

# Prevalence of Psychological Khat Dependency and It's Associated Factors Among Mettu University Students, Southwest Ethiopia, 2021

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## Research Article

**Keywords:** khat chewing, psychological dependency, severity of dependency scale

**Posted Date:** March 16th, 2022

**DOI:** <https://doi.org/10.21203/rs.3.rs-1429881/v1>

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# Abstract

**Introduction:** It is estimated that 5 to 10 million people worldwide chew Khat, the majority of whom live in the Horn of Africa and the Arabian Peninsula, particularly Ethiopia, Somalia, and Yemen. Chewing khat is a part of life for a vast majority of the people in these countries. Excessive and long-term khat use has the potential to cause psychological dependency with a prominent feature akin to amphetamine-type stimulant dependence.

The goal of this study was to determine the prevalence of psychological khat addiction and the factors that contribute to it among Mettu University students.

**Methods:** institution based cross-sectional study was conducted from April 01/2021 – April 29/2021 at Mettu University. The study sample was recruited through Stratified multistage sampling technique (n = 1046). Structured English version self-administered questionnaire were used to collect data on socio-demographic factors, habit of khat use and other variables. The data were edited, cleaned, coded and entered in to Epi-data version 4.6.02 then it was exported to Stata/SE 14.0. Binary and multivariable logistic regressions were used to identify sociodemographic factors and other substance-use related factors that are associated with psychological khat dependency. Results were interpreted and presented in the form of table, figures & chart.

**Result:** Among the original 1046 participants 1001 of them were clearly fill and respond the questionnaire but only 157 of current khat chewer were included in the analysis process since the target of the study was to study dependency on khat. The results of the other 1001 respondents were simply reported descriptively through table and diagram. Among 157 current khat chewers 47.7% (95% CI: 39.9–55.6) of them were found dependent on khat based on SDS score whether the left 52.23% respondents were not khat dependent. Among those found dependent the amount of khat chewed each session (AOR; =6.72, 95% CI' =2.17–20.78), duration of chewing khat in each session (AOR; =4.2, 95% CI; =1.43–12.73), days chewing khat per week (AOR; =4.2, 95% CI; =1.39–12.96), depression (AOR; =4.08, 95% CI; =1.40–11.9), cigarette smoking (AOR; =3.5, 95% CI; =1.0032–12.37), poor social support (AOR; =4.4, 95% CI; =1.34–14.43) and 4th year and above (AOR; =3.65, 95% CI; =1.07–12.49) were show significance association with khat dependency both in bivariate and multivariate analysis.

**Conclusion:** khat chewing has a psychological dependence effect on those who use khat for prolonged time, chewing large amount of khat and those who chew khat frequently, Therefore, it calls for a strong multi sectorial involvement including local administrative bodies, health services providers, and non-governmental organizations.

## Introduction

## Statement of the problem

Khat is a natural cathadulis stimulant cultivated in the Republic of Yemen and most countries in eastern Africa.(1) It is a plant with a large green shrub that grows at high altitudes in areas ranging from eastern Africa to the Arabian Peninsula between 1,500-2,000 meters above sea level. The number of people chewing Khat globally is estimated to range from 5 to 10 million, most of whom are in the Horn of Africa and the Arabian Peninsula, especially in Ethiopia, Somalia, and Yemen(2). Reports indicating that 80–90% of East African males use khat daily and 10–60% of East African females use khat daily (3, 4). Khat is also consumed by immigrants from these regions who reside in western countries, including the United Kingdom (UK) and the United States of America (5).

Cathinone, an alkaloid in Khat, is considered responsible for the effects of chewing the leaves of the plant, such as excitement, loss of appetite and euphoria (6). On average, Fresh Khat contains 36 mg of cathinone, 120 mg of cathine, and 8 mg of nor ephedrine per 100 g of leaves (7). After Khat chewing, the Cathinone plasma level reached a height of 1.5–3.5 hours (8).

Khat has a stimulant effect on the body (9, 10). This stimulates both the peripheral and vital nervous system, causing, for instance, insomnia, alertness, anorexia, and increased respiration, body temperature, blood, and heart rate (10). Despite its popularity, there are sufficient evidences of adverse effects on physical and mental health as well as social well-being. It causes serious adverse neurological, psychiatric, cardiovascular, dental, gastrointestinal and genitourinary health problems (11–13). Following a khat session, the user may experience depressed mood, irritability, anorexia and difficulty falling to sleep (14)

Functional mood disturbances (anxiety and depression) have also been reported during khat sessions, but these are temporary and may disappear the next day (10). Some khat chewers experience, tension, restlessness, hypnagogic hallucination, hypomania and aggressive behavior or psychosis (15).

