ORIGINAL ARTICLE

The Prevalence of Khat –Induced Psychotic Reactions among College Students: A Case in Jimma University College of Agriculture

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ABSTRACT

As it may prolong energy and mental alertness, khat has gained popularity among college students. However, many undesirable psychoactive effects khat use are not reported. A dorm-to-dorm survey was carried out from May 5-15, 2006 to investigate the prevalence of khat –induced psychotic reactions among habitual khat chewer students of Jimma University College of Agriculture (JUCA). A total of 210 male students who are habitual khat chewers were identified through dorm-to-dorm survey and who were voluntary to participate were taken for the study. The prevalence of short-lived psychiatric manifestations and other psychological problems following the use of khat are clearly reported by some subjects. Hallucinations are reported by 7.1%, depression by 43.8% and 33.3% of the habitual khat chewers reported the frequent incidence of anxiety following the euphoric sessions. The majority (65.7%) of the samples also mentioned that they are mostly subjected to grandiose fantasies. While 33.3% of the habitual Khat chewers reported the frequency of insomnia, the majority (40.5%) responded that they are free from lack of sleep. Out of 107 sexually active subjects, only 28(16.7%) reported the frequent episode of loss of sexual desire during khat use.42.9% of the habitual khat chewers started khat chewing practice so as to increase their concentration and to help them stay alert through the night. The other 32.9% mentioned that they started it because their friends urged them, while the remaining subjects began khat chewing because of some religious and cultural reasons. While 40% of the subjects are now using khat to overcome stressful academic works, the other 31.4% reported that they are using khat mostly to enjoy with their friends. The rest 23.8% of the habitual khat chewers reported that they are using khat most of the time to be free from anxiety. The case study, involved in this research, had observable and frequent psychiatric manifestations. The subject's hospital record showed that he didn't have a past psychiatric history or family history of psychiatric illness. As he is subjected to khat–induced psychoses, he was advised to quit khat chewing so that the resolution of symptoms usually occurs within a short period. However, due to his inability to withstand the withdrawal symptoms (such as insomnia, irritability, weakness, dizziness, and the like), he could stop khat use. He was living with clear psychotic reactions by the time this research was conducted. Generally, this research findings implied that khat use has some potential dangers; so, its use needs to be discouraged. Especially, individuals with some psychological disorders should be careful to avoid it, for it may worsen depressive, manic, or psychotic behaviors.

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INTRODUCTION

Khat (Catha edulis Forsk) is an evergreen tree that grows in different parts of the world extending from East to Southern Africa, as well as Afghanistan, Yemen and Madagascar (Krikorian, 1984; Kennedy, 1987). The earliest scientific report concerning khat was in the eighteenth century by the botanist Peter Forskal (Baasher, 1980). Ethiopia is thought to be the country of origin of khat use. Since the Khat leaf rapidly loses it s effect upon wilting, the Khat habit has remained, until recently, endemic to the areas where the plant was grown. During the last decades, however, due to the development of road networks and the availability of air transport, the habit has spread considerably in those regions and to countries where the plant does not grow. Thus, customs authorities in different parts of the world have even observed shipments of Khat.

Chewing khat is a worldwide practice. Different Several million people are estimated to be frequent users of khat for its euphoric effects and other desired effects. In some countries where the use of Khat is widespread, the habit has a deep-rooted social and cultural tradition. This is particularly true for Ethiopia. The chewing of khat has a deep-rooted social and cultural tradition (Kalix & Braenden, 1985). Chewing khat is both a social and a culture-based activity. It is said to enhance social interaction and for structuring social life. So, it is usually chewed in company (Kennedy, 1987), but may be used by individuals to enhance their working capacity (Elmi, 1983; Kalix & Braenden, 1985; Kennedy, 1987).

