

# Prevalence and associated factors of khat chewing among atse fasil campus students, university of gondar, north west ethiopia june 2013

## Abstract

**Introduction:** Khat is a shrub or tree its leaves have been chewed for centuries in the Eastern part of Africa and the Arabian Peninsula. Globally, Khat chewing habit is being a hot issue of discussion and spreading at an alarming rate in young generation, especially in higher institutions; where there are intensive academic activities are more intended. Similarly in Ethiopia it is consumed by some population groups commonly youths. It has a reported negative economic and health impact on the individuals engaging in the habit of Khat chewing. There were no studies conducted to investigate the prevalence and associated factors of Khat chewing in our study area.

**Objective:** This study was conducted to assess the prevalence and associated factors of khat chewing among students of Atse Fasil campus in university of Gondar, North West Ethiopia.

**Methods:** Institution based cross-sectional study was conducted from April 29 to May 03, 2013 in Aste Fasil campus, University of Gondar. A total of 310 students were selected using a stratified random sampling technique in which only 302 answer the question making the response rate of 97.4%. The data was entered and analyzed using SPSS version 20 software. Odds ratio and chi-square were used to test the association between different variables and also frequency, proportion and summery statistic were used to describe the study population. The analysis was taken confidence interval of 95% and association with P-value of < 0.05.

**Results:** The study revealed 9.6% of life time prevalence rate of Khat chewing. The current prevalence of Khat chewing was found to be 6.95%. There were 6.72% female Khat chewers and 11.7% male Khat chewers. A large proportion (58.6%) life time chewers were started Khat chewing after joining university. Tigre ethnic group was significantly associated factor (AOR=0.041, 95%CI (0.002-0.718) with outcome variable.

**Conclusion:** The prevalence of Khat chewing seems to decrease among university students. According to the study, Tigre ethnic group were at low risk of chewing Khat than other ethnic group. Majority of the students were started chewing after joining university. Increasing control measures and awareness about the health and social problems associated with Khat chewing need to be implemented. Recreational alternatives for young people have to be found.

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## Introduction

### Statement of the problem

Khat (*cathaedulis*) is a shrub or tree whose leaves have been chewed for centuries in the eastern part of Africa and the Arabian peninsula but it is also imported into other countries.<sup>1,2</sup> It is estimated that as many as ten million people worldwide chew Khat (*Cathaedulis*). In one large study in Yemen, 82% of men and 43% of women reported at least one life time episode of Khat use and up to 40% of Khat users develop tolerance to, and a dependence on, Khat.<sup>3</sup> WHO classified Khat as a drug of abuse that can produce mild to moderate psychological dependence.<sup>4</sup>

It is estimated that up to 90% of adult males and 50% of females chew Khat three to four hours daily in Yemen's. Recent study for the World Bank estimated that 73% of women chew Khat leaves more or less frequently.<sup>5</sup> The most recent estimates suggest that Europe accounts for about 40% of the Khat seized worldwide.<sup>6</sup> The stimulating drug, Khat is a drug of abuse that has become known in Norway due to increased immigration from east Africa, especially Somalia. Khat is

a drug which stimulates the central nervous system causing increased alertness, euphoria, and occasionally psychosis and increases activity in the peripheral sympathetic nervous system leading to palpitation, increased blood pressure, large publicus and red eyes.<sup>7,8</sup>

Long term use or abuse can cause insomnia, anorexia, gastric disorders, depression, liver damage and cardiac complications, including myo-cardiac infarctions. Manic and delusional behavior violence, suicidal depression, hallucinations, paranoia and Khat-induced psychosis have also been reported.<sup>2,9</sup> For instance, such evidence in Yemen showed Khat chewers were more likely to present with myocardial infarction (74.3%) followed by unstable angina (14.3%) and had significantly higher mortality rates compared with non-Khat chewers (8.7% vs 2.9%). Among patient with acute coronary syndrome in Yemen 72.2% were Khat chewers.<sup>10</sup> Similarly, the incidence of gingival bleeding was significantly higher in Khat chewers compared with non Khat chewers (23% vs 1%) and ulcers in the oral mucosa were present in about 7% of chewers, as compared to 0.5% non-chewers.<sup>11</sup> People who chewed Khat also high risk to death following stroke and heart failure. Such study showed Khat users admitted to the hospital for heart disease had 7.5% death rate

in the hospital compared to 3.8% rate among non-users. The death rate within one year was nearly 19% among Khat users' vs 11% among non-users.<sup>12</sup> Chronic use of Khat predisposes the users to have oral keratotic white lesions. Such study reported that 22.4% of Khat chewers had oral keratotic white lesions at the site of Khat chewing, while only 0.6% of non-chewers.<sup>13</sup>