Chronic consumption can lead to impairment in mental health, possibly contributing to personality disorders and mental deterioration (16, 17). It leads to elevated blood pressure, increased in heart rate and increased incidence of acute myocardial infarction (18). Gastro intestinal hazard include constipation, stomatitis, esophagitis and gastritis (19).

A significant association between habits of khat chewing and the development of hemorrhoidal disease was reported (20). Evidence indicates that long-term or excessive khat use is a risk factor for progression of ongoing mental health problems (4, 12, 13). It has been also linked with the use of other drugs and behaviors such as smoking, alcohol use and risky sexual behavior (21, 22)

Even though chewers in general and students in particular use khat to increase their concentration during studying, it was reported that students who use khat have less academic performance than non-users and chewing khat also encourage school absenteeism (10, 23).

Khat was listed by the World Health Organization (WHO) as a substance of abuse that can lead to mild to moderate psychological dependency, but to a lesser extent than nicotine and alcohol (24). And the WHO

does not consider Khat to be as dangerously addictive as cocaine (1)

Excessive and prolonged khat use could have the potential to induce psychological dependence with a dominant feature similar to dependence on amphetamine-type stimulants(25). The potential to induce psychological dependence is confirmed by a number of recent studies, using a version of the Severity of Dependence Scale (SDS) that has been adapted and validated for the study of khat dependence (26, 27). It has been shown that khat chewers scoring high on this instrument show more khat-related behaviors and have higher khat alkaloid levels in their saliva (28). About 39% of a sample of Yemeni khat users living in the UK scored at a level comparable with a clinical population with severe heroin dependence in need of treatment (29).

Little information is available on the prevalence of khat dependence as defined by the International Classification of Diseases (ICD) or Diagnostic and Statistical Manual of Mental Disorders (DSM). Recently, a study showed the applicability of the dependence syndrome as defined by DSM-IV (30). 31% of a group of 204 khat users of Yemeni origin living in the UK fulfilled the DSM-IV criteria for dependence (30). while 84% of 25 chronic psychotic patients in Somalia and 100% among 33 khat-using male Somali refugees in Nairobi (31) fulfilled the DSM-IV criteria for dependence.

Older age, male gender, Muslim faith, having friends who chewed khat and the availability of someone with similar family habits were found to be independent predictors of chewing, according to the study done in Harar town (58). Depression, anxiety and cigarette smoking are show significant association with psychological khat dependency among different population group.(26, 45, 59). There is also significant association between psychological khat dependency and duration of chewing khat in each session, days chewing khat per week and amount of khat chewed in each session according to the study conducted among UK residents Yemeni khat chewers (26).

By other hand psychological dependency and gender show significant difference according study conducted in Ethiopian using the WHO's Composite International Diagnostic Interview, among representative sample from a traditional khat-producing area, in this study the life time prevalence of khat dependency among male and female were found 5% and 1.3% respectively.(32)

Even if khat use has become a common problem among university students in Ethiopia, only scant information is available about the magnitude of psychological khat dependency and factors contributing for its use in this segment of the population. Furthermore, the effect of khat use is not wellexplored. Therefore, the aim of this study was to assess the magnitude of psychological khat dependency and associated factors among Mettu university students.

## **Methods And Materials**

### **Study design and period**

An institutional based cross-sectional study was conducted from April 01/2021-April29/2021 GC.

## Study area

The study was conducted at Mettu University. Mettu town is located in Oromia regional state, Illubabora zone 600 km far from capital city of our country in south west Ethiopia. There are two campuses in Mettu University, named as Mettu university campus and Bedele campus, the former has 7369 students and the Bedele campus has 810 students, total of 8168 students. Among the students enrolled in Mettu University 5204 of them are male students and the rest are females. The university has six colleges and one institution and one school (engineering and technology college, college of natural and computational science, medical and health science college, college of agriculture and forestry, business and economics college, college of social science and humanities), one institution (institution of education) and one school (school of law).

## Population

All students of Mettu University who were chewing khat. All regular students of Mettu University who were available during data collection period were included and each students who selected using lottery method were the study unit. Those Students who were seriously ill and not volunteer to participate in the data collection process were excluded.

