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RESEARCH ARTICLE

PREVALENCE OF KHAT CHEWING AND FACTORS AFFECTING IT AMONG ADDIS ABABA UNIVERSITY, SELALE CAMPUS STUDENTS 2016

*Abdisa Boka

Addis Ababa University, College of Health Science, School of Nursing and Midwifery, Addis Ababa, Ethiopia

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ABSTRACT

Background: Khat (*Catha edulis*) is a flowering shrub, native to the region extending from Eastern to South Africa, as well the Arabian Peninsula. The plant is seedless and hardy, growing in a variety of climates and soils. The taste is astringent and slightly sweet. khat chewing habit was started in the 15th century, just before the start of use of coffee. The crop now grows well at higher altitudes of Horn of Africa and the Arabian Peninsula where khat chewing has a long history as social custom dating back thousands of year. The harm from Khat has been debated globally. Khat affects both peripheral and central nervous system. The use of Khat results to significant negative psychological, physiological and sociological impact on compulsive users.

Objectives: To assess the Prevalence of khat use and its associated factors among Addis Ababa University, Selale campus students in 2016.

Methods: School based cross-sectional survey was conducted from November 25 to May19, 2016 on 220 students from selale campus, Ethiopia. Data was collected using pre-tested structured facilitator guided self-administered questionnaire. Stratified random sampling and simple random sampling technique was used to select students for the survey.

Results: The study revealed 21.9% of life time prevalence rate of Khat chewing. There were 11.45% female Khat chewers and 30.7% male Khat chewers. A large proportion (39.1%) of chewers was started Khat chewing after joining university. Nearly two third 33(71.7%) of students among khat chewers have a monthly income greater than 500 birr (2.56(1.12, 3.43 at 95%CI) and more than half 24 (52.2 %) were from third year (2.21(1.20, 3.92 at 95%CI). Of the total khat chewer majority of them were located at age interval of 23-26 years (2.34(1.92, 4.53 at 95%CI).

Conclusion: In the study area significant numbers of College students were chewing khat. The predominant factors associated with khat chewing were being male; families from urban area, peer pressure, parental and income specially have greater than 500 birr per month. The findings suggest the need to have audience specific behavioral change communication to avert and prevent khat chewing practice. Colleges and health bureau should design education about consequence of khat chewing for students, their parents and the community at large to bring behavioral change.

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INTRODUCTION

Khat (*Catha edulis*) also known as Abyssinian tea, Africa salad, Bushman's tea, Gat, Kat, Miraa, Tohai and Chat is a flowering shrub, native to the region extending from Eastern to South Africa, as well the Arabian Peninsula (Sikiru, 2009). The taste is astringent and slightly sweet. The plant is seedless and hardy, growing in a variety of climates and soils. Khat can be grown in droughts where other crops have failed and also at high altitudes. Khat is harvested throughout the year. Planting is staggered to obtain a continuous supply (Luqman, 1976).

Khat was first identified by a botanist whose name was Forskal in 1762 in Yemen and he categorized the plant in group spinosa. However, currently it is botanically classified under the family Celastraceae. Ethiopia is the country of its origin and it is the world's largest khat producer; where a khat chewing habit was started in the 15th century, just before the start of use of coffee. The crop now grows well at higher altitudes of Horn of Africa and the Arabian Peninsula where khat chewing has a long history as social custom dating back thousands of year. By now there are more than 10 million people in the world who uses khat on a daily basis for its euphorizing and psycho-stimulant effect (Andualem, 2002 and Bongard, 2011). Previously, khat was mainly cultivated in the eastern part of Ethiopia. Nowadays, it is grown in most parts of the country. It grows at high altitudes of 1500 - 2500 meters

*Corresponding author: Abdisa Boka

Addis Ababa University, College of Health Science, School of Nursing and Midwifery, Addis Ababa, Ethiopia

