



# Prevalence of depression and associated factors among adult inpatients in Mizan Tepi University Teaching Hospital, Mizan-Aman, Ethiopia, 2019

## Abstract

**Background:** Depression is a type of mental disorder which is characterized by an excessive and persistent feeling of sadness or despair and/or a loss of interest in things. It is mainly co-morbid with chronic illnesses and is associated with a range of adverse clinical outcomes.

**Objective:** To assess prevalence of depression and associated factors among adult inpatients at MizanTepi University teaching hospital, Mizan-Aman, Ethiopia, 2019.

**Methodology:** Institution based cross sectional study design was conducted from April 10 to May 20, 2019 at Mizan Tepi University Teaching Hospital among adult in patients with sample size of 374. Systematic sampling method was used to select the sample involved in the study. Data was entered into Epi data version 3.1 and exported to SPSS version 23 for data analysis. Descriptive statistics was used to identify the distribution of socio demographic, clinical and behavioral characteristics of the study participants. Bivariate and multivariate logistic regression and odds ratio with 95% confidence interval was used to identify the associated factors with Depression. A p value of less than 0.05 was considered statistically significant.

**Results:** The prevalence of depression among adult patients admitted to Mizan Tepi University Teaching hospital was 58.4%. Depression has statistical significance association with having previous hospital admission, being diagnosed with chronic disease, ward, being user of cigarette and social support.

**Conclusion and Recommendation:** Hospitalized patients were more depressed than the general population at Mizan Tepi University Teaching Hospital. Smokers suffering from a chronic illness, with poor perception of support and previous history of hospital admission were more likely to be depressed. All health care professionals working with patients suffering from chronic illness need to be trained on screening for depression. Health-care providers do thorough assessment to address common mental disorders, especially depression, and suggest that training to recognize and manage depression appropriately be given for admitted patientsn.

**Keywords:** depression, prevalence, adult, inpatient, associated factor

## Introduction

Depression is a type of mental disorder which is characterized by an excessive and persistent feeling of sadness or despair and/or a loss of interest in things [1].

Depression affects person's capacity to perform his tasks and execute his responsibilities. Severe depression could lead to suicide which takes 1 million and 3000 lives per year and day respectively [2].

In Ethiopia mental Health has been one of the most disadvantaged health programs, both in terms of facilities and trained manpower,

however, during the last decade; encouraging efforts have been taken to expand services throughout the country. In Ethiopia depression was found to be the seventh leading cause of disease burden. Generally the prevalence of depression is high in hospital compared to community setting because hospital environment itself is stressful [3,4].

WHO report in 2012, one out of ten people suffer from depression and almost one out of five persons has suffered from this disorder during his/her lifetime one-year prevalence is 10% and lifetime prevalence 17%.

Institution based cross-sectional study done in

**Abiru Neme Negewo<sup>1\*</sup>,  
Wadu Wolancho  
Debocho<sup>1</sup> and  
Mirressa Guteta<sup>2</sup>**

<sup>1</sup>Department of Nursing, Jimma University Institute of Health, Ethiopia

<sup>2</sup>Department of Nursing, Mzan Tepi University Institute of Health, Ethiopia

\*Author for correspondence:  
abiruneme@gmail.com

Baquba Teaching Hospital revealed that sixty eight (8.8%) out of 707 admitted patients had depression [5].

Similar hospital based studies at Shariati in Tehran show that the prevalence of depression was 77.9% [6].

Another study on prevalence of depression among patients on medical and surgical wards of Chaudhry Rehmat Memorial Trust and Saira Memorial Hospitals Lahore Pakistan indicated prevalence of depression was 45.3% in Medical and 53.7% in Surgical patients which is unrecognized by their clinicians [7].

Based on institution based cross-sectional study the prevalence of depression among 489 adult patients admitted to Harari Regional State hospitals was 292 (59.7%) [8].

Other studies done among admitted patient in Gondar University Hospital and Adare General Hospital, Hawassa shows that the prevalence of depression was 58.6% and 38% respectively [9,10].

Similarly study done in Mekelle, Tigray region revealed that the prevalence of depression among 280 adult patients admitted in governmental hospitals is about half of the study participants 153 (54.6%) had depression, while male accounts 62.7% and female were 48.8%. Out of the total depression on the study participants 54.2% had mild depression, 21.5 had moderate depression, 7.2 had severe depression and 17% had very severe depression [11].