## Sample size determination

The minimum number of sample required for this study was determined by using Single population proportion formula considering the following assumptions:

$$n = (Z_{\alpha/2})^2 p (1-p)$$

d<sup>2</sup>

Where;

n = minimum sample size required for the study

Z = standard normal distribution (Z = 1.96) with confidence interval of 95% and  $\alpha=0.05$

P = study done on Gondar university (17.9%) (41).

d = Absolute precision or tolerable margin of error (d) = 3%=0.03

$$n = (Z_{\alpha/2})^2 p (1-p) / d^2 = (1.96)^2 \times 0.179(1-0.179) / (0.03)^2 = 628$$

Then adding 10% (628 x 0.1 = 69) of non-respondent the total sample size for this study is 628 + 69 = 697, by multiplying with design effect of 1.5 final sample size was 1046

## Sampling technique

Stratified multi stage sampling technique was used to select students from each college of study. The first step was stratifying regular undergraduate students of Mettu University by their colleges, and then total Sample size for each college was allocated according to their proportion to the number of students in each college.

### Figure 1: **proportional allocation of sample size among undergraduate students in Mettu University**

The first step was stratifying regular undergraduate students of Mettu University by their colleges, and then total Sample size for each college was allocated according to their proportion to the number of students in each college. The third step was selecting participants from each department first to fifth-years based on the proportion to each years of study.

A list of students' identification number was taken from the registrar office to select the study unit. The participant was selected randomly by lottery method.

## **Data collection tools and Data quality control**

Data was collected using self-administered structured questionnaire prepared by English language to assess socio-demographic characteristics of students and substances other than khat. **SDS (Severity of Dependence Scale)** was used to assess psychological khat dependency which was validated for khat use among Yemeni resident in UK with good internal reliability of 0.76(28) and also validated in Ethiopia among poly substance user in Mizan town(63) with moderate internal consistency of 0.58. It is a five item questions which scored out of 15 by adding the whole responses from 0–3 and cut off point of less than or equal to 5 score which is not likely psychologically dependent and above 5 score is psychologically dependent.

**Patient Health Questionnaire (PHQ-9)** was used to measure depression among students. PHQ-9 score ranges from 0 to 27. Each of the 9 items was scored from 0 (not at all) to 3 (nearly every day). A PHQ-9 score 0–4 indicates minimal/no depression, 5–9 indicates mild depression, 10–14 indicates moderate depression, 15–19 indicates moderately severe depression and a score of 20 to 27 indicates severe type of depression (64). Moreover, PHQ-9 has been validated in Ethiopian healthcare context with specificity and sensitivity of 67% and 86%, respectively. A cut-off point of 10 or more has been used to screen depression (61).

**GAD-7 (Generalized Anxiety Disorder- 7)** was used to assess anxiety. A seven questions calculated by assigning scores of 0, 1, 2, and 3, to the response categories of 'not at all', 'several days', 'more than half the days', and 'nearly every day', respectively, and adding together the scores for the seven questions. Using the threshold score of 10, the GAD-7 has a sensitivity of 89% and a specificity of 82% for GAD(62).

Social support was assessed by the **Oslo-3** social support scale. The OSS-3 scores ranged from 3–14 with a score of 3–8 = poor social support; 9–11 = moderate social support; and 12–14 = strong social support (65).

Data was collected using self-administered structured questionnaire by 2 BSc nurses and 2 BSc psychiatry nurses and was supervised by 1 ICCMH professional recruited from MeU department of psychiatry and they were given two days training on data collection. Training was given for data collectors and supervisors by the principal investigator on the data collection tool and sampling methods based on the manual. During data collection, the questionnaire was checked for its completeness on daily basis by data collectors, supervisors and then by the investigator. Pilot study was conducted among 5% of Mettu teachers college

## **Operational definitions**

### **Life time use**

defined as the proportion of students who had ever used khat at least once in their lifetime.(60)

### **Current use**

defined as the proportion of students who used khat at least once in the last three months preceding the study (60)

### **Psychological dependency**

Those who are found to score above 5 on SDS scale.

### **Depression**

Those who are found to score  $\geq 10$  from PHQ-9 were considered as having depression (61).

### **Anxiety**

Those who score  $\geq 10$  from GAD-7 were considered as having anxiety(62).