The growing use of Khat has motivated an interest in further knowledge of its active ingredients and their pharmacological effects. A number of studies have therefore been made in an attempt to throw light on these problems. Khat contains more than 40 alkaloids, glycosides, tannins, amino acids, vitamins and minerals (Halbach, 1972). Most of the effect of chewing khat is thought to come from two phenylalkylamines – cathinone and cathine – that are structurally related to amphetamine (Nencini *et al*, 1984). A number of other constituents, including cathidine, eduline and ephedrine, have

been identified, but it is unlikely that any of these, except tannin, play a role in khat's effects (Giannini *et al*, 1986).

Khat is a central nervous stimulating drug. Thus, the principal features of the 'khat experience' are described as increased levels of alertness, ability to concentrate, confidence, friendliness, contentment and flow of ideas (Kennedy, 1987). In a khat chewing session, initially there is an atmosphere of cheerfulness, optimism and a general sense of wellbeing. 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. The psychoactive effects of khat are not only pleasurable, but there are also some psychoactive phenomena following khat-euphoric sessions. Several case reports of khat-induced psychotic reactions have been published, though results seem inconsistent. Different studies evidenced that the psychological impacts of chewing khat are hazardous both to the individual and the community (Alemayehu, 1999).

Cathinone, one of the stimulant chemicals, is the dependence-producing constituent of khat leaves. It is a reinforcer and maintains very high rates of responding in animal experiments (Kalix & Khan, 1984). Debate exists as to whether khat, like amphetamines, can actually cause dependence. Some authors describe a psychological dependence rather than a physical one (Halbach, 1972). Tolerance to khat practically does not occur; if it does, the doses are increased only very slowly. This may be due to the intrinsic properties of khat or to the physical limits on the amount that can be consumed (Kalix, 1988). There are conflicting opinions regarding the existence of a withdrawal syndrome. Physical withdrawal symptoms are documented, including lassitude, anorexia nightmares and slight trembling, which appear several days after ceasing to chew. Depressive disorder, sedation and hypotension are sometimes seen after withdrawal of khat. In one study only 0.6% of khat chewers continued to use in order to prevent withdrawal symptoms (Alem &Shibre,1999).

Unwanted effects associated with khat are sleeplessness, nervousness, impotence and nightmares (Kennedy, 1987). Gastro-intestinal tract problems are common, such as anorexia and constipation (Giannini, Burge, Shaheen, & Pnce, 1986). The latter is most likely due to the astringent effects of the tannins in khat (Halbach, 1972), and laxative use is high in khat-chewing areas, the sale of laxatives decreasing markedly when khat is prohibited (Luqman & Danowski, 1976). Khat has been implicated in a number of other gastrointestinal and cardiovascular conditions (Halbach, 1972; Gendron , Ardouin. & Martine, 1977; Giannini et al. 1986). However, Kennedy et al. (1983) and Kennedy, (1987) have questioned the extent of such associations. Anorexia leads to malnutrition and increased susceptibility tom infectious diseases, especially tuberculosis (Kalix, 1987). There is also increased prevalence of respiratory problems in men, resulting from associated heavy smoking during khat sessions (Kennedy, Teague, Rokaw, & Cooney, 1983).

Chewers report their subjective experiences of khat use in a positive way when consuming small amounts. They describe a feeling of well-being, a sense of euphoria, excitement, increased energy levels, increased alertness, increased ability to concentrate, improvement in self-esteem and an increase in libido. Also experienced are an enhanced imaginative ability and capacity to associate ideas, an improvement in the ability to communicate and a subjective improvement in work performance. After chewing ceases, unpleasant after-effects tend to dominate the experience: insomnia, numbness, lack of concentration and low mood. Some chewers also experience unpleasant effects during the chewing process, describing anxiety, tension, restlessness and hallucinations. Objectively, chewers can be seen to show a range of experiences, from minor reactions to the development of a psychotic illness. Minor reactions include over-talkativeness, over activity, insomnia, anxiety, irritability, agitation and aggression. Broadly, the main psychiatric manifestations linked to the use of khat are a short-lived

schizophrenia a form of psychotic illness, mania (Yousef, Huq, & Lambert, 995) and, more rarely, depression (Pantelis *et al*, 1989).

