PSYCHOMETRIC PROPERTIES OF BECK DEPRESSION INVENTORY II SCREENING TOOL AMONG HIV POSITIVE PATIENTS IN JUMC, ART CLINIC, JIMMA, ETHIOPIA, 2018

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Abstract

Background: *Rates of depression are high among individuals living with HIV. Accurate assessment of depressive symptoms among this population is important for ensuring proper diagnosis and treatment. The Beck Depression Inventory-II (BDI-II) is a widely used measure for assessing depression; however its psychometric properties have not been investigated for use among HIV-positive populations in Ethiopia.*

Objective: *To assess the psychometric properties of beck depression inventory II in the detection of depression among HIV patients in JUMC Jimma, Ethiopia, 2018.*

Methods*: Institution based cross sectional study was conducted in JUMC ART clinic in a sample of 152 clients using consecutive sampling method. Cronbach' alpha coefficient was used to evaluate internal consistency. Semantic validity (Amharic version), Criterion validity and Convergent validity were analyzed. Sensitivity, specificity, PPV, NPV and the area under the curve (AUC) for various BDI-II scores was calculated by ROC analysis. To identify the best fit model PCA was compute for variables which have significant (p<0.05) and inter-item correlation (r=0.3-0.9).*

Results: *A total of 152 HIV positive patients participated in the study with 100% response rate. Using mini international neuropsychiatric interview (MINI) as 'gold standard' to determined major depressive disorder, Sensitivity of 86%, specificity of 83%, PPV (0.82) and NPV (0.87) were optimal at a cut-off score of 13. Receiver Operating Characteristic (ROC) analysis confirmed that BDI-II has an adequate diagnostic measure (AUC = 0.90). BDI-II was good correlation with other construct of WHODAS-12 (r=0.66). Exploratory Factor analysis revealed three factors that explained 64% of total variance. The BDI-II test scores showed excellent internal consistency. Cronbach's alpha was 0.91 for the total questionnaire and* 0.91, 0.75 and 0.63 *for the three factors respectively. The affective-vegetative, cognitive and somatic dimensions described the latent structure of the instrument*

Conclusions and recommendation: *The results suggested that BDI-II is a valid measure for assessing depressive disorder among HIV-positive patients. Cut-off score was adjusted to enhance sensitivity and specificity of the tool. A score of 13 and above is appropriate to screen depression in HIV positive patients.*

Key words*: HIV/AIDS, Depression, Validation, BDI-II, Ethiopia.*

Acknowledgment

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List of Abbreviation and Acronyms

AIDS- Acquired Immune Deficiency Syndrome

ART/HAART- Anti Retro Viral Therapy and High Active Anti Retro Viral Therapy

AUC- Area Under Curve

BDI- Beck Depression Inventory

CES-D- Center for Epidemiological Study of Depression

CFA- Confirmatory Factor Analysis

DSM –IV-Diagnostic and Statically Manual of mental disorder

EDHS- Ethiopian Demographic Health Survey

HIV - Human Immune Deficiency Virus

JUMC - Jimma University Medical Center

MDD- Major Depressive Disorder

MINI- Mini International Neuropsychiatric Interview

PHQ-9 Patient Health Questionaires-9

PLHIV- People Living With Human Immune-Deficiency Virus

PPV/NPV- Positive Predictive Value /Negative Predictive Value

ROC –Receiver Operating Characteristics

SPSS- Statically Package for Social Science

SSA- Sub-Saharan Africa

TPR/FPR- True positive rate/False positive rate

WHO- World Health Organization

WHODAS- World Health Organization Disability Assessment

CHAPTER ONE

INTRODUCTION

1.1 Background

Major Depressive disorder (MDD) is one of the most common and serious mental illness that negatively affects individual feeling, thinking, and behavior. According to the American diagnostic and statistical manual fifth edition diagnostic criteria for MDD consisting of five or more of the following symptoms and from those symptoms at least depressed mood or loss of interest should present: subjective feelings of sadness or emptiness, anhedonia, significant weight gain or loss, insomnia or hyper somnia, psychomotor agitation or retardation, fatigue, feelings of worthlessness or excessive guilt, difficulty concentrating, and thoughts of suicide and last at least 2 week (1).

HIV infection increases the patient's risk for various psychiatric disorders, including major depression disorder. Depression is one of the most common mental health disorders that people with HIV experience, with some figures placing rates of depression among people with HIV as high as 50%,among those 60–70% of depression cases are unrecognized in HIV positive patients. The reasons for this higher risk of depression are numerous, including ART side effects, inflammatory processes, stigma/discrimination related to HIV/AIDS and fear of premature death (2).

Depression can occur at multiple time points along the HIV/AIDS care continuum: at the time of becoming aware of one's diagnosis, during the time Telling friends and family that you have been HIV-infected, during engagement in HIV medical care, when starting ART, and while staying adherent to ART, AIDS diagnosis, Recognition of new symptoms and disease progression awareness, Hospitalization, Physical illness, Death of a significant other by similar illness and Major life changes related to the illness (3, 4).

Antiretroviral therapy and Various complications of HIV infection like opportunistic infections of the CNS, tumours, systemic disease, and adverse effects of medications precipitate or worsen depression (5). On the other depression may leading to carelessness or increased high-risk behaviour predisposing to infection with HIV (6).

Both depression and HIV/AIDS are an important public health issue, yet it is often missed or misdiagnosed, hence the development of valid and reliable diagnostic instruments for depression is importance. A brief and accurate screening tool for depression among people

living with HIV is necessary to increase access to mental health care and improve HIV-related outcomes in the long-term (7).

The Beck Depression Inventory-II (BDI-II) is a widely used measure for assessing depression which was created in 1996 by Aaron T. Beck, with the sole purpose of determining the severity and intensity level of the symptoms of depression. The tool also used for diagnosis of major depressive disorder with appropriate cut-off point (8).

Up to this time its psychometric properties of BDI-II have not been investigated among HIV-positive patients as well as general populations in Ethiopia. So the current study was the first to assess the psychometric properties of the BDI-II among this group of population.

1.2 Statement of Problem

Major depression and HIV/AIDS contribute significantly to the global burden of disease, as indicated by the Global Burden of Disease and Study showed that HIV/AIDS and major depressive disorders were the third and fourth most important causes of disease burden (9). The World Health Organization (WHO) estimates that depression will rank second next to heart disease by 2020 in terms of global disability (10).

Depression among people with HIV/AIDS is very high also affects 121 million people globally (11).The Prevalence of major depression among patients with HIV infection only and patients with AIDS have been estimated to be between 15% and 40% respectively, which is far above the prevalence for the general population in united state (12).Depression among PLHIV vary widely and range between 20 percent and 48 percent in high-income countries and up to 72 percent in resource-limited countries (13).

Globally, 34.0 million people were living with HIV at the end of 2011. An estimated of 0.8% adults aged 15-49 years worldwide are living with HIV. Sub-Saharan Africa remains the most severely affected region. In many countries, the incidence of HIV infection among adults fell by more than 25% from 2001 to 2011 (14).

According to the Ethiopian Demographic Health Survey (EDHS) report Adult HIV prevalence was estimated to be 1.8% in 2016. Women takes highest number estimated to 60% of people living with HIV in the country. In urban areas, more than 18 percent of the population is infected with HIV. About 90 percent of reported AIDS cases are 20 to 49 years old, Since this age group constitutes the most economically productive segment of the population, an enormous economic burden is created, including Health Care Costs (15).

As life expectancy increases for people living with HIV, the patient has higher risk of developing Co morbid non-communicable disorders including major depressive disorder, cardiovascular disease, renal disease and cancer (16).

Depression is one of the most prevalent psychiatric illness seen in HIV-positive individuals that has been associated with poor HAART adherence and higher rates of morbidity and mortality (17). Social isolation, marginalization, and discrimination resulting from HIV can have profound effects for major depressive disorder in PLHIV (18). HIV related stigma has been associated with depressive symptoms. depressive symptoms and stigma lead to poor engagement to care and ultimately poor health outcomes (3). When depression Co morbid with HIV it can increase progression of both illness and reduce survival (19). Depressive disorders are associated with poorer health outcomes in people living with HIV/AIDS (20).

Studies have identified several indicators that affect adherence to highly active antiretroviral therapy (HAART), among those Depressive disorder and clinical parameters are significant factors in determining patients' adherence to their HAART. Non-adherence to HAART was reported by 30.5% of those prescribed HAART in patients Co morbid with depressive disorder (21, 22).

Depression in PLHIV also leads to alteration of economic productivity, decrease of working abilities, social isolation, physical decline and difficulties in solving problems. It also associated with poorer health status, including low weight gain, suicide, decreasing CD4 with faster progression to AIDS, seriously compromise ART outcomes and increased mortality (23).

There is a bidirectional relation between depression and HIV/AIDS in which HIV positive cases may trigger symptoms of depression in turn depression may result in risky sexual behavior and spread of HIV. Study shows that 3%-23% of adults with severe depressive disorder are HIV infected, compared with 0.6% of the population in the United States which implies depression gets to high-risk behavior (24).

Since the problem is high burden globally evidence that high prevalence of Depression in people living with HIV, the nature and severity of disabilities associated with depression. the Negative impact of depression on HIV progression, increase mortality and non-adherence to medication among PLHIV and MDD increases the possibility of engaging in risky behavior such as unprotected intercourse (25, 16). In order to handle this problem early detection of depression by appropriate screening tool and treatment are the most important priorities for HIV care services.

Among those tools Beck Depression Inventory II is the most widely use measure that has been used in clinical and research to diagnoses depression, due to its most recent revisions and more closely resemble the diagnostic criteria for depression even though appropriate cut-off score for use with HIV- positive individuals has not yet been determined. Over the year many studies have questioned the credibility of the BDI-II but its soundness have been established through documentations of the internal consistency of the scale, its test-retest reliability, and its extensive validation against other measures of depression and independent criteria for depression. The utilization of the Beck Depression Inventory-II still continues to expand into a variety of clinical and non-clinical practice. even though its credibility and usability have come into question in this specific population (26).