## **Data processing and analysis**

The data was checked for completeness and consistency. The data was edited, cleaned, coded and entered into Epi-data then it was exported to Stata/SE 14.0. Results was presented in the form of table, figures & chart using frequency & summary statistics such as mean, & percentage to describe the study population in relation to Different variables. Binary and multivariable logistic regressions were used to identify socio-demographic factors and other substance-use related factors that are associated with psychological khat dependency. Variables with P-value  $< 0.2$  was further entered in the multivariable logistic regression analysis. Those variables with P-value  $< 0.05$  in multivariable logistic regression analysis was identified as having a significant association with psychological khat dependency khat. To determine an association between dependent and independent variables adjusted odds ratio at 95% CI was declared statistical significance.

# Result

## Socio-demographic characteristics of respondents

among 1046 students provided with self-administered questionnaires, 1001 completed and returned them (response rate: 95.7%); Of the total 1001 respondents, 930 (93.0%) were age ranged from 20 to 24 years with a mean age of 22.6 (SD =  $\pm 1.20$  years). 697 (69.63%) of the respondents were males and 304 (30.37%) females and the majority 970 (97.7%) were single. Large proportions 436 (43.56%) of the respondents were Orthodox Christians, followed by protestants 286 (28.57%). The majority of respondents 612 (61.14%) were of Oromo in ethnicity, followed by Amhara 241 (24.08%). Most respondents 596 (59.6%) were originally from an urban area. The 341 (34.07%) of the students were from 3<sup>rd</sup> year followed by students in the 4<sup>th</sup> year which was 215 (21.48%) and, 415 (41.50%) get monthly pocket money of 500–999 Ethiopian birr (Table 1)

Table 1: Socio-demographic characteristics of undergraduate students at Mettu University, South West Ethiopia, 2021 (n=1046)

## Khat chewing practice

The lifetime and current prevalence of khat chewing among students were 21.3% (95% CI; 18.86-23.95) and 15.7% (95 CI; 12.67-18.89), respectively. The majority of current khat chewers (25.35%) reported that they started khat chewing at the age of 20 years. The mean (SD) age for starting khat chewing was 19.68%. Most students who were currently khat chewer are males 142 (90.45%), Muslim followers 130 (82.80%), students from urban 134 (85.35%) and students from 4<sup>th</sup> year and above 101 (64.33%). In addition most of the students currently chewing khat were chewing khat at commercial khat chewing places (6.09%), spent 100 hundred ETB per week (21.66%), their source of income to afford for khat was their family (13.79%), about 49 (31.21%) of them have family history of khat chewing and most of the students 95 (60.51%) were chewing khat with their friends, 66 (42.04%) students were chewed khat greater than three days per week, 61 (38.85%) of khat user's students were spent more than 6hrs in each single chewing session and about 69 (43.95%) were consume greater than half bundle of khat in each chewing session. Figure 1

## Prevalence of psychological khat dependency

Of the 1001 respondents, 157 students reported that they are currently used to chew khat and included in the analysis. Questionnaires with significant missing values on key questions were excluded from the analysis. Of the 157 students who reported khat use during the 3 months' period preceding the survey, 75 [47.77% (95% CI: 39.9 -55.6)] were classified as having khat dependency, all but 3 were females.

## Factors associated with psychological khat dependency

Cigarette smoking, poor social support, depression, year of study, duration of chewing khat in each session, amount of khat chewed in each chewing session and days chewing khat per week were found to

be significantly associated with psychological khat dependency both in bivariate and multivariate analysis. However, sex, place of residence, religion and anxiety were found to be associated with psychological khat dependency in bivariate analysis but not in multivariate analysis.

In multivariate logistic regression analysis result the occurrence of depression was about 4 times higher (AOR =4.08, 95% CI =1.40, 11.9) among dependent khat chewers compared to non-dependent khat chewers. Similarly, the odds of having psychological dependency was 6.72 times higher (95 CI; 2.17-20.78) for those who were chewed more than half of a bundle in each chewing session than those who were chewed less than half a bundle in each chewing session.(Table 2)

Table 2: Factors associated and not associated with psychological khat dependency among undergraduate Mettu university students, south west Ethiopia 2021

## Discussion

Our study is the first to evaluate khat dependence in one of its original places of khat cultivation and chewing. The interpretation of my SDS results revealed that around half of the khat chewers 47.7%(95% CI: 39.9–55.6) were psychological khat dependent, which is close to the percent of dependents among Yemeni chewers living in UK (51.0%)(26), chewers in Jazan region, Saudi Arabia (52.2%) (43) and among adult people in Amhara region (43.3%)(59).