(Bongard, 2011). The people of these countries have chewed khat for centuries (Glenice Cox, 2003). According to a famous legend in Ethiopia the first human to use Khat was a Yemen herder who noticed the effect of the leaves of the plant on his goats and tried them himself after which he experienced wakefulness and added strength (Getahum, 1923). During khat chewing session, initially there is atmosphere of cheerfulness, optimism and a general sense of wellbeing. After khat chewing cessation, the individuals perceive some health problems where tension, emotional instability and irritability begin to appear, later leading to feelings of depression, confusion, insomnia and sluggishness. Different studies evidenced that psychological impacts of chewing khat are hazardous both to the individual and the community. Gastrointestinal adverse effects of khat chewing include anorexia, constipation and stomatitis. Anorexia leads to malnutrition and increased susceptibility to infectious diseases, especially tuberculosis (Mekonnen, 2006 and Yigzaw, 2005). Over the past decades, the economic importance and consumption of Khat has increased dramatically from a custom practice only by certain social or ethnic groups in the parts of Africa and Arabian Peninsula where it is grown, to a widespread habit in the general population of the countries in the Diaspora and amongst the immigrants with Somalia, Yemen, Kenya and Ethiopia origin, all around the world (Odenwald, 2007). The pleasure derived from khat chewing is attributed to the euphoric actions of its cathinone, a sympathomimetic amine with properties described as similar to those of amphetamine (Kalix, 1985; Kalix, 1992; Weir, 1985). Users of khat report increased levels of energy, alertness and self-esteem, a sensation of euphoria, enhanced imaginative ability and a higher capacity to associate ideas and these effects have been attributed to the khat's cathinone (Kalix, 1992; Kennedy, 1987; Bizuayehu, 2014). In Ethiopia, khat is used for direct consumption, local sale and for export. It is estimated that 85 to 90% of khat production is for sell; the rest is used for local consumption (Dechassa, 2014).

Statement of the problem

The harm from Khat has been debated globally (Szenderei, 1980). Khat affects both peripheral and central nervous system (Kalix, 1992). The use of Khat results to significant negative psychological, physiological and sociological impact on compulsive users. The challenge however is that Khat is at present cultivated both for export and for local consumption and because of its economic importance control may be difficult at present since the export potential is increasing. However, it is evident from different studies that, the medical and psychosocial effects of Khat chewing are harmful both to the individual and community (Sikiru, 2009). Khat use affects cardiovascular, digestive, respiratory, endocrine, and GUS. In addition, it affects the nervous system and can induce paranoid psychosis and hypomanic illness with grandiose delusions (Kalix, 1988). The main toxic effects include increased blood pressure, tachycardia, insomnia, anorexia, constipation, general malaise, irritability, migraine and impaired sexual potency in men (Nencini, 1989). Mild depressive reactions have been reported during khat withdrawal or at the end of a khat session and Frequent use of high doses may evoke psychotic reactions (Hassan, 2002). The habit of khat chewing is believed to affect a large segment of the Ethiopian population, especially the productive age group. It is commonly used for social recreation. Occupational groups such as motor vehicle drivers, truck drivers, who chew khat during long distance driving, to

