

**Prevalence, Attitude and Associated Problems of Khat Use
among Bahir Dar University Students, Northwestern Ethiopia**

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Summary

Khat edulis is one of the common substances abused in most parts of Ethiopia and the associated problems are of current global concern. It has become an epidemic in all parts of Ethiopian region adolescent being the main victims of ill health and social effects of substance use. It widely abused for various purposes. Thus, this study intended to assess the prevalence of khat use and associated risks among university students. A cross sectional survey was conducted among 269 Bahir Dar University students by using self administered questionnaire in May to June 2008. Students from each department and year of study were selected by using random sampling method. Result was analyzed by using EPI info version 3.4.3 statistical software package. A total of 269 students were studied with response rate of 91.8%. Out of the respondents 218(81.1%) were males and 51(18.9%) were females. One third of the respondents were found ever chewers and current khat chewing prevalence was 84 (31.2%). Nearly half of the current khat users chew khat once or more than a week and about 40% chew khat daily. Among the current khat users' majority use substances like cigarette, coffee, tea and shisha while chewing khat. Majority of the students chew khat for studying/increase performance and for relaxation purpose 58 (43.3%) and 42 (31.3%). Few students gave reason to kill extra time and for socialization purpose. Majority of the respondent have got financial crises followed by behavioral changes 56 (50.2%) and 38 (34.2%) respectively due to khat use. Most of the students have got sleeping difficulties and loss of appetite and other miscellaneous health problems include weight loss, anxiety, depression, lethargy, hallucination. There is higher significant relationship between year of study and chewing khat ($P < 0.001$). The finding on the assessment of attitude revealed 58.4% strongly agree as khat cause health problem. In order to decrease the prevalence of chat chewing public education in substance abuse and preparing educational materials and conduct awareness creation campaign at the university is recommended.

Key words: khat Chewing; substance use; University students; Bahir Dar University; Ethiopia.

Introduction

Khat edulis grows wild in countries bordering the Red Sea and along the east coast of Africa. The people of these countries have chewed khat for centuries. There are several names for the plant, depending on its origin: chat, qat, qaad, jaad, miraa, mairungi, cat and catha. In most of the Western literature, it is referred to as khat. Khat is an evergreen shrub, which is cultivated as a bush or small tree. The leaves have an aromatic odour. The taste is astringent and slightly sweet. Khat is harvested throughout the year. Khat is mainly grown in Ethiopia, Kenya, Yemen, Somalia, Sudan, South Africa and Madagascar. It has also been found in Afghanistan and Turkestan. Previously, khat leaves were available only near to where they were grown [1, 2].

Ethiopia is thought to be the country of origin of khat use. The chewing of khat leaves probably pre-dates the use of coffee. The earliest written record of the medical use of khat appears to be in the New Testament. Khat has been used to treat various ailments, including relieving the symptoms of depression. Some believe it to be a dietary requirement [3]. Khat can be described as a herbal product consisting of the leaves and shoots of the shrub *cathat edulis* forks (celasraceae). khat contains the alkaloids stimulant cathione (alpha aminopropiophenone) an chathin (norpseudoephedrin) in addition to more than 40 alkalioids, glycosides, tannins, and terpeniods. Cathinone is said to be the main active ingredient of khat and it has amphetamine like activity [4].

In Ethiopia, khat 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. A significant number of students chew khat to be alert especially during examination periods. There is also specific usage of khat by the special sections of the community: craftsmen and farmers use khat to reduce physical fatigue and traditional healers to heal ailments (5, 6).

Khat chewing usually takes place in groups in a social setting. Only a minority frequently chewed alone. A session may last for several hours. During this time chewers drink copious amounts of non-alcoholic fluids such as cola, tea and cold water. In a khat chewing session, initially there is an atmosphere of cheerfulness, optimism and a general sense of well-being. After about 2 hours, tension emotional instability and irritability begin to appear, later leading to feelings of low mood and sluggishness. Chewers tend to leave the session feeling depleted [2, 7].

