Prevalence of Depression among Active TB and TB/HIV Patients in Kisumu County

Esther Lee
SIT Graduate Institute - Study Abroad

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PREVALENCE OF DEPRESSION AMONG ACTIVE TB AND TB/HIV PATIENTS IN KISUMU COUNTY

Esther Lee
SIT Fall 2015
Wellesley College
ABSTRACT

According to the World Health Organization (WHO), one in four people have been affected by a mental health disorder at one point in their lives.¹ Kenya’s mental disorders account for 5.9% of the total global burden.² Mental disorders like depression is often comorbid with TB and HIV and disproportionately affects those with lower socio-economic income. Kisumu, a city in Nyanza province, has the highest HIV and TB prevalence in Kenya. This study aimed to determine the prevalence of depression among TB non-coinfected and TB/HIV co-infected patients at Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) and the Clinical Research Center (CRC) in Kisumu County. This study evaluated the social factors associated with depression, the effect of TB/HIV comorbidity on mental health, as well as the perceptions regarding mental disorders among mental health professionals. The severity of depression was measured using the Beck’s Depression Inventory II (BDI-II). A total of 51 eligible patients attending the TB clinic at JOOTRH and CRC participated in the study; 26 females and 25 males. The results indicated that 31% of the participants suffered from depression of varying severity. Among the factors studied, the side effects from anti-TB drugs and the history of mental illness significantly affected depression, which agreed well with other studies. This study also revealed no significant association of depression between TB and TB/HIV co-infected patients. For such study, it was recommended to take into account a larger sample size of patients, the duration of their taking anti-TB medications and substance abuse.

ACKNOWLEDGEMENT

There were many people who have made it possible for me to do my research. First, I would like to thank Dr. Steve Wandiga for providing me with timely insight and great guidance. I would also like to extend a huge thank you to Dr. Elisha Okeyo for taking time out of his busy schedule to track down people and provide me with staff to help me with this research. Leah, Dr. Karama and Dr. Jama, thank you for providing direction and constructive feedback regarding research methods and ethics. Emily, Kennedy and the staff from Jaramogi Oginga Odinga Hospital, thank you all for taking time off work to administer questionnaires to patients. Thank you to Dr. Njenga, Dr. Ndetei, Dr. Owiti, for letting me interview them. I would also like to thank Athman and Miltone for their endless support and for making this research possible. Also, thanks to Maya, Kirsten, and Emily for making the study abroad experience so memorable. Last, but not least, I would like to thank my family for supporting me in my decision to study abroad in Kenya and allowing me to have this remarkable, eye-opening experience.
# TABLE OF CONTENTS

**DEFINITIONS** ................................................................................................................... 5  
**INTRODUCTION** ................................................................................................................ 6  
**LITERATURE REVIEW** ................................................................................................. 12  
**METHODOLOGY** ............................................................................................................. 15  
  - Ethical consideration .............................................................................................................. 18  
**RESULTS** ....................................................................................................................... 19  
**DISCUSSION** ................................................................................................................. 26  
  - Study Limitations ................................................................................................................. 30  
**CONCLUSION AND RECOMMENDATION** ..................................................................... 31  
**BIBLIOGRAPHY** .............................................................................................................. 33  
**APPENDICES** ................................................................................................................ 35  
  - Appendix I: Informed Consent Form .................................................................................. 36  
  - Appendix II: Questionnaire (English) ............................................................................... 37  
  - Appendix III: Questionnaire (Kiswahili) ......................................................................... 41
**DEFINITIONS**

**Active Tuberculosis:** TB disease that multiplies and spreads in the body. Highly infectious through airborne droplets.

**Latent Tuberculosis:** TB germs that are dormant in the body. Often doesn’t manifest symptoms of Tuberculosis and is not infectious.

**Category I:** Patients who have never had TB before and are newly diagnosed pulmonary that are sputum positive or patients with severe extra-pulmonary TB.

**Category II:** Patients who have stopped TB treatment after defaulting or who have relapsed after treatment and were restarted on TB treatment.

**Category III:** Sputum negative pulmonary TB. Mild form of extra-pulmonary TB.

**Pulmonary TB:** TB infection in the lungs.

**Extra-pulmonary TB:** TB infection in areas outside of the lungs such as bone, joint, lymph nodes, and nervous system.

**Intensive Phase:** The first two months of TB treatment regimen. TB drugs isoniazid, rifampicin, pyrazinamide, and ethambutol are taken daily.

**Continuous Phase:** The last four months of TB treatment regimen after intensive phase during which TB drugs isoniazid and rifampicin are taken daily.
The World Health Organization (WHO) describes mental disorders as illnesses “characterized by a combination of abnormal thoughts, perceptions, emotions, behavior, and relationships with others.” An estimated 450 million people worldwide experience mental disorders. In 2013, the WHO estimated that 5% of the African population suffered from mental health disorder with the projection that this rate would rise to 15% in 2030. As the leading cause of disability in the world, mental health disorder has especially affected the continent of Africa, causing some to dub it the “silent crisis” in this part of the world.

