



# A cross-sectional study measuring the magnitude of depression and associated factors among patients attending orthopedic outpatient clinic at Ambo University Referral Hospital, Ambo Town, Oromia, Ethiopia, 2023

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**Background:** Depression is a leading cause of major public health problems globally, and its frequency has been increasing, particularly in low-income and middle-income countries. The prevalence of depression in sub-Saharan Africa ranges from 15 to 30%. In Ethiopia, depression is found to be the seventh leading cause of disease burden, yet no study was done in West Shewa, Ethiopia. Therefore, this study aimed to assess the magnitude of depression and associated factors among adult orthopedic outpatients getting treatment at Ambo University Referral Hospital, West Shewa, Oromia, Ethiopia, in 2023.

**Methods:** An institution-based cross-sectional study was conducted among 391 adult orthopedic patients from January 1–30, 2023. A systematic random sampling technique was used to select the study subjects. The data were collected by using a structured questionnaire and checklist through face-to-face interviews and chart review techniques. The collected data were entered into Epi-data, version 4.6, and then exported to SPSS, version 26.0, for statistical analysis. The binary logistic regression model was fitted, and both bivariable and multivariable logistic regression analyses were employed.

**Result:** The magnitude of depression was found to be 38.9% (95% CI: 34.5%, 43.9%), being female [adjusted odds ratio (AOR) = 2.41; 95% confidence interval (CI): 1.45–4.00], chewing chat (AOR = 2.39; 95% CI: 1.29–4.43), and no disorder on the lower limb (AOR = 0.24; 95% CI: 0.07–0.85), had ligament injury (AOR = 2.62; 95% CI: 1.23–5.59), had no complication (AOR = 0.07; 95% CI: 0.01–0.52), and had amputation (AOR = 3.83; 95% CI: 2.09–7.00) were significantly associated with depression.

**Conclusion and recommendation:** The study found that the prevalence of depression among orthopedic patients was considerable; nearly half of the participants developed depression at Ambo University Referral Hospital, and being female, chewing chat, having no disorder on the lower limb, having a ligament injury, having a complication, and being amputated were significantly associated with depression. Therefore, due attention is needed from concerned bodies in order to tackle this problem.

**Keywords:** depression, orthopedic trauma, outpatient clinic, referral hospital

## Introduction

Depression is a common illness worldwide, with an estimated 3.8% of the population affected<sup>[1]</sup>. It is one of the top three diseases in the world, and it will soon top illness as the second-leading cause of mortality. As a result, the complexity of the injury-induced bodily response and the number of affected systems grows with the degree of the injury<sup>[2]</sup>.

According to a WHO report, more than 450 million individuals worldwide suffer from depression, mainly from orthopedic trauma<sup>[3]</sup>. Due to orthopedic trauma, about 16 000 people die from injuries each day. As a result, the impact of orthopedic trauma on depression is 16%, and it is the main cause of death<sup>[4]</sup>. Some hospital-based studies continue to show that in China, the prevalence of depression with accidental orthopedic injuries was at a rate of 19.20%<sup>[5]</sup>; in India, according to the International

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Classification for Diseases, Edition 10 diagnosis, 38% had depressive disorder<sup>[6]</sup>.

Hospital-based studies continue to show that depression among orthopedics patients is a major prevalence in Africa. For instance, in Uganda, the prevalence ranges from 15 to 30%<sup>[7]</sup>; in tertiary institutions in Kano, North-Western Nigeria, the prevalence ranges between 17 and 27%<sup>[8]</sup>; and in Ethiopia, some studies revealed that depression among orthopedics patients is prevalent. For example, in Addis Ababa, Tikur Anbesa specialized hospital revealed that the prevalence of depression among orthopedic trauma patients was 36.1%<sup>[9]</sup>; in southern Ethiopia, Wolaita Sodo Hospital showed that the prevalence of depression among orthopedics patients attending output in outpatient clinics was 36.4%<sup>[2]</sup>.

Orthopedic patients have been told that inadequate functional recovery results are associated with the inadequacy of depression, coping behaviors, and social support systems. However, the failure of the results of various orthopedic interventions, including spinal surgery, trauma care, fracture repair, rotator cuff repair, sports-related injuries, total hip replacement, total knee replacement, and surgery for an upper limb fracture, negatively affects the patients emotionally<sup>[9]</sup>.