The recent sharp increase in khat consumption may not only affect the health of individuals but could also have serious socio-economic consequences for the countries involved. The potential adverse effect is diversion of income for the purchase of khat, resulting in neglect of the needs of the family, leading to family discord and divorce. Furthermore, in countries where its use is substantial, it may negatively affect the economy since productivity is reduced in quantity and quality as the result of absenteeism and after-effects of the drug [2, 5].

Although khat has an extreme social nature (individual feelings of sociability in social gatherings), it influences physical and psychological functions. Its psychic influence depends on its active ingredients that have a stimulating and euphoric effect. And the medical and psychosocial effects of khat chewing depend on its capacity to lead to dependency (addiction) and to specific physical and behavioral effects, including socioeconomic consequences for individuals and the community [7].

In communities where khat is used regularly it has negative impacts on health and socio-economic conditions. Decreased productivity Khat chewing leads to loss of work hours, decreased economic production, malnutrition and diversion of money in order to buy further khat. This is indirectly linked to absenteeism and unemployment, which may in turn result in a fall in overall national economic productivity. It is reported that habitual khat chewing has led to decreased productivity in Ethiopia, Somalia, Uganda and Kenya. Others argue that moderate use improves performance and increases work output, owing to the stimulant and fatigue-postponing effects. Acquisition of funds to pay for khat may lead to criminal behaviors and even prostitution [2, 8]. A study in Jimma University revealed that CGPAs of khat chewers were significantly lower than those of non chewers, which is in contrary to the believe of khat chewing students concentrate while studying and get good grade. Animal studies also showed that khat could cause impairment of memory [8, 9]. Thus, this study aims to assess the prevalence, attitude and associated problems of khat use among Bahir Dar University students.

Methodology

Description of the Study Area

Bahir Dar is a city in Northwestern Ethiopia, and the capital of the Amhara Region administratively and Bahir Dar is considered as Special Zone. Bahir Dar is situated southern shore of Lake Tana, the source of Blue Nile. The city is located approximately 578 kms North West of Addis Ababa having at latitude and longitude of 11° 36'N, 37° 23'E and an elevation of 1840 above sea level. The city has estimated population of 280,070 with estimated area of 28 square kilometers. Bahir Dar University (BDU) is one of the 21 public universities in Ethiopia. BDU has nine faculties 39 departments and it has total 9735 students in the 2007/2008 academic year [10, 11]. This study was conducted with in different departments of Bahir Dar University starting from first year to final year undergraduate students.

Study Design

A cross sectional survey was conducted on the assessment of the prevalence, attitude, and associated problems related to khat use of among Bahir Dar University students by using semi-structured questionnaire.

Sample size and sampling technique

The study populations are students of BDU from first year to final year of different departments were included which are enrolled as regular students in the 2007-2008 academic year. Some studies indicate that khat chewing prevalence in university is about 22.3%. Thus, the sample size was calculated by using the prevalence rate of 22.3%, 95% level of significance, marginal error of 5% and none response rate 10%, and calculated as 293 students. Random samples were taken from different departments and number of samples was taken proportionally.

Data Collection and Management:

Data collection was done by four trained data collectors using a standardized pre-tested questionnaire. The questionnaire was prepared after reviewing previous studies and all

data collected were checked for completeness and necessary correction was at the site where the problem occurred.

Data analysis and interpretation:

After data collection was completed data entry, clearance and analysis was done using Epi-Info version 3.4.3 statistical software package. During analysis frequencies of the different variables were determined. In this study the independent variable used include khat chewers age, sex, religion, field, and year of the study and dependant variables include khat chewing pattern, such as percentage of chewers frequency of chewing, health problems sexual stimulation, reasons for chewing. Results were interpreted by using percentage, means, and other statistical values and displayed in tables and graphs.