Institution based cross-sectional study done in Baquba Teaching Hospital out of 707 revealed that depression is more common in female 42 (62%) than that in male 26 (38%) also in housewives than employed and in younger age groups than older and in more in early days of admission than later days [5].

According to study done at Tikur Anbessa Specialized Hospital being female AOR=2.3595% CI (1.48, 3.72), poor social support AOR=2.5195% CI (1.30, 4.85), developing complication AOR=1.9195% CI (1.07, 3.52), presence of amputation AOR=3.6495% CI (1.60, 8.24) and having pain AOR=2.0295% CI (1.24, 3.30) associated with depression [12].

Based on institution based cross-sectional study among 489 adult patients admitted to Harari Regional State hospitals; having duration of 1-2

weeks in the hospital AOR=2.02, 95% CI: (1.28, 3.19), being diagnosed with chronic morbidity AOR=4.06, 95% CI: (2.23, 7.40), being users of psychoactive drugs AOR=2.24, 95% CI: (1.18, 4.24), and having been admitted to surgical ward AOR=0.50, 95% CI: (0.31, 0.81) were significantly associated with depression [8].

The study done in Mekelle, Tigray region among adult patients admitted revealed that age, educational status, medical illness, and ward admission had a significant association with depression [11].

Based on studies done in Gondar University Hospital among admitted patient shows that being female, being widowed, having a history of previous hospital admissions, illiterate, had substance abuse, or concerned about the length of their hospital stay associated with mental distress [9].

Similar study done at Adare General Hospital revealed being age category 18-24, having cardiovascular disorder and being in surgical ward had association with depression [10].

## Materials and Methods

### ■ Study setting and period

The study was conducted in MTU Teaching Hospital which is located in SNNPR, of Ethiopia, Bench-Maji zone. Mizan-Aman town is 565 km from Addis Ababa and 835 km from regional town, Hawassa. Data was collected from April 10 to May 20. The hospital has 4 wards (medical, pediatric, surgical, gynecology and obstetrics) and 1 emergency, 3 OPDs, MCH, ART, Ophthalmology, Dentistry departments. MTUH has 6 specialists, 49 General practitioners, 89 nurses, 32 midwifery, 21 laboratory technicians, 19 pharmacists, 4 anesthetists and 200 beds. The hospital serves several zones of SNNPs and Gambella states for around 8,50538 peoples [13].

### ■ Study design

Institution based cross sectional quantitative study design was used.

### ■ Population

#### *Source population*

All adult inpatients admitted to medical, surgical and gynecological wards during study period.

### **Study population**

Patients who were admitted to the study wards in the study hospitals at the time of data

Collection and meet the inclusion criteria.

### **Eligibility criteria**

#### **Inclusion criteria**

All adult patients, who aged 18 years old and above, are admitted to medical, surgical and gynecological wards.

#### **Exclusion criteria**

Patients staying in the hospital less than one day and those patients not fully recovered from anesthesia. Patients are unable to respond to the interviews.

### **Sample size determination and sampling technique**

#### **Sample size determination**

The sample size was determined by using single population proportion formula, considering the following assumptions; 5% marginal error, 95% confidence interval, adding 1% to compensate for non-response and prevalence of depression  $p=59.7\%$  based on study done at Harar Hospital.

$$N = (Z_{\alpha/2})^2 \frac{p(1-p)}{d^2}$$

$d^2$

$p=59.7\%=0.597$  Prevalence of depression based on study done at Harar Hospital.

$W=5\%$ , 0.05 (Margin of error)

$Z_{\alpha/2}=(95\% \text{ Confidence interval}), 1.96$

$$369.7=370$$

After adding 1% non-response rate the final sample size became 374.

On an average the number of patients admitted in the hospital medical, surgical and gynecology over a month is 800. A systematic sampling technique used to select from 800 patients and the final sample size become 374. The sampling fraction is:  $800/374=2$ . Therefore, the sample interval is 2. We select the first individual with lottery method and individuals are chosen at regular intervals (every 2nd).

#### **Sampling technique**

Systematic sampling method was used to get study participants. As a result, a proportional allocation has done for the 3 wards.