keep awake, also use it under a variety of other conditions and It has negative impact on health, socioeconomic and political matters (Yigzaw Kebede, 2005). A significant number of students chew khat to be alert especially during examination periods and it is currently recognized as one of the substances that are of concern in Ethiopian universities (Federal Democratic Republic of Ethiopia, 2010). The prevalence of khat among Ethiopian university students have been reported between 9% and 32% by different researchers (Kebede, 2002; Eshetu, 2006; Deressa, 2011). In other countries, khat chewing among college students ranges from 19% in Saudi Arabia to 54% in Yemen (Laswar, 2009). In recent years khat induced psychosis (serious mental illness) including mania, paranoia and schizophrenia has become more common (Pantelis, 1989). Furthermore khat chewing seems to complicate the management of pre-existing serious mental illness (Hassan, 2003). khat chewers often complain of symptoms suggestive of inflammation of the mouth, esophagus, stomach and these effects were believed to be caused mainly by tannins in khat. The study also showed that chewing delays gastric emptying of a semi-solid meal, probably as a result of the sympathomimetic action of cathinone in khat (Heymann, 1995). A common complaint of khat chewers is constipation, probably caused by a combination of the astringent properties of the chemical in khat, called tannins and the sympathomimetic properties of cathinone (Gunaid, 1999). Studies again reported about the effect of both khat and nicotine dependence on self-reported oral problems were discoloration of teeth, cuts, trouble eating and experiencing mouth infection after khat chewing and oral cancer (squamous cell carcinoma) (Kassim, 2006). khat is a controversial crop to the world in general; and to Ethiopia in particular. For instance, by accounting 13.4 % of the export earnings, khat is the third largest export crop, next to coffee and oil seed (Aden, 2006). These controversies is also found among the international community, where some didn't classify khat as addictive drug, like the World Health Organization (WHO); and those who strictly banned it with enforced law, like Saudi Arabia. But some countries, like the UK, had classified the crop as a drug, but they didn't take serious measure to ban it. Hence there were no legal prosecutions taken in UK to date but even to worse paradox (Bongard, 2011). Though experiences of prohibition of khat in Kenya, Yemen, Uganda and Madagascar resulted in increased illegal importation, with possible controversial socio-economic effect, and lack of any law enforcement, khat had being circulated freely in Ethiopia today. Hence, there are quite thousands of people who chew khat regularly and who are vulnerable to its associated effect which finally could end up aggressive manic actions and recklessness (Rawlins, 2005). This controversy is also the same to Ethiopia, where the government neither encourages nor takes any action against its cultivation, trade and use. However, the silence assisted for the extensive multiplication of the crop and; therefore, khat has now taken an area of 94330 hectares of land in nationwide, which is equivalent to one third of the area allocated to coffee (Dawit, 2005).

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. No research has been conducted in students of Selale campus of AAU to determine the Prevalence of khat chewing and factors affecting it among students of selale campus, that is why the investigator

is intended to conduct study on prevalence of Khat chewing and factors affecting it among students of AAU, selale campus. Conducting this research will also help to identify the distribution of problems and its impact on educational and social impact on the students. The finding will be also serving as base line information for further study in the area.

Objectives

General objective

To assess the Prevalence of khat chewing and factors affecting it among AAU, Selale campus students in 2016.

Specific Objectives

- To identify the prevalence of Khat chewing among students of Addis Ababa university, Selale campus.
- To describe factors affecting of Khat chewing among students of Addis Ababa University, Selale campus.

Literature Review

There is an extensive literature on Khat providing information. Some of the literature dates as early as the 17th century. However, most of it appeared as writers views on the impact of Khat and the various aspect of its use. The medical, psychological and oral aspects are emphasized, and the current knowledge about the microbiological effects of Khat is also documented (Aden, 2006). It was noticed, in 1930's that the leaves of Khat growing in some regions of Eastern Africa, which including Ethiopia and Kenya, have a certain influence of the psychic and physical state of persons who use it (Bongard, 2011). Consumption of Khat is determined by cultural prevalence and the interplay of supply and demand (Rawlins, 2005). In the UK, Australia and America Khat is almost exclusively consumed by people with Eastern Africa origin. The dramatic expansion of air cargo has made Eastern African Khat available in Europe, America and Australia markets. Many studies emphasis that Khat consumption helps maintain "culture" and "identity" for the Diaspora communities (Dawit, 2005).

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%) (Telake, 2007). Out of the total 10000 questionnaires distributed, 8965 were returned making the response rate 89.65%. The college students participating in the study were 2466 (27.5%) and the secondary schools 6499 (72.5%). The male students were 4639 (51.75%), whereas female students were 4326 (48.25%). About 69.5% of the students were in the age group 15–20 years. The mean age of the respondents was 18.9 years (SD = 2.58). The overall prevalence of khat chewing in all the studied population of students was 21.4%. Khat prevalence was high in secondary schools (21.5%) compared to the colleges (15.2%). The life time prevalence rate of Khat chewing in the colleges was: 44.40% in Boys Community College, 43.6% in Boys Technical College, 41.90% in Boys Health College, 38.20% in