The literature outlining the characteristics of psychoses following the use of khat describes two main types: a paranoid or schizophrenic form psychosis (similar to an amphetamine-like psychosis) and a manic psychosis. Case histories typically describe a recent increase in khat use or heavy consumption. The patients typically present with paranoid delusions, fear, a hostile perception of the environment, auditory hallucinations (frequently of a persecutory or threatening type), ideas of reference, thought alienation and a tendency to isolate themselves, or alternatively displaying aggressive behavior towards others. If khat consumption is ceased at this time, resolution of symptoms usually occurs within a short period (3–11 days), but there is a tendency for the psychosis to recur if khat chewing is restarted. Several authors have described a manic-type- psychosis. Giannini & Castellani (1982) reported the first case in the USA. The patient presented with hyperactivity, shouting, pressure of speech, and grandiose delusions with flight of ideas and tangential thought processes, and a labile mood varying from euphoria to anger. The patient had used khat for the first time, chewing about 24 leaves (this is equivalent to a single dose of khat). Symptoms subsided spontaneously within about 8 hours of chewing. Drake (1988) also described a case of mania following prolonged chewing, with the patient 'running amok'.

Different researchers tried to investigate the features of psychotic reactions following khat use. Psychoses due to khat are considered by many authors to be rare phenomena (Kalix, 1987; Baasher, 1980; Halbach, 1972). Halbach (1972) believes this is the result of the way in which khat is ingested, thereby not permitting high blood levels of its active ingredients. Luqman & Danowski (1976), however, make the point that in khat-using areas where health facilities are lacking; their families usually lock persons with psychosis in their homes until the episode subsides.

Carothers reported the first cases of khat-induced psychosis in 1945(Giannini & Castellani, 1982). In the findings of Carothers, there were twelve individuals,

ages range from 20 to 36, with a predominance of males. In only two of the twelve cases was there a past psychiatric history and in one of these cases the onset of psychosis was probably related to khat abuse. A family history of psychiatric illness was present in two cases of the six cases where this information was recorded.

In 1973, the WHO Expert Committee on Drug Dependence included khat type preparations of Catha edulis Forsk, in their group of 'dependence-producing drugs'. In their 22nd report in 1985 cathine was assessed as having a central stimulating action similar to amphetamine but about 7-10 times less potent. Similarly, cathinone was regarded as a CNS stimulant about half as potent as amphetamine. Both compounds were felt to meet the criteria for control under the Convention on Psychotropic Substances.

Subjectively, the pleasurable effects of khat are considered as beneficial (Kalix, 1987). These effects are similar to those of amphetamine and include euphoria, increased alertness and excitement etc. (Giannini et al. 1986). The khat user believes he thinks more clearly and quickly and is more alert, though concentration and judgments are objectively impaired. There is a tendency to querulousness with lability of mood and increases in anxiety and tension (Margetts, 1967). Kennedy (1987) has described transient psychotic phenomena following a khat session. Confusion, disorientation, grandiose fantasies and a mildly depressed mood may occur. We report here on three cases of khat related psychoses occurring in Somalian males in the UK.

Ethiopia is one of the main consumer countries of khat. It is the country where khat plantation is ever increasing. Different kinds of khats are grown in different regions of the country. As consumers frequently reported, one type of khat grown in one area is different not only in plant biotype but also in its potency and psychoactive effects. Because it may prolong energy and mental alertness, khat has gained popularity among college students and other parts of the community. As khat contains chemicals which stimulate the central nervous system activities, it produces pleasurable consequences: The taker /chewer feels excitement, mental alertness and happiness. Though Khat