In Djibouti: the chewing of Khat leaves is a wide spread habit of the male population that has a pro-found socio-cultural importance, credited with fostering amity and building social relationships.<sup>14</sup> Ethiopia is thought to be the country of origin of Khat use. Today it is consumed everywhere in the country by all population groups commonly youths.<sup>15</sup> In our country substances have been consumed by young people, as reported in one rapid survey 30.5% were Khat chewers. These days the use and abuse of Khat is increasing at an alarming rate.<sup>16</sup> In Ethiopia Khat is commonly used for social and religious purposes; in 2010 the prevalence of Khat chewing among secondary school students was 24.2% and nearly 30% of adolescent girls, and over 70% of adolescent boys, chew Khat in Eastern Ethiopia.<sup>17</sup> Currently in Ethiopia the prevalence of substance use particularly Khat chewing is increasing at alarming rate. The prevalence of Khat use varied widely 0.3 to 64.7%.<sup>18</sup> Similarly in 2002 the current prevalence of Khat chewing among university students was estimated to be 24.79 %.<sup>19</sup>

## Literature Review

A cross-sectional study done in Saudi Arabia in May 2006, on 10,000 college and secondary school students, to assess the prevalence of Khat chewing, showed that the overall prevalence of Khat chewing in all the studied population were 21.4%. There were 51(3.8%) female Khat chewers and 1783 (37.7%) male Khat chewers. The prevalence was high in secondary schools (21.5%) compared to the colleges (15.2%). Khat chewers were more in urban areas (24.5%) than in rural areas (20.50%).<sup>20</sup>

A cross-sectional study in Jimma University, Ethiopia in 2003 on 400 Jimma university staff to assess the prevalence of Khat chewing and its socio-demographic correlates showed that the current prevalence of Khat chewing was 30.8%. More males (33.0%) than females (20%), Muslims (49.0%) than other religious groups, Tigres (42.9%) than other ethnic groups, Technical (33.8%) than academic staff, married (32.4%) than singles, age group 18-24 years (34.4%) than other age group, and general practitioners (40.5%) than other professional groups were found to be Khat chewers. About 50.4% of the Khat chewers have one or more times missed their regular work at Jimma University because of chewing.<sup>21</sup>

A descriptive cross-sectional study done in Addis Ababa in 2006 on 4001 men and women to assess the prevalence of substance use and its association with high blood pressure showed that 18% of men and 2% of women reported current Khat chewing. Approximately 16% of the men chewed Khat 1 or more every week; 5% chewed Khat daily. Median age at start of chewing was 22 years among current chewers.<sup>22</sup>

A cross-sectional study done in North Western Ethiopia in February 2007 on in-school and out of school youth to assess the prevalence and risk factors of Khat chewing showed that the prevalence of Khat chewing was 37.1%. The current prevalence rate of chewing was 31.4%. Of the respondents, 155 (3.3%) have ever used Khat, cigarette and alcohol. Among those who currently chew Khat 30% has chewer age 18 years. Thirty six percent of the chewers chew in public recreation areas and 30.7% chew in special rooms arranged for daily chewing session. Of the chewers 17% have chewed for less than

1 year, 38% for 1-2years and 44.8% for more than 2years, females account for 22.8% of the current chewers.<sup>23</sup>