The comorbidity of depression in orthopedic patients negatively impacts their quality of life. Functioning, adherence to medication, and high risk of suicide and increased morbidity and mortality<sup>[10]</sup>. The impact of orthopedic trauma on individuals, their families, and society as a whole is immense. It has a significant impact on the victim's mental health, affecting their healing<sup>[11]</sup>. Therefore, it is urgent to understand, develop, and evaluate evidence-based treatments for depression among this specific group of patients. Before treatment, it is a top priority to establish the psychological characteristics and related factors of orthopedic trauma patients. According to the previous study, factors associated with depression among orthopedic patients were female, low level of education, financial difficulties, divorced, separated, or widowed status, and having numerous children<sup>[10,12]</sup>.

As far as my search is concerned, no similar study has been undertaken so far in this study area regarding the magnitude of depression and its associated factors among orthopedic trauma patients attending an orthopedic outpatient clinic. Therefore, this study aimed to assess the magnitude of depression and its associated factors among orthopedic trauma patients attending the orthopedic outpatient clinic at Ambo University Referral Hospital. The result of this study has been significant in adding to the body of knowledge in the identification of factors related to depression among orthopedic injury and the database orthopedic injury registry for healthcare planners and policymakers to develop preventive strategies and improve the management protocol. For researchers, this can be used as baseline information for future studies.

## Method and material

### Study area, design, and period

The study was conducted at Ambo University Referral Hospital, which was established in 2007 by FMOH and ORHB. Currently, it is a teaching hospital under Ambo University. This hospital provides health services such as medical management, surgical intervention, obstetric and gynecological management, pediatrics,

## HIGHLIGHTS

- The study found that the magnitude of depression was high.
- Females, chewing chat, and being amputated were significantly associated factors.
- Depression is a leading cause of major public health problems.

orthopedics, and other essential services to a large number of populations. The hospital hosts 75 000–100 000 patients per year. It also has approximately 140 beds for inpatient services. Twenty-five (17%) of the total are occupied by orthopedic trauma patients and two OPD rooms: one regular OPD and one referral orthopedics OPD. An institution-based cross-sectional study was conducted among adult orthopedic patients from January 1–30, 2023. It is registered in the Research Registry under UIN 9999. The work has been reported in line with the STROCSS criteria 2021<sup>[13]</sup>.

### Population

#### Source population

All orthopedic trauma patients who had treatment at Ambo University Referral Hospital.

#### Study population

All orthopedic trauma patients aged  $\geq 18$  years visiting Ambo University Referral Hospital during the data collection period were the study population.

### Inclusion and exclusion criteria

#### Inclusion criteria

Patients aged  $\geq 18$  years, both sexes, with musculoskeletal injuries (including closed or open fractures and muscle or soft tissue injuries) who were attending the OPD clinic.

#### Exclusion criteria

Patients with cognitive impairment or consciousness disorder, unable to communicate; central nervous system disorder due to acute trauma.

### Sample size determination and sampling technique

#### Sample size determination

The sample size required for the study was determined by using a single population proportion formula by considering a 95% confidence level that falls within a 5% margin of error, a 10% nonresponse rate, and a  $P$  value of 36.4% prevalence of depression among orthopedic patients: from a study conducted at Wolayita Specialized Hospital, Ethiopia<sup>[2]</sup>.

Where:

$n$  = the minimum sample size required.

$P$  = estimated proportion (36.4%) = 0.364.

$z$  = the standard value of confidence level of  $\alpha = 95\%$ .

$d$  = the margin of error between the sample and the population (0.05).

Applying the formula:

$$n = \frac{(Z\alpha/2)^2 \times P(1 - P)}{d^2}$$

$$n = \frac{(1.96)^2 \times 0.364(1 - 0.364)}{0.05^2}$$

Then,  $n$  = the calculated sample size was 356.

By adding a 10% nonresponse rate, the final sample size for depression was 391.

### Sampling technique and procedures

A simple random sampling technique with the lottery method was applied to select study participants at orthopedic OPD. The total number of patients enrolled per 2 months (from December 1, 2022, to January 30, 2023) was 900 orthopedic patients at Ambo University Referral Hospital.

### Variables of the study

#### Dependent variable

Depression (depressed/not depressed).

#### Independent variables

Sociodemographic variables (age, sex, religion, marital status, educational status, monthly income, and occupational status).