Engineering and Computer College, 35.80% in Jazan Boys Teachers, 21.40% in Boys College of Medicine, 7.20% in Samtah Girls Education, 4.80% in Sabiya Girls Education, 4.10% in Abu Arish Girls Community College, 3.50% in Jazan Girls Education and 1.40% in Farsan Girls Education (Beckerleg, 2005). 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 (Wolfes, 1930). 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 (Patel, 2005). 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 1-2 years and 44.8% for more than 2 years, females account for 22.8% of the current chewers (Stevenson, 1996). 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 (Ayana, 2004).

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%) (Hussein, 2009). A cross-sectional study done in AAU 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 12 months, Khat use was reported by 7% (9% males Vs 1.5% females) of the students (Ageely, 2009 and Yeshigeta, 2004). 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 1.5 times higher odds of chewing compared to those who didn't. As the age of students increased by 1 year 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 (Tesfaye, 2008). School based cross-sectional survey was conducted in May 2012 among 754 College students in Bahir Dar town, Ethiopia to assess the overall prevalence of khat chewing in students was 146 (19.6%). Of these 92(63%) were male students. Ninety six (12.9%) of students were currently chewing khat. Of these 62(64.6%) were male students. Among khat chewers 80 (54.8%) were from third year and 100(68.5%) of students parent were from urban area. More than three fourth 116 (79.4%) of khat chewers were chewing khat occasionally. The amount of khat consumed at a time was estimated per cost in birr and 36(24.7%) of the chewers consumed khat that costs >25 birr per ceremony. The mean hour spent for a single khat ceremony was 4 hours (Telake, 2007).

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 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. Tigre ethnic group was significantly associated factor (AOR=0.041, 95%CI (0.002-0.718) with outcome Variable (Sikiru, 2009). 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 (Damena, 2011).

METHODS AND MATERIALS

Study design and period: Institutional based cross-sectional study design was conducted at AAU, Selale campus students from November 25 to May 19, 2016.

The study area/setting: The study was conducted in AAU which is one of the largest higher learning institutions in Africa that was established at the end of the 1950. It was granted a charter in July 1950 as an autonomous higher learning institution under different names. One of the branches of Addis

Ababa University is Selale Campus which is located in fische town which is the administrative center of the Semien Shewa zone of orormia region and separate woreda, which is 112Km from the capital. The campus covers a total area of 74266.5m². It was established in 2013 by accepting 86 Agricultural, 35 plant science, 18 Horticultural and 16 Animal science students and also accept health science students in 2015 which are transferred from Addis Ababa Science and Technology university from second year to four years nursing and public health students. Currently the campus has 25 teachers (20 men and 5 women) for health science students, 39 teachers (38 men and 1 woman) for agricultural students and 161 other staff members.

Study population: The source population for the study was students of Addis Ababa University, Selale campus. The study population was from all regular students of a total number of 692. All students who were randomly selected by stratified sampling from source population. Those regular undergraduate students, who are not blind and not critically sick (to the extent of being unable to read and write) during the time of data collection, were included.

Inclusion and Exclusion criteria

Inclusion criteria

- All regular students of Addis Ababa university, selale campus branch

Exclusion criteria

- Students who were attending in extension programme
- Blind students who can't read a questionnaire

Variable

Dependent variables: khat chewing

Independent variables: Age, Religion, Ethnicity, Residence, Year of study, Department, Family members chew khat, Stress, Peer influence, Ignorance of khat effect, Availability, Monthly income.

Operational definition

Grams of khat: the amount of khat leafs sold to chewers in the study area during khat session.

Frequent chewers: those who chew khat for three and more days a week.

Less frequent khat chewers: those who chew khat less than three days a week.

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

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

Dental problems: comprised of dental caries (decay), and dental abscess as well as teeth discoloration.

Khat sellers: those who prepared a special place and setup for chewers and sold grams of khat for users during khat session.