My study result is higher than that found among Bahirdar university students (33%), among Jimma university undergraduate students which were 17.9% for khat abuse and students in Bahirdar university (20.6%) for harmful khat users(44, 45, 49).

The variation in result is may be due to difference in cutoff point used and in some studies variation in screening tool used. A cutoff point for the SDS scale of 5 was used as it was used by Kassim and her colleagues for the Yemeni chewers in UK (26), but less than the cutoff point used among adult people in the Amhara region which was 6 (59)

The mean SDS score of the chewers was 5.6 and it is similar with that of the mean score among adult people in Amhara region, North west Ethiopia (5.26)(59) and Kassim et al (5.5) (26). But it was higher than that of the mean score among Jazan region (4.3)(43). This would be explained by the chewing behavior of our chewers, where the majority of them 65.3%(95% CI; = 2.17–20.78) chew above a half bundle during the chewing session, about 53.3%(95% CI; =1.39–12.96) of them chew more than 3 days per week, and about 52%% (95% CI;= 1.43–12.73) spent more than 6 hours in each chewing session which is close to that of Kassim et al(26).

Most related khat chewing feature associated to dependency was the amount of khat chewed in each single session, where more dependent chewers 65.3% ( 95% CI; 2.17–20.78) chewed more than half of bundle in a chewing session which is consistence with study conducted among UK residents Yemeni khat chewers (61.6%)(26), but not in line with study conducted in Jazan region, Saudi Arabia in which duration

of khat chewing in each session was mostly associated to khat dependency (43). The variation was may be due to different sample size and time variation.

In study conducted among Bahirdar university students in Ethiopia on harmful khat users cigarette smoking was showing significant association to harmful khat use which was compatible with my study that cigarette smoking was significantly associated with current khat dependency(44).

Excessive cigarette consumption during khat chewing sessions has also been reported among UK residents Yemeni khat chewers for which the prevalence of khat dependent found to be 39%(29). Among this study group the prevalence of smoking cigarette was found 95% which was more than twice among my study population that was 47.7%. The high prevalence among UK residents of Yemeni chewers was may be due to the difference in study population, socio cultural variation, and more chronic users of khat than my Sample population.

Another factor associated with khat dependency was depression in which 33.7% of respondents were reported presence of depression on phq-9 score with statistical significance of p-value 0.010 (95 CI; =1.40, 11.9), consistent with study conducted among Bahirdar university undergraduate students(45),but higher than study conducted among adult people living in Amhara region who were khat chewers, among this study groups the prevalence of depression was found 25.3% (95% CI; =1.67–23.61)(59). The observed variation was may be due to population, sample size and tool difference.

By other hand the odds of depression among dependent chewers were about 4 times higher than those non-dependent khat chewers. This is supported by study conducted among adult people in Amhara region in which the odds of depression among dependent khat chewers were 6 times higher than non-dependent khat chewers (59). This might be explained by the effect of chronic khat use through catecholamine depletion in the central nervous system. Similarly, the odds of having psychological dependency is 6.72 times higher for those who were chewed more than half of a bundle in each chewing session than those who were chewed less than half a bundle in each chewing session. This is supported by study conducted among UK resident Yemeni khat chewers(28) This might be due the tolerance effect of psychoactive substances in which dependent individuals are need to increase the amount of substance used to achieve the required effect of the substance which previously achieved with minimum amount of the same substance.

The odds of psychological khat dependency were 3.5 times higher for cigarette smoker when compared to those who were chewing khat but not psychologically dependent, supported by study conducted among UK resident Yemeni khat chewers (26).

The odds psychological khat dependency was 4.4 times higher among students who had poor social support when compared to those students who had strong social support and the odds of psychological khat dependency were 3.65 times higher among students in 4th year and above when compared to students in 1st, 2nd and 3rd years.

# Strength and limitation of the study

It is the first to study psychological khat dependency among the study population in relation to different associated factors but since the study design was cross sectional in nature it didn't show causal relationship between outcome variable and independent variable and, the topic of study was sensitive and may be subjected to social desirability bias.