### **Study variable**

#### **Dependent (outcome) variable**

Depression

#### **Independent (exposure) variable**

1. Socio-demographic factor
2. Age, sex, religion, ethnicity, educational status, income, marital status
3. Substance use
4. Medical problem
5. Hospital stay
6. Family history of mental illness
7. Pre-existing mental illness
8. Ward (Medical, Surgical and Gynecology)

### **Data Collection Instrument and Procedures**

#### **Data collection procedure**

The data was collected through structured interviewer questionnaires after obtaining consent from participants. Questionnaires were adopted after reviewing of different literatures and the data collection instrument prepared in English. It was translated to Amharic and back to English to ensure consistency by language expert.

#### **Data collection instrument**

Data collection tool adopted from literature which contains five parts: part I: socio demographic factor, part II: types of diagnosis, part III: substance use, part IV: social support, part V: patient health questionnaire-9 (PHQ-9). PHQ-9 is a 9 item questionnaires used to screen symptoms of depression which is used to rate level of depression. It is validated in Ethiopia with internal (Cronbach's  $\alpha=0.85$ ) and test re-test reliability (intraclass correlation coefficient=0.92), sensitivity=86% and specificity=67 [14]. It is a simple depression screening tool which has a brief questionnaire that scores each of 9 DSM-IV criteria for depression as "0" (not at all) to "3" (nearly every day). A score of 3-8 is poor social support, 9-11 is moderate social support and 12-14 is strong social support. In Ethiopia, Cronbach's  $\alpha$  for OLSO found to be 0.88.

#### **Data collectors**

Three BSc Nursing staff was the data collectors who are responsible to lead the whole situation of the data collection processes, to check the data collected consistency, completeness with one BSc Nurse Supervisor.

### ■ Data management and analysis

Data was entered into Epi data version 3.1 and exported to SPSS version 23 for data analysis. Descriptive statistics was used to identify the distribution of socio demographic, clinical and behavioral characteristics of the study participants. It was processed by using descriptive analysis, including frequency distribution, cross tabulation and summary measures Bivariate and multivariate logistic regression and odds ratio with 95% confidence interval was used to identify the associated factors with Depression. Variables with p-value ( $\leq 0.05$ ) was used as the cut-off point and independent variables with p-value  $\leq 0.05$  in bivariate logistic analysis will be fitted in to multivariate logistic regression to identify independently associated factors in the final model. Finally, finding of study was presented on table, Chart and graph.

### ■ Data quality assurance

One week prior to the actual data collection, the questionnaire was pretested on 5% of the sample in Tepi hospital. The purpose of pretest is to ensure that the respondents are able to understand the questions and to check the wording, logic and skip order of the questions in a sensible way to the respondents. Modification was making accordingly after the pre-test. Three B.Sc. Nurses were receiving 1 day training on data collection techniques. Data collection was supervised by 1 B.Sc. Nurse, and each questionnaire was check for completeness by the principal investigator on a daily basis.

### Ethical Consideration

Ethical clearance was obtained from Jimma University Institute of Health institutional review board. A formal letter was written and permission obtains from Mizan Tepi University teaching hospital administration office. After a detail explanation of the purpose of the study, verbal consent was obtained from each study participants. Participants who were refusing to participate in the study were not being forced and participants can withdraw from the study at any time. Those study participants who was had depression based on PHQ 9 and suicidal ideation symptom was linked to the respective

health care provider for further diagnosis and treatments.

### Dissemination Plan

The result of this study will be presented at Jimma University, Institute of health science, school of nursing and midwifery. Then, the hard copy will be submitted to school of nursing and midwifery as well as the hard copy of the finding also will be sending to Mizan Tepi university teaching hospital. Lastly, this research finding will publish on peer reviewed international journal.

### Result

A total of 368 patients were interviewed in this study with response rate of 98.4%. Out of the total 368 study subjects, females make a majority 190 (51.6%). One hundred sixteen (31.5%) were aged between 25 and 34 years with mean age of 36.01 years. They were predominantly protestant 209 (56.8%) by religion and majority of the respondents 148 (40.2%) were Bench in ethnicity. Two hundred seventy one (73.6%) of the respondents were married. Regarding educational status and occupation 178 (48.4%) was unable to write and read and 114 (31%) farmer respectively. Two hundred twenty four (60.9%) study participants coming from rural and 325 (88.3%) were living with their families (TABLE 1).

Majority 278 (75.5%) of the respondents stayed in the hospital for less than one week. Ninety nine (26.9%) had history of previous hospitalization and 156 (42.4) were diagnosed with chronic morbidity, among which 36 (9.8%) had Heart failure (TABLE 2).