Depression is among the most common mental disorders with an estimated 350 million people affected by depression worldwide. According to the National Institute of Mental Health, depression can be caused by genetic, biological and psychological, as well as environmental factors like trauma, loss of a loved one, or poverty.

Kenya currently has a population of approximately 45 million. Of this total population, over three million people, most of whom live in poverty, are considered to have intellectual and mental disabilities according to the United Nations. An estimated one in four Kenyan patients...
who present to a primary health facility today is suffering from mental illness.\textsuperscript{11} The burgeoning case of mental disorders, especially among youth in urban cities is significantly attributable to the rampant poverty, HIV, and rising substance abuse.\textsuperscript{12}

**MENTAL ILLNESS COMPOUNDED BY TB AND/OR HIV**

Tuberculosis (TB) is a widely spread infectious disease caused by the bacterium Mycobacterium (M.) Tuberculosis.\textsuperscript{13} Currently, about one third of the world’s population has been affected with M. Tuberculosis.\textsuperscript{14} Often considered a disease of poverty and an opportunistic disease, TB is believed to be associated with over-crowding and malnutrition.\textsuperscript{15} It disproportionately affects those with lower socio-economic status. It is usually transmitted through airborne droplets when active TB infected patients cough or sneeze.\textsuperscript{16} Active TB bacteria can be treated with antibiotics.\textsuperscript{17} However, if one develops drug resistant TB as a result of poor original treatment regimen, then it can take about four times as long to complete, and the treatment often produces physical and mental side effects which often produces Multidrug-Resistant TB (MDR-TB) patients.\textsuperscript{18}

\textsuperscript{13} *Tuberculosis*. Center for Disease Control and Prevention, n.d. Web.
\textsuperscript{15} *Tuberculosis*. Center for Disease Control and Prevention, n.d. Web.
\textsuperscript{16} Ibid.
\textsuperscript{17} Ibid.
The largest risk factor to the TB infection is Human Immunodeficiency Virus (HIV) because the virus compromises the immune system. According to the WHO, about 13% of people infected with TB are co-infected with HIV.\(^\text{19}\) HIV is a virus that attacks the immune system, making it difficult for the body to fight off infection often leading to Acquired Immunodeficiency Syndrome (AIDS.)\(^\text{20}\) HIV can be treated with the use of Antiretroviral Therapy. People with TB/HIV comorbidity have HIV along with either latent or active TB disease. If someone has both TB/HIV, each disease speeds up the progress of the other; therefore HIV can speed up the progress from latent to active TB and the TB infection can speed up the progress of HIV.\(^\text{21}\) HIV, without anti-retroviral treatment, lowers the immune system which makes one more susceptible to TB infection.\(^\text{22}\) It is reported that the risk of changing from latent to active TB among HIV infected people is 12 to 20 times greater than the risk among the non-HIV infected.\(^\text{23}\) In 2013, it was estimated that, among 9 million that had TB, 1.1 million (13%) were HIV positive.\(^\text{24}\) Furthermore, there were 360,000 deaths from HIV that were associated with TB which accounts for 25% of all TB deaths.\(^\text{25}\)

In Kenya, it is estimated that there are about 130,000 TB/HIV co-infected patients with a morbidity rate of 9,500 per year, making Kenya a high TB and HIV burden country.\(^\text{26}\)

Consequently, co-infected patients not only need to take two treatment regimens, but they are

\(^{20}\) Ibid.
\(^{23}\) Luetkemeyer, A. “Tuberculosis and HIV”, HIVInsite, http://hivinsite.ucsf.edu/
\(^{25}\) “Global Tuberculosis Control 2014” www.who.int/tb/publications/global_report/
also faced with social stigma from community members as TB is often associated with poverty while HIV with sexual transmitted disease.\textsuperscript{27}

Depression is often a comorbidity of tuberculosis, due to the nature of tuberculosis infection, side effects from medications, and other social determinants of health. Depressed patients are less likely to seek treatment or consistently take their medications and are more likely to result in default.\textsuperscript{28} This can lead to drug-resistant tuberculosis that can quickly spread afterward. Therefore, depression could be a concerning exacerbating factor in a potential MDR-TB epidemic.

\textbf{MENTAL ILLNESS IN KENYA}

Recent efforts from Kenyan governmental and nongovernmental organizations have pushed to draw up policy and legislation to protect the rights of people with mental disorders and improve mental health services. In 2010, the Constitution of Kenya devolved all health services, including mental health, to its 47 county governments, allowing for more efficient mental health related reforms to take place.\textsuperscript{29} Furthermore, Kenya adopted the World Health Assembly 65.4 Resolution on global burden of mental disorder to implement a “comprehensive and coordinated response from health and social sectors at country levels.”\textsuperscript{30} As a result, treatments for mental disorders like schizophrenia have increased in both quantity and quality.