## Conclusion And Recommendations

We conclude from the study that psychological khat dependency were prevalent. Use khat for prolonged time, chewing large amount of khat, chew khat frequently, as well as having poor social support, smoking cigarette, depression and being in 4th year and above were also show significant association psychological khat dependency. This indicates that khat has harmful effects on students' academic performance and also on the countries productivity by Trans passing its evil effect among youth population. Therefore, it needs comprehensive intervention at different level to reverse its bad effect and to produce an effective and productive university student who will be able to take part in countries development and who will be able to take responsibilities for their own behavior. Furthermore, these preliminary results support the potential utility of the SDS-khat to healthcare providers to identify those at risk for khat-related harms. Further investigation into the relationship between khat dependence, use patterns, and related health outcomes is warranted. The university should take a measure to control students chewing habit through close monitoring and inspection even to the level of dorm to dorm assessment

In collaboration with the psychiatry department the university should prepare drug free campaign and give education regarding the hazardous of using psycho active substance and also transmitting message about the bad effect of those substances through university mass media.

The university should also work with the concerned body to avoid or decrease khat chewing center surrounding to the university. The zonal health bureau should give great emphasis to decrease or avoid khat chewing center found in Mettu town. The policy makers should consider including the issue of substance use in countries rule and regulation, and also regarding its implementation at all levels of governmental and non-governmental organizations.

We recommend future researchers to conduct study to find the causal relationship between psychological khat dependency and its associated factors such as depression.

## Abbreviations

CI: Confidence Interval, DSM-5: Diagnostic and Statistical Manual Fifth edition, GAD -7: Generalized Anxiety Disorder-7, ICCMH: Integrated Clinical and Community Mental Health, ICD: International Classification of Disease, OR: Odds Ratio, OSS -3: Oslo Social Support -3, PHQ -9: Patient Health

## Declarations

### Ethical approval and consent to participate

Ethical clearance and approval was obtained from an institutional review committee of the University of Gondar, College of medicine and health science and permission was asked from Mettu University to collect the data.. The necessary ethical consideration of ethics involving human participants in research was done as per Helsinki's declaration. Informed written consent was obtained from each participant.

### Consent for publication

Not applicable

### The availability of data and materials

Data will be available upon request from the corresponding author.

### Funding

Funding not applicable

### Competing interests

The authors declare that they have no competing interests

### Authors' contributions

ME conceptualized the study and was involved in design, analysis, interpretation, report, and manuscript writing. HM, TK and WM made a substantial contribution to the conception, analysis, and interpretation of data, drafting the manuscript, and critical revision for important intellectual content. All the authors read and approved the final manuscript.

### Acknowledgments

We would like to express our thanks to the department of psychiatry, college of medicine and health science, the University of Gondar for giving me the chance to conduct this research. The author's appreciation also goes to Mettu University for allowing attending the master's program in integrated clinical and community mental health program. The authors' thanks extend to our data collectors and study participants.

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## Tables

Table 1: Socio-demographic characteristics of undergraduate students at Mettu University, South West Ethiopia, 2021

Socio-demographic characteristics	Frequency	Percentage
<b>Sex</b>		
Male	967	69.63
Female	304	30.37
<b>Age</b>		
< 20	7	0.7
20-24	930	93.0
>=25	64	6.4
<b>Place of residence</b>		
Urban	596	59.6
Rural	405	40.5
<b>Marital status</b>		
Single	977	97.0
Married	23	2.30
<b>Year of study</b>		
1st year	77	7.69
2nd year	211	21.08
3rd year	341	34.07
4th year	215	21.48
5th year	157	15.68
<b>Religion</b>		
Orthodox	436	43.56%)
Protestant	286	28.6%
Muslim	251	25.1%
Catholic	22	2.2%
Others	6	0.6%
<b>Ethnicity</b>		

Oromo	612		61.14
Amhara	241	45	24.08
Tigre	81		4.50
Gurage	22		8.09
Others			2.20
<hr/>			
Monthly pocket money			
1-100	9		0.90
101-299	84		8.40
300-499	275		27.50
500-999	415		41.5

**Table 2:** Factors associated and not associated with psychological khat dependency among undergraduate Mettu university students, south west Ethiopia 2021

