti ebbiri eziyisewo, obaddeko awo nga olaba nti ebintu tebikyakunyimira oba nga ebyakusanyusanga ebiseera ebisinga nga tebikyakusanyusa?

Nedda  Yee

A1 oba A2 nga bididdwamu nti YEE?

Nedda  Yee

Bwekiba nti kiri NEDDA ku A1 ne A2, genda ku katundu akakwata kubyenzigyanjaba era otikinge Nedda.

A3 mu bangla lya sabiti bbiri eziyise, bwe wawulira nga wenyamidde oba ngatonyumirwa bintu:

a) okwagala ebyokulya kwekendera oba kweyongera nga buli lunaku? Obuzito bwo bwakendera mu oba bweyongera nga tokigenderedde (i.e., ebintu du35% mu buzito oba ±3.5 kgs ku muntu owa 70 kgs mu mwezi?

Nedda  Yee

SINGA YEE KUBYOMBI, WANDIIKA YEE

b) Wafunanga obuzibu okwebaka kumpi buli lunaku (obuzibu okubulwa otuulo, okuzukuka ekiro mutumbi, okuzukuka ku maky enyo, oba okwebaka enyo)?

Nedda  Yee
c) Wayogera oba okutambula empola okusinga bulijo oba obutekakasa, okukankana oba okwesanga nga kizibu okutuula awamu kumpi buli lunaku?
   Nedda Yee

  d) Wawulira nga okoye oba nga talina manyi kumpi buli lunaku?
   Nedda Yee

  e) Wawulirako nti tokyalina mugaso oba okwekubagizanga kumpi buli lunaku?
   Nedda Yee

  f) Wasanga obuzibu okuba nga olemera ku mulamwa oba okusalawo ku kyokukola kumpi buli lunaku?
   Nedda Yee

  g) Wawulirako nga buli kiseera oyagala kwetasako obulabbe, okwagala okwetuga, oba okwagala okuba nti offa?
   Nedda Yee

KUBIDDDWAMU, WALIWO BITAANO OBA EBISINGAKO (A1–A3) EBIDDDWAMU NTI YEE?
   Nedda Yee

Okujjanjabimbwa embeera y’okwenyamira eyamanyi eyakati
   Nedda Yee

OMULWADDE BWAAKAA ALINA EMBEERA Y’OKWENYAMIRA EYAMANYI, GENDA MAASO OBUUZE A4.

A4. a. mu bulamubwo wali ofunyewo ebeera ennala ezokwenyamira oba okulaba nti ebintu tebikyakunyimira oba nga ebyakusanuyusaanga ebiseera ebisinga nga tebikyakusanyusa, oba nga’olina ebiziibu bingi bitwodende ko wagulu okumala ebanga erya sabiti bbiri oba okusingawo?
   Nedda Yee

Bwekiba nti kiri yee, genda ku A4.b

A4.b. Wakaati we mbeera embi ezokwonyamira Iwezaliwo wafuna mu ekiseera nga kya mwezi ebbiri wewabeeranga tolimu ngeri yakwenyamira ekutawanya oba okuba nti obutayagala bintu kukendedde?
   Nedda Yee

Okujjanjabimbwa embeera y’okwenyamira eyamanyi ey’emirundi mingi
   Nedda Yee
B. DYSTHYMIA

B1. Wali owuliddeko obubbi, nga omuntu omunaku oba okwenyamira ebiseera ebisinga mu myaka ebbiri emabbega?
   
   Nedda       Yee

B2. Ekiseera kino kytaganyiizibwamu bwewewulira nga oli bulungi okumala emwezzi ebbiri oba okusingawo?
   
   Nedda       Yee

SINGA NEDDA, KU B1 OBA YEE KU B2, genda mu bokisi eyenziijanjaba owandiike nti NEDDA

B3. Mukiseera kino ekyowwenyamira buli kiseera:
   
   a) Engeri gyewali oyagalamu okulya yakyuka mungeri eyewunyisa?
      
      Nedda       Yee

   b) Walina obuzibu okufuna otulo oba webaka nyo ekiyitridd?
      
      Nedda       Yee

   c) Wawulirako nga olimukowu oba nga tolina manyi?
      
      Nedda       Yee

   d) Waberako awo nga tokyekirizamu?
      
      Nedda       Yee

   e) Wafuna obuzibu okubeera ku mulamwa okumala ekiseera oba okusalawo ku kyokukola?
      
      Nedda       Yee

   f) Wawulirako nga olyowo tokyalina mugaso?
      
      Nedda       Yee

WALIWO EBBIRI OBA B3 EZISINGA EZIDIDDWAMU NTI YEE?

   
   Nedda       Yee

SINGA KIBA NEDDA, tikinga NEDDA mu katundu akebyobujjanjabi

B4. Obubonero bw'okweralikira bwakuletera okwenyamira okwamanyi oba okuba nti wali tokyasobola
    kukola bulungi ku mulimu, munkolagana yo nabantu, oba mungeri endala yonna?