chewing is ever increasing for its euphoric effect, prolonged energy, and

its religious and social benefits, large bodies of evidences indicate that Khat chewing has a wide range of physiological and psychological effects. Men who use khat may experience infertility and lose interest in having sex. Of course, increased libido with impotence is also common (Kennedy, 1987). It also reduces appetite, it causes bleeding (hemorrhoids), drive a way sleep, affect sexual activity, chronic gastric, etc (Fatuma, 1998). The psychoactive effects of khat are not always pleasurable. There are also unpleasurable consequences as well. There is a tendency to querulousness with liability of mood and increases in anxiety and tension. There are some brief psychotic phenomena following a khat euphoric session. Confusion, disorientation, grandiose fantasies and a mildly depressed mood may occur. Previous studies on khat showed that, its effects are generally amphetamine like. The clinical and psychological features of khat as well as its effect on some organs were described. It produces sympathetic action, anorexia, euphoria and alertness (Seid, 1996).

Although the prevalence of khat chewing and its physiological and psychosocial effects are studied in some parts of Ethiopia, the psychotic reactions and other unwelcome psychoactive effects are not systematically studied. So, it is imperative to conduct a research on empirical basis to assess the prevalence psychotic reactions induced by khat. Thus, taking those problems into consideration, the present study tried to assess the prevalence of khat – induced psychotic reactions among male adolescents of Jimma University College of Agriculture.

Definition of Terms

Major concepts to be used in this study are defined as follows:

Addiction: A physical or psychological craving for higher and higher doses of a drug that leads to bodily harm, social maladjustment, or economic hardship, dependence on a substance, habit, or behavior.

Amphetamines: A class of drugs, similar in some ways to the body's own adrenaline epinephrine) that act as stimulants to the central nervous system

Cross – Tolerance: Increased tolerance for one drug that develops as a result of taking another drug.

Delusions: Irrational but firmly held beliefs about the word that have basis in reality

Euphoria: Exaggerated sense of happiness and well being brought on by some drugs; popularly called a high.

Hallucination: A sensory perception without external stimuli.

Insomnia: Sleep abnormalities, including difficulty in falling asleep and wakefulness through the night

Stimulants: Chemical compounds that elevate mood, induce euphoria, increase alertness, reduce fatigue, and, in high doses, produce irritability, anxiety, and a pattern of psychotic behavior. Stimulants include amphetamines, nicotine, caffeine, and cocaine.

Substance Induced Psychotic Disorder: Condition provoked by large, repeated doses of drug, which resembles schizophrenia and includes hallucinations and delusions.

Withdrawal Symptoms: The (usually unpleasant) set of physical symptoms experienced by the user as a result of stopping use of a drug upon which he or she has become dependent; these may include anxiety, insomnia, perspiration, hot flashes, nausea, dehydration, tremors, weakness, dizziness, convulsions, or behavior

Methodology

The source population of this study is male students of Jimma University College of Agriculture. 210 students who are habitual khat chewers were identified through dorm-to-dorm survey and who were voluntary participated in this study. The past psychiatric history of the 209 subjects were not studied; so, this is one important limitation this study.

Both primary and secondary data were used in the study. Both questionnaire and interview were used as primary sources of data .The secondary data are gained from other documents and records that were relevant to the topic.

Regarding the ethical consideration, informed consent was obtained from each respondent after explanation of the survey objective. Confidentiality of the

information obtained was assured and privacy was maintained. The Instrument and procedures, which was used in this study, was not causing any harm to the study subjects and the data collectors. The research participants were told that (a) they have right to discontinue or refuse to participate in the study and (b) they can ask questions. Besides, in developing the questionnaire possible efforts were made to make the questions clearly worded.

Result

The Socio Demographic Characteristics of the Study Population

In this study, 210 students who completed the questionnaire were taken for analyses. Their description results are depicted in the following tables.