Sample size and sampling strategies

Sample size: 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 [51] to get the possible sample size with z-value of 1.96 and marginal error of 5% was calculated as;

$$n! = (Za/2)^2 \cdot P(1-p)/w^2$$

n! = initial sample size

a= confidence interval (95%)

p=proportion of Khat chewed

w=marginal error of 5%

$$n! = (1.96)^2 \times 0.242(1 - 0.242)/(0.05)^2 = 3.8416 \times 0.242 \times 0.758/0.0025 = 282$$

The total number of Selale campus students is 692. Since this figure is below 10,000, I used the correction formula for the final sample size estimation.

$$nf = n! / (1 + n! / N)$$

where, nf=final sample size

N=total number of regular students

$$nf = 282 / (1 + 282/692) = 282 / 1.40751445 = 200$$

Since, there is a big significant difference between 282 and 200 I take 200 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:

$$nf + (10/100) \times nf = 200 + 0.1 \times 200 = 220$$

Sampling procedure

Stratified random sampling procedure was used 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 six departments in Salale campus with total 692 numbers of students. 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. Based on this from Agricultural department 1st year 44 students 14 sample, from 2nd year out of 42 students 13 sample, 3rd year 86 students 27 sample, Plant Science department 1st year 39 students 12 sample, from 2nd year 33 students 11 sample, 3rd year 35 students 11 sample, Horticulture department 1st year of 42 students 13 sample, from 2nd year 17 students 5 sample, 3rd year 18 students 6 sample, Animal Science department 1st year of 41 students 13 sample, from 2nd year 14 students 4 sample, 3rd year 16 students 5 sample, Public Health department 2nd year of 46 students 15 sample, from 3rd year 50 students 16 sample, 4th year 45 students 15 sample and Nursing Department 2nd year of 40 students 13 sample, from 3rd year 43 students 14 sample, 4th year 41 students 13 samples.

Data collection: For all types of data collection, A structured questionnaire was initially developed in English and then translated into Amharic and then back to English before data collection for checking the consistency of translation. The Amharic version was used during data collection. Data was collected via well prepared structured questionnaire to collect information from students of AAU, selale campus student.

Data quality control issues: The questionnaire was developed after reviewing relevant literatures to the subject to include all the possible variables that address the objective of the study. The questionnaire was first prepared in English and then translated to Amharic and back translated to English to maintain the consistency of the contents of the instrument. The completed questionnaires were checked every day during data collection for completeness, clarity and consistency by the supervisors and the principal investigator. Any mistake detected was corrected at the spot or in the next day the next day.

Data analysis: Collected data was entered into and cleared using Epi-data software version 3.1 and then exported to SPSS version 16 for further statistical analysis. Descriptive statistics were used to describe the study participants with major independent and dependent variables. Frequency distribution (descriptive statistics) used to describe the major variables of the study. Tables and figures were used to summarize data. Bivariate analysis used to look for association between predictors and dependent variables. Multivariable logistic regression analysis used to control for confounding and to see for the impact of variable of interest on outcome variable. Odds ratio and p-value was computed to see whether any relation exist between the two variables. P-value less than 0.05 will be considered as statistically significance.

Ethical Consideration: Ethical clearance was obtained from Research Ethics Committee (REC) of Addis Ababa University, college of Health science, school of nursing and midwifery. Permission from Selale Campus and then informed written consent of individual participants was obtained after being fully informed of the study purpose and procedures. During the consent process, they were provided with information regarding the purpose of the study, why and how they selected for this study and opportunity given to ask questions if they had. Participants also assured about confidentiality of the information obtained from them during the data collection by not using personal identifiers and analyzing the data in aggregates. Confidentiality and anonymity was ensured. No name or other identifying information included in the instrument.

RESULTS

Socio-demographic characteristics of the study participant

A total of 220 students were participated in the study. Of these 210 of them filled the questionnaires fairly completed. The response rate was 95%. The range of respondents age fall between 19-26 with the mean age of 21.55, Most of the study subjects (48.1%) were fall between the age range of 23-26 and 114 (54.1%) of respondents were Males. The majorities of participants were Orthodox Christian followers 132(62.9%) and from Amhara ethnic group 95 (45.2%). Nearly half 95(45.2%) of students were from third year.