Alcohol was the most commonly used substance 181 (49.2%) with majority of the respondents 77 (20.9 %) having used it for more than eleven years. Whereas fifty-five (14.9%) and 51 (13.9%) were khat users and cigarette smokers respectively (TABLE 3).

All of the respondents got social support of which 188 (51.1%) rated that they received medium level of support (FIGURE 1).

### ■ Prevalence of depression

The PHQ-9 was used to screen for depression among 368 in patients who participated in this study, using cut-off score  $\geq 5$ . More than half the respondents in this study had scores indicative of depression, prevalence as high as 215 (58.4%).

Four (1.1%) participants were found to be severely depressed (TABLE 4).

### ■ Severity of depression

Among the total participants, 195 (53.0%) fulfilled the criteria for mild depression (PHQ-9 score 5-9), 12 (3.3%) of them fulfilled moderate depression (PHQ-9 score 10-14), 4 (1.1%) of them for moderately severe depression (PHQ-9 score 15-19) and 4 (1.1%) of them fulfilled criteria of severe depression (PHQ-9 score 20-27).

### ■ Factors associated with depression

In this study, having previous hospital admission was 3 times more likely to experience depression compared with patients who were not had history of hospital admission before  $p=0.000$  AOR=3.181, 95% CI: (1.695, 5.972) and participants who were cigarette smokers were 2 times more likely to have depression as compared with participants who were non-smoker  $p=0.046$  AOR=2.164, 95% CI: (1.015, 4.611).

Result of multivariable logistic regression indicated that having previous hospital admission, being diagnosed with chronic disease, ward, being user of cigarette; and social support AOR=2.794, 95% CI: (1.518, 5.140); AOR=1.806, 95% CI: (1.058, 3.082); AOR=0.503, 95% CI: (0.261, 0.969), AOR=2.660, 95% CI (1.292, 5.475); and AOR=0.397, 95% CI: (0.243, 0.650) were more likely associated with development of depressive symptoms as compared with their counterparts, respectively, whereas patients who were admitted to gynecology ward were less likely AOR=0.503, 95% CI: (0.261, 0.969) to have depressive symptoms compared to those who were admitted to medical ward (TABLE 5 AND FIGURE 2).

## Discussion

This study revealed that the prevalence of depression was 58.4%, 195 (53%) had mild depression and it is mainly affected by having previous hospital admission, having chronic disease, ward, cigarette smoking and social support. Similar findings were reported in many studies. This study finding was higher than the studies done in Pakistan (36.6%), Jamaica (36.8%) and lower than studies done in Tehran (77.9%) [6,7,15]. This difference of findings across different studies might be due to method used, different sample size, reporting

bias, difference in baseline characteristic of study population (FIGURE 3).

The prevalence of current finding is higher than studies done in outpatient in Black Lion specialized hospital (36.1%), Hawassa Adare hospital (24.5%), Dessie referral hospital (39.1%) and Bahirdar Felege Hiwot referral hospital (40.4%) [2,12,16,17]. This difference of findings might be due to limitation of diagnostic tools, setting area, severity of their illness, method used, different sample size, reporting bias, difference in baseline characteristic of study population (FIGURE 4).

Study done among inpatients in Mekelle hospital (54.6%) and Hawassa Adare general hospital (38%) was lower than this finding [10,11]. This difference of findings across these studies might be due to limitation of diagnostic tools, method used, different sample size, reporting bias, difference in baseline characteristic of study population, different setting. In addition Mizan-Tepi university teaching hospital was became teaching hospital one year ago before it was general hospital which has shortage of resources besides high flow of patients. Most of the patients receive their treatment in the collider and on the ground without bed.

On the other hand, this finding is almost similar with study done in Gonder university hospital (58.6%) and Harar public hospital (59.7%). This similarity among these findings might be due to similar setting [8,9].

When compared to the general population the finding of this study was higher than study done in the community. The study conducted on prevalence and risk factors of depression in Ethiopia; and prevalence of depression in Ethiopia was (11%) and (9.1%) respectively. This discrepancy might be due their health status of admitted patients since they are less healthy than people in the general population as well as the hospital environment by itself is stressful for the admitted patients [3,18].

Among the type of depression severe depression was higher in this study than the study done in Gonder university hospital (0.8%) and Nigeria (0.8%) and lower than study done in Mekelle hospital (17%) and Harar public hospital (22.9%) [8,9,11,19].

In this study, having previous hospital admission was 3 times more likely to experience depression compared with patients who were not had history

of hospital admission before. This may be explained by if patients admitted to hospital frequently they blame themselves and losing their hope why I am always affected than the other which may be one risk for depression and need further studies.