Ethical Considerations:

Permission was obtained from relevant Bahir dar University officials, Deans of the respective faculties, Head of schools, departments by explaining the purpose of study and students who participated in the study were requested to give verbal consent.

Results

Socio-demographic characteristics

Two hundred ninety three students were planned to be included in this study. A total of 269 students were studied with response rate of 91.8%. Out of the respondents 218(81.1%) were males and 51(18.9%) were females. More than half of the respondents 145(53.9%) were in the age range 21-24years, mean age was found 21 ± 2.27 years. From 269 students the majority 191(71%) were orthodox religion followers followed by Muslims 46(17.1%) and with the least Catholics 3(1.1%). Approximately half of the respondents 134 (49.8%) complete there high school in Amhara region and remaining from other regions. The respondents were from different departments of which natural sciences students account 144(53.5%) and social sciences students 125 (46.5%) (Table 1).

Khat use practice

Of 269 respondents 91(33.8%) were ever chewers of which 57(62.6%) students were started chewing before joining BDU and the rest 34 (37.4%) were started after they joined BDU. And the current khat chewing prevalence was 84 (31.2%). Nearly half of the current khat users chew khat once or more than a week and about 40% chew khat daily. Among the current khat users' majority use substances like cigarette, coffee, tea, shisha while chewing khat.

Majority of the students chew khat for studying/increase performance and for relaxation purpose 58 (43.3%) and 42 (31.3%). Few students gave reason to kill extra time and for socialization purpose (table 2).

Problems associated with khat use

Majority of the respondent have got financial crises followed by behavioral changes 56 (50.2%) and 38 (34.2%) respectively due to khat use (Table 3).

Table 1: Socio-demographic Characteristics of the respondents among Bahir Dar University students.

Characteristics	Frequency (n)	Percent (%)
Sex		
Male	218	81.1
Female	51	18.9
Age		
17-20	112	41.9
21-24	145	53.9
25-28	9	3.4
Above 28	3	1.1
Religion		
Orthodox	191	71
Muslim	46	17.1
Protestant	28	10.4
Catholic	3	1.1
Other	1	0.4
Location of high school completion		
Amhara	134	49.8
Oromia	47	17.5
Addis Ababa	24	8.9
Tigray	20	7.4
SNNPR	18	6.7
Dire Dawa	8	3.0
Harar	7	2.6
Benshangul Gumuz	7	2.6
Somalia	2	0.7
Afar	1	0.4
Gambella	1	0.4
Field of study		
Natural	144	53.5
Social	125	46.5
Year of Study		
Year 1	90	33.5
Year 2	38	14.1
Year 3	119	44.2
Year 4	22	8.2

Table 2: Reasons given by students why chew khat

Reasons given	Frequency (n)	Percent (%)
To study/increase performance	58	43.3
For relaxation	42	31.3
To kill extra time	6	4.5
For socializations	9	6.7
Different reasons	19	14.2
Total	134*	100

* Multiple response is taken

Table 3: Problems associated with khat uses

Problem associated with khat use	Frequency (n)	Percent (%)
Economic and other Problems		
Financial crises	56	50.5
Behavioral changes	38	34.2
Social disobedience	15	13.5
Other problems	2	1.8
Total	111*	100
Health Problems		
Sleeping difficulties	30	25.2
Loss of appetite	24	20.2
Weigh loss	16	13.4
Hallucination	15	12.6
Depression	3	2.5
Urge to chew khat	1	0.8
Lethargy	1	0.8
Miscellaneous problems	29	24.4
Total	119*	100.0

* Multiple response is taken

Most of the students have got sleeping difficulties and loss of appetite and other miscellaneous health problems include weight loss, anxiety, depression, lethargy, hallucination. Among the current chewers 60.7% (51/84) has plan to stop khat chewing but very few decide to stop right now 10 (16.7%) and 20 (33.3%) don't know when they stop chewing khat (Table 4).