\textsuperscript{27} Ibid.
\textsuperscript{29} Kiima, David M. "MENTAL HEALTH IN A DEVOLVED SYSTEM OF GOVERNMENT IN KENYA." (n.d.): n. pag. Ministry of Health, Jan. 2015. Web.
\textsuperscript{30} Ibid.
Despite these advances, treatments for mental disorders among the TB/HIV community in Kenya are few with even fewer resources for those living in rural areas. Among the various mental disorders, treatment for depression or bipolar disorder is the least accessible. One of the main reasons for the lack of resources is that depression is not generally perceived as a mental health illness in Kenya, resulting in a greater lack of detection, research, and services for treatment. Furthermore, the quality of treatment, although available, is deficient due to the lack of doctors and trained mental health professionals.\textsuperscript{31} According to Araujo et al, “there are research evidences that support a strong correlation between the prevalence of mental illness like depression and TB patients.”\textsuperscript{32} With an HIV prevalence rate of 15\% and a TB notification of 400/100,000, Nyanza province has the highest burden of TB and HIV patients in Kenya.\textsuperscript{33} In Kisumu, 126 out of 10,000 people in Kisumu have TB, compared with the national count of 39.\textsuperscript{34} And, 75\% of TB cases in Nyanza are co-infected with HIV. Yet, no studies have been done to look at the prevalence of depression among TB/HIV patients in Kisumu County. Depression, if not properly met, could lead to an increase in suicide rate. Youth suicide cases are on the rise in Kenya due to the rampant substance abuse, depression, and unemployment. According to the WHO report in 2012, suicide was accountable for an estimated 1 million deaths in Kenya every year.\textsuperscript{35} Out of 192 countries studied, Kenya ranked 65\textsuperscript{th} in the suicide prevalence rates.\textsuperscript{36}

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OBJECTIVES

The objective of this thesis was to determine the prevalence rate of depression among TB/HIV co-infected patients in Kisumu County in comparison to TB non-coinfected patients. The data collected from this study was compared with data from prior studies that also studied the prevalence of depression among TB patients. The data collected was stratified by age, gender, occupation, income, marital status, number of children and education.

More specific objectives for this study can be described as follows:

- To study the factors of depression in association with TB/HIV by stratifying data with socioeconomic/demographical questions.
- To explore perceptions of mental health among mental health professionals
- To provide recommendations for future policy.
LITERATURE REVIEW

As depression is widely accepted as a comorbidity with chronic illnesses, numerous studies on depression in association with TB patients can be found, especially done in regional hospital settings of Africa and India.

In 2012, Basu et al studied the prevalence of depression linked to the TB patients in a DOTS clinic in India using a nine-item Patient Health Questionnaire (PHQ-9). The findings showed that 62% of all respondents were depressed; two thirds of them had mild to moderate depression while 5.5% were suffering from severe depression with the elderly population (greater than 54 years of age) at most risk. More than 60% of the patients suffering from depression were on anti-tubercular drugs (ATD). This study illustrated that the prevalence of depression was high among TB patients attending DOTS clinics, and it evaluated the factors contributing to this including medication side effects and the socioeconomic status of the individual patients.

A 2009 study done by Issa et al in a university teaching hospital and outpatient clinic in Nigeria used the PHQ-9 method to find that 27.7% of the admitted TB patients had depression: 21.5% of them with mild depression and 6.2% with moderate depression. According to their findings, the authors observed that the prevalence of depression (27.7%) among the TB patients in the clinic was highly attributable to financial status of the individuals, old age, and persistence.

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38 Ibid.
of cough. They pointed out that depression associated with prolonged treatment and coughing could result in low compliance rates with anti-TB medication, further exacerbating the quality of life of the patients.

Ige et al did a similar study in 2011, aimed at determining the prevalence of depression among the TB patients and their families visiting at University College Ibadan Centre in Nigeria, and its correlation with disease pattern. The results indicated that the prevalence of depression was 45.5% among the patients, and 13.5% among their family members. The results were consistent with those of the study by Issa et al, in that depression rate was high among the patients, especially for the elderly and those with longer history of TB. Based on the findings, the authors suggested that the care of TB patients be must comprehensive and include consultative-liaison psychiatric care.

Janmeja et al (2005) aimed at using psychotherapy to improve compliance with short-course anti-TB chemotherapy in India. The sample of patients for this study were mostly from low- and middle-income backgrounds urban settings, and having low motivation, considerable apprehensions and nearly no knowledge about the disease. The study concluded that psychological intervention (including depression treatment) was an effective means to improve compliance with anti-TB treatment, possibly reducing treatment failure and drug resistance.