Previous research suggests that the experience of living with HIV and depressive symptoms are influenced by cultural factors such as stigma, cultural beliefs, and collective knowledge

These cultural factors may influence the validity of the BDI-II among varying populations and geographic regions, thus warranting a thorough examination of the BDI-II among this group of population as well country (8).

In many parts of the world, Beck Depression Inventory (BDI-II) is the most extensively used self-reporting tool. This screening tool is also being used in Ethiopia both in research and clinical practice to detect depression among the general population as well as in patients. However the tool is not culturally validated in this country both in the community as well as in patients. The use of a non validated screening tool could result in under or over detection of the problem in clinical practice as well as in the general population. Therefore, validating simple screening tool can be easily used by the general health professionals to facilitate the integration of the service. Finally the study aided In order to minimize this high rate of mortality and morbidity and maximize the productivity of the citizens by insuring optimal level of mental health, by detection of cases early and treatment of the problem before it exerts its negative consequence to the affected individual. So the aim of this study is to assess the psychometric properties of beck depression inventory II among HIV positive patients in JUMC ART clinic in 2018.

1.3 Significance of the Study

There is remarkable sufficient evidence that prevalence of depression is high in peoples living with HIV/AIDS, Particularly in the SSA including Ethiopia. But the illness is under diagnosis as well as untreated. The problem may due to the lack of trained mental health care providers or mental health professionals, however we can screen or detect patients by non psychiatric professionals like nurse, public health officers and general practitioner using valid screening tool. So BDI-II is one of the most popularly used screening tools for depression in both research and clinical practice even though the tool is not validated based on our cultural context in Ethiopia until this time.

Early Identify HIV positive patients at risk of depression is important to initiate antidepressant treatment which may prevent ART non-adherence, subsequent disease progression and morbidity (27). So it helps for early detection of cases, initiate treatment and this improves ART drug adherence.

For Integration of the mental health service in the existing general health care service and empowering of the general health care professional to screen and treat depression by using this simple and brief tool. This is also very important to give comprehensive service and to increase mental health care.

The study is also important in clinical practice to follow the progress or treatment outcome of patients by using the score of BDI-II.

It could be also used to serve as a base line and provide a validated tool to conduct future research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Psychometric Properties of BDI-II

Psychometric property of BDI-II varies for different cut-off scores depending on the population sampled and different cultural context (8). According to the manual of Beck and Steer report BDI-II has a higher internal consistency: Cronbach's was reported as 0.92 for psychiatry outpatients and 0.93 for college students. The BDI-II revision improved content validity by rewording and adding items to assess DSM-IV criteria for depression. Factor analysis of the BDI-II in medical outpatients yielded 2 factors (somatic–affective and cognitive factors). Criterion validity in psychiatric outpatient, BDI-II and Hamilton Rating Scale for Depression were positively correlated (0.71) (28, 29).

The study conducted in the United States on the psychometric properties of the BDI-II among HIV-positive participants sampled at multiple sites across the United States. Using Composite International Diagnostic Interview as a "gold standard" to diagnoses major depressive disorder. The BDI-II test scores showed good internal consistency (α = 0.93). Sensitivity and specificity were maximized at a total cut-off score of 17 and a receiver operating characteristic analysis confirmed that the BDI-II is an adequate diagnostic measure (AUC = 0.83. Confirmatory factor analyses confirmed the best fit for a three-factor model over one-factor and two-factor model (8).

The other Validation study of Beck Depression Inventory-II in a Low-Income African American sample of medical outpatients with a sample of 220, Reliability was demonstrated high internal consistency (0.90) and good item-total correlations ranged from 0.35 to 0.67 (30).

Another study conducted in Portuguese community based with sample of 208 people shows that good internal consistency (0.82), and high discrimination of depressive symptoms (75-100%). Factor analysis extracted two factors: cognitive-affective dimension and somatic dimension (31).

In Sri Lanka the Validation of Beck Depression Inventory II among the Sinhalese speaking population, the scale showed a high level of internal consistency (0.93). Exploratory factor analysis showed a two- factor structure (cognitive-affective and somatic). Criterion validity was satisfactory. Based on the receiver operating characteristics curve a cut-off score of 16

was determined to be the most appropriate cut off value for the detection of depression in this population group (32).

Meta analysis research in Brazil also shows good Psychometric properties of the Beck Depression Inventory-II; the mean internal consistency was around 0.9. The correlation between BDI-II and BDI-I was high. The criterion-based validity showed good sensitivity and specificity for detecting depression in comparison with the adopted gold standard (DSM-IV) However, the cut-off score to screen for depression varied according to the type of sample. Factor analysis showed two constructs: cognitive-affective and somatic-vegetative (33).

Beck inventory II was also validated in Jamaica both in HIV patient and university students. In HIV positive patients with a sample of 191, the BDI-II was found to have a high degree of internal consistency reliability (0.89). The scale also had good concurrent validity as evidenced by a high correlation with scores on the CES-D (r = 0.74) (34). In Jamaican University Student the BDI – II was found to have an excellent degree of reliability (α = 0.90). The scale also had good concurrent validity as evidenced by high correlations with scores on the BSD (r = 0.74) and the CES-D (r = 0.71) (35).

In Japan Beck Depression Inventory-II was validated in the general population in a sample of 766 using CES-D as a gold standard. The result shows high level of internal consistency reliability (α = 0.87) and item homogeneity. Exploratory factor analysis showed a two-factor structure (cognitive and somatic-affective) (36).

Study conducted in Korean on Reliability and Validity of the Beck Depression Inventory-II among Adolescents with a total sample of 1071 people, the Cronbach's alpha for the BDI-II total score was 0.89. The correlation between BDI-II and PHQ-9 was strong (r=0.75). Exploratory factor analysis showed three-factor model demonstrated the best fit (37).

Another cross-sectional study conducted in Malawi the Prevalence of depression and validation of the Beck Depression Inventory-II amongst HIV-positive adolescents with a sample of 562. The Cronbach's alpha was 0.80 and the area under curve for the BDI-II was 0.82. A score of >13 in BDI-II achieved sensitivity of 80%, and a score of >17 had a specificity of 80%. The correlation between the BDI-II and CDRS-R was 0.42 (38).

In Nigeria BDI-II is also validated among adolescents, the BDI-II has good psychometric properties in screening depression in adolescents. At a cut off score of 18 and above, the BID-II has a sensitivity of 0.91, specificity of 0.97, positive predictive value (PPV) of 0.88 and negative predictive value (NPV) of 0.98 (39).

In Uganda the Psychometric Properties of Beck Depression Inventory-II in HIV Infected Population is also shows that, the Cronbach's alpha was 0.79 (40).

2.2 Prevalence of Depression in HIV Positive Patients

Researchers studying the prevalence of depression disorders among HIV-positive patients in different country and shows significant figure in this population.

Research conducted in south west India the prevalence of depression among HIV positive people by using BDI-II as screening instrument was high (67.3%) (24).

The Other cross-sectional study of depression among 137 HIV positive women in India, the prevalence of depression was 51.1% (17).

Cross-Sectional Study in Cameroon also shows there is high prevalence of Depression among HIV/AIDS Patients on Highly Active Antiretroviral Therapy. The prevalence of depression was 26.7%, from those 75.0% were non-adherent to HAART compared to 37.3% of those without depression (41).

Another cross-sectional study conducted in Malawi the Prevalence of depression among HIV positive adolescents with a sample of 562 was 18.9% using CDRS-R as measuring instrument (38).

Institutional based cross-sectional study conducted in Harare general hospital ART clinic, eastern Ethiopia in a total of 740 study subjects. The prevalence of depression was 45.8% (11).

The Other study conducted in Debrebirhan Referral Hospital on Prevalence of Depression and Associated Factors among HIV/ AIDS Patients, attending ART clinic among 416 participants. The prevalence of depression was 38.94% (42).

Another institution based cross-sectional study conducted in Addis Ababa ALERT hospital, the prevalence of depression among HIV patients was 41.2 % (43).

In the study conducted at zewidtu memorial hospital in HIV positive patients using Patient Health Questionnair-9 assessment tool. The prevalence of depression was 44.4% (44).

Overall the above mentioned article shows the prevalence of depression among HIV/AIDS patient is high and they used different screening tool including BDI-II, which is not validated in Ethiopia. Limited number of study on the validation of BDI-II in this specific population (HIV/AIDS) and the result also shows different in different cultural context as well as population.

CHAPTER THREE

OBJECTIVE

3.1 General Objective

❖ To assess psychometric properties of beck depression inventory II among HIV positive patients in JUMC, ART clinic, Jimma, Ethiopia, 2018.

3.2 Specific Objectives

❖ To assess semantic validity of beck depression inventory II among HIV positive patients in JUMC, ART clinic, Jimma, Ethiopia, 2018.

❖ To assess content validity of beck depression inventory II among HIV positive patients in JUMC, ART clinic, Jimma, Ethiopia, 2018

❖ To assess reliability of beck depression inventory II among HIV positive patients in JUMC, ART clinic, Jimma, Ethiopia, 2018.

❖ To assess convergent validity of beck depression inventory II among HIV positive patients in JUMC, ART clinic, Jimma, Ethiopia, 2018.

❖ To assess criterion validity of beck depression inventory II among HIV positive patients in JUMC, ART clinic, Jimma, Ethiopia, 2018.

❖ To assess construct validity of beck depression inventory II among HIV positive patients in JUMC, ART clinic, Jimma, Ethiopia, 2018.

CHAPTER FOUR

METHODS AND MATERIALS

4.1 Study Area and Period

The study was conducted in Jimma University Medical Center (JUMC) ART clinic. Jimma University Medical Center (JUMC) is found in Jimma town, Oromia regional state, in the south west, Ethiopia far from Addis Ababa by 352 km, which is the capital city of Ethiopia. JUMC is one of the oldest governmental hospitals, which was established in 1937 during Italian occupation for the service of their soldiers. After the withdrawal of the colonial conquerors, it has been running as public hospital under the Ministry of Health by different names at different times. Currently become "Jimma University Medical Center" under federal ministry of education. It provides service for approximately 9,000 inpatient and 80,000 outpatient attendances per year, serving a catchment population of about 15 million people. Out-patient treatment services for HIV were established in 2005 and now provide care for a total of 3100 patients receiving ART medication on follow-up every one month. The study was conducted from June 1 To June 30, 2018.