Table 1: Descriptions of the Subjects

No	Variables	Respondents	
1	Age	NO	%age
	15-20	36	17.14
	21-25	102	48 .57
	26-30	58	27.62
	>30	14	6.66
	Total	210	100%
2	Religion		
	Muslim	65	30.95
	Protestant	41	19.52
	Orthodox	70	33.33
	Catholic	21	10
	**Others	18	8.57
	Total	210	100%
3	Ethnicity		
	Amahara	36	17.14
	Guraghe	24	11.43
	Oromo	87	41.43
	Tigri	20	9.52
	Others***	43	20.48
	Total	210	100%
4	Educational level		
	2nd year	42	20%
	3rd year	90	42.86
	>4th year	78	37.14
	Total	210	100%

Other***Somali, SNNP, etc

Others**Jehovah witness, wakoo, etc

As can be seen from the table, majority (48.6%) of the habitual chat chewer adolescents belong to the age group of 21-25 years implying that when they are free from family supervision and susceptible to be hooked easily with drugs. This finding can be comparable with similar study done by Alemayehu (1999). In regard to religion of respondents, among the habitual khat chewers, majority of them were followers of orthodox (33.3%) followed by Muslims (30.9%). The remaining subjects were followers of catholic and other religions.

With regards to the ethnic composition, 41.4% were Oromo, followed by 17.1% Amhara, and 11.4% Gurage ethnic groups. Most (42.9 %) of the respondents were 3rd years students and the rest 37.1% and 20% were 4th and 2nd year students, respectively. Majority (42.9%) of respondents replied that they have begun khat chewing in the college, while the rest reported that they had been chewing since junior/high schools.

Factors for khat chewing practice

Information was sought how the subjects started khat chewing and why they are chewing now. The factors that pave a way to start and the reasons are presented in the fourth coming table.

Table 2: Reasons for khat chewing

N0	Variables	Responses	
		No	%
1	What are pulling and pushing factors to start khat?		
	Peer pressure		
	Culture	69	32.86
	Family back ground	18	8.57
	Religious purpose	24	11.43
	Academic purpose	9	4.28
		90	42.86
	Total	210	100%
2			
	Why do you chew khat mostly?		
	To be free from anxiety	50	23.81
	To overcome a stressful academic work	84	40.00
	To enjoy with friends	66	31.43
	Others	10	4.76
	Total	210	100%

As depicted in table 2, among the 210 habitual khat chewers included into the study, 90(42.9%) started khat chewing for academic purpose while 69(32.9%) due to peer pressure. The remaining hooked to it because of religious and cultural reasons. The subjects were also asked why they are now chewing khat. The majority responded that they are using khat to overcome academic stressful work 40%, the next 31.4% and 23.8% reported that mostly they are using khat to enjoy with their friends and to be free from anxiety, respectively.

The Prevalence of Psychotic Reactions following khat Sessions

The psychoactive effects of khat are not only pleasurable, but there are also some psychoactive phenomena following khat-euphoric sessions. Thus, identifying khat- induced psychotic reactions was the main objective of this study. Accordingly, the subjects were about their experiences some brief psychotic phenomena following a khat euphoric sessions. They were also asked about other problems (such as insomnia and impotence) they encounter due to khat abuse. The following table pulls together their responses.

Table 3: Unwelcome Psychotic Phenomena following a khat Euphoric Sessions

	Psychotic Phenomena											
Magnitude	Hallucination		Grandiose Fantasy		Insomnia		Depressed mood (Dizziness)		Impotence		Anxiety	
	No	%	No	%	No	%	No	%	No	%	No	%
Frequently	15	7.1	138	65.7	70	33.3	92	43.8	28	16.7	70	33.3
Rarely	30	14.3	30	14.3	55	26.2	35	16.7	32	19.1	33	15. 7
Not at all	165	78.6	42	20.0	85	40.5	83	39.5	107	64.3	107	50. 9
Total	210	100	210	100	210	100	210	100	167	100	210	100

As depicted in table 3, the unpleasurable psychoactive effects of khat are clearly seen in some of the takers. For example, 15(7.1%) and 30(14.3%) of the subjects reported that they see hallucinations frequently and rarely, respectively.