Predictors	Bivariable analysis		Multivariable analysis	
	COR (95%CI)	p-value	AOR(95%CI)	P-value
<b>Sex</b>				
Female	1		1	
Male	4.11 (1.11-15.2)	0.034	1.63 (0.24-11.1)	0.614
<b>Place of residence</b>				
Rural	1		1	
Urban	3.0 (1.11-8.09)	0.029	1.68(0.394-7.2)	0.479
<b>Religion</b>				
Protestant	1		1	
Muslim	3.1 (1.15-8.38)	0.025	2.66 (0.67-10.43)	0.161
<b>Year of study</b>				
<= 3 <sup>rd</sup> year	1		1	
>= 4 <sup>th</sup> year	3.09 (1.54-6.18)	0.001	3.65 (1.07-12.49)	<b>0.039</b>
<b>Anxiety</b>				
No	1		1	
Yes	4.8 (2.34-9.95)	0.0001	2.24 (0.689-7.2)	0.180
<b>Depression</b>				
No	1		1	
Yes	4.86 (2.44-9.49)	0.0001	4.08 (1.40-11.9)	<b>0.010</b>
<b>Cigarette smoking</b>				
No	1		1	
Yes	5.46 (2.39-12.4)	0.0001	3.5 (1.05-12.37)	<b>0.035</b>
<b>Social support</b>				
Strong	1		1	
Poor	5.2 (2.5-10.77)	0.0001	4.4 (1.34-14.43)	<b>0.015</b>
<b>Amount of khat chewed each session</b>				
< =½ bundle	1		1	

> ½ bundle	3.2 (1.67-6.28)	0.0001	6.72 (2.17-20.78)	<b>0.001</b>
<b>Duration of chewing khat in each session</b>				
< =6hrs	1			
> 6h hrs.	5.85 (2.86-11.95)	0.0001	4.2 (1.43-12.73)	<b>0.009</b>
<b>Days chewing khat per week</b>				
1-3 days	1			
> 3 days	1.28-4.71	0.007	4.2 (1.39-12.96)	<b>0.011</b>

## Figures

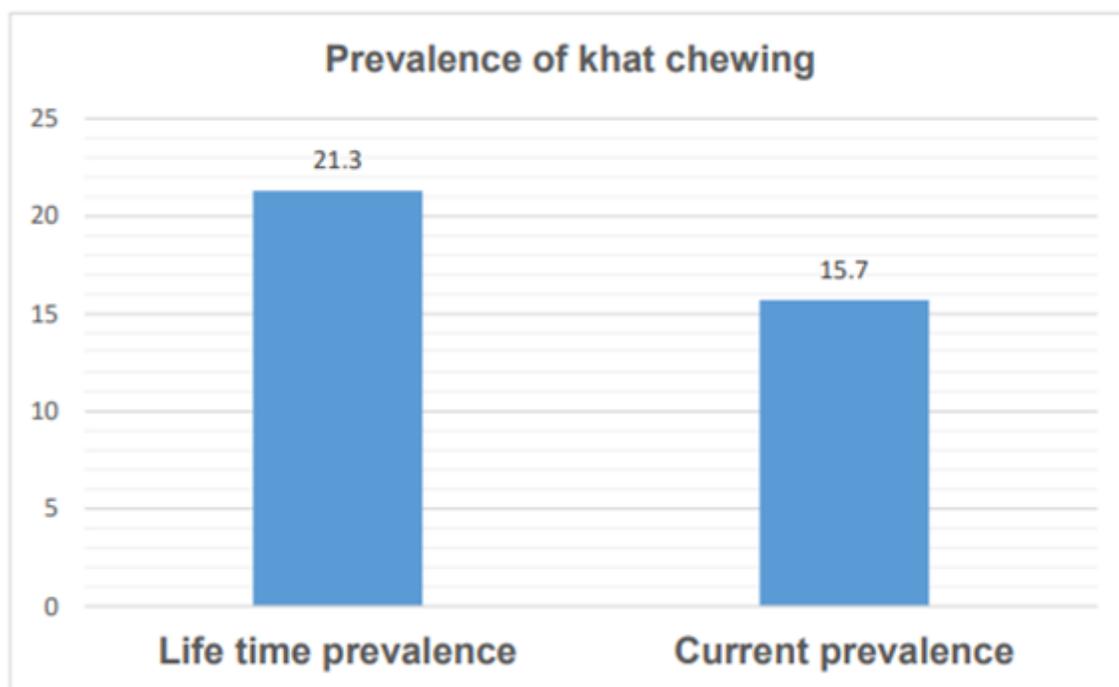


Figure 1

Prevalence of khat chewing among undergraduate Mettu university students, south west Ethiopia, 2021