4.2 Study Design

Institution based cross-sectional study was conducted.

4.3. Population
4.3.1 Source Population

All HIV positive patients who are attending ART clinic in JUMC

4.3.2 Study Population

All HIV positive patients who are follow up visit in JUMC ART clinic in June 2018.

4.4 Inclusion and Exclusion Criteria

4.4.1 Inclusion Criteria

- ➢ All patients presented during study period
- ➢ Age greater than 13 years
- ➢ Amharic language speaker

4.4.2 Exclusion Criteria

- ➢ For Patient's age between13-18 and those who were not have parents with them for ascent.
- ➢ Critically ill patients

> Patients who are not able to converse Amharic language.

4.5 Sample Size Determination

Sample size was determined by using sensitivity and specificity for single validation test formula by considering the following assumption.

Where   n= required sample size,

S_N= Anticipated sensitivity (80%).

S_P= Anticipated specificity (80%).

α = Size of the critical region (1-α is the confidence level) 5%

$Z_{1-a/2}$ = Standard normal deviate corresponding to the specified size of the critical region (α) 95 %(1.96)

L= Absolute precision desired. 10%

P=Prevalence of depression among HIV positive patients. (by taking the result done in zewidtu memorial hospital, prevalence of depression in HIV positive patients was 44.4% (44).

❖ Sample size (n) based on Sensitivity=$\dfrac{Z^2_{1-a/2}*S_{N*(1-S_N)}}{L^2_{*P}}$

$$n= \frac{1.96^2 \times 0.8 \times 0.2}{0.1^2 \times 0.444}$$

n=138

Non-response rate (10% of 138) =138+14=152

❖ Sample size (n) based on Specificity= $\dfrac{Z^2_{1-a/2}*S_{p*(1-S_p)}}{L^2_{*(1-P)}}$

$$\frac{1.96^2 \times 0.8 \times 0.2}{0.1^2 \times 0.556}$$

n=111

Non-response rate (10% of 111) =111+11=122

N.B. finally 152 participants were taken to get the maximum sample size.

4.6. Sampling Technique

Consecutive sampling method was applied to select participants until it reached the total sample size.

4.7 List of variables
  - ➢ Socio demographic and socioeconomic characteristics
  - ➢ Semantic validity of BDI-II
  - ➢ Content validity
  - ➢ Reliability of BDI-II
  - ➢ Convergent validity of BDI-II
  - ➢ Criterion validity of BDI-II
  - ➢ Construct validity of BDI-II

4.8 Terms and operational definitions

Psychometrics: It's a technique used to measure validity of a test (BDI-II).

Internal consistency reliability: The homogeneity or the saturation of items included in BDI-II to measure depression. Cronbach alpha coefficient (α)> 0.9 – Excellent, > 0.8 – Good, > 0.7 – Acceptable, > 0.6 – Questionable, > 0.5 – Poor, and < .5 – Unacceptable"

Inter-rater reliability: The level of agreement between three interviewers in the same patients.

Validity: The ability of a test (BDI-II) to identify accurately which individuals have the disease (MDD) and which do not.

Sensitivity: The ability of BDI-II to identify correctly those who have MDD.

Specificity: The ability of BDI-II to identify correctly those who do not have MDD.

Semantic validity: the equivalent meaning of BDI-II items with the new language (Amharic language).

Criterion validity: the agreement or Correlation of new measure (BDI-II) with gold standard (MINI) at the same point in time. Correlation coefficient(r)>0.5 is desirable

Convergent validity: The measures of BDI-II correlates highly with measures of the same construct (WHODAS). Correlation coefficient (r_s)>0.5 is desirable.

Construct or factorial validity: Clustering items of BDI-II supports the theory-based grouping of items in measuring depression.

Receive Operating Characteristic: The plot between the TPR and FPR across a series of cut-off points and important to show the ability of test (BDI-II) detecting depression.

4.9 Data Collection Procedure and Instruments

Three clinical nurses and three psychiatry professionals was used for data collection after they completed practical training on the procedures of data collection and standardization of interviews. In addition to items of BDI-II socio-demographic, WHODAS-12 and MINI for depression were incorporated. Face-to-face interview method was used for data collection.

The scale was administered to a sample of 152 HIV positive patients. The sample to item ratio was 7:1 and this is considered as adequate.

The study was carried out in two stage procedures:

1. In the first step 50% of the participant was initially interviewed by clinical nurses using BDI-II and again those who are interviewed by using BDI-II at the same day with double blinded was clinically interviewed by psychiatric professional guided by MINI and WHODAS-12.

2. In the second step the remained 50% of participant was first interviewed by psychiatric professional using MINI prepared for depression and WHODAS-12 later they were interviewed by clinical nurses using BDI-II.

4.9.1 Beck Depression Inventory (BDI-II)

The Beck Depression Inventory is a widely utilized 21-item self-report scale in both clinical and research studies. The scale was originally developed in 1961 as an interviewer-assisted format but has undergone several revisions over the last 35 years from the BDI-1A (1978), to the most recent version of Beck Depression Inventory-II (1996).

BDI-II is the most recent version of the Beck Depression Inventory. The instrument was upgraded in order to make its symptoms content more reflective of the diagnostic criteria that are described by the American Psychiatric Association for major depressive disorders. Although BDI-II is still composed of 21 items, it now contains four new symptoms namely agitation, worthlessness, concentration difficulty, and loss of energy, in place of weight loss, body image change, work difficulty, and somatic preoccupation. the time frame for the rating has been changed from one to two weeks (45).

Beck Depression Inventory rates symptoms of depression in terms of severity on a scale from 0 to 3 based on the 21 specific items with a maximum score of 63. The items include: sadness, pessimism, sense of past failure, loss of pleasure, guilt feelings, sense of

punishment, self-dislike, self-accusations, suicidal wishes, crying, Irritability, loss of interest, indecisiveness, worthlessness, concentration difficulty, sleep disturbance, fatigability, loss of appetite, agitation, loss of energy and loss of interest for sex.

The sum of the BDI generally represents the severity of the depression with the test being scored differently for the general population compared to those individuals with an established clinical diagnosis of depression (26).

4.9.2 Mini International Neuropsychiatric Interview for Depression (MINI)

MINI is a gold standard psychiatric interview to guide and structure the psychiatrist or the mental health professional during the clinical assessment of the patient within a clinical interview. For this study MINI prepared for depression was used to set the criterion measure of depression. This means every patient underwent for a clinical psychiatric interview by psychiatric professional. The MINI criterion is prepared based on DSM-5 diagnostic approach.

4.9.3 Functional Impairment Screening Test (WHODAS-12)

The convergent validity of BDI-II was evaluated by testing the relationship between depression score by BDI-II against functional impairment score using WHODAS-12. In this case the higher the depression score on the screening tool, expected to have a higher score for functional impairment rated with a functional assessment scale about their general level of functionality. In this study WHODAS-12 functionality assessment was used, which is brief and have 12 items. Each domain ranges from 0 (no difficulty) to 4 (extreme difficulty or can't do). The overall score is getting by sum up each item value and it range from 0-48. WHODAS is a cross-cultural assessment tool that captures an individual's ability of function in different domains like work, social interaction, hygiene.

4.10 Data Quality Control

Before data collection, training was given for data collectors. The training focused on the objective of the study, brief explanation about the tool and how they fill the tool as well as the issue of consent and privacy of participants. The scale was pretested on fifteen HIV infected patients where they were encouraged to comment on the acceptability, clarity and cultural equivalence of items. They were reach in common understand before the actual data collection. The missing data, completeness and consistence were checked by principal investigator.

4.11 Data Process and Analysis

After checking of the data for completeness, missing value, and coding of questionnaires, the data was entered by using EPI data version 3.1.1. Then the data was exported to SPSS version 230 for analysis. Reliability, Semantic validity (Amharic version), Content validity, Criterion validity, Convergent validity and Construct (Factorial validity) was analyzed using the following statistic analysis.

Descriptive statistics were analyzed for socio demographic and item characteristics. The internal consistency reliability (Cronbach's alpha) for the BDI-II, as well as for each domains identified by PCA, were calculated. For individual Items which are item-total correlation less than (r<0.3) was used to remove items with poor reliability. Inter-rater reliability of BDI-II was analyzed by intra-class correlation coefficient (ICC).

Convergent validity of BDI-II against WHODAS-12 was examined by spearman correlation coefficient (r_s). Construct validity was analyzed by exploratory factor analysis (EFA) using principal components analysis (PCA) for variables which have significant (p<0.05) and item-total correlation (r=0.3-0.9). To find the best fit model, orthogonal and rotated factor analysis were conducted. Factor loadings of more than 0.40 were considered satisfactory. Findings of the PCA were further validated by internal consistency reliability analysis in which the findings of the factor structure were repeated by cronbach alpha for each factors. PCA was extracted factors by using the following criteria:

(1) Eigen value ≥1.

(2) Pass scree (scree plot) test of non-liner

(3) The cumulative variance of identified factors ≥60%.

Sensitivity, specificity and the area under the curve (AUC) for various BDI-II cut-off scores was calculated with receiver operating characteristics (ROC) analysis.

Semantic Validity: BDI-II was translated to Amharic language by Two Bilingual Instructors from Jimma University; Department of Linguistic. The forward-translated instrument was then back-translated into English by experts again from linguistic department who are blinded in the initial translation. After both back and forward translation difficult items in the translation were noted for further investigation.

Content validity: The translated (Amharic) version of BDI-II tool was pre-tested to fifteen HIV infected patients from JUMC ART clinic to assess the conceptual equivalence or content validity of the tool.

The interviewer was used three criteria to identify problematic items.

- ✓ The first indicator was when the respondent disclosed that the meaning of the item or specific word was not clear.
- ✓ The second was when the respondent gave a response but failed to elaborate on what he/she understood from the question.
- ✓ The third aspect was when respondent gave examples that indicated there was mis-conceptualization of what the question was intended to elicit.