Table 4: Students response on when to stop chewing khat among current khat users at BDU, June 2008

Response	Frequency (n)	Percent (%)
When I leave BDU	21	35.0
I don't know when I stop	20	33.3
Right now	10	16.7
When I get the rank what I want	9	15.0
Total	60	100

Attitudes towards khat use

The finding on the assessment of attitude 157(58.4%) strongly agree as khat cause health problem and 10(3.7%) has strong agree as chewing khat cause health problem. Most of the respondents 132(49.1%) and 163(60.6%) strongly disagree as chewing alright for both men and women respectively. And most of the students 135(50.3%) strongly disapprove khat chewing and only 14(5.3%) approved strongly khat chewing.

Majority of the respondents 174 (54.6%) strongly disagree for older to chew khat. Students 118(43.9%) and 119(44.2%) respondents strongly prefer chat chewing to drinking alcohol and smoking respectively. Only 48(17.8%) agree as chewing khat is in moderation (Table 5).

Table 5: Respondents distribution by their attitude towards khat use

Attitudes towards khat use	Strongly disagree n(%)	Disagree n(%)	Agree n(%)	Strongly agree n(%)
Khat chewing does not cause problems for most people	153(58.4)	61(22.7)	41(15.2)	10(3.7)
It is alright for men to chew khat	132(49.1)	86(32.0)	47(17.4)	4(1.5)
It is alright for women to chew khat	163(60.6)	70(26.0)	32(11.9)	4(1.5)
I approve of khat chewing	135(50.3)	79(29.5)	40(14.9)	14(5.3)
Men who chew khat often do not look after their families properly	77(28.6)	77(28.6)	70(26.0)	45(16.8)
Khat use OK for older people, but not young people	174(54.6)	80(29.7)	10(3.7)	5(2.0)
I would rather my family member chewed khat than drank alcohol	118(43.9)	74(27.5)	47(17.5)	30(11.1)
I would rather my family member chewed khat than smoked cigarettes	119(44.2)	62(23.0)	50(18.6)	38(14.2)
Chewing khat is alright if it is done in moderation	137(50.9)	84(31.3)	32(11.9)	16(5.9)

Discussion

Epidemiological studies on khat chewing are rare, particularly studies conducted on university students far less. Most publication on khat deals with the botanical, biochemical or pharmacological aspects related to khat. It is only for Yemen that a broader of all aspects, including social and economic factors has been carried out. Comparable research in northeast Africa where khat is equally important has lagged behinds [12]. Only recently have more encompassing studies of khat use in Western Europe and Australia have been carried out. There are indications that the once indigenous practice of chewing khat is becoming an international issue [1, 13-15].

This study it was found that the prevalence of current khat chewers is 31.2% of the BDU students. The life time prevalence rate of khat chewing was found 33.8 %. There is an increase trend of khat chewing as indicated by subsequent studies conducted for example among students of GCMS 22.3% in 1983 and Addis Ababa University 26.7% in 2001 [8, 16].

The proportion of students who started chewing khat before joining university was found to be higher than those who started using khat after joining the university this indicate the importance of targeted health education at high school level.

The frequency of khat chewing in this study founds to be higher among male than female which is 9.2%. Similar findings were reported from college medical sciences, Jimma University and colleges in North West Ethiopia and Addis Ababa. This could perhaps be due to the cultural restrictions imposed on females in Ethiopia towards the use of khat [8, 16].

This study reported that current khat chewer students smoke cigarette, drink alcohol and others while chewing. In most cases smoking of cigarette while chewing khat increases the excitation that one gets from khat chewing alone has both are known to stimulate the central nervous system. The reasons behind drinking alcohol after khat chewing are termination of excitation after chewing and have a good night sleep as alcohol has central nervous system depressant effects [17, 18].