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40 Ibid.
41 Ibid.
43 Ibid.
Deribew et al (2010) studied the relationship between TB/HIV co-infection and common mental disorders (CMD) such as depressive disorders in Ethiopia. Using face-to-face assessment along with questionnaires, they found that TB/HIV co-infected patients had a greater rate of CMD risk at 63.7% than the non-co-infected patients at 46.7%. TB/HIV co-infected patients were 1.7 times more likely to have CMD when compared to the non-co-infected patients. The results also indicated that the patients who had low motivation regarding their health, lack of stable income and a sense of high stigma were at greater risk for CMD.

The aforementioned literature reviews significantly contributed to understanding the association between the prevalence of depression and TB infected patients. Some of the studies went further to find factors improving the TB treatments such as psychological counseling and care. All or most of the reviewed studies were done with patients who were admitted to a regional hospital. In the same context, no such study is done in Kisumu County, one of high TB/HIV comorbid counties in Kenya. Therefore, this study focuses on the prevalence of depression among TB non-coinfected and TB/HIV co-infected patients admitted to Jaramogi Oginga Odinga Hospital and the Clinical Research Center.

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47 Ibid.
48 Ibid.
METHODOLOGY

In order to get a comprehensive range of perspectives on mental health among specialists and institutions, multiple interviews were conducted in person with mental health professionals and academics at the African Mental Health Foundation, University of Nairobi Psychiatry Department, and Upper Hill Medical Centre.

To determine the prevalence of depression among TB and TB/HIV patients, data was collected in the form of a questionnaire. This questionnaire played an integral part in collecting the pertinent data, so its final composition was verified through stringent reviews from different advisors and professionals. Questionnaires were self-administered and distributed to a total of 51 TB non-coinfected and TB/HIV co-infected patients. Beck’s Depression Inventory II (BDI-II) was used to evaluate depression among patients. The collected data was analyzed using Statistical Package for the Social Sciences (SPSS) version 20.

Kisumu County is one of the 47 counties west of Kenya bordering Lake Victoria with a population of 1,131,982. Within Kisumu County is the Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH), the major referral hospital in Nyanza, and Western and North Rift Kenya. The hospital is located 3km from Kisumu town Centre. With a bed capacity of 467, JOOTRH serves a population of five million, and receives an estimated 197,200 patients per year. They have an estimated 160 TB patients currently with 80 active TB patients. This cross-sectional study, conducted in November 2015, encompasses all participants at the JOOORTH who were visiting or admitted at the TB ward with their consent of participation. All participants

50 Ibid.
under the age of 13, who were just diagnosed with smear-positive TB, who just started anti-TB medication or who were too sick or infectious, were excluded from the study.

The questionnaire had four components. The first part consisted of questions regarding demographics (age, gender, occupation, marital status, place of residence, education, sources of income, etc.) The second part included questions regarding TB and HIV status (pulmonary and extra pulmonary) and category (I, II, III). TB cards from the patients were used to assist with this step. The third part was the Beck’s Depression Inventory II (BDI-II). BDI-II was used to measure the severity of depression among patients. BDI-II is a 21 multiple choice questionnaire self-assessed inventory to measure the affective and somatic symptoms of depression among patients. BDI-II is composed of items to measure depression such as irritability, hopelessness, cognitions guilt feelings, lack of interest in sex, and physical symptoms like weight loss of appetite and fatigue. Each question had a scale between 0-3 from which participants indicate. The total score determined the severity of depression. A total score of 0-9 indicated minimal depression, 10-18 mild depression, 19-29 moderate depression, and 30-63 severe depression. Patients who scored between 30-63 were to be referred to the counselor at the TB clinic at the provincial hospital for additional counseling. BDI-II was based on the DSM IV, which was commonly used to measure the severity of depression, and cited among 2,000 empirical studies. The last section of the questionnaire included social questions. It inquires about the resources that participants could utilize for counseling and any barriers to access the mental healthcare they needed.

The sample population comprised TB or TB/HIV patients, currently taking anti-TB medications, who came into the provincial hospital during their clinic days on Tuesdays and Fridays. In addition, four admitted patients were also administered the questionnaire at the TB
ward at JOOTRH. Nine participants who were on anti-tubercular treatment at the Clinical Research Center (CRC) were also asked to fill out the questionnaire on Wednesday, November 25, 2015.

Data was collected by administering the questionnaire at JOOTRH TB clinics on Tuesday, November 24, 2015 (Intensive TB patients) and Friday, November 27, 2015 (Continuous TB patients) for a total of 20 hours. Two nurses from the Center for Disease Control (CDC) and staff from the TB clinic agreed to assist me in administering the questionnaire in the TB clinic. After eligible patients had their weight checked, and while waiting for doctor, questionnaires were administered individually with their consent. The two staff from CDC helped translate the questionnaire into Luo and Kiswahili. For patients who were illiterate, questionnaires were administered orally. After they were finished, completed questionnaires were collected in a folder and were protected and safeguarded. The collected data was entered in MS Excel 2013 and results were calculated using SPSS 20.