The interviewer made a note of problematic items. The input of the patients was also presented for the group (translators and principal investigator). Discrepancies in conceptual and semantic equivalence were resolved through discussion by involving both translators with principal investigator. The final translated items used for data collection were generated through consensus on the wording; clarity and conceptual equivalence of items.

4.12 Ethical Consideration

The research proposal was submitted to Jimma University Ethical Review Board to obtain ethical clearance, and then data collection was initiated after a letter of recommendation that was obtained from the above responsible office. The ethical letter was given to the medical director and to the ART clinic coordinator. Informed written consent was taken from each patient and the information from individual patient will be kept confidential.

4.13 Dissemination of results

After completion of the research and finalizing the report, the finding of the study will be disseminated to all relevant stakeholders through Presentation and publication. Copies of the research will be submitted to psychiatry dept, JU research and dissemination office, JU medical director and specifically to JUMC, ART clinic coordinator and for other concerned institutions and stake holders for possible applications of the study findings.

CHAPTER FIVE

RESULTS

5.1 Socio demographic characteristics of the respondents

A total of 152 patients were participated in the study with 100% response rate. Participants completed both the questionnaire and the interview. The Participants age ranged from 15 to 63 years and the mean age of the patients was 36.4 (SD ±9.8) years. Most of them included in this study (62.7%) were females, (34.6%) were married, (50.5%) were Oromo, (45.8%) were Muslim and (39.9%) were educated up to grade eight. The average Monthly income of the participant's was 1322 (SD ±1207.9) Ethiopian Birr and it was ranged from 200 Ethiopian Birr to 6,000 Ethiopian Birr.

TABLE 1: SOCIO DEMOGRAPHIC CHARACTERISTICS (N=152) JUMC, 2018.

Variable	Category	Frequency	Percent
Age	15-21	6	3.9
	22-27	18	11.9
	28-33	43	28.3
	34-39	28	21.0
	40-45	27	18.8
	46-51	13	8.5
	52-57	8	5.3
	58-63	5	3.3
Sex	Female	96	44.8
	Male	56	55.2
Marital status	Married	53	34.5
	Widowed	39	25.5
	Divorced	34	22.2
	Not married	26	17.0
Ethnicity	Oromo	77	50.5
	Amhara	49	32.0
	Kefa	5	3.3
	Dawro	8	5.2
	Other*	13	8.5
Religion	Muslim	70	45.8
	Orthodox	65	42.5
	Protestant	16	10.5
	Other*	1	0.7
residence	Urban	128	83.7
	Rural	24	15.7
Educational status	Unable to read and write	43	28.1
	Primary school	61	39.9

	Secondary school	36	23.5
	College and above	12	7.8
Occupation	Merchant	43	28.1
	Dailey laborers	42	27.5
	Governmental worker	22	14.4
	House wife	15	9.8
	Farmer	10	6.5
	Others*	20	13.1
Monthly income	200-925	71	46.7
	926-1650	41	27.0
	1651-2375	20	13.1
	2376-3100	6	4.0
	3101-3825	4	2.4
	3826-4550	3	2.0
	4551-5275	6	3.9
	5276-6000	1	0.7

Others= Means groups which are not mentioned in any category like tigri and gambella in ethnicity, catholic in religion, non-governmental worker in occupation.

5.2 Semantic validity

Both forward and backward translation of BDI-II was done by four bilingual translators from Jimma University linguistic department. There was no discrepancy between the original English version of BDI-II items and the new (Amharic) version of BDI-II. The Amharic version of BDI-II is indicated in Annex III.

5.3. Content validity

Even though the translation showed no problem, there were identified items which had conceptual problems in pilot study. Three items detected as problematic, which were: item 15 "loss of energy", item 20 "fatigability and Item 12 "loss of interest".

In item 15 "loss of energy" and item 20 "fatigability" there is conceptual problems in participants, even though the translation was clearly forwarded. Loss of energy was translated to "*gulebet/akem matate*" and fatigability was "*ydekam semate*". But most of the participants was understood both items as "*akem matate*". Then After discussion with translators the item of loss of energy was modified to loss of energy for activity. The translation of Loss of energy for activity was "*sera lemeserat akem/gulebet matate*".

For Item 12 "loss of interest" even though the translation of this item is "*felagot matatae*" which is not specific but the options which are mentioned under this item was limited only

for peoples. So after discussion with the translators the item was re-phrased to loss of interest for social interaction mean that "*lemehaberawy geneghunet felagot matatae*".

After this modification the participants was understood the modified items without difficulty.

5.4. Characteristics of BDI-II items

The Minimum score of BDI-II was 0 and maximum score of 42. The mean score of BDI-II and mean item-total correlation was 15.6 and 0.33 respectively. More than half of participants was scored 1 or more for item 3 "sense of past failure" (53.9%), item 4 "loss of pleasure" (61.8%), item 15 "loss of energy for activity" (59.8%), item 20 "fatigability" (61.8%) and for item 21 "loss of interest in sex" (60.5%).

Whereas item 14 "worthlessness" (21.1%), item 11 "agitation" (13.8%) and item 9 "suicidal thought or ideation" (5.3%) were less endorsed by participants.

Loss of pleasure (61.8%) and Fatigability (61.8%) were the most frequently endorsed symptoms where as suicidal ideation (5.3%) was the least endorsed symptom.

TABLE 2: SCALE MEAN, ITEM-TOTAL CORRELATION AND CRONBACH'S ALPHA FOR BDI-II ITEMS (N=152) JUMC, 2018.

	Scale Mean if Item Deleted	Item-Total Correlation	Cronbach's Alpha if Item Deleted
Sadness	14.76	.748	.908
Pessimism	14.72	.710	.909
Sense of past failure	14.53	.701	.909
Loss of pleasure	14.41	.813	.906
Guilty feeling	14.57	.641	.911
Sense of Punishment	14.62	.523	.914
Self-dislike	15.19	.553	.913
Self-accusation	14.91	.460	.915
Suicidal Thoughts	15.55	.314	.918
Crying	15.14	.553	.913
Agitation	15.42	.322	.917
Loss of interest	14.76	.659	.910
Indecisiveness	15.24	.495	.914
Worthlessness	15.17	.564	.912
loss of energy	14.52	.699	.909
Changes in SleepPattern	14.96	.615	.912
Irritability	14.81	.347	.917
Changes in Appetite	15.16	.437	.915
Concentration difficulty	15.11	.494	.914

Fatigability	14.44	.667	.910
Loss of Interest in Sex	14.52	.465	.915

5.5 Reliability

Inter-rater reliability (mean intra-class correlation coefficient) of BDI-II between the three data collectors was (ICC=0.98; CI, 0.95- 0.99).

The internal consistency reliability (Cronbach's alpha) of the Amharic version of BDI-II was (α =0.91) and the internal consistencies of the domains were: 0.91, 0.75, 0.63 and 0.09 for factor 1, factor 2 and factor 3 respectively. The mean item-total correlation was (r=0.33). The item-total correlations ranged from (r=0.31) for "Suicidal thought or ideation" to (r=0.81) for "Loss of pleasure". There is no specific item accountable for the low alpha value and also no items which has low item-total correlation (r<0.3). There is no multicollinarity between items which had normal inter-item correlation (r=0.3-0.9) and all items had VIF less than 10 and tolerance of greater than 0.1.

5.6 Convergent validity

Convergent validity of BDI-II against WHODAS-12 was examined by Pearson correlation coefficient. Statistically significant correlation (r=0.66) was detected (p<0.01) between the two screening instruments. BDI-II also have highly correlated with the domains which are identified by PCA (r=0.95, 0.76, 0.57) for factor 1, factor 2 and factor 3 respectively.
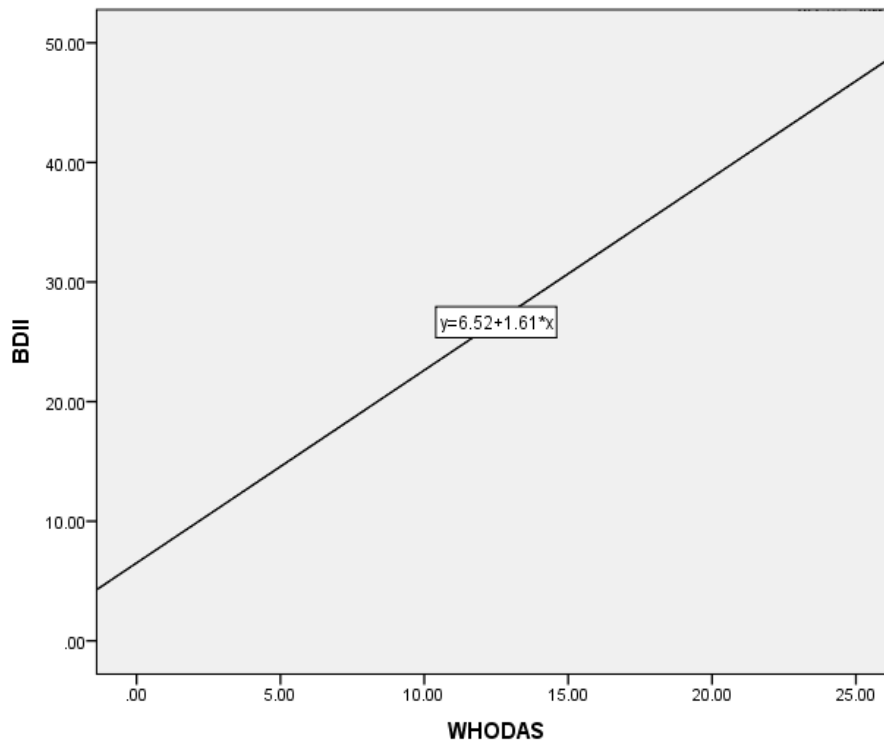
FIGURE 1: CORRELATIONS OF BDI-II WITH WHODAS-12 (N=152) JUMC, 2018.

The figure showed that there is positive correlation between BDI-II and WHODAS-12. When the score of BDI-II is up to 6.5 there is no functional impairment (score of WHODAS is 0) and when the score of WHODAS increased by a unit the score of BDI-II is also increased by 1.6.