A cross-sectional study done in Jimma University in 2008 on 528 students to assess the academic, health and psychological effect of Khat on mature students showed that 63.52% of males and 54.9% of females were Khat chewers. Among chewers 51.6% were Muslims; 46.3% of the students reported focus and concentration on their studies as the reason for chewing Khat.<sup>24</sup> A cross-sectional community based study done in Jimma University in 2009 on 1200 individuals to evaluate the association between Khat use and mental distress and to determine the prevalence of mental distress and Khat use showed that the Khat use prevalence was found to be 37.8%. Majority of the Khat users were males (73.5%), age group 18-24 (41.1%), Muslims(46.6%), Oromo ethnic group (47.2%), single(51.4%), high school students (46.8%), and employed (80%).<sup>25</sup> A cross-sectional study done in Addis Ababa University in June 2009 on 622 undergraduate medical students (year I to internship program) at the school of medicine to determine the prevalence of substance use and identify factors that influenced the behavior showed that in the last 12months, Khat use was reported by 7% (9% males Vs 1.5% females) of the students.<sup>26-27</sup>

A descriptive cross-sectional study done in Harare town, Eastern Ethiopia in April 2010 on 1,890 secondary school students to assess the prevalence and determinants of Khat chewing showed that the overall prevalence of Khat chewing was 24.2%. About 28.5% of females and 71.5% of males had chewed Khat. Of 24.2% chewers, 20.9% chewed Khat daily and 29.9% used shisha when they chewed Khat. Out of those who chewed Khat, 33.6% spent more than 26 birr per week. The analysis showed that the odds of chewing were eight times higher with students who had friends who chewed Khat compared to those who didn't. Male students had two times higher odds of chewing Khat compared to female student. Those students who are living with Khat chewers had 1.5times higher odds of chewing compared to those who didn't. As the age of students increased by 1year the odds of Khat chewing increased by 1.3%. Muslim students had closed to two times higher odds of chewing Khat compared to orthodox Christians.<sup>17</sup>

## Justification of the study

Khat chewing habit has its own adverse effect on the health of individuals and social life of users. Khat is widely consumed among Ethiopian youth's for different purposes. Conducting research on prevalence and associated factors of Khat chewing among students of Atse Fasil campus in University of Gondar will help to identify the distribution of problems. And it also serves as a critical role of providing information to form rational foundation for public health policy, prevention and planning to bring change in contributing factors for Khat chewing. It is not more studied in this area that is why we are intended to conduct our study in Atse Fasil campus. The finding will be serving as base line information for further study.

## Objectives

### General objective

To assess the prevalence and associated factors of Khat chewing among regular students of Aste Fasil campus in university of Gondar, North West Ethiopia 2013.

### Specific Objectives

a) To identify the prevalence of Khat chewing among students of Atse Fasil campus in university of Gondar.

b) To describe determinant factors of Khat chewing among students of Atse Fasil campus in university of Gondar.

## Methods and materials

### Study design and period

Descriptive and analytical quantitative cross-sectional study was conducted among students of Atse Fasil campus in university of Gondar from April 29 to May 03 /2013.

### Study Area

The study was conducted in Atse Fasil campus in university of Gondar at Gondar town, North West Gondar Amhara region. Gondar town is located at 727 km from Addis Abeba to the North West part of the country. The town has a population of around 300,000. The university of Gondar currently has four functioning campuses those are Maraki, Atse Tewodros ,Atse Fasil and College of medicine and health sciences and one under construction that is Meles Zenawi campus. Atse Fasil campus was our study area which is located slightly far from the mid town piazza about 2.5 km to west of Gondar town. This campus has currently five departments: department of architecture, department of water resource and environmental engineering, department of civil engineering and department of electrical engineering and has a total of 3071 students out of these 2981 are regular students.

### Source Population

All Atse Fasil campus regular students

### Study Population

Students who were present during the data collection time.

### Inclusion and exclusion criteria

Inclusion Criteria: Regular students of Atse Fasil campus who were enrolled during the data collection time.

Exclusion criteria: Those who were ill during the data collection time.

### Sample size estimation

A single population proportion formula was used to estimate the sample size; assuming the proportion of the students who chewed Khat was 24.2% which is taken from previous study done on Harare town secondary school students<sup>17</sup> to get the possible sample size with z-value of 1.96 and marginal error of 5% was calculated as;

$$n! = \left( \frac{z\alpha}{2} \right)^2 \cdot \frac{p(1-p)}{w^2}$$

n! =initial sample size

a= confidence interval (95%)

p=proportion of Khat chewed

w=marginal error of 5%

$$n! = \frac{(1.96)^2 \cdot 0.242 \cdot (1-0.242)}{(0.05)^2} = 3.8416 \cdot 0.242 \cdot 0.758 / 0.0025 = 282$$

The total number of Atse Fasil campus students is 2981. Since this figure is below 10,000, we use the following correction formula for the final sample size estimation.