Table 1. Socio-demographic characteristics of respondents in AAU, Selale campus students 2016

variable	Frequency(n=210)	Percentage
Sex		
A. male	114	54.3
B. female	96	45.7
Age		
A. 17-20 years	47	23.4
B. 21-23 years	62	29.5
C. 24-26years	101	48.1
Year at the campus		
a) Year one	24	11.44
b) Year two	49	23.36
c) Year three	95	45.2
d) Year four	42	20.0
Religion		
• No religion	10	4.8
• Orthodox	132	62.9
• Protestant	20	9.5
D. Muslim	39	18.6
E. Other	9	4.3
Ethnicity		
A. Amhara	95	45.2
B. Oromo	39	18.6
C. SNNP	31	14.8
D. Tigray	45	21.4

Table 2. Prevalence of khat users among respondents in AAU, Selale campus students 2016

Variable	Frequency (n=46)	Percentage (%)
khat users		
Male	35	76.1
Female	11	23.9
Do your friends chew khat?		
a) Yes	31	67.39
b) No	15	32.61
Monthly income		
100-299 birr	4	8.47
300-499 birr	9	19.6
>500 birr	33	71.7
Age of student that chew khat		
17-20 years	4	8.7
21-23 years	16	34.9
24-26 years	26	56.5
When did you start to chew khat?		
	1	2.2
a) Before elementary school	7	15.2
b) At the elementary school	8	17.4
c) At the high-school	12	26.1
d) At the preparatory	18	39.1
e) At the university		
Place of khat chewing		
a) At the campus dorm	8	17.41
b) At the khat house	26	56.5
c) At friend house	9	19.6
d) If other specify _____	3	6.5
Duration of khat chewing		
a) < 2 hours	14	30.4
b) > 2-4 hours	22	47.8
c) > 4 hours	10	21.7
Money expense to buy khat		
a) <15	9	19.6
b) 15-30	23	50
c) >30	14	30.4
Do you think that Chewing khat have negative impact?		
Yes	20	43.5
No	26	56.5
If yes to the above, do you have a plan to stop chewing chat?	Frequency(n=20)	
Yes	13	65%
No	7	35%

The overall prevalence of khat chewing in students was 46 (21.9%). Of these 35 (76.1%) were male students that was 30.7% from the overall male students that are included in

the study. More than half 26(56.5%) of the students that chew khat were on the age between 23-26. Nearly two third 33(71.7%) of students among khat chewers have a monthly income greater than 500 birr and more than half 24 (52.2 %) were from third year. 36(78.3%) of the khat chewer students responded that khat is available around their campus and dorm. The amount of khat consumed at a time was estimated per cost in birr 23 birr (50%) of the chewers consumed khat that costs 15-30 birr per ceremony. The mean hour spent for a single khat ceremony was 2-4 hours by 22(47.8%) khat users and 26 (56.5%) of the khat chewers chew khat at the khat shop (house). 19 (41.3%) of the khat chewers chew chat to feel good and 17(37%) to score high marks. Among the chat chewers 34 (63.6%) of their parents didn't know that they chew khat and from the parents that knew their child chew khat 8(57%) of them agree and support them. (See Table 2)

Factors affecting for khat chewing

Among reasons given for chewing khat by the current respondents: 60(28.6%) reported to kill time, 31(14.8%) for socialization, 22(10.5%) because of easy availability, 16(7.6%) for study purpose, 22(9.2%) due to peer pressure, 26(10.5%) to increase performance and concentration, 5(2.4%) for religious purpose and 36 (17.14%) to escape from anxiety and depression.