5.7 Criterion validity

Although the BDI-II was not specifically designed for diagnostic purposes, it assesses the presence or severity of depressive symptoms and patients with major depression should have higher BDI-II scores on average than patients without this diagnosis. Analyses indicated that patients with a diagnosis of current major depression disorder guided by MINI had significantly greater BDI-II total scores (Mean 24.5, SD 10.21; $p<0.01$) compared with patients not having major depression disorder guided by MINI (Mean 7.6, SD 8.79; $p<0.01$). There was also statistically significant correlations between BDI-II and MINI ($r=0.78$).

5.7.1 ROC curve and Cut off score

While Beck et al, suggested that a score of 14 or greater was indicative of at least mild depression, they also encouraged the selection of appropriate cut off score based on the intended purpose and setting of use. The Receiver Operating Characteristic (ROC) curve was generated to determine the ideal cut off score.
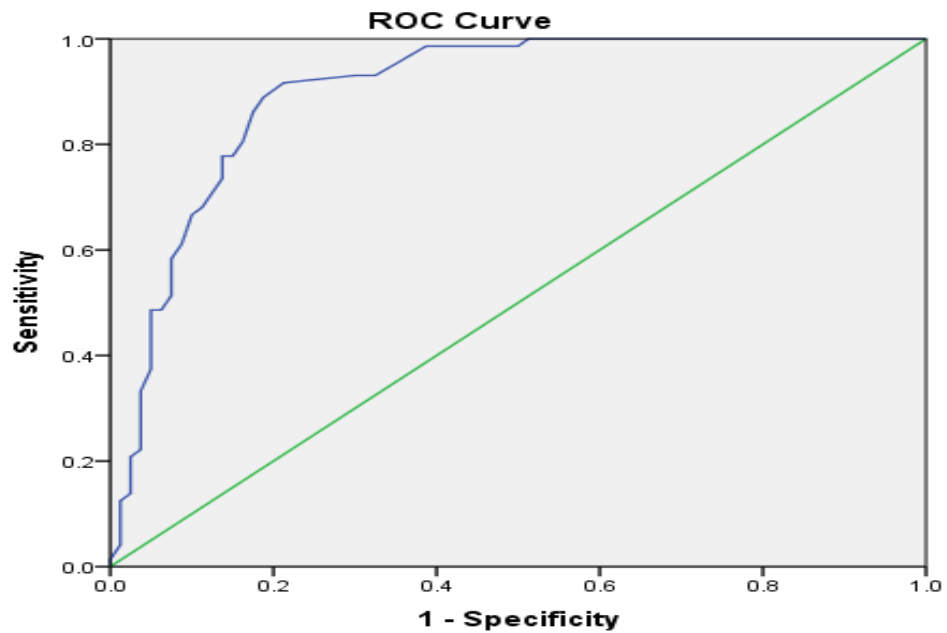
Diagonal segments are produced by ties.

FIGURE 2: ROC CURVE AND AUC TO DETERMINE APPROPRIATE CUT OFF POINT OF BDI-II (N=152) JUMC, 2018.

The above figure showed that the area under curve (AUC) for the BDI-II to predict major depressive disorder is 0.90 (95%, CI 0.85 - 0.95).

TABLE 3: SENSITIVITY, SPECIFICITY, POSITIVE AND NEGATIVE PREDICTIVE VALUE AT DIFFERENT CUT OFF SCORE OF BDI-II (N=152) JUMC, 2018.

Score	Sensitivity	Specificity	PPV	NPV
9	0.93	0.70	0.72	0.92
10	0.93	0.70	0.74	0.92
11	0.91	0.79	0.80	0.91
12	0.88	0.82	0.81	0.89
13	**0.86**	**0.83**	**0.82**	**0.87**
14	0.80	0.84	0.82	0.83
15	0.77	0.85	0.82	0.81
16	0.77	0.87	0.84	0.81

17	0.73	0.87	0.83	0.78
18	0.68	0.89	0.85	0.76
19	0.66	0.90	0.86	0.75
20	0.61	0.92	0.86	0.72

Boldface indicated the appropriate cutoff point. PPV/positive predictive value and NPV/negative predictive value

The table showed that when the cut-off score increases, sensitivity and negative predictive value become decrease where as specificity and positive predictive value of the instrument become increase. A cut-off score of 12 gave a sensitivity of 88% with a specificity of 82% but the specificity was improved to 83% with a sensitivity of 86% at a cut-off score of 13. So a score of 13 balances sensitivity, specificity, PPV and NPV for the Amharic version of BDI-II as a screening instrument among patients with HIV. There was no difference cut-off score across male and female.

The MINI and psychiatric evaluation demonstrated that 72 (47%) of participants were depressed and the prevalence become increased to 50% by using BDI-II screening tool at 13 cut off point.

5.8 Construct validity

5.8.1 Exploratory factor analysis

The data met the Kaiser-Meyer-Olkin criteria for sample adequacy (MSAs= 0.89), as well as for Bartlett's test of sphericity, x^2 =1626 (d.f=210 P<0.01). Scree plot extracted three factors based on (Eigen value ≥1 and minimum cumulative variance ≥60%). Factor extraction decision that takes into account different criteria, Details are shown below in figure and Table.
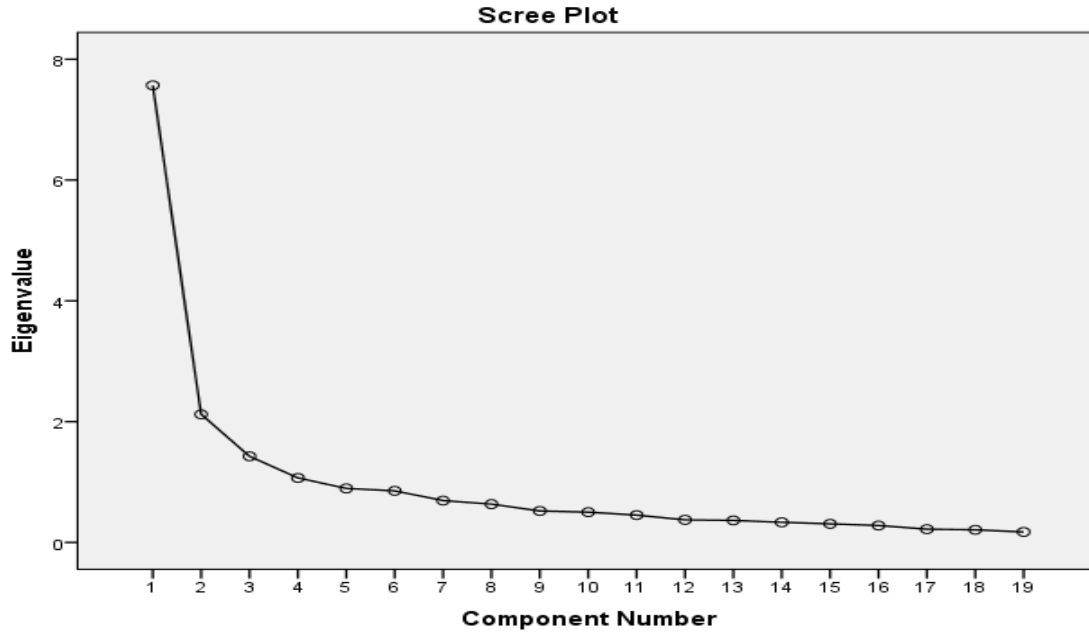
FIGURE 3: EXTRACTION METHOD BY USING SCREE PLOT (EIGEN VALUE≥1), PRINCIPAL COMPONENT ANALYSIS (N=152) JUMC, 2018.

TABLE 4: EXTRACTION METHOD BY EIGEN VALUE, PRINCIPAL COMPONENT ANALYSIS (N=152) JUMC, 2018.

Component	Initial Eigen values	Total % of Variance	Cumulative % of variance
1	7.6	39.8	39.8
2	2.1	13.1	52.9
3	1.5	11.1	64.0
4	0.9	4.6	68.6
5	0.8	4.7	73.3
6	0.8	4.5	77.8

Based on the criteria of scree plot and Eigen value, Principal component analyses identified three factors. Those factors were explained a total of 64.0% variance. The first principal component explained 39.8% of the variance, the second component explained 13.1% of the variance and the third component explained 11.1% of the variance. A value of 0.4 and above was used as cutoff point for judging factor loading. After varimax rotation, all items showed silent factor loading for one of the three factors.

TABLE 5: FACTOR LOADINGS OF BDI-II ITEMS ON EACH COMPONENT AFTER VARIMAX ROTATION (N=152) JUMC, 2018.

BDI-II items	Components		
	Factor 1	Factor 2	Factor 3
Sadness	**.71**	.36	.13
Pessimism	**.74**	.27	.11
Sense of past failure	**.57**	.54	.04
loss of pleasure	**.64**	.54	.17
Guilty feeling	**.55**	.46	.00
Sense of Punishment	.10	**.72**	.31
Self-dislike	.34	**.59**	.03
Self-accusation	.04	**.79**	.13
Suicidal Thoughts	.00	**.41**	.01
Crying	**.57**	.12	.27
Agitation	.01	.18	**.81**
Loss of interest	**.76**	.20	.03
Indecisiveness	**.49**	.14	.31
Worthlessness	.35	**.58**	.07
Loss of energy	**.78**	.16	.14
Changes in Sleep	**.85**	.03	-.03
Irritability	.07	.26	**.55**
Changes in Appetite	**.59**	-.02	.06
Concentration difficult	.35	.02	**.77**
Fatigability	**.66**	.17	.30
Loss of Interest in Sex	**.44**	.13	.30

Bold indicates an item loading of 0.40 or more and for items loaded in more than one factor; it was grouped with greater item loading value.