Since, there is no a significant difference between 282 and 258 we were take 282 as a final sample size.

$$nf = \frac{n!}{1 + n!/N} \text{ where, nf=final sample size}$$

$$N=\text{total number regular students}$$

$$nf = \frac{282}{1 + 282/2981} = \frac{282}{1.094599} = 258$$

Since, there is no a significant difference between 282 and 258 we were take 282 as a final sample size.

By assuming non-response rate, we add 10% correction factor from the final sample size. Therefore the total final sample size was:

$$nf + \left( \frac{10}{100} \right) Xnf = 282 + 0.1 \times 282 = 310$$

### Sampling procedure

Stratified random sampling procedure was employed according to the departments and year of the study. Then simple random sampling method was applied for selection of participants in each sub stratified population proportionally. Over all sample size was taken proportionally from each departments. There are a total of five departments. The total sample size was allocated to each batch proportionally to the number of students, and also participant students were selected from each batches using simple random sampling technique (Figure 1).

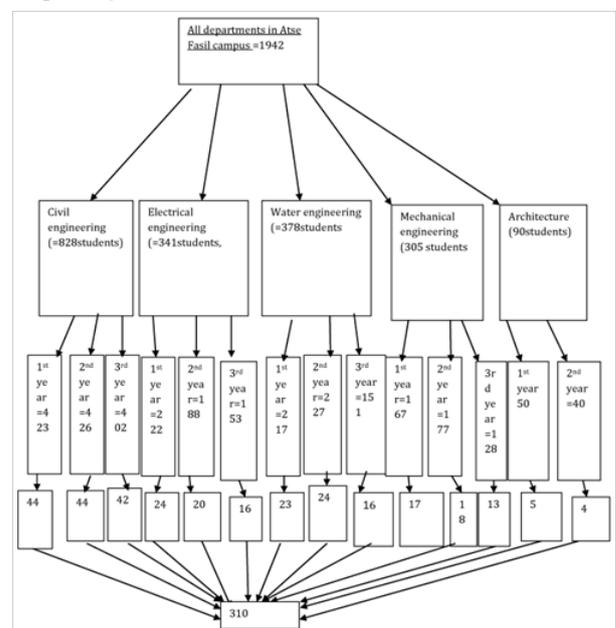


Figure 1 Schematic presentation of sampling procedure.

The proportional formula for each batch is:  $= \frac{nf \cdot x}{N}$

Where, nf = final sample size

n=total number of each batches

N=total number of students.

## Variables

**Dependent variable:** Khat chewing

### Independent variables

- Age Religion
- Sex Marital status
- Residence Year of study
- Department Family members chew khat
- Stress Peer influence
- Ignorance of khat effect Availability
- Joining University Ethnicity
- Operational definitions

**Current prevalence of Khat chewing:** The proportion of students who are chewing Khat within 30days precedes the study.

**Life time prevalence of Khat chewing:** The proportion of students who had ever chewed Khat in their life time.

### Data collection method

Data were collected by using structured self administered questionnaires which was prepared first in English and then translate into Amharic and back to English. Five data collectors who were under graduate nursing students were involved, and training was given; mainly on the purpose of the study, handling ethical issues and method of data collection.

### Data quality control

The questionnaire was checked thoroughly for its completeness before it was distributed to the respondents. The principal investigator and data collectors were make close follow up and frequent checks on the data collection process to ensure the completeness and consistency of the gathered information. Pre-test was given for 31 Maraki campus students before the actual data collection time. We were discussing each other about data collection.

### Data compilation and analysis

The collected data were cleared and checked for completeness and were entered, compiled and analyzed using SPSS 20 computer soft ware package was used appropriately. Data cleaning was performed to check for accuracy, consistencies, missed values and variables. Any error identified was corrected. Frequencies, proportion and summary statistics were used to describe the study population in relation to relevant variables. Odds ratio and chi-square were computed to assess the strength of the association and statistical significance. A p-value of less than 0.05 was considered to be statistically significant.