This study shows that depression has significant association with assigned ward. Patients who were admitted to gynecology ward were less likely to have depressive symptoms compared to those who were admitted to medical ward. Study conducted in Harar and Mekelle indicated that depression has association with ward [8,11]. However, patients who were admitted to gynecology ward were less likely to have depressive symptoms compared to those who were admitted to medical ward unlike of Harar study those admitted to surgical ward were less likely to develop depression. This association may be due to admission to hospital itself is stressful; reason of admission; hospital environment; patients worry because of separation from her/his family, community as well from the occupation. Those mothers who were admitted to gynecology ward to get delivery services; so that one of the valuable gifts for human being is having child this may be the possible reason why patients admitted to gynecologic ward were less likely to have depression.

Depression was two times more likely common among patients with chronic disease based on present study. Study conducted in Harar public hospital, Jimma University Specialized Hospital and Jimma Health Center and WHO 2012 report is consistent with this study finding. This might be explained by chronic diseases can present with physical limitation of self-care and activity daily of life which inhibit patients to involve into different assets of social life [8,14,17].

The result of present study indicated that one of the important behavioral factor was user of cigarette smoker was associated with depression ( $p < 0.05$ ). This result demonstrate that smoker have to be depressed two times greater than nonsmokers. This finding is in agreement with study conducted among substance use in Jimma town and Harar public hospital [8,20]. Usually cigarette has numerous chemicals which act on central nervous system and produce exciter effect. However, those patients who smoke cigarette discontinue smoking during admission be able to result in depress the patients.

Furthermore, this study showed that poor social support was significantly associated with depression ( $p = 0.000$ ). This finding is in line with the study done in Black Lion Specialized Hospital and Saint Paulo's Hospital Millennium Medical College [21]. This might be due to exacerbation of patient negative feeling further contributing for the development of depression because of separation from the family and the society, since positive social support increase patients ability to cope with negative events.

There were no statistically significant differences found between depression and the socio demographic characteristic of age, educational status, employment status and marital status in this study. This finding is in line with other studies found out [15,22].

---

## Conclusion

The prevalence of depression among adult inpatient admitted to medical, surgical, and gynecology ward in Mizan-Tepi university teaching hospital was high which is higher than the general population. Depression had statistically significant association with previously admitted patients, having chronic disease, ward, cigarette smoking, and social support. This requires an effective screening in admitted patient for depression.

---

## Recommendation

Health-care providers do through assessment to address common mental disorders, especially depression, and suggest that training to recognize and manage depression appropriately be given for admitted patients.

Mizan-Tepi university teaching hospital need to create the way through which the admitted patients who have severe depression to get linkage with psychiatric unit and try to solve those problems related to infrastructure.

Moreover, another studies need to be carried out in the area considering the existed limitation.

---

## Declarations

Ethics approval and consent to participate

The research proposal was approved by institutional review board of Jimma University, Jimma University Institute of Health. A permission letter was obtained from Mizan Tepi University Teaching Hospital. Since this was a retrospective record review, there was no need

for getting consent from participants.

### ■ Consent to publish

Not applicable

### Availability of Data and Materials

All the data included in the manuscript has been included in the form of tables and figures. The de-identified raw data is not publicly available. But the de-identified raw data can be requested from the corresponding author after providing the necessary justification for request.

### Competing Interest

The authors declare no competing interest.

### Funding

The study was funded by Jimma University Institute of Health (JIH) throughout inception, data collection and analysis.

### Authors' Contribution

Abiru Neme, Wadu Wolancho and Miressa Guteta contributed on data analysis, and checked the draft. Abiru Neme and Wadu Wolancho prepared manuscript. All authors read and approved the final paper.

### Acknowledgements

We would like to thank the Mizan Tepi University Teaching Hospital was conducted. Mizan Tepi University Teaching Hospital for all the help and support given for us during the data collection period. We also thank Jimma university institute of health for permitting us to conduct this study.