The above extracted factors were explained by different items. Factor 1 (Eigenvalue=7.6; variance=39.8 %) contained 13 items which were: sadness, pessimism, sense of past failure, loss of pleasure, guilty feeling, crying, loss of interest, indecisiveness, loss of energy, sleep change, change of appetite, fatigability and loss of interest for sex, and they were labeled as *affective-vegetative* components. Factor 2 (Eigenvalue=2.1; variance=13.1%) contained 5 items which were: sense of punishment, self dislike, self accusation, suicide and worthlessness and they were labeled as *cognitive* components. Factor 3 (Eigenvalue=1.5; variance=11.1%) contained 3 items which were: difficulty of concentration, irritability and agitation, and they were labeled as *somatic* components. The correlation between factor 1 and factor 2 was (r=0.58), between factor 1 and factor 3 (r=0.41), between factor 2 and factor 3 (r=0.43). The correlation between total BDI-II with each factors which was identified by PCA were (r=0.95, 0.76, 0.57, p<0.01) in the respective order for factor 1, factor 2 and factor

3. All the items correlated with the specific domain and with the total significantly (p<0.01). However, items correlated more to the domains to which they belonged.

CHAPTER SIX

DISCUSSION

6.1 Semantic & Content validity of BDI-II

The semantic equivalence of BDI-II was acceptable for most of the items, Even though some items have conceptual problems. Although the translation was well done by incorporated the problematic items by rewording, the interviews also revealed that the meaning of some items was not clear. Therefore besides rewording, it was essential to have additional explanations to ensure that the respondents understood what the question was intended to measure. So the method of data collection (face-to-face interviews) was helped to examine the problem as well as to give explanation for difficulty items. The value of reliability and item-total score of each item also showed that the original English version of BDI-II was appropriately translated and understand by participants.

6.2 Reliability of BDI-II

Inter-rater reliability (mean intra class correlation coefficient) of BDI-II was (ICC=0.98; CI, 0.95- 0.99), which showed that there was an excellent agreement or consensus of the questionnaire between data collectors and they measure almost the same things.

The result showed an excellent Cronbach alpha (α=0.91) and mean item-total correlation (r=0.33). Which demonstrated that Amharic version of BDI –II items were homogeneous. The internal consistency reliability of BDI-II was confirmed by numerous studies (18, 30- 32, 35- 38, 40). Most of the researchers report cronbach alpha-coefficients, on the average higher than (α=0.79). this finding is similar to the manual of Beck and Steer report the average coefficient was reported as (α=0.92) for psychiatry outpatients and (α=0.93) for college students (28). Only few investigations in Portuguese (α=0.82), Malawi (α=0.80) and Uganda (α=0.79) were report low coefficients (30, 37, 40). The variation of coefficients may be related to cultural or population difference and sampling effects, which lead to a reduction in the subject variance and this reduces the size of the consistency coefficients.

Loss of pleasure (61.8%) and fatigability (61.8%) had the highest item score followed by loss of interest in sex (60.5%), loss of energy (59.8%) and sense of past failure (53.9%). Most of the items which have higher response rate were somatic symptoms and fatigability. So Endorsement of somatic symptoms and fatigue in HIV positive patients may important to have high suspicion and diagnosis of depressive disorder.

On the other worthlessness (21.1%), agitation (13.8%) and suicidal ideation or thoughts (5.3%) were least endorsed symptoms. The low score in suicide item may have been influenced by reluctance to reveal suicidal ideation or associated stigma and due to social unacceptability. However it should be noted that 8 participants were scored positive response for suicide while 144 answered no or scored 0 for this item.

6.3 Convergent validity of BDI-II

In this study the convergent validity of BDI-II across with WHODAS-12 showed significant positive correlation between the two screening tools (r=66). It also significantly correlated with the domains (r=0.95, 0.76, 0.57) for factor 1, factor 2 and factor 3 respectively. Other Studies also done in different country on the convergent validity of BDI-II with other different self-rating scale like with Hamilton psychiatric scale for depression, CES-D, BSD, PHQ-9, and CDRS-R, They all reported moderate to high correlation coefficients (r=0.71, 0.74, 0.71, 0.75, 0.42) respectively (29, 34, 35, 37, 38). The variation of validity coefficients in this study may be related to the difference of comparative instrument, severity of depression and co-morbid illness.

6.4 Criterion validity of BDI-II

Cut-off scores were calculated using two main parameters sensitivity and specificity. In this study a cut off score 13 and (AUC=0.9) appeared to provide the best balance for sensitivity of 86% and specificity of 83% for the Amharic version of BDI-II as a screening instrument of depression in HIV positive patients. This cutoff score is similar to other studies in Malawi among HIV positive patients a score of 13 is appropriate with sensitivity of 80% and specificity of 80% (38). Whereas lower than the Studies done in USA on ART patients a score of 17 and (AUC=0.83) is appropriate to screen depression in HIV positive patients (8). In sri lanka community based research score of 16 has sensitivity of 80% and specificity of 80% (32). And in Nigerian adolescents cut off 18 is appropriate with sensitivity of 91% and specificity of 97% (39).The variation of this cut-off score may be the difference in sample size, cultural context and the instrument used as gold standard.

When evaluating an instrument for screening purposes, sensitivity should be regarded as more important in order to decrease the risk of false negatives, because if it is left the case and delays the treatment it may lead to high mortality, morbidity and spent greater amounts of resources on these individuals. But it is important to consider both sensitivity and specificity of screening tool in a country like Ethiopia with little resources to minimize over

diagnosis of depression. With this consideration BDI-II total scores of 0-12 indicated no depression and 13-63 have mild to severe depression.

So based on this cut off point the prevalence of MDD in HIV positive patients was 50% and the prevalence become decrease to 47% when they evaluated by MINI. The reasons for this high prevalence of depression may be related to female participants were dominated in this study. For patients who were identified as depression by MINI were linked to psychiatry clinic to get formal diagnosis and treatment

6.5 Construct or factorial validity of BDI-II

In this study explanatory Factor analysis revealed three factors that explained 64.0% of total variance. In the other studies the number of extracted factors ranges from one to three (8, 28, 31, 32, 33, 36, 37). The Studies was consistently extracted and confirmed two factors cognitive and affective-somatic factors (28, 31, 32, 33, 36) and three factors cognitive, somatic-affective and vegetative factors (8, 37). The result is similar with studies in USA in a population of HIV positive patients confirmatory factor analysis confirmed that BDI-II was best fit for a three-factor model (8). Whereas greater number of factor extracted than the manual of Beck in a clinical population revealed that cognitive and somatic-affective factors were identified (28). Most of the items categorized in the domain also have similarly grouped in previously studies. The difference in Number of factors identified in this study against the other studies may be the sample size, the extraction method, the criterion for the estimation of the factor number and the objective of the validity study.

LIMITATION OF THE STUDY

✓ One of the possible limitations of this study could be its cross-sectional nature in which it does not allow to do some validity test like test retest reliability, content validity and factors that affect the score of BDI-II.

✓ The study did not employ the discriminatory validity analyses and this measurement may provide participants with another emotional distress.

✓ The quantitative assessment of patient using interview questionnaire can be associated with a declaration bias. Indeed, the interview may influence the reaction of those patients, for fear of reprisal or prosecution, so they may give social acceptable answers that do not reflect reality.

✓ Since the research was done only in one hospital and this may not represent all Amharic speaking HIV positive patients in Ethiopia.

CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATION

7.1 Conclusions

This preliminary validation study of the Amharic version of BDI-II showed relevant psychometric instrument; showing excellent reliability, capacity to discriminate depressed and non-depressed subjects, improved concurrent, content, and structural validity. A score of 13 and above (AUC; 0.90, S_N; 0.86, S_P; 0.83) is appropriate to screen depression in HIV positive patients.

So BDI-II can be used to screen depressive disorder in HIV positive patients using this appropriate cut-off score.

Additional studies need to be conducting to further explore the validity, reliability and case finding ability of BDI-II tool not only in HIV positive patients but also in other patient groups by incorporating the above limitation of this study.

7.2. Recommendations

On the basis of the most important findings of the study, the following recommendations are suggested:

✓ For health professionals who work on ART clinic:

- To screen depression by using this valid screening tools every HIV positive patients.

- After screening cases based on the above cut off point you should link to psychiatry clinic to get formal diagnoses and treatment.

✓ For psychiatry department and mental health professionals

- You can use to follow the severity of depression and treatment outcome of patients with depression in psychiatry clinic.

- To provide training for non mental health professional regarding screening tools.

- Since the prevalence of mental illness including depression is high In HIV positive patients, so the psychiatry department should assigned mental health professional in ART clinic.

- ✓ For academician or researchers
  - You can use this valid tool, if you have interested to do in the area of depression.
  - To do further research on the validity and reliability of this screening tool in other patient groups by incorporating the above limitation.
- ✓ To minister of health
  - Since the number of mental health professionals are limited and associated to this it's difficult to afford mental health care to the community level so the minister of health is better to provide training for non mental health professional about mental health and how they screen mental illness in case of other medical co-morbidity.

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Annex-I Information Sheet and Consent Form

Dear Sir/madam;

Good morning my name is _____. I am research assistant and working with Mr. Endashaw Habtamu from Jimma University. He is doing a research on the psychometric property of beck depression inventory II among HIV positive patients in JUMC ART clinic Jimma Town, Southwest Ethiopia, 2018 as partial fulfillment for Degree of Masters Science in integrated clinical and community mental health. I am going to give you information and invite you to be part of this research. If you agree to participate, you will be required to fill out a questionnaire, which will take about 10 minutes of your time.

The information that you will obtain using this interview will be used only for research purpose and also I need to assure you that confidentiality is our main quality.

Therefore; I politely request your cooperation to participate in this interview. You do have the right not to respond at all or to withdraw in the meantime, but your input has great value for the success of our objective.

Did you agree _____

Did not agree _____

Thank you for your cooperation!!