Substance-related variables, such as alcohol and cigarette.

Trauma-related variables, such as part of the body injured, type of injury, cause of injury, time since injured, presence of amputation, and presence of pain.

Clinical-related variables such as family history of mental illness.

Chronic medical illnesses, such as hypertension, diabetes, cardiovascular disease, chronic lung disease, cerebrovascular disease, hepatic dysfunction, and renal dysfunction, were determined by surgeons' reports and patients' reports of medical history.

Pain severity variable: pain as the patient rates from a numeric pain rating scale that ranges from 0 to 10 scores.

Social support variables: support at a time when difficulties and critical conditions like financial, social, and psychological are assessed by using the Oslo three-item social support scale.

### Operational definition

Depression is a mental disorder that was measured using the Beck Depression Inventory (BDI) tool. The tool had 21 items, and the sum score was 63. Then, by calculating the mean of each item and the overall mean, if each item of the mean was higher than the overall mean, we considered it to be depression. However, each item of the mean is lower than the overall mean, so we considered there was no depression<sup>[14]</sup>.

Social supports: support at a time when difficulties and critical conditions like financial, social, and psychological are assessed by using the Oslo 3-item social support scale. It is used to measure high or low social support by calculating the overall mean of three items of questions; that is, each means above the overall mean is considered high social support, but each means below the overall mean is considered low social support<sup>[15]</sup>.

Substance use means the use of substances such as alcohol, chat, and tobacco<sup>[16]</sup>.

Current use: those who used at least one of a specific substance for nonmedical purposes within the last 3 months (such as alcohol and tobacco)<sup>[17]</sup>.

Income: assessed by using the WHO poverty line, which is less than or equal to 1.9 dollars per day as extreme poverty and greater than 1.9 dollars per day as the poverty line, which is 3072 according to Ethiopian birr during the study period<sup>[18]</sup>.

Intensity of pain: pain as the patient rates from a numeric pain rating scale that ranges from 0 to 10 scores and is classified into four broad categories. According to this, those respondents who gave a value of 0 will be considered as having no pain, those who gave a value from 1 to 3 will be considered as having mild pain, those who gave a value from 4 to 6 will be considered as having moderate pain, and those who gave a value from 7 to 10 will be considered as having severe pain<sup>[19]</sup>.

### Data collection tools and procedures

A structured pretest and checklist tool were used to collect the data. The tool was prepared by reviewing different literature and a locally adopted (BDI) checklist<sup>[2,14,20,21]</sup>. It contains five parts, and the (BDI) checklist was used to assess depression. Data was collected using a face-to-face interview and a patient's chart review. For this study, two different language experts translated the questionnaire from English into Afan Oromo and back to English to ensure consistency. Two-day training was given to data collectors and the supervisor on basic data collection and interviewing techniques. Two BSc nurses collected data, and one BSc psychiatry nurse was recruited as a supervisor.

### Data quality control and management

Training was given to data collectors and supervisors by the principal investigator on the methods of data collection for 2 days. The questionnaire was pretested 2 weeks prior to the actual data collection on 5% of patients of the same size at St Luke Catholic Hospital Orthopedics Unit that were not included in the main survey, and some arrangements and modifications were made to the questionnaires. The pretest Cronbach  $\alpha$  result was 0.72. The (BDI) item assessment Cronbach  $\alpha$  result was 0.95. During data collection and then by the investigator, the incomplete data was discarded. There was a discussion between supervisors and data collectors about any problems encountered during the data collection period.

### Data processing and analysis

The completed data were checked, coded, and entered into Epi-data, version 4.6, then exported to SPSS, version 25.0, statistical software for analysis. Descriptive statistics, bivariable, and multivariable logistic regressions were used. The sociodemographic, clinical, and behavioral characteristics of respondents were analyzed by descriptive statistics (percentage, mean, and SDs). Bivariable analysis was used to see the association between outcome and each independent variable, and variables whose  $P$  values were  $<0.25$  were entered into multivariable logistic regression to control confounding factors. The variables were declared statistically significant at  $P$  value  $<0.05$ , and the strength of the association was described using the adjusted odds ratio (AOR) with its respective 95% confidence interval (CI). Results

were presented in the form of tables and graphs using frequency and summary statistics such as median and interquartile range.