Grandiose fantasy is found to be common to the majority or 138 (65.7%) of the respondents. Regarding depression, 92(43.8%) of the chat chewers indicated that they frequently subjected to depressed mood following khat sessions while only 35 (16.7%) of the subjects reported rare dizziness. The other psychotic phenomena following a khat euphoric session is anxiety or tension. With regards to anxiety, however, the majority or 107 (50.9%) of the subjects responded that they didn't encounter it, whereas, 70(33.3%) and 33 (15.7%) reported the experience of anxiety frequently and rarely, respectively. The subjects were also asked about the impotency impact of khat use. Only 28(16.7%) subjects reported such a problem while the majority (64.3%) of the sexually active students reported that they didn't encounter impotence due to khat use.

Case History of one of the Subjects

While data about the prevalence of some psychotic reactions among khat users were collected through the questionnaires, the subjects were informed that any volunteer with sever psychological unwelcome effects can contact the present researcher for further structured interview. Accordingly, based on the clinical interview, and retrospective analysis of his records in Jimma Hospital, proctors of the college and from his dorm mates the following case history of the given student (named **X**) is built.

X is a 22 years old third year student. He came from a family of eight children. He is the eldest child in the family. He started chewing khat when he was at grade seven. Since then, he had been chewing khat on daily basis. Before he joined to college, mostly he had been chewing khat on social bases. However, after he joined the Agricultural College of Jimma University, he became socially isolated for reasons he don't know and has been chewing khat mostly while he is alone.

He had been chewing khat heavily over the 2004/05 academic years. He seems developed drug tolerance because he reported that he has been in need of larger and larger amounts of khat, from day -in and day- out, to produce the original desired effects. Besides to khat, he has been smoking at least five "joints" per day, especially in the khat

session. In doing that he is also developing cross-tolerance of khat and cigarettes. His report and other evidence showed that the undesirable psychological consequences of khat are so observable in him. His concentration, sleep, and libido were poor, and his self-care declined. He was bad tempered and changed in his personality. He developed delusions of persecution that many people were his enemies, and he thought that the government bodies are behind these all.

Once **X** was very suspicious that his dormitory mates were conspiring each other to burn his notebooks during the exam weeks. He also had been hearing many times students talking about him indirectly. While he was in his dormitory, he heard people knocking the door and shouting, "Come on! Let us enter and kill him!" Many times, he reported such kinds "hallucinations" to the proctors.

As his hallucinations, depression, and other related psychoses increased from time to time, his dorm-mates and others urged him to visit a psychiatrist at Jimma Specialized Hospital. The diagnostic result of **X**, in the psychiatric department, indicated *that* he didn't have a past psychiatric history or family history of psychiatric illness. Rather he is suffering from khat–induced psychoses. He was treated with some psychotherapeutic drugs and *he was advised to quit khat chewing. The resolution of symptoms occurred within a short period* and he became settled within a few days. After the treatment he decided to stop chewing khat. Nonetheless, it was a futile attempt. He described that he cannot withstand the withdrawal symptoms such as insomnia, irritability, weakness, dizziness, and the like. On top of these bodily reactions, he was suffering from what he called "Dukkak", frightening nightmares. In the first day, he had a nightmare in which people were whipping him with snakes and chasing him saying, "If you don't chew, we will dismiss you from this college." On the next day, after many efforts to get asleep, he saw another nightmare. He described the event as follows: "Men-like creatures used me as a stone grinder. They had been pouring stones into my ears and the crushed stones (as fine as sands) come out of my mouth." He then restarted

chewing khat for fear of the "Dukkaks" and because of his inability to withstand the withdrawal symptoms. By the time of this study, this student is still with some the unwelcome consequences of khat use, though this time he said that he is trying to limit the amount khat he is using.