Annex-II English Version Questionnaires

Part I-Assessment of Depression Using BDI-II

Section I. Socio demographic and socio economic characteristics

N<u>O</u>	Question	Response	Code
101	Age	------------	
102	Sex	1.Male 2.Female	
103	Marital status	1. Not married 2Married 3.Divorced 4.Widowed	
104	Ethnicity	1.Oromo 2.Amhara 3. Kefa 4. Yem 5. dawero 6.Other(Specify)_____	
105	Religion	1.Muslim 2.orthodox 3. protestant 4. Other (Specify)_____	
106	Residency	1 urban 2 rural	
107	Educational status	1.Illiterate 2.primary 3. secondary 4.college and above	
108	Occupation	1.gov,t worker 2.farmer 3.merchant 4. house wife	

		5dailey laborer 6.others			
109	Income	---------			

Section II. BDI-II (21) Items

			Response			Score
No	Item	0	1	2	3	
201	Sadness	I do not feel sad	I feel sad	I am sad all the time	I am so sad and unhappy that I can't stand it	
202	Pessimism	I am not particularly discouraged about the future	I feel discouraged about the future	I feel I have nothing to look forward to	I feel the future is hopeless and that things cannot improve	
203	sense of past failure	I do not feel like a failure	I feel I have failed more than the average person	As I look back on my life, all I can see is a lot of failures	I feel I am a complete failure as a person	
204	Loss of pleasure	I get as much satisfaction with things as I used to	I don't enjoy things the way I used to	I don't get real satisfaction out of anything	I am dissatisfied or bored with everything	

39

				anymore		
205	Guilty feeling	I don't feel particularly guilty	I feel guilty a good part of the time	I feel quite guilty most of the time	I feel guilty all of the time	
206	Punishment feeling	I don't feel I am being punished	I feel I may be punished	I expect to be punished.	I feel I am being punished	
207	Self-dislike	I don't feel disappointed in myself	I am disappointed in myself	I am disgusted with myself	I hate myself	
208	Self-criticalness	I don't feel I am any worse than anybody else	I am critical of myself for my weaknesses or mistakes	I blame myself all the time for my faults	I blame myself for everything bad that happens	
209	Suicidal Thoughts or Wishes	I don't have any thoughts of killing myself	I have thoughts of killing myself, but I would not carry them out	I would like to kill myself	I would kill myself if I had the chance	
210	Crying	I don't cry any more than usual	I cry more now than I used to	I cry all the time now	I used to be able to cry, but now I can't cry even though I want to	
211	Agitation	I am no more restless or	I feel more restless or wound up	I am so restless or agitated	I am so restless or agitated	

		wound up usual	than usual	that it is hard to stay still	that I have to keep moving and doing something	
212	Loss of Interest for social interaction	I have not lost interest in other people	I am less interested in other people than I used to be	I have lost most of my interest in other people	I have lost all of my interest in other people	
213	Indecisiveness	I make decisions about as well as I ever could	I put off making decisions more than I used to	I have greater difficulty in making decisions more than I used to	I can't make decisions at all anymore	
214	Worthlessness	I don't feel I am worthless	I don't consider myself as worthwhile and useful as I used to	I feel more worthless as compared to other people.	I feel utterly worthless	
215	loss of energy for activity	I have as much energy as ever	I have less energy than I used to have for things	I don't have enough energy to do much	I don't have enough energy to do anything	

216	Changes in Sleep Pattern	I can sleep as well as usual	I sleep somewhat more than usual	I sleep a lot more than usual	I sleep most of day	
			I sleep somewhat less than usual	I sleep a lot less than usual	I wake up 1-2 hours early and can't get back to sleep	
217	Irritability	I am no more irritated by things than I ever was	I am slightly more irritated now than usual	I am quite annoyed or irritated a good deal of the time	I feel irritated all the time	
218	Changes in Appetite	I have no experienced any change in my appetite	My appetite is somewhat less than usual	My appetite is much less than before	I have no appetite at all	
			My appetite is somewhat greater than usual	My appetite is much greater than before	I crave food all the time	
219	Concentration difficulty	I can concentrate as well as ever	I can't concentrate as well as usual	It's hard to keep my mind on anything for very long	I find I can't concentrate on anything	
220	Fatigue or	I don't get	I get tired	I get tired	I feel too	

	tiredness	more tired than usual	more easily than before	almost by anything	tired by anything	
221	Loss of Interest in Sex	I have not noticed any recent change in my interest in sex	I am less interested in sex than I used to be.	I have almost no interest in sex	I have lost interest in sex completely	

BDI-II Manual by Aaron T. Beck, Robert A. Steer and Gregory K. Brown© 1996 by Aaron T. Beck (46).

Questioners for Assessment of Depression by MINI

301. Have you been consistently feel sad or depressed? Did you feel this way most of the time, for at least 2 weeks?

A. yes   B. no

302. For the past 2 weeks were you bored a lot or much less interested in things (like playing your favorite Games)? Have you felt that you couldn't enjoy things?

A. yes   B no

303. Was your appetite increased or decreased most of days? Did you lose or gain weight without trying? (i.e.by ±5% of body weight in the past month)

A. yes   B. no

304.did you have trouble sleeping almost every night ("trouble sleeping" means trouble falling asleep, waking up in the middle of the night, waking up too early or sleeping too much)?

A. yes   B. no

305. Did you talk or move slower than usual? Were you restless or couldn't sit still almost every day?

A. yes   B. no

306. Did you feel tired most of the time?

A. yes   B. no

307. Did you feel guilty or worthless most of the time?

A. yes   B. no

308. Did you have trouble concentrating or did you have trouble making decision?

A. yes   B. no

309. Did you repeatedly consider hurting yourself, feel suicidal and feel that you wished that you were dead?

A. yes   B. no

310. Are 5 or more answers yes from question number 401-409?

A. yes   B. no

311. Specify the episode is current or past.

A. current   B. past

WHODAS-12 Questionnaires

401. Standing for long periods such as 30 minutes?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty
3. Severe difficulty   4. Extreme difficulty or can't do

402. Taking care of your household responsibilities?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.
3. Severe difficulty   4. Extreme difficulty or can't do

403. Learning a new task, for example, learning how to get to a new place?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.
3. Severe difficulty   4. Extreme difficulty or can't do

404. How much of a problem did you have in joining in community activities (for example, festivities, religious or other activities) in the same way as anyone else can?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.
3. Severe difficulty   4. Extreme difficulty or can't do

405. How much have you been emotionally affected by your health problem?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.
3. Severe difficulty   4. Extreme difficulty or can't do

406. Concentrating on doing something for ten minutes?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.

3. Severe difficulty   4. Extreme difficulty or can't do

407. Walking a long distance such as a kilometre.

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.

3. Severe difficulty   4. Extreme difficulty or can't do

408. Washing your whole body?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.

3. Severe difficulty   4. Extreme difficulty or can't do

409. Getting dressed?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.

3. Severe difficulty   4. Extreme difficulty or can't do

410. Dealing with people you do not know?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.

3. Severe difficulty   4. Extreme difficulty or can't do

411. Maintaining a friendship?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.

3. Severe difficulty   4. Extreme difficulty or can't do

412. Your day-to-day work/school?

0. No difficulty   1. Mild difficulty.   2. Moderate difficulty.

3. Severe difficulty   4. Extreme difficulty or can't do

በጅማ ዩኒቨርሲቲ ጤና እንስቲትዩት በጤና ሳይንስ ፋካሊቲ

የስነ_አእምሮ ት/ክፍል

መረጃ ማስብሰብያ ቅጽ በአማርኛ የተዘጋጀ

ክፍል-1 መረጃ መስጫ ቅፅ

ጤና ይስጥልኝ ፤ ስሜ --------------ይባላል፡ በጅማ ዩኒቨርሲቲ ከአቶ እንዳሻዉ ሀብታሙ ጋር በጥናት ስራ ላይ እየተሳተፍኩ ስሆን ለሁለተኛ ድግሪ መመረቂያ ይሆናቸዉ ዘንድ "on the psychometric property of beck depression inventory II among HIV positive patients in JUMC ART clinic Jimma Town, Southwest Ethiopia, 2018" በሚል ርዕስ በሆስፒታላችን እየሰሩ ይገኛሉ፡፡ እርሶ የዚህ ጥናት አካል ይሆኑ ዘንድ በዕጣ ከሚሰሩበት ክፍል የተመረጡ ስሆን ፡፡ በጥናታችን ላይ ለመሳተፍ ከተስማሙ መጠይቃችንን ሙሉ በሙሉ ለመጨረስ ከ10-15 ደቂቃ ይፈጃል፡፡ የጥናታችን ጥራትና ተዓማኒነት የሚለካዉ፡ የሚረጋገጠዉ እርስዎ በምሰጡት፤ በሚሞሉት መጠይቅ መሰረት ስለሆነ የእርስዎ ተሳትፎና ጥያቄዎቹን በሙሉ መመለስ ወሳኝና የመስራቤትዎን የአገልግሎት ጥራት እና የስራ ሁኔታ ለማሻሻል ጠቃም ግብዓት ነዉ፡፡

በጥያቄዉ ላይ የመሳተፍም ሆነ ያለመሳተፍ ሙሉ መብት አልዎት፡፡ በመሳተፏ ከሚሰጡት ደቂቃ ዉጪ የሚመጣብዎ ምንም አይነት ጉዳት አይኖርም፡፡ የሚሰጡን መረጃ ላይ ማንነትዎን የሚገልፅ ምንም አይነት ነገር አይኖርም ወይም አያስቀምጡ፡፡ መረጃዎን ከጥናቱ አስተባባር በቀር ማንም ማወቅ አይችልም፡፡ በጥናቱ ላይ ስለምያጋጥምዎ ማንኛዉም ጥያቄ እባክዎ በነፃነት የጥናቱን አስተባባሪ ያግኙ፤ ይጠይቁ፡፡

የአስተባባሪዉ አድራሻ ፤

ስም- እንዳሻዉ ሀብታሙ

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ክፍል-2፤ የስምምነት ዉል

በመጥይቁ ላይ ለመሳተፍ ፍቃደኛ ኖት?

አዎ -----------(አመስግናለሁ፤ መጠይቁን ስጥ!)

አይደለሁም------- (አመስግናለሁ፤ አቁም!)