Independent variables in this study were age, gender, education, occupation, income, marital status, and residence. Data was analyzed using SPSS 20. Results were calculated using descriptive statistics such as frequencies, mean and median. The Chi-square test was carried out to calculate the variations between different groups at 5% significance level. Data was analyzed using bivariate, two tailed tests.
ETHICAL CONSIDERATION

Ethical approval to conduct this study was given by NASCOSTI. Permission was also obtained from the hospital administrators at Jaramogi Oginga Odinga Teaching and Referral Hospital (JOOTRH) and the CRC.

Considering the cultural sensitivity and stigmatization of mental disorders in Kenya, extra precaution and consideration were taken into account to ensure the privacy and confidentiality of the patients, staff and participants interviewed. Prior to the process of obtaining consent, all participants were informed of the purpose of the study and given explanations regarding the instructions. Furthermore, participants were asked for their consent before filling out the questionnaire. All information presented in the interviews and questionnaires were safeguarded. Before interviews were conducted, participants were asked for consent to have the interviews be recorded. All names in this study were kept anonymous. Names were completely confidential and fully protected by the interviewer. Participants were informed that at any point in time they could withdraw research consent and stop the interview or questionnaire.
RESULTS

57 questionnaires were administered to the consented participants but only 51 were eligible. 26 (51%) of the eligible participants were female and 25 (49%) were male. The average age was 32.3 years (STD=12.7), and the age range was from 13 years to 71 years. The distribution of data obtained from the participants was outlined in Table 1.

According to the results, 31 (61%) of them were in the married status, the majority of participants (66%) had between 1 to 3 children, and no participants were reported to be currently cohabiting or polygamous. The average personal income was ksh 9,327 per month. 29 (57%) were employed, while 16 (31%) unemployed and 6 (12%) students. 5(10%) of participants had an education of college and above and 46 (90%) had a secondary degree and below.

27 (53%) were in their continuous phase of treatment, while 24 (47%) in their intensive phase. 26 (51%) participants had TB non-coinfection and 25 (49%) were TB/HIV co-infected. 40 (78%) of participants had Category I TB, 10 (20%) with Category II, 1 (2%) with Category III, and no participants were reported to have Category IV. 45 (88%) had pulmonary TB while only 6 (12%) had extra-pulmonary. 33 (65%) were experiencing side effects from their TB drugs while 18 (35%) having no side effects from the drugs. 4 (8%) participants had pre-existing condition of depression, 2 (4%) with anxiety, and 1 (2%) with schizophrenia.
Table 1. Distribution of Data for the Variables Used for This Study (Total Participants=51)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Option</th>
<th>Frequency</th>
<th>Variable</th>
<th>Option</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>13 - 24</td>
<td>12 (24%)</td>
<td>Treatment Phase</td>
<td>Continuous</td>
<td>27 (53%)</td>
</tr>
<tr>
<td></td>
<td>25 - 54</td>
<td>34 (67%)</td>
<td></td>
<td>Intensive</td>
<td>24 (47%)</td>
</tr>
<tr>
<td></td>
<td>55 and older</td>
<td>5 (9%)</td>
<td>TB Status</td>
<td>TB</td>
<td>26 (51%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TB/HIV</td>
<td>25 (49%)</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>25 (49%)</td>
<td>Category</td>
<td>I</td>
<td>40 (78%)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>26 (51%)</td>
<td></td>
<td>II</td>
<td>10 (20%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>III</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Education</td>
<td>Secondary</td>
<td>46 (90%)</td>
<td>Classification</td>
<td>Pulmonary</td>
<td>45 (88%)</td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>5 (10%)</td>
<td></td>
<td>Extra-pulm.</td>
<td>6 (12%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>History of Mental Illness</td>
<td>No</td>
<td>44 (86%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Depression</td>
<td>4 (8%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Anxiety</td>
<td>2 (4%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Schizophrenia</td>
<td>1 (2%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Counseling</td>
<td>No</td>
<td>5 (10%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>46 (90%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Receive support</td>
<td>No</td>
<td>3 (6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>48 (94%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Side effect from Drug</td>
<td>No</td>
<td>33 (65%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>18 (35%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>&lt; 5000</td>
<td>26 (51%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5000 to 9999</td>
<td>13 (25%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt; 10000</td>
<td>12 (24%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital</td>
<td>Single</td>
<td>16 (31%)</td>
<td>Counseling</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Separated/widows</td>
<td>4 (8%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>31 (61%)</td>
<td>Receive support</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Children</td>
<td>0</td>
<td>10 (20%)</td>
<td>Side effect from Drug</td>
<td>No</td>
<td>33 (65%)</td>
</tr>
<tr>
<td></td>
<td>1 to 3</td>
<td>34 (66%)</td>
<td></td>
<td>Yes</td>
<td>18 (35%)</td>
</tr>
<tr>
<td></td>
<td>&gt; 3</td>
<td>7 (14%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Overall Prevalence of Depression in TB Patients

The mean BDI score of all participants was 11, and the depression categories of BDI score used for this study are as follows: minimal (score 0 to 13), mild (score 14 to 19), moderate (score 20 to 28), and severe (score 29 to 63). As a result, 16 (32%) of patients were reported to be depressed. Most of the depressed had severe and moderate depression; 6 (12%) had severe depression and 6 (12%) had moderate depression. 4 (8%) had mild depression. Those results were summarized in Table 2.