Discussion

As khat contains chemicals which stimulate the CNS activities, it produces pleasurable consequences: The taker /chewer feels excitement, mental alertness and happiness. The user believes that he or she think more clearly and quickly and is more alert, though concentration and judgment are objectively impaired (Kennedy, 1987; Giannini et al. 1986). The psychoactive effects of khat, however, are not only pleasurable. There are also unpleasurable consequences. There is a tendency to querulousness with liability of mood and increases in anxiety and tension. There are some brief psychotic phenomena following a khat euphoric session. Confusion, disorientation, grandiose fantasies and a mildly depressed mood may occur (Alemayehu, 1999). There are also many unwelcome physiological effects of khat use. The present study, however, was confined to the assessment of the prevalence of some brief psychotic phenomena following a khat euphoric session and other related psychological problems in Jimma University College of Agriculture.

To achieve this objective, quantitative and one case study were employed. The quantitative study was used to estimate the prevalence of some khat- induced psychotic reactions among habitual khat chewers of the students who are identified through dorm-to-dorm survey. One of the subjects who is found to be suffering from severe and frequent psychotic reactions was used as a case study. Using a deep clinical interview with him, retrospective analysis of his records from the psychiatric department of Jimma Hospital and proctors of the college, and from his dorm mates and others, a case history of one student was built.

Among a sample 210 students who are habitual khat chewers, 90(42.9%) reported that they started khat chewing practice because they were informed that khat increases their concentration and

helps them to stay alert through the night. The other 69(32.9%) mentioned that they started it due to peer pressure, while the remaining subjects began khat chewing because of some religious and cultural reasons. This is true to Debruyne's (1999) assertion, which states that drug dependence is unexpected by the takers. No one who starts out using a substance intends to get hooked, but it still happens. Any one who uses almost any kind of psychoactive drug (a drug that changes one's moods and behavior) has the potential to develop drug (chemical) dependence or addiction. A person tries a drug for one reason, but continues taking it because addiction has set in.

In an attempt to crosscheck their views, the subjects were asked why they are chewing day-in and day-out. While 40% of them are using khat to overcome stressful academic work, the other 31.4% reported that they are using khat mostly to enjoy with their friends. About 50 or 23.8% of the habitual khat chewers claimed that they are using khat most of the time to be free from anxiety. Although these study subjects attributed their reasons for chewing to different factors, researches in the area of psychoactive drugs revealed that once an individual start using a drug, s/he might continue using it because addiction can set in. The original reason is long gone and the dependency or addiction has taken over and may last lifetime (Debruyne, 1999).

As an important element of this study, the prevalence of psychotic reactions that following a khat euphoric sessions was investigated by this study. Accordingly, the frequency of hallucinations grandiose fantasy, depressed mood, and anxiety were assessed as the fundamental unpleasurable consequences of khat use. Grandiose fantasy was frequent for 65.7% of the subjects, followed by depressed mood (43.8%), and anxiety (33.3%). Hallucination, the extreme psychotic phenomenon of khat session (Gendron, et al, 1977), is seen by 15(7.1%) of the subjects. This figure is really unexpected compared to previous studies done by (kalix, 1987; Baasher, 1980; and Halbach, 1972). Mostly, hallucination or illusion is induced by excessive consumption of khat and such kind of psychotic reaction is found on

case studies (kalix, 1984). Besides to thought broadcast or mental trips, fantasies and the like, insomnia (lack of sleep) is a common phenomenon following khat use (Baasher, 1980). However, in this study only 33.3% of the habitual Khat chewers reported the frequency of insomnia. As the subjects are college students with many works to do that college requires, they might accept the lack of sleep as some thing good. That is why they didn't complain or report it as one of the consequence of khat use. Although it is related with physiological phenomenon, the prevalence of sexual impotence was investigated in this study, Accordingly, out of 107 sexually active subjects, only 28(16.7%) reported the frequently happening of the impotence, while the majority (64.3%) didn't at all encounter such side effect of khat use. Many evidences (e.g., kennedy, 1987; kalix, 1985), however, indicated that loss of sexual desire is reported frequently by men during khat use. Although libido initially may be enhanced, a loss of sexual drive, spermatorrhea (which is sometimes accompanied by testicular pain) and subsequent impotence soon follow.