   
   Nedda       Yee

OBUJJANJABI BWA DYSTHYMIA
OLUPAPULA OKULI EBIBUUZZO – 9 KUBULAMU BW’ABALWADDE


Ensengeka eri bweti:

<table>
<thead>
<tr>
<th>PHQ-9</th>
<th>Okwekebejjja kwobujjanjabi obwekiseera</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 – 9</td>
<td>Obubonero sibwamutawana</td>
</tr>
<tr>
<td>10 – 14</td>
<td>Okwenyamira okutali kwamanyi</td>
</tr>
<tr>
<td></td>
<td>Dysthymia</td>
</tr>
<tr>
<td></td>
<td>Okwenyamira okwemanyi naye nga kutonotono</td>
</tr>
<tr>
<td>15- 19</td>
<td>Okwenyamira okwamanyi, okwekigero,</td>
</tr>
<tr>
<td></td>
<td>okweralikiriza enyo</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>Okwenyamira okwamanyi, okweralikiriza enyo</td>
</tr>
</tbody>
</table>
**Mu banga erya sabiiti 2 emabega emirundi emekka ebizibu bino wamanga gyebikutawanyizamu?**

(Kozesa "tick" okulaga ekididwamu)

<table>
<thead>
<tr>
<th></th>
<th>Nedda Nakato</th>
<th>Ennaku ezisinga</th>
<th>ennaku eziwerako</th>
<th>kumpi buli lunaku</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Obwagazi butono oba essanyu okukola ebintu</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>2. Okuwulira nga oli munakuwanvu, olimwenyamivu, tewetegera</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>3. Obuzibu okufuna oba obutebaka, oba okwebaka enyo</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>4. Okuwulira obukowu oba okuba namanyi amatono</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>5. Obutagala kulya oba okulya enyo</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>6. Okwewulira nti oli muubi – oba nti ensi ekulemeredde oba gweweletera ebizibu oba ovunanyizibwa ku mbeera embi mu makka go</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>7. Obuzibu okulemera ku mulamwa obudde bwona, nga okusoma amawulire oba okulaba ttivi.</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>8. Okutambula oba okwogera empola enyo nekiba nti abantu bakiraba? Oba kuludda olulala okuba nga opakuka oba nga toteredde mu birowoozo olwokuba nti obadde otambula mu kitundu emirundi mingi okusinga bulijjo.</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>9. Ekulowoozo nti kisingako singa offa oba okuba nga wetusako obulabe mu ngeri endala</strong></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

FOR OFFICIAL CODING: 0 + _____ + _____ + _____ = Total Score: _____

Bwoba nga wazulibwamu ekizibu kyona, ekizibu kino kikuzibuwaliza kitya munkola yemirimu gyo, okulabirira ebintu ekka, obo munkolagana yo nabantu?

- Sikizibu nakamu
- kiizibuzibu
- kizibu kyamanyi nyo
- kizibu kyamanyi nyo ddaala
July 5, 2017

Dr. Rachael Alinaitwe  
Department of Psychiatry

Category of review  
[X] Amendment  
[ ] Initial review  
[ ] Continuing review  
[ ] Termination of study  
[ ] SAEs

Dear Dr. Alinaitwe,

Re: REC REF 2017-062

Title: “Prevalence and factors associated with depressive illness in patients with tuberculosis in Mulago Hospital”

Your proposal entitled “Prevalence and factors associated with depressive illness in patients with tuberculosis in Mulago Hospital” was initially reviewed and approved by the School of Medicine Research and Ethics committee on May 11th 2017.

On June 29th 2017, you requested for permission to make some modifications in the study: to revise the socio-demographic questionnaire and add option c on numbers 10 and 20, to adjust diagnosis and numbering of question A4 on the MINI questionnaire.

The committee considered these changes on 05th July, 2017. On behalf of the committee, I am glad to inform you that these changes have been approved. You may now proceed with the study. But forward regular reports on your study to the committee.

Yours sincerely,

Assoc. Prof. Ponsiano Okello  
Chairman School of Medicine Research & Ethics Committee

Page 1 of 1
17th July, 2017.

The Executive Director
Mulago National Referral Hospital

Dear Sir,

RE: RECOMMENDATION FOR ADMINISTRATIVE CLEARANCE.

The Mulago Hospital Research & Ethics Committee has reviewed the protocol entitled MREC: 1204: “Prevalence and Factors Associated with Depressive Illness in Patients with Tuberculosis in Tuberculosis in Mulago Hospital” by Dr. Alinaitwe Racheal as lead principal investigator.

The study got an initial approval from Makerere University School of Medicine Research and Ethics Committee for a period of one (1) year from 11th May, 2017 to 12th April, 2018.

The study has met the following obligations;

1. Paid the MREC review fees of 20,000/=  
2. Agreed to comply with all institutional policies and regulations of Mulago national referral hospital
3. Agreed to provide end of study report and acknowledge Mulago hospital in all publications

The study is therefore recommended for your provision of administrative clearance by Mulago national referral hospital.

Yours sincerely;

[Signature]

DR. NAKWAGALA FREDERICK NELSON
CHAIRMAN- MULAGO RESEARCH & ETHICS COMMITTEE.

C.C Dr. Racheal Alinaitwe

Vision: “To be the leading centre of Health Care Services”
**Reporting**

Other events which must be reported promptly in writing to the School of Medicine Research and Ethics Committee include:
- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to participants or others

Adverse events, including unanticipated or anticipated but severe physical harm to participants.

Do not hesitate to contact us if you have any questions. Thank you for your cooperation and commitment to the protection of human subjects in research.

Final approval is to be granted by Uganda National Council for Science and Technology.

Documents approved for use along with protocol:
- Informed consent documents
- Data collection tools

Yours sincerely,

Assoc. Prof Ponsiano Ocama
Chairperson School of Medicine Research and Ethics Committee