## References

- Birhanu A, Hassein K. Prevalence and factors associated to depression among ambo university students, Ambo, West Ethiopia. *J Heath Med Nur.* 25, 26-34 (2016).
- Estifanos M. Prevalence of depression and associated factors among medical and surgical out patients in dessie referral hospital, North Eastern Amahara, Ethiopia. *Google Sch.* (2017).
- Hailemariam S, Tessema F, Asefa M, et al. The prevalence of depression and associated factors in Ethiopia: findings from the National Health Survey. *Int J Ment Health Syst.* 6, 1-11 (2012).
- Abbasi MS, Tahir M, Ranjha MA. Proportion of unrecognized depression among patients attending medical outpatient department, federal general hospital, Islamabad. *Pakistan J Public Heal.* 7, 11 (2017).
- Hyder Hammo BMA. Prevalence of depression among patients admitted to Baquba Teaching Hospital. *Iran J Psychiatry.* 12, 5251-5254, 2017.
- Noorbala AA, Arbabi M, Shalbfafan AR. Psychological dimensions in patients admitted in imam khomeini general hospital in Tehran. *Iran J Psychiatry.* 5, 51-54 (2010).
- Sabeen A, Aziz A, Jamal Q, et al. Prevalence of recognized and unrecognized depression among medical and surgical patients in a tertiary care hospital, Karachi, Pakistan. *J Pak Med Assoc.* 65, 1320-1324 (2015).
- Tilahun H, Awoke N, Geda B, et al. Depression and associated factors among adult inpatients at public hospitals of harari regional state, Eastern Ethiopia. *Psychiatry J.* 2018, 1-6 (2018).
- Alemu WG, Malefiya YD, Bifftu BB. Mental distress among patients admitted in Gondar university hospital: A cross sectional institution based study. *Heal Sci J.* 10, 1-7 (2016).
- Duko B, Erdado M, Ebrahim J. Prevalence and factors associated with depression among hospital admitted patients in South Ethiopia: Cross sectional study. *BMC Res.* 12, 10-13 (2019).
- Hailu A, Mandush A, Berhe KK, et al. Assessment of depression prevalence and its determinants among adult patients admitted in governmental hospitals, Mekelle, Tigray, Ethiopia, 2012. *Int J Pharm Sci Res.* 4, 1882-1892 (2013).
- Srahbzu M, Yigizaw N, Fanta T, et al. Prevalence of depression and anxiety and associated factors among patients visiting orthopedic outpatient clinic at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2017. *J Psychiatry.* 21, 4 (2018).
- Sisay S, Endris M, Genet Y, et al. Assessment of magnitude and factors contributing to obstructed labor among mothers delivered in Mizan-Tepi University Teaching Hospital, Bench-Maji. *Glob J Reprod Med Hist.* 2, 4 (2017).
- Adem A, Tesfaye M, Mohammed MA. The Prevalence and pattern of depression in patients with tuberculosis on follow-up at Jimma University Specialized Hospital and Jimma Health Center. *Med Science.* 3, 955-968 (2014).
- Morgan AN, Coore A, Simms L, et al. The prevalence of depression among medical inpatients at the university hospital of the West Indies, Jamaica. *WIMJ Open.* 2, 33-35 (2015).
- Bedaso A, Gezahegn B, Mekonnen N, et al. Prevalence of unrecognized depression and associated factors among patients attending medical outpatient department in Adare Hospital. *Neuropsychiatr Dis Treat.* 12, 2723-2729 (2016).
- World Mental Health Day. A global crisis. (2012). [Available at: [https://www.who.int/mental\\_health/management/depression/wfmh\\_paper\\_depression\\_wmhd\\_2012.pdf](https://www.who.int/mental_health/management/depression/wfmh_paper_depression_wmhd_2012.pdf)].
- Bitew T. Prevalence and risk factors of depression in Ethiopia. *Ethiop J Heal Sci.* 24, 161-169 (2014).
- Shittu RO, Odeigah LO, Issa BA, et al. Association between depression and social demographic factors in a Nigerian family practice setting. *Open J Depress.* 3, 18-23 (2014).
- Mossie A, Kindu D, Negash A. Prevalence and severity of depression and its association with substance use in Jimma Town, Southwest Ethiopia. *Depress Res Treat.* 2016, 3460462 (2016).
- Assefa B, Duko B, Ayano G, et al. Prevalence and factors associated with depressive symptoms among patient with Chronic Kidney Disease (CKD) in black lion specialized hospital and saint Paulo's hospital millennium medical college, Addis Ababa, Ethiopia: Cross sectional study. *J Psychiatry.* 9, 6 (2016).
- Worku DK, Yifru YM, Postels DG, et al. Prevalence of depression in Parkinson's disease patients in Ethiopia. *J Clin Mov Disord.* 1, 1-12 (2014).