Ethical considerations

Ethical clearance was obtained from Ambo University. Written informed consent was obtained from participants aged 18 years and older. Each respondent was informed about the objective of the study, which was to provide necessary information for policymakers and other concerned bodies. Anyone who was not willing to participate in the study was not forced to do so. They were also informed that all data obtained from them was kept confidential by using a code instead of any personal identifier and was meant only for the study, and the study result was submitted to concerned bodies for further planning and intervention in the future.

Results

Sociodemographic characteristics of the respondents

Three hundred eighty-three orthopedic patients participated in the study, with a response rate of 98%. Out of the total study subjects, a majority, 209 (54.6%), were males. One hundred thirty-three (34.7%) were aged between 18 and 29 years, with a median of 34 and an IQR of 20 years. Two hundred forty-nine (65.0%) of the respondents were married. Orthodox Christianity was the predominant religion in 189 (49.3%). Regarding educational status, 211 (55.1%) of them completed college and above. Two hundred eighty-four (74.2%) of the respondents were living in urban areas, and 241 (62.9%) of them were earning more than 3072 birr (Table 1).

Clinical and psychosocial characteristics of the respondents

About 62 (16.2%) of the respondents had chronic medical illnesses, of which 24 (6.3%) had diabetes mellitus. Nearly half, 239 (48.9%), of the respondents got low social support. The majority of upper extremity injuries were arm and elbow joint injuries, which constitute 111 (29%) and 120 (31.3%) of the injuries that occurred around the thigh and knee joints on the lower extremity. The majority of causes of injury were road traffic accidents, which constitute 134 (35%). The type of fracture, open and/or complicated, was 297 (77.5%). Three hundred forty-eight (90.9%) of the respondents had orthopedic complications; of those, 263 (68.7%) had infections (Table 2).

Substance use status

Two hundred twenty (57.4%) of the respondents were alcohol users, and 70 (18.3%) of the respondents were khat users, whereas, around 30 (7.8) of the respondents were tobacco users (Fig. 1).

Magnitude of depression

This study showed that 149 (39%) of respondents were depressed (Fig. 2).

Table 1 Sociodemographic characteristics of respondents at Ambo University Referral Hospital, West Shewa, Ethiopia, 2023 (n = 383)

Variables	Frequency	Percent
Sex		
Male	209	54.6
Female	174	45.4
Age		
18–29	133	34.7
30–39	121	31.6
40–49	52	13.6
≥ 50	77	20.1
Marital status		
Single	57	14.9
Married	249	65.0
Divorced	39	10.2
Widowed	38	9.9
Religion of respondent		
Orthodox	189	49.3
Protestant	127	33.2
Muslim	38	9.9
Others*	29	7.6
Family size		
≤ 3	179	46.7
> 3	204	53.3
Occupation		
Civil servant	104	27.2
Housewife	91	23.8
Merchant	37	9.7
Driver	61	15.9
Farmer	40	10.4
Daily laborer and housemaid	22	5.7
Others**	28	7.3
Residence of respondent		
Rural	99	25.8
Urban	284	74.2
Educational status		
Not formal educated	49	12.8
Primary school (1–8)	60	15.7
Secondary school (9–12)	63	16.4
College and above	211	55.1
Monthly income status		
≤ 3072	142	37.1
> 3072	241	62.9

\*Others stands for Waqefeta, and Catholic.  
\*\*Others means student and soldier.

Factors associated with depression

Bivariable binary logistic regression analysis

In bivariable binary logistic regression analysis, sex, residence, chronic illness, upper extremity injury, fracture, duration of staying after injury, chat, lower limb injury, amputation, complication trauma, and ligament injury were associated with depression (at  $P \leq 0.25$ ) (Table 3).

Multivariable binary logistic regression analysis

In the multivariable binary logistic regression analysis, sex, chat, lower limb injury, amputation, complication trauma, and ligament injury were found to have a statistically significant association with depression ( $P \leq 0.05$ ). Female adult orthopedic patients were 2.41 times more likely (AOR = 2.41;

**Table 2**  
**Clinical and psychosocial characteristics of the respondents at Ambo University Referral Hospital, West Shewa, Ethiopia, 2023 (n = 383).**