Among the current chewers 61.4 % were natural science students. Among the total current chewers third year students cover 57.1%. There is higher significant relationship between year of study and chewing khat ($P < 0.001$). The students who follow orthodox religion account 65.2% and the least catholic 1.1%. This study shows that there is relatively significant relation between chewing and religion ($P < 0.01$).

Students who came from Amhara region cover 40.2% of the total ever chewers. Financial crises were their prominent problem that was observed from current chewers. Majority of the students who were chewing khat respond chewing khat doesn't cause problem for most people ($P < 0.001$). While those who don't chew strongly disagree (69.8%)

Conclusion

In conclusion, the prevalence rate of khat chewing is fairly high among the study subjects. High rate were found among males, Orthodox religion. Drinking alcohol, smoking and use of other substances were found to have significant association with both life time and current prevalence of khat chewing. The high prevalence khat chewing as well as use of other substances is paramount important in this study finding which needs attention by responsible bodies. The most frequent reasons for khat chewing were to study and increase their performance. In order to decrease the prevalence of chat chewing public education on substance abuse, preparing educational materials and conduct awareness creation campaign at the university is recommended.

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References

1. Asuni T. and Pela O. Drug abuse in Africa. Bulletin on Narcotics (United Nations publication), vol. 38, Nos. 1 and 2 (1986), pp. 55-64.
2. Cox G., and Rampes H. Adverse effects of khat: a review. *Advances in Psychiatric Treatment* (2003), vol. 9, 456–463.
3. Kalix P: Khat: scientific knowledge and policy issues. *Br J Addict* 1987, 82:47-53.
4. Al-Motarreb A, Baker K, Broadley KJ. Khat: pharmacological and medical aspects and its social use in Yemen. *Phytother Res.* 2002 Aug; 16(5):403-13.
5. Kalix P. The pharmacology of khat. International symposium, Addis Ababa, 1984:69-73.
6. Mekasha A. Clinical aspects of khat (*Catha edulis forsk*): In: Proceedings of the International Symposium on khat 1983; 77-83
7. Zein A. Polydrug abuse among Ethiopian university students with particular reference to khat (*Catha edulis*). *J Trop Med Hyg.* 1988 Apr; 91(2):71-5.
8. Eshetu E., Gedif T. Prevalence of Khat, Cigarette and Alcohol Use Among Students of Technology and Pharmacy, Addis Ababa University. *Ethiopian Pharmaceutical Journal* Vol. 24 (2) 2006: pp. 116-124.
9. Kebede Y. Cigarette smoking and Khat chewing among college students in North West Ethiopia. *Ethiop. J. Health Dev.* 2002; 16 (1):9-17
10. Bahir Dar University. About Bahir Dar University, University Highlights. www.telecom.net.et/~bdu/. Accessed on March 8, 2009
11. Development Indicators of Amhara National Regional State 5th Ed. 2008, pp 6.
12. Carol F. *Dangerous Drugs: An Easy-to-Use Reference for Parents and Professionals.* Center City, Minnesota: Hazelden, 2003.
13. Kalix, P. and Braenden, O. Pharmacological aspects of the chewing of khat leaves. *Pharmacological Reviews.* 1985; 37:2, 149–164.
14. Alem A, Shibre T. Khat induced psychosis and its medico-legal implication: a case report. *Ethiop Med J.* 1997 Apr; 35(2):137-9.
15. Giannini AJ, Miller NS, Turner CE. Treatment of khat addiction. *J Subst Abuse Treat* 1992; 9:379-382
16. Ayana AM, Mekonen Z. Khat (*Catha edulis Forsk*) chewing, sociodemographic description and its effect on academic performance, Jimma University students 2002. *Ethiop Med J.* 2004 Apr; 42(2):125-36.
17. Kalix P. Khat, an amphetamine-like stimulant. *J Psychoactive Drugs* 1994; 26:69-74
18. Jager AD, Sireling L. Natural history of khat psychosis. *Australian and New Zealand Journal of Psychiatry* 1994; 28:331-332