### Ethical consideration

Ethical clearance was obtained from the department of nursing, college of medicine and health science, University of Gondar. Written permission was secured to undertake the study from Atse Fasil campus dean's office then official letter was written to each department heads. All the study participants were informed about the objective of the study and their verbal consent was obtained. Additionally, we also explained that confidentiality and privacy of the information were seriously respected.

## Result

### Socio-demographic

Out of the total 310 questionnaires distributed , 302 were returned making the response rate 97.4%.The range of respondents age fall between 18-23 with mean of 19.4 (SD=1.008).Most of the study subjects (87.09%) were fall between the age range of 18-20.Majority (60.6%) of the respondents were male. A large proportion (66.6%) of the respondents were followers of the orthodox Christianity followed by protestant for (18.9%) participants. One hundred forty five (48.0%) came from Amhara region followed by Oromia region (16.2%). Two hundred eighty eight (95.4%) were single. Two hundred twelve (70.2%) were urban resident. A large proportion (42.4%) was civil engineering. Majority (36.8%) were first year students (Table 1).

**Table 1** Socio-demographic characteristics of regular students of Atse Fasil campus in Gondar University, North West Ethiopia, April 2013

Socio-demographic Characteristics	Frequency	Percent (%)
<b>Age(n=302)</b>		
18-20	263	87.09
21-23	39	12.91
<b>Religion(n=302)</b>		
Orthodox	201	66.6
Protestant	57	18.9
Muslim	29	9.6
Catholic	11	3.6
Others(1)	4	1.3
<b>Ethnicity (n=302)</b>		
Amhara	145	48
Tigre	43	14.2
Oromo	49	16.2
Somali	6	2
SNN	47	15.6
Others(2)	12	4
<b>Marital status(n=302)</b>		
Single	288	288
Married	14	14
<b>Residence(n=310)</b>		
Urban	212	70.2
Rural	90	29.8
<b>Year of study(n=310)</b>		
1st year	111	36.8
2nd year	108	35.8
3rd year	83	27.5
<b>Department (310)</b>		
Mechanical	46	15.2
Electrical	57	18.9
Civil	128	42.4
Water	62	20.5
Architecture	9	3

### Khat chewing practice

The overall prevalence of khat chewing was 9.6%. Twenty one students (6.95%) were current khat chewers. The life time prevalence rate of khat chewing in each year was: 6.31% in the first year, 10.2% in second year, and 13.3% in third year .The current prevalence rate of khat chewing in each year was: 4.5% in first year, 7.41% in second year, and 9.64% in third year. The life time prevalence rate of khat chewing in the each department was: 8.6% in civil engineering, 10.53% in electrical engineering, 8.7% in mechanical engineering,

11.3% in water engineering and 11.11% in Architecture. The current prevalence rate of khat chewing in civil engineering, mechanical engineering, electrical engineering, and water engineering student was 5.47, 7.02, 8.7, and 9.68% respectively.

There were 11.47% male life time chewers and 9.3% current chewers and 6.72% and 3.36% female life time and current chewer respectively. Twenty two (75.9%) and 14(66.7%) of life time and current khat chewers respectively fall the age between 18-20years.

Six (20.69%) and 17.24% of Muslim religion were life time and current khat chewers respectively. Similarly Orthodox 5.97% and 3.48%, Protestant 14.4% and 10.52%, Catholic 9.09% and 9.09%, and others 50% and 50% religion followers were life time and current khat chewers respectively.

Five (83.33%) and 83.3% of Somali ethnic group were current and life time chewers and 2.13% and 4.3% of south nation nationality was current khat chewer respectively. The current and life time prevalence of khat chewing in each ethnic group were 3.45 and 5.52%, 14.29 and 20.41%, 2.33 and 4.65%, 16.67 and 16.67% of Amhara, Oromo, Tigre, and others respectively.

Three (21.4%) and 15.38% of married were the life time and current prevalence of khat chewer. Sixteen (7.55%) and 5.56% of urban and rural residence was current khat chewer (Table 2).