<table>
<thead>
<tr>
<th>Degree</th>
<th>Count (%)</th>
<th>Sum of BDI score</th>
<th>Mean of BDI score (STD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>35 (68%)</td>
<td>58</td>
<td>4.3 (4.3)</td>
<td>0 - 13</td>
</tr>
<tr>
<td>Mild</td>
<td>4 (8%)</td>
<td>151</td>
<td>14.5 (1.0)</td>
<td>14 - 19</td>
</tr>
<tr>
<td>Moderate</td>
<td>6 (12%)</td>
<td>138</td>
<td>23.0 (3.2)</td>
<td>20 - 28</td>
</tr>
<tr>
<td>Severe</td>
<td>6 (12%)</td>
<td>214</td>
<td>35.7 (6.3)</td>
<td>29 - 63</td>
</tr>
</tbody>
</table>

Association of Depression with Socio-Demographic Variables

Besides the prevalence of depression among TB patients, the data collected about basic socio-demographic and economic status was evaluated, and outlined in Table 3. The age group of 55 years and older showed no depression while that of 13 – 24 years reported 33% and that of 25 – 54 years 35%. Males showed higher depression (40%) than females (23%). The prevalence of depression is lower for the patients with a college degree (20%) than for those with a secondary education only (33%). The occupation status didn’t provide any statistical distinction. As for the income variable, the income bracket of khs 5000 to 9999 per month led to the highest depression (46%), compared to the bracket of less than khs 5000 (31%) and the bracket of khs
The prevalence of depression for marital status explained that the separated and widows had the highest depression rate (50%) than the singles (31%) and the married (29%). No significant distinction in depression rates could be found among the number of children; all amounted to about 30%. According to the P-values in Table 3, all the variations were statistically not significant.

<table>
<thead>
<tr>
<th>Table 3. Association of Depression with Socio-demographic Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Gender</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Education</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Occupation</td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Income</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Marital</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td># of Children</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>
**Association of Depression with TB Patients under Specific Conditions**

The patients who were in the intensive phase had a considerably higher depression rate (42%) than the patients who were in the continuous phase (22%). However, the variations were not enough for the statistical significance. The patients with TB only (35%) showed a higher depression rate than the patients with TB/HIV (28%). There was only one patient in TB treatment category III who was not depressed. Therefore, excluding that patient, the patients in category I (33%) and category II (30%) showed statistically no difference. The depression rates of the patients with pulmonary TB and extra-pulmonary TB, respectively, are 33% and 20%. For the history of mental illness, the patients with previous history of mental illness such as depression (75%), anxiety (100%) and schizophrenia (100%) showed clearly higher depression rates than those without the previous mental history (27%); these results were statistically significant (P=0.05). The prevalence of depression was higher for the patients who hadn’t experience side effects from drugs (65%) than for those who had experience the side effects (35%); these results were also statistically significant (P<0.05).
<table>
<thead>
<tr>
<th>Variable</th>
<th>Option</th>
<th>Minimal</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
<th>Total (%) Depressed</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment Phase</td>
<td>Continuous</td>
<td>21</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6 (22%)</td>
<td>0.135</td>
</tr>
<tr>
<td></td>
<td>Intensive</td>
<td>14</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>10 (42%)</td>
<td></td>
</tr>
<tr>
<td>TB Status</td>
<td>TB</td>
<td>17</td>
<td>2</td>
<td>5</td>
<td>2</td>
<td>9 (35%)</td>
<td>0.611</td>
</tr>
<tr>
<td></td>
<td>TB/HIV</td>
<td>18</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>7 (28%)</td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>I</td>
<td>27</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>13 (33%)</td>
<td>0.783</td>
</tr>
<tr>
<td></td>
<td>II</td>
<td>7</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>3 (30%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Pulmonary</td>
<td>30</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>15 (33%)</td>
<td>0.409</td>
</tr>
<tr>
<td></td>
<td>Extra-pulm.</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1 (20%)</td>
<td></td>
</tr>
<tr>
<td>History of Mental Illness</td>
<td>No</td>
<td>32</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>12 (27%)</td>
<td>0.050</td>
</tr>
<tr>
<td></td>
<td>Depression</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3 (75%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anxiety</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>2 (100%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schizophrenia</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1 (100%)</td>
<td></td>
</tr>
<tr>
<td>Side Effect from Drug</td>
<td>No</td>
<td>24</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>9 (27%)</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>11</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>7 (39%)</td>
<td></td>
</tr>
</tbody>
</table>