Variables	Groups	Frequency	Percent
Chronic medical illness	Yes	62	16.2
	No	321	83.8
Types of diseases (N= 62)	Hypertension	20	5.2
	Diabetes mellitus	24	6.3
	HIV/AIDS	5	1.3
	Cardiac problems	6	1.6
	Others*	7	1.8
Family history of mental illness	Yes	38	9.9
	No	345	90.1
Social support	Low social support	208	54.3
	High social support	175	45.7
Did she/he has an upper extremity injury	Yes	283	73.9
	No	100	26.1
Upper extremity injury disorder (N= 283)	Shoulder	38	9.9
	Arm and elbow joint	111	29.0
	Forearm and wrist joint	42	11.0
	Hand and digits	54	14.1
	Multiple sites	38	9.9
Did she/he has lower extremity injury	Yes	347	90.6
	No	36	9.4
Lower extremity injury disorders (N= 347)	Pelvis and hip joint	28	7.3
	Thigh and knee joint	120	31.3
	Leg and ankle joint	94	24.5
	Foot and toe	71	18.5
	Multiple sites	34	8.9
Both limbs were injured	Yes	36	9.4
	No	347	90.6
Cause for injury	Road traffic accident	134	35.0
	Fall	77	20.1
	Blow/assault	44	11.5
	Machine	25	6.5
	Crush by a heavy object	20	5.2
	Bullet/blast	58	15.1
	Others**	25	6.5
Types fracture	Closed	28	7.3
	Open and/or complicated	297	77.5
	Fracture-dislocation	54	14.1
	Not specified	4	1.0
Dislocations and sprain	Yes	99	25.8
	No	284	74.2
Ligament injury	Yes	39	10.2
	No	344	89.8
Complication	Yes	348	90.9
	No	35	9.1
Types of complication (N= 348)	Infections	263	68.7
	Gangrene	55	14.4
	Others***	30	7.8
Duration of staying after injury	< 5.7	222	58.0
	≥ 5.7	161	42.0
Did amputation make you	Yes	96	25.1
	No	287	74.9
Part of your body is amputated (N= 96)	Upper extremity	23	6.0
	Lower extremity	73	19.1
Do you have pain	Yes	347	90.6
	No	36	9.4

**Table 2**

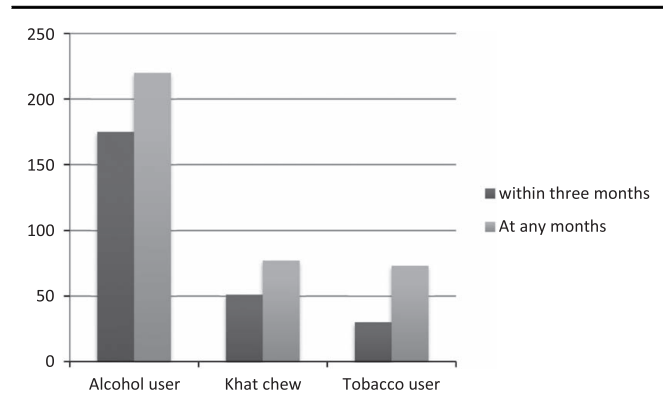
(Continued)

Variables	Groups	Frequency	Percent
Intensity of current pain level over the past 24 h	None	36	9.4
	Mild	101	26.4
	Moderate	203	53.0
	Sever	43	11.2

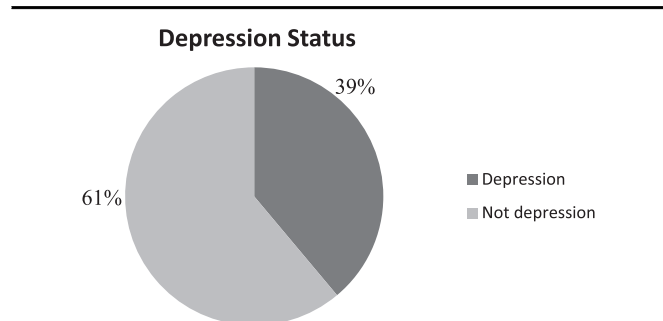
\*Other stands for lung problem and mental disorder.

\*\*Other stands for stick and stone injury.

\*\*\*Other stands for swelling of the limb, malunion, and pseudarthrosis.



**Figure 1.** Substance use status among orthopedic traumatized patients at Ambo University Referral Hospital, 2023.



**Figure 2.** Magnitude of depression among orthopedic patients on follow-up visit at Ambo University Referral Hospital, West Shoa, Central Ethiopia, 2023.