Table 3. Subjective reasons given for starting khat chewing by the respondents among students at Selale campus. 2016

Factors for chewing n= 210	Frequency	Percent
To kill time	60	28.6
For socialization purpose	31	14.8
Easily a viability of chat	22	10.5
For study purpose	16	7.6
Peer group pressure	22	9.2
To increase concentration and strength	26	10.5
For religious purpose	5	2.4
To escape from anxiety and depression	36	17.14
Total	210	100

Bivariate and Multivariate Logistic Regression analyses

From the Bivariate analyses of khat chewing in relation to each explanatory variables age group from 21-23 years, sex, monthly income, ethnicity, year of study and Religion (Muslim) were fulfilled the minimum requirement 0.2 level of significance in this study and were entered in to multivariate logistic analysis for further assessment. Out of those six independent variables which were significant in bivariate analysis only four variables had shown statistically significant association for khat chewing in multivariate logistic regression analysis. Age between 21-23 year 2.34 times more likely chat chewers than other age groups (AOR 2.34; 95% CI: 1.92, 4.53). From monthly income status those who have more than 500 Ethiopian birr are 3.56 times more likely khat chewer than other low income (AOR 3.56: 95%CI: 1.12, 3.43). Regarding to year of study 3rd year students were 2.21 times highly chat chewer than other educational levels (AOR 2.21: 95%CI; 1.20, 3.92) and from Religious groups Muslims 2.1 times more likely chat chewers than other Religious groups (AOR 2.10: 95%CI: 1.61, 3.49).

Table 4. Factors associated with khat chewing among students of Addis Ababa University Selale Campus, Ethiopia 2016

VARIABLES	khat chewing			COR 95%CI	AOR 95% CI
	Yes	No	Total		
Sex- Female	11	85	96	1.00	1.00
Male	35	79	114	2.34(1.64,4.41)	1.15(0.23,3.70)
Age 17-20	4	43	47	2.91(1.32,4.25)	1.22(0.63,2.42)
21-23	16	46	62	6.34(5.84,9.33)	2.34(1.92, 4.53)**
24-26	26	75	101	2.48(1.30,4.32)	1.38(0.26,2.80)
Religion					
Orthodox	12	120	132	2.11(1.81,3.24)	1.34(0.32,2.38)
Muslim	32	7	39	2.16(1.77,4.36)	2.10(1.61, 3.49)**
Protestant	1	19	20	1.00	
Others	3	16	19	1.23(0.12,2.33)	1.18(0.13,2.17)
Monthly income					
100-299	4	69	73	1.00	1.00
300-499	9	73	82	2.65(1.89,3.10)	1.10(0.12,2.33)
≥500	33	22	55	2.11(1.16,2.78)	2.56(1.12,3.43)**
Ethnicity					
Tigre	5	40	45	1.00	1.00
Amhara	21	74	95	2.21(1.67,3.73)	1.11(0.72-2.12)
Oromo	13	26	39	2.22(1.65, 3.90)	1.23(0.16-2.11)
SNNP	7	24	31	3.32(3.94,5.62)	1.45(0.26-2.78)
Year of study					
1 st year	4	20	24	1.00	
2 nd year	10	39	49	1.46(0.21,3.72)	2.26(0.82-2.32)
3 rd year	24	71	95	2.41(2.04,5.92)	2.21(1.20,3.92)**
4 th year	8	34	42	3.43(0.43,3.76)	1.31(0.34-2.21)

DISCUSSION

In spite the use of Khat results to significant negative psychological, physiological and sociological impact on compulsive users (Sikiru, 2009). The habit of khat chewing is believed to affect a large segment of the Ethiopian population, especially the productive age group (Yigzaw Kebede, 2005). The prevalence of khat among Ethiopian university students have been reported between 9% and 32% by different researchers (Kebede, 2002; Eshetu, 2006 and Deressa, 2011) and this finding is in line with other university previous study findings which is 21.9%. This study is much lower than its Khat use prevalence in Jimma University which was found to be 37.8% (Hussein, 2009). Similarly, this result also lower than a similar study conducted on the prevalence of Khat chewing among secondary school students was 24.2% (Damena, 2011). The possible explanations for this difference could be due to religion of students; in this study more than half 132(62.9%) were orthodox Christian followers; due to religion prohibition orthodox Christian followers are not used khat than Muslim and other religions, Muslim students had closed to two times higher odds of chewing Khat compared to orthodox Christians (Tesfaye, 2008). In contrary, the overall prevalence of this study is higher than the findings of a studies conducted on Aste Fasil campus, University of Gondar The overall prevalence of khat chewing was 9.6% (Sikiru, 2009).