A Google map (Figure 1) was created of the place of residence of the 51 participants. Markers in green represents TB non-coinfected patients, markers in red represents TB/HIV co-infected patients, and markers in the shape of stars represents patients with depression. The marker in yellow indicates JOOTRH. According to the map, most participants came from Nyalenda, Manyatta, and Kondele, the areas of lower income residence. Most participants were from nearby Busia, Kakamega, and Megacity. No patient was living in the central business district near Millimani.
Based on the interviews conducted, it appeared that the patients generally believed that mental health resources in Kenya were inadequate. Mental healthcare in Kenya lags far behind the physical healthcare in quality and quantity of support, which is most likely due to a lack of funding and government leadership in policy and legislation to ensure the rights of people affected with mental disorders to access and afford quality care.

**Figure 1:** Map of TB and TB/HIV patients’ residence

**Key:**

- **Star:** Patients with depression
- **Green:** TB non-coinfected patients
- **Red:** TB/HIV co-infected patients
- **Yellow:** JOOTH

DISCUSSION

This study attempts to determine the prevalence of depression among TB non-coinfected and TB/HIV co-infected patients in Kisumu County in terms of various socio-demographic and economic factors associated with depression, as well as the effect of the existing TB disease conditions including TB/HIV co-infection. This study found that about 31% of TB and TB/HIV co-infected patients attending the TB Clinics at Jaramogi Oginga Odinga Teaching and Referral Hospital were suffering from depression. This prevalence rate of depression is comparable yet higher to the study done in Nigeria (28%)\(^51\) and Turkey (22%)\(^52\) yet lower than the studies done in South Ethiopia (43%\(^53\)), India (81%\(^54\)), South Africa (32.9 % and 81 %\(^55\)), and Pakistan (80%\(^56\)).

According to this study, it can be found that the prevalence of depression was lower for patients who were old, female, college educated, married, and earned the highest (>10,000 khs), compared with their counterparts. Most of these findings might agree with a general perception that social and financial stabilities would provide a less likelihood of being depressed. However,
the findings that the old aged (55 years and older) and females had a lower depression rate didn’t agree with other studies. Among various variables used, two were found to be strongly related to depression with a statistical significance, and they are: side effects from anti-TB drugs and past/present history of mental illness.

It had been found that TB was associated with depression due to biological and social determinants of health. A study also found that patients with TB could develop depression through side effects from their treatment. According to Dr. Owiti, a psychiatrist I interviewed, patients who received first generation anti-TB drugs, which are cheaper than the next generation ones, experienced greater side effects from drugs. This study confirmed the significant relation between side effects from drugs and symptoms of depression.

The history or current state of having a mental illness also can be a compounding factor to depression, which perpetuates the added burden leading to comorbidity. TB patients with such comorbidity tend to have poor management of their wellbeing, leading to poor adherence to their treatment regimen. Furthermore, patients with depression can neglect their personal hygiene and health care and they can be more susceptible to catching TB infection. In a similar study done in Tanzania, the prevalence of depression among TB patients was evaluated in Temeke Clinics.

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57 Issa, Baba A. "Depression Comorbidity among Patients with Tuberculosis in a University Teaching Hospital Outpatient Clinic in Nigeria." Mental Health Farm Med 6.3 (2009): n. pag. Web.
They found the prevalence rate to be 46.9%, which was higher than the prevalence rate (31%) found in this study. They observed a significant association between the history of mental illness and depression, but unlike in my study, their results also indicated an association between age and religion.

Another psychosocial stressor strongly associated to depression is stigma. Through interviews with mental health professionals, it was told that there was a lot of stigma attached to mental disorders. Mental disorders like depression have been wrongly perceived to be rare, infectious, and incurable even among psychiatrists, physicians and other health professionals. Often associated with spirits, mental disorders are often seen as weaknesses and character flaws, and in that regard, a person with mental disorder is unduly expected to control themselves or “snap out of it.” To reduce the attached stigma, community-wide efforts need to be made through education, training and dissemination of information.

Although not included in this study, alcohol and substance abuse were also known to increase depression on TB patients. Such behaviors can cause poor nutrition and adherence to the treatment regimen that are critical to existing TB patients, and also make patients who have not been infected even more susceptible to the disease. Through interviews conducted with psychiatrists and staff from JOOTRH, I learned that many TB patients at the hospital were young patients suffering from substance abuse. The staff had also expressed their challenge of keeping patients from drinking while on their treatment.

Most patients resided in areas of generally lower socioeconomic status. No patients indicated they were from central business district. Either patients living in the central business district area have a lower prevalence of tuberculosis or attend private hospitals that provide TB
treatment. This reflects the association of TB and poverty. Unlike informal settlements like Manyatta, homes in the central business district are less over-crowded and have better quality systems of ventilation, thereby lowering the chance of transmitting TB.