95% CI: 1.45–4.00) to develop depression than male orthopedic patients. The odds of depression among adult orthopedic patients who chewed chat were 2.39 times more likely than those who did not chewed chat (AOR=2.39; 95% CI: 1.29–4.43). Adult orthopedic patients who had no injury to the lower limb were 76% less likely to develop depression than those who had injuries to the pelvis and hip joint (AOR=0.24; 95% CI: 0.07–0.85). The likelihood of developing depression among adult orthopedic patients who had a ligament injury was 2.62 more likely (AOR=2.62; 95% CI: 1.23–5.59) when compared with adult orthopedic patients who did not have a ligament injury. Adult orthopedic patients who were not diagnosed with a complication of injury were 93% less likely to develop depression than those who were

**Table 3**

**Bivariable logistic regression for factors associated with depression among adult orthopedics patients, Ambo University Referral Hospital, January 1, 2023 to January 30, 2023 (N = 383)**

Variables	Depression status		COR (95% CI)	Significance
	Depressed	No depressed		
Sex				
Male	65	144	1	
Female	84	90	2.07 (1.36–3.14)	0.01
Residence				
Rural	46	53	1.53 (0.96–2.42)	0.07
Urban	103	181	1	
Chronic illness				
Yes	55	48	2.27 (1.43–3.59)	0.00
No	94	186	1	
Fracture				
Closed fracture	9	22	1	
Open and/or complicated fracture	120	166	1.77 (0.79–3.97)	0.168
Fracture-dislocation	14	39	0.88 (0.33–2.36)	0.795
Not specified	6	7	2.10 (0.55–7.99)	0.279
Duration of staying after injury				
< 5.7	73	149	1	
≥ 5.7	76	85	1.82 (1.202–2.77)	0.01
Khat				
Yes	38	39	1.71 (1.03–2.83)	0.01
No	111	195	1	
Lower limb injury				
Pelvis and hip joint	11	17	1	
Thigh and knee joint	56	64	1.35 (0.58–3.13)	0.93
Leg and ankle joint	34	60	0.88 (0.37–2.09)	0.43
Foot and toe	33	38	1.34 (0.55–3.27)	0.91
Multiple sites	8	26	0.48 (0.16–1.42)	0.16
No abnormal disorders	7	29	0.37 (0.12–1.14)	0.02
Ligament				
Yes	23	16	2.49 (1.27–4.88)	0.01
No	126	218	1	
Complications				
Yes	148	208	1	
No	1	26	0.05 (0.01–0.40)	0.01
Amputation				
Yes	60	36	3.71 (2.29–6.01)	0.00
No	89	198	1	

CI, confidence interval; COR, crude odds ratio.

diagnosed with a complication of injury (AOR = 0.07; 95% CI: 0.01–0.52). The odds of developing depression among orthopedic patients who had amputation were 3.83 more

**Table 4**

**Multivariable logistic regression for factors associated with depression among adult orthopedics patients, Ambo University Referral Hospital, January 1, 2023 to January 30, 2023 (n = 383)**

Variables	Depression status		AOR (95% CI)	Significance
	Depressed	No depressed		
Sex				
Male	65	144	1	
Female	84	90	2.41 (1.45–4.00)	0.01
Khat				
Yes	38	39	2.39 (1.29–4.43)	0.01
No	111	195	1	
Lower limb injury				
Pelvis and hip joint	11	17	1	
Thigh and knee joint	56	64	0.94 (0.36–2.44)	0.894
Leg and ankle joint	34	60	0.63 (0.23–1.71)	0.366
Foot and toe	33	38	0.851 (0.30–2.42)	0.761
Multiple sites	8	26	0.33 (0.09–1.14)	0.080
No abnormal disorders	7	29	0.24 (0.07–0.85)*	0.027
Ligament				
Yes	23	16	2.62 (1.23–5.59)	0.01
No	126	218	1	
Complications				
Yes	148	208	1	
No	1	26	0.07 (0.01–0.52)	0.01
Amputation				
Yes	60	36	3.83 (2.09–7.00)	0.00
No	89	198	1	

AOR, adjusted odds ratio; CI, confidence interval.

\*Stands for significantly associated factors.

likely (AOR = 3.83; 95% CI: 2.09–7.00) than those who had no amputation (Table 4).

## Discussion

This study focused on depression among adult orthopedic patients as well as factors associated with depression, like sociodemographic characteristics, clinical-related, psychosocial-related, and trauma-related factors at Ambo University Referral Hospital.