**Table 2** The life time and current prevalence of khat chewing according to marital status, residence, and gender among Atse Fasil campus students, University of Gondar, April 2013

Socio-Demographic Characteristics	Life Time Prevalence Of Khat Chewing n (%)	Current Prevalence Of Khat Chewing n (%)
<b>Marital status</b>		
Single	26(9.02)	19(6.60)
Married	3(21.4%)	2(15.38)
<b>Residence</b>		
Urban	21(9.91)	16(7.55)
Rural	8(8.89)	5(5.56)
<b>Sex</b>		
Male	21(11.47)	17(9.30)
Female	8(6.72)	4(3.36)

Among the ever chewer, 58.6% started chewing after they were joining the university. Majority (76.48%) of the chewers who started to chew khat after joining university were started to chew khat when they are first year university student. Two (11.76%) were started khat chewing when they are second year and third year student. Among the ever chewer, a large proportion (57.73%) started to chew between the age of 19-23years.

A large proportion of current khat chewers (70.4%) were chew khat occasionally. Six (22.2%) and 7.4% of current khat chewers were chew khat usually and always respectively. The average amount of khat chewed per week by one individual was 102gram.

### Reason for starting khat chewing

The main reason given for starting chewing was for relieving stress (44.8%) followed by due to peer pressure (37.9%). Table 3 shows the reasons for starting chewing. The minimum age for starting khat chewing was 9 years. The mean age for starting khat chewing was 15years.

\*The percentages do not add up to 100.0% because one respondent can give more than one answer.

**Table 3** Reasons given by Atse Fasil campus students in Gondar University, North West Ethiopia for starting khat chewing, April 2013

Reasons	Khat chewing(n=29) n (%)*
Relieve stress	13(44.8)
Peer pressure	11(37.9)
Family members chew khat	3(10.34)
Religious purpose	2(6.9)
Other reason	1(3.45)

### Association between dependent and independent variable

To determine the association between independent variables and dependent variable multiple logistic regressions was done. Statistical significant association was seen between the outcome variable and the independent variable ethnic group. Table 4 shows the results of the bivariate analysis between the outcome variable “ever khat chewing” and different independent variables.

### Discussion

In this study the overall prevalence rate of khat chewing among university students was 9.6%. This study is much lower than its prevalence in the Harare town secondary school students which was 24.2%. Similarly, this result also lower than a similar study conducted on north western Ethiopia in-school and out school youth the overall and current prevalence were 37.1% and 31.4% respectively.<sup>17,23</sup> The possible explanations for this difference could be the disadvantages of khat chewing are widely disseminated, and the previous study was done in the population having similar characteristics. In contrary, the overall prevalence of this study is higher than the findings of a studies conducted on Addis Ababa University undergraduate medical students that was 7.0%.<sup>26</sup> It could be speculated that the low prevalence among medical students is due to increased awareness towards the harmful effects of khat.

In this study 11.47% of male and 6.72% of females were practiced khat chewing which was higher in males with the large proportion of chewers fall between 18-20. Similarly, a study in Jimma university and Harare town 73.5% of chewers and 71.5% of chewers were male respectively.<sup>17,25</sup> In consistence with this finding, a study done in Addis Ababa revealed 18% of men and 2% of women reported current khat chewing. Another study Saudi Arabia among college and secondary school students reported that 37.7% male khat chewers and 3.8% female khat chewer.<sup>20,22</sup> This might be due to social and cultural influence on females.

This study revealed that Muslims than other religious groups, Somali than other ethnic groups, married than singles and age group 18-20years were found to be more khat chewers. It was reported in Jimma University<sup>21</sup> that khat use was more frequent among males than females, Muslims than other religious groups, Tigres than other ethnic groups, married than singles and age group 18-24years than other age group were found to be khat chewers.

In this study there were 7.54% and 5.55% of urban and rural resident khat chewers. In line with this study, 24.5% and 20.50% of urban and rural residents were khat chewer which was done in Jazan region<sup>20</sup>. Even if khat is cultivated in rural areas, it is not more practiced due to their negative attitude towards this behavior. The secondary school and the university age (14-24years) constitute a critical period of time. In consistence with a study conducted in Jimma University,<sup>17</sup> this study revealed that the prevalence of khat chewing increases with age and year of study.