ከላይ የተጠቀሰዉን መረጃ አንብበዉለሁ እና ማንኛዉንም ጥያቄ የመጠየቅ እድል ስላለኝ በመጠይቁ ላይ ለመሳተፍ ተስማምቻለሁ፡፡

የመልስ ሰጪዉ አጠቃላይ መረጃ

የመጠይቁ ቁጥር _____የተቆጣጣሪዉ ስምና _____

መጠይቁ የተሰጠበት ቀን _____

ኮድ	ጥያቄዎች	መልስ
101	ዕድሜ	_____ዓመት
102	ፆታ	ወንድ ሴት
103	የጋብቻ ሁኔታ	ያላገባ/ች ያገባ/ች የተፋታ/ች የሞተበት/ባት
104	ብሔር	ኦሮሞ አማራ ከፋ የም ዳውሮ ሌላ
105	ኃይማኖት	ሙስሊም ኦርቶዶክስ ፕሮቴስታንት ሌላ
106	የመኖሪያ ቦታ	ከተማ ገጠር
107	የትምህርት ደረጃ	ያልተማረ/ች 1ኛ ደረጃ 2ኛ ደረጃ ከዚያ በላይ
108	የስራ ሁኔታ	የመንግስት ሰራተኛ ገበሬ ነጋዴ የቤት እመቤት የቀን ሰራተኛ ሌላ _____
109	ወርሃዊ ገቢ	_____ብር

Amharic version of BDI-II

201 ሀዘን

    0 የሀዘን ስሜት አይሰማኝም

    1 አብዛኛውን ጊዜ የሀዘን ስሜት ይሰማኛል

    2 በማንኛውም ሰዓት ውስጤ ያዝናል

    3 የሚሰማኝ ሀዘን መቋቋም እስከማልችለው ድረስ ነው

202 መጥፎ ነገር ብቻ ይሆናል የሚል አስተሳሰብ

    0 ስለወደፊት ተስፋ አልቆርጥም

    1 ከበፊቱ ይልቅ አሁን ስለወደፊት ተስፋ የለኝም

    2 ነገሮች ሁሉ ለኔ ይሳኩልኛል ብዬ አልጠብቅም

    3 ወደፊት ተስፋ እንደሌለው ይሰማኛል፣ ከዚህም አይሻልም

203 አለመሳካት

    0 ያልተሳካለት ሰው እንደሆንኩ አይሰማኝም

    1 ከሚገባው በላይ አልተሳካልኝም

    2 ወደ ኃላዬ ዞሬ ሳይ ያልተሳኩልኝ ነገሮች ብዙ ናቸው

    3 ምንም ነገር የማይሳካለት ሰው እንደሆንኩ ይሰማኛል

204 ደስታ ማጣት

    0 የሚያዝናኑኝን ነገሮች ባደረኩበት መጠን ደስታን አገኛለሁ

    1 ነገሮች እንደበፊቱ አያዝናኑኝም

    2 በፊት ከሚያዝናኑኝ ነገሮች አሁን ትንሽ ደስታ ብቻ ነው የማገኘው

    3 በፊት የሚያዝናኑኝ ነገሮች አሁን ምንም ደስታ አይሰጡኝም

205 የጥፋተኝነት ስሜት

    0 የተለየ የጥፋተኝነት ስሜት አይሰማኝም

    1 በስራ ኃታው ወይም መስራት በነበረብኝ ነገሮች የጥፋተኝነት ስሜት ይሰማኛል

    2 ብዙውን ጊዜ በጣም የጥፋተኝነት ስሜት ይሰማኛል

    3 በማንኛውም ሰዓት የጥፋተኝነት ስሜት ይሰማኛል

206 እየተቀጣሁ ያለሁ አይነት ስሜት

    0 እየተቀጣሁ ያለሁ አይነት ስሜት አይሰማኝም

    1 እቀጣ ይሆናል የሚል ስሜት አለኝ

    2 እንደምቀጣ እጠብቃለሁ

    3 እየተቀጣሁ እንደሆን ይሰማኛል

207 ራስን መጥላት

    0 በራሴ አልበሳጭም

    1 በራሴ እበሳጫለሁ

    2 በራሴ እናደዳለሁ

    3 እራሴን እጠላለሁ

208 ራሴን መውቀስ

    0 ምንም አይነት ከሌሎች ሰዎች የባሰ ነገር በእኔ ላይ የተፈጠር አይመስለም

    1 ለተፈጠሩ ሁሉ ስህተቶች ወይም ድክመቶች ራሴን እወቅሳለሁ

    2 ለጥፋቶቼ ሁሉ ራሴን እወቅሳለሁ

    3 ለተከሰቱት መጥፎ ነገሮች ሁሉ ራሴን እወቅሳለሁ

209 ራስን የማጥፋት ሀሳብ/ምኞት

    0 ራሴን የማጥፋት ሀሳብ የለኝም

    1 ራሴን የማጥፋት ሀሳብ አለኝ ግን አላደርገውም

    2 ራሴን ማጥፋት እፈልጋለሁ

    3 እድሉን ካገኘሁ ራሴን አጠፋለሁ

210 ማልቀስ

    0 ከበፊቱ የተለየ አላለቅስም

    1 ከበፊቱ የበለጠ አለቅሳለሁ

    2 በትንሹም በትልቁም አለቅሳለሁ

    3 የማልቀስ ስሜት አለኝ ግን ማልቀስ እንኳን አልቻልም

211 መቅበዝበዝ

    0 ከሁልጊዜው የተለየ የመቅበዝበዝ ስሜት የለኝም

    1 ከሁልጊዜው የበለጠ የመቅበዝበዝ ስሜት አለኝ

    2 ከመቁነጥነጤ የተነሳ አንድ ቦታ እንኳን መቆየት አልችልም

    3 ከመቁነጥነጤ የተነሳ ሁልጊዜ መንቀሳቀስ / የሆነ ነገር መስራት ይኖርብኛል

212 ለማህበራዊ ግንኙነት ፍላጎት ማጣት

    0 በሰዎች ላይ ላይ ፍላጎቴን አላጣሁም

    1 ለሰዎች እንደበፊቱ ፍላጎት የለኝም

    2 ለሰዎች ፍላጎቴ በጣም ቀንሷል

    3 ለሰዎች ፍላጎቴን በአጠቃላይ አጥቼያለሁ

213 መወሰን አለመቻል

    0 እንደበፊቱ በነገሮች ላይ እወስናለሁ

    1 ከሁልጊዜው ይበልጥ ውሳኔ መወሰን አስቸጋሪ ሆኖብኛል

    2 ከበፊቱ ይልቅ ውሳኔ መወሰን በጣም አስቸግሮኛል

    3 ምንም አይነት ውሳኔ መወሰን አዳጋች ሆኖብኛል

214 ዋጋ ቢስ

    0 ዋጋ ቢስ እንደሆንኩ አይሰማኛም

    1 ዋጋ ቢስም ጠቃሚም እንደሆንኩ አይሰማኝም

    2 ራሴን ከሌሎች ሰዎች ጋር ሳነፃፅር ዋጋቢስ እንደሆንኩ ይሰማኛል

    3 ምንም አይነት ዋጋ እንደሌለኝ ይሰማኛል

215 ጉልበት ማጣት

    0 ጉልበቴ እንደበፊቱ ነው

    1 ከበፊቱ ይልቅ ጉልበቴ ቀንሷል

    2 ነገሮችን ለማድረግ በቂ ጉልበት የለኝም

    3 ምንም ነገር ለማድረግ በቂ ጉልበት የለኝም

216 የእንቅልፍ መዛባት

0 በአተኛኘቴ ላይ ምነም ለውጥ የለኝም

  1

ትንሽ ከበፊቱ የበለጠ እተኛለሁ

ትንሽ ከበፊቱ የያነስ እተኛለሁ

   2

ከበፊቱ የበለጠ በጣም እተኛለሁ

ከበፊቱ በጣም ያነስ እተኛለሁ

  3

የቀኑን አብዛኛውን ሰዓት እተኛለሁ

1—2 ሰዓት ቀድሜ እነሳለሁ ግን መልሼ መተኛት አልችልም

217 መበሳጨት

0 ከሁልጊዜው የተለየ አልበሳጭም

1 ከሁልጊዜው ይበልጥ እበሳጫለሁ

2 ከሁልጊዜው በጣም በተለየ ሁኔታ እበሳጫለሁ

3 በማንኛውም ሰዓት እበሳጫለሁ

218 የምግብ ፍላጎት መቀየር

0 የምግብ ፍላጎት ላይ ለውጥ የለኝም

    1

ፍላጎቴ ከሁልጊዜው ቀነስ ብሏል

የምግብ ፍላጎቴ ከበፊቱ በዛ ብሏል

   2

የምግብ ፍላጎቴ ከበፊቱ በጣም አንሷል

የምግብ ፍላጎቴ ከበፊቱ በጣም ጨምሯል

   3

ምንም የምግብ ፍላጎት የለኝም

ምግብ በጣም እበላለሁ

51

219 ሀሳብን የመሰብሰብ ችግር

    0 እንደበፊቱ ሀሳቤን መሰብሰብ እችላለሁ

    1 እደሁልጊዜው ሀሳቤን መሰብሰብ አልችልም

    2 አንድ ነገር ላይ ረዘም ላለ ሰዓት ሀሳቤን መሰብሰብ አልችልም

    3 ምንም ነገር ላይ ሀሳቤን መሰብሰብ አልችልም

220 ድካም/መዛል

    0 ከበፊቱ የተለየ አይደከመኝም/አልዝልም

    1 ከሁልጊዜው በተለየ በቀላሉ ይደከመኛል/እዝላለሁ

    2 ከበፊቱ ይልቅ ብዙ ነገሮችን ለማድረግ ይደከመኛል/እዝላለሁ

    3 በከበፊቱ ይልቅ ነገሮችን ለማድረግ በጣም ይደከመኛ

221 ፆታዊ ግንኙነት ለማድረግ ፍላጎት ማጣት

    0 ከቅርብ ጊዜ ወደህ የሚስተዋል የተለየ የፆታዊ ግንኙነት ፍላጎት መቀየር የለኝም

    1 ከበፊቱ ይልቅ ለፆታዊ ግንኙነቴ ፍላጎቴ ቀንሷል

    2 አሁን ለፆታዊ ግንኙነት ያለኝ ፍላጎት በጣም ቀንሷል

    3 ምንም አይነት የፆታዊ ግንኙነት ፍላጎት የለኝም