The current study found that the prevalence of depression among adult orthopedic patients was found to be 38.9% (95% CI = 34.5%, 43.9%). This result was consistent with the result reported by a study conducted at Welaita Sodo University Teaching and Referral Hospital in Welaita Sodo (34.6%) and Addis Ababa University, Tikur Anbesa Specialized Hospital (36.1%)<sup>12,91</sup>. The result of this finding is relatively lower than the result reported by a study conducted at Harari Regional State Public Hospitals, Ethiopia (59.7%); however, the result of this finding is relatively higher than a study conducted in China

(23.53%)<sup>[5,22]</sup>. These discrepancies might be due to the socio-demographic characteristics of the participants. This finding is also inconsistent, which is higher than the finding in Uganda, which ranged from 15 to 30%, and a study conducted in a tertiary institution in Kano, North-Western Nigeria, which ranged from 17 to 27%<sup>[7,23]</sup>. This discrepancy might be due to the study setting, sample size, measurement tool, and differences in socio-economic environments between the studies.

This study revealed that female respondents had 2.41 times higher odds of developing depression among adult orthopedic patients compared to male patients. This finding is comparable with the findings from South Korea and India<sup>[10,11]</sup>.

The current study showed that adult orthopedic patients who were chewing chat were 2.39 times more likely to develop depression than those patients who were not chewing chat. This finding is comparable with the finding in Harari Regional State Public Hospital<sup>[10,22]</sup>.

In this study, adult orthopedic patients who had no lower limb injury were 76% less likely to develop depression than those who had injuries to the pelvis and hip joint. This finding is comparable with the finding in Wolaita Sodo<sup>[2]</sup>.

The current study showed that the likelihood of developing depression among adult orthopedic patients who had a ligament injury was 2.62 times higher when compared with adult orthopedic patients who did not have a ligament injury. This finding is comparable with the findings of Harari regional state specialized hospitals<sup>[22]</sup>.

Adult orthopedic patients who were not diagnosed with a complication of injury were 93% less likely to develop depression than those who were diagnosed with a complication of injury. This finding is comparable with the findings at Dila University Referral Hospital in Ethiopia and Uganda<sup>[7,24]</sup>.

This study revealed that the odds of developing depression among orthopedic patients who had amputations were 3.83 times higher than those who had no amputations. This finding is comparable to the findings at Dila University Referral Hospital, Addis Ababa, and Tikur Anbesa Specialized Hospital<sup>[9,24]</sup>.

## Conclusion and recommendation

### Conclusion

The study found that the prevalence of depression among orthopedic patients, nearly half of the participants considerably developed depression at Ambo University Referral Hospital, and being female, who chew chat, who had no lower limb injury, ligament injury, complication, and amputation were significantly associated with depression.

### Recommendations

#### For healthcare providers

From the findings of the present study, depression was higher among female patients. Hence, it is better to give attention to female orthopedic patients to reduce the prevalence of depression among them.

It is better to focus on ligament injury, complicated injury, and amputation patients to reduce the depression of orthopedic traumatized patients and those patients who chew chat. It is better to give attention to healthcare workers working in the hospital in the orthopedic care unit, especially on orthopedic

trauma cases. It is better to conduct a prospective cohort study to determine other potential factors that predict depression among orthopedic trauma patients.

### Strengths of the study

This study was done by using a standardized validated and reliable checklist questionnaire to measure the outcome variable.

### Limitations of the study

Since the study involved patient chart review, in addition, there were incomplete patient charts and registry books, and this was a major challenge to get relevant information. In addition, as the study is cross-sectional, it could not show a cause and effect relationship.

### Ethical approval

Ethical approval was secured from the Ambo University Institutional Review Board.

### Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the editor-in-chief of this journal on request.

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### Author contribution

D.B.D. has made substantial contributions to conception, writing – review, and also contributed to the editing of the manuscript drafts for scientific merit and depth.

### Conflicts of interest disclosure

The authors declare no conflicts of interest.

### Research registration unique identifying number (UIN)

1. Name of the registry: Researchregistry.com.
2. Unique identifying number or registration ID: researchregistry. UIN = 9999.

### Guarantor

Daditau B. Duresa.

### Data availability statement

Data will be available on request.

## Provenance and peer review

Not commissioned, externally peer-reviewed.

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