**Table 4** Factors associated with current chewing of khat among Atse Fasil campus students in Gondar University, April 2013

Variables	Ever Yes	Chewer No	P-value	COR (95%CI)	p-value	AOR (95%)
<b>Religion</b>						
Orthodox	12	189	0.008	15.75(2.038-121.731)	0.244	4.437(0.362-54.421)
Protestant	8	49	0.09	6.125(0.752-49.899)	0.496	2.425(0.89-31.081)
Muslim	6	23	0.222	3.833(0.444-33.11)	0.337	3.401(0.235-49.320)
Catholic	1	10	0.112	10.00(0.584-171.20)	0.241	8.861(0.229-343.584)
Others	2	2				
<b>Ethnicity</b>						
Amhara	8	137	0	0.009(0.09-0.116)	0.181	3.340(0.572-19.524)
Oromo	10	39	0.927	0.173(0.036-0.838)	0.855	0.846(0.141-5.077)
Tigre	2	45	0.736	0.041(0.002-0.718)	0.029	0.041(0.002-0.718)
Somali	5	1	0.927	0.76(0.156-3.716)	0.245	3.596(0.415-31.65)
SNN	2	41	0.845	0.256(0.041-1.056)	0.228	3.813(0.434-33.537)
Others	2	10				

In this study 58.6% of the life time chewers started chewing after they were joining the university. The critical time to start this practice after joining the university is first Year University (76.48%). Since first year students are new for the university environment in that the style of teaching is different and the contents to learn are many compared to preparatory schools, these students may start to chew khat as a means of escape from stress. The mean age for starting chewing was 15 years. This is almost similar with what was reported in 2007.<sup>23</sup> In agreement with this statement is that the main reasons mentioned for starting chewing were “peer pressure” and “for relieving stress”. This is an important indication to direct interventions towards decreasing the prevalence of these habits. Additionally, students need counseling service on ways of coping with their problems. As it was shown by the average age of starting chewing, most of these chewers were adolescents where peer pressure has a significant role for such behaviors.

On average one chewer was found to chewed 102gram of khat per week. This indicates that money spent by students for khat is high. Very few families can afford for this expense. When these students have no money to buy khat, they could be engaged in criminal activities. Even after graduation these people will spend much amount of money for khat which can affect the economy of the family. Six (9.68%) of water engineering students were current khat chewer.

In this study only ethnicity was significantly associated with ever khat chewer that was Tigre ethnic group was preventive risk (AOR=0.041, 95%CI= (0.002-0.718), P-value=0.029) of chewing khat than other ethnic group. In contrary to this study, a study in Harare town showed there was a significant association between age, sex, religion, and student living with khat chewer and the outcome variable. This might be due to the present study was done on a small sample size.

## Conclusion

In general the prevalence of khat chewing seems to decrease among university students. There were no significant association between the independent variables and outcome variable except Tigre ethnic group. Tigre ethnic group was at lower risk of chewing khat than other ethnic group. Majority of the students were started chewing after joining university in which most of the chewer started to chew when they are first year students.

## Limitation of the Study

The study is related to sensitive issues as a result they may not

be genuine respondents which may restrict the generalization of all students in the university.

### Recommendation

Based on the findings of the study the following recommendations are made:

For university of Gondar

- i. It will be better to inform their students, especially freshman students, about the health and socioeconomic problems associated with khat chewing.
- ii. It will be better to teach and counsel their students on ways of coping with the problems rather than they started to chew khat.
- iii. For Preparatory schools
- iv. It needs to teach their students about the danger of khat chewing.
- v. It will be better to orient their students about university life before joining university.
- vi. For Students
- vii. They have to protect themselves from khat chewing practice by knowing the side effects chewing khat.
- viii. It is better to use other recreational things rather than khat chewing.

### Declaration

We the undersigned nursing students declare that, this research is our original work in partial fulfillment for the requirements for the first degree of nursing. All sources of the materials used for this research and all people and institutions who gave support for this work are fully acknowledged.

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## Conflicts of interest

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