Conclusion and Recommendations

Khat is a stimulant with a mild narcotic effect when taken in moderate quantities. Like any central nervous system stimulating psychoactive drug, the effect of khat is manifested by euphoria, increased alertness, garrulousness, hyperactivity, excitement, elevated blood pressure and the like. The psychoactive effects of khat are not always pleasurable. Insomnia, malaise, dizziness and lack of concentration almost always follow (Kalix, 1984). Lines of research evidences indicate that true psychotic reactions occur following khat euphoric effects. Any authorities also assert that little is known of the plant's health effects. In this case further research and investigation is needed. In effect, an attempt is made in this study to asses the prevalence psychotic phenomena following a khat euphoric sessions.

This study revealed the prevalence of short-lived psychiatric manifestations and other psychological problems following the use of khat. Hallucinations are reported by 7.1%, depression by 43.8% and 33.3% of the habitual khat

chewers reported the frequent incidence of anxiety following the euphoric sessions. The majority (65.7%) of the samples also mentioned that they are mostly subjected to grandiose fantasies. While 33.3% of the habitual Khat chewers reported the frequency of insomnia, the majority (40.5) responded that they are free from lack of sleep. Out of 107 sexually active subjects, only 28(16.7%) reported the frequent episode of loss of sexual desire during khat use.

The majority (42.9%) of the habitual khat chewers involved in this study reported that they started khat chewing practice so as to increase their concentration and helps them to stay alert through the night. The other 32.9% mentioned that they started it because their friends urged them, while the remaining subjects began khat chewing because of some religious and cultural reasons. While 40% of the subjects are now using khat to over come stressful academic works, the other 31.4% reported that they are using khat mostly to enjoy with their friends. The rest 23.8%of the habitual khat chewers reported that they are using khat most of the time to be free from anxiety.

As part of this study, case history was built based on one student who had observable and frequent psychiatric manifestations. The subject's hospital record showed that he didn't have a past psychiatric history or family history of psychiatric illness. He was advised to quit khat chewing because he is subjected to khat–induced psychoses. If khat consumption is ceased, resolution of symptoms usually occurs within a short period. However, due to his inability to withstand the withdrawal symptoms (such as insomnia, irritability, weakness, dizziness, and the like), he could stop khat use. He was living with clear psychotic reactions by the time this research was conducted.

Generally, like any euphoria- producing drugs khat urges the takers to get hooked easily. After sometime, khat users will show intense craving for it. Besides to its psychological side effects, khat can have physiological and psychosocial impacts. Above all, still the unexamined areas of khat exceed the investigated ones; it may have other characteristics that have not been identified. To this end, based on the findings of this study and other established facts the following recommendations are made:

- Awareness must be raised about the potential dangers of khat use and the restrictions of its use need to be introduced.
- A general health promotion program that are important to change the behavior of students towards drug abuse must be designed by the universities and colleges.
- While its use is strongly discouraged for all individuals, people with *mental illness* should be especially careful to avoid it. They should not use khat due to the possibility that it may cause or worsen depressive, manic, or psychotic behavior.
- Some students with observable khat dependency may be need of one or a combination of the following addiction treatment programs: drug counseling, pharmacological therapy, and psychotherapy. So, such programs should be available in the college for those students who are wiling to kick their bad habits.
- As many undesirable psychoactive effects khat use are reported, higher institutions should take measures about legal restriction khat use in campuses.
- Despite the dramatic increase in the production and consumption of khat in Ethiopia in recent years, similar regulatory measures have not been attempted to be taken by the authorities in charge. So, attention should be paid to the potential-adverse effects of habitual use of khat on mental, physical and social well-being.
- Although the literature on khat (Catha edulis Forsk) is fairly extensive, and several authors have stated the potential-adverse effects of habitual use of khat on mental, physical and social well- being, population-based studies are scarce in Ethiopia. Thus, further research that will ultimately lead to policy recommendations in the area of khat abuse is needed.

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