This difference may be because the previous study was done in the population having similar characteristics. In this study using Binary logistic regression analysis revealed that khat chewing have association with sex of the respondent based on confidence interval 95% (1.15(0.23,3.70). 30.7% of male and 11.45% of females were practiced khat chewing which was higher in males with the large proportion of chewers were with age interval of 23-26. Similarly, a study in in Aste Fasil campus, University of Gondar 11.47% of male and 6.72% of females were khat chewers and another study in College students in Bahir Dar town, Ethiopia 27% of men and 13.1 of women were chat chewers (Sikiru, 2009 and Telake, 2007). In consistence with this finding, a study done in AAU in undergraduate medical students (year I to internship program)

at the school of medicine Khat use were 9% males Vs 1.5% females (Ageely, 2009; Yeshigeta, 2007), of the students. This might be due to social and cultural influence on females. In this study 39.1% of the chewers started chewing after they were joining the university. This is almost similar were reported in Atse fasil campus, University of Gondar which were 58.6% of the chewers start chewing at the university (Sikiru, 2009). 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. In agreement with this statement is that the main reasons mentioned for starting chewing khat were "peer pressure" and "for relieving stress" for study. 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. khat chewer students have more likely have a friend that chew khat this is seen in 67.39% of the students. Students who had friends used khat were more likely to use khat than students who doesn't have khat chewer friends. This finding is in agreement with previous study findings in Harare town, Eastern Ethiopia (Tesfaye, 2008). This is a well-established fact that youth directly persuade their friends to conform to their behavior; therefore khat chewer encourage their inexperienced peers to chew khat (Telake, 2007). Monthly income (Pocket money) especially students those that had >500 birr per month are more likely prone to use khat 71.7% of khat users have a monthly income >500 birr. This finding was in line with study finding in Bahir dar town college students (Telake, 2007). The reason may be, students those have pocket money can purchase the substance that they want to use.

Conclusions

In the study area significant numbers of College students were chewing khat. The predominant factors associated with khat chewing were being male, families from urban area, peer pressure, parental and income specially have greater than 500 birr per month. The findings suggest, the need to have

audience specific behavioral change communication to avert and prevent khat chewing practice. Colleges and health bureau should design education about consequence of khat chewing for students, their parents and the community at large to bring behavioral change.

Recommendation

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

For AAU, Fiche campus administrators

- It will be better to inform their students, especially freshman students, about the health and socioeconomic problems associated with khat chewing.
- It will be better to teach and counsel their students on ways of coping with the problems rather than they started to chew khat.

For Preparatory schools and high schools

- It needs to teach their students about the danger of khat chewing and It will be better to orient their students about university life before joining university.

For Students

- They have to protect themselves from khat chewing practice by knowing the side effects chewing khat.
- It is better to use other recreational things rather than khat chewing.

Consent for publication

This manuscript contains original material. Neither the article nor any part of its essential substance, tables, figures, has been or will be published elsewhere. We have submitted for publication without conflict of interest among authors.

Availability of data and materials

The data that support the findings of this study are available on request from the corresponding author.

Competing interests

I declare that I have no significant competing financial, professional or personal interests that might have influenced the performance or presentation of the work described in this manuscript.

Authors' contributions

AB conceived the study, the design, field work, data analysis and interpretation, report writing and manuscript preparation.

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Annex:

Acronyms

AAU.....	Addis Ababa University
AASTU.....	Addis Ababa Science and Technology University
GUS.....	Genito Urinary System
NACADA	National Agency for the Campaign Against Drug Abuse
POH.....	Public Health Officer
UK.....	United Kingdom