The TB system in Kenya is highly efficient and effective. With an organized, devolved structure, there is high priority given to combating communicable diseases in Kenya such as TB. However, government leadership has fallen short of providing people with affordable access to quality mental healthcare. Mental health is often neglected despite being integrated and decentralized into Kenya’s current healthcare system. Current Kenyan policies and legislation treat mental health diseases as though they are in a vacuum in that they are not perceived to be comorbid with other communicable diseases. In mental healthcare, leadership has often fallen to non-governmental organizations resulting in a fragmented and inefficient system. Although mental health is supposed to be represented on all levels of the healthcare system, it remains to be a low priority. According to the Kenyan National Commission on Human Rights, for the past five years 1% of the budget of the Ministry of Medical Services and no budget have been allocated for mental health in the development expenditure. Despite mental health being included in the Bill of Rights Chapter four, Article 43(1) and the Kenyan Health Policy 2014 and strategic objectives, most Kenyan policies towards mental health are outdated and largely focused on in-patients. The Board of Mental Health hasn’t effectively performed its role in initiating more reform and development for mental healthcare, and the Mental Health Policy in 2003 hasn’t been finalized. Most regulations in mental health focus on equipment and

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bureaucratic administration than on direct mental health resources for treatment and care. Of note, less than 77 psychiatrist in the country, 48 of whom are in universities and most of whom are in private practice. Lack of mental health resources, policy, and gumption from the government are all challenges to greater access of mental healthcare in Kenya.

**LIMITATIONS**

The initial sample size intended was 100. However, the small time frame of research, compounded by a longer-than-expected approval time from the hospital administrators, cut into the actual data collection time. The questionnaires were intended to be administered at the Kisumu County Hospital, which would have allowed more diverse and larger sample size. However, due to the time constraint, questionnaires were not administered at the county hospital. In addition, the translation itself was difficult because the questionnaires were translated into Kiswahili instead of Luo. That made it difficult for the translator to administer the questionnaires orally, which would have affected patients’ response. The duration of time for which patients were on anti-tubercular treatment was not included in the questionnaire, which could possibly be another significant factor to depression of TB patients.
CONCLUSION AND RECOMMENDATION

This study indicated that a substantial portion (31%) of the TB patients at JOORTH clinic in Kisumu County in Kenya, were suffering from depression of varying severity. The prevalence of depression was lower especially among patients who were college educated, married, who had many children (>3), and earned the highest (>10,000 khs), compared with their counterparts. These findings would agree with a general perception that social and financial stabilities would provide a less likelihood of being depressed. This study also showed that patients who were old (55 years and older), female, and TB/HIV co-infected had lower depression rates than their counterparts, which didn’t agree with the findings of other published studies. Such disagreement could be attributed to the fact that the sample size (51) used for this study were probably too small, requiring more in-depth research for future study. With a statistical significance (p<0.05), this study revealed that TB patients, who experienced side effects from anti-TB drugs or the history of other mental illness, had a higher prevalence of depression. This possibly could explain the association of depression with social stigmatization and psychosocial distresses.

Based on these findings, it is recommended that there be a careful screening procedure for depression of TB patients who are experiencing any side effects from anti-TB drugs or having a history of mental illness especially in their intensive phase of treatment regimen. In addition, due to the limited mental healthcare specialists in Kenya, there is a need for more trained non-mental health specialists to deliver mental healthcare services like screening and treatment. Last, more government leadership needs to be made to make mental health a priority through more funding.

For future research, more studies on the relationship between substance use and depression among TB and TB/HIV co-infected patients in Kisumu County can be done with a
large sample size. In addition, more evidence-based research needs to be done by looking at the economic implications of mental health in Kenya in order to shape far-reaching policies on mental health and receive appropriate funding needed. To get questionnaire responses and data analysis done in a right time frame, a thesis needs to be well planned ahead to go through all the approval procedures needed from the hospitals and the CDC.

Through this research, I learned a lot about the structure and procedure relating to quantitative study. This study has given me the opportunity to work with data collection and statistical methods. Working with the Center for Disease Control (CDC) taught me about an ethical protocol with regard to research subjects. In retrospect, for the scale of this type of research, more time and better planning are needed to undertake all the approval procedure, formulate a comprehensive questionnaire, and generate a sufficient sample size in a timely manner.
Bibliography


"Kenya Doctor Fights Mental Health Stigma in 'traumatized Continent' - CNN.com." *CNN.* Cable


Luetkemeyer, A. “Tuberculosis and HIV”, HIVInSite, http://hivinsite.ucsf.edu/

Mayer, K. “Synergistic Pandemics: Confronting the Global HIV and Tuberculosis Epidemics” Clinical Infectious Diseases, 2010, Volume 50, Supplement 3,


Westaway MS, Wolmarans L: *Depression and self-esteem: rapid screening for depression in black, low literacy, hospitalized tuberculosis patients.*

APPENDICES