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Original Article

An Overview of Khat

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Abstract

This is a mini-review of the effects of khat—leaves of which are chewed by people around the world. Khat chewing could have profound short and long-term effects on various human body systems, of which some of the main effects are discussed in this review. Although various countries recognize the potential harm of using khat, legal mechanisms controlling the use of khat vary widely. Nevertheless, medical professionals, psychiatrists, and social workers are required to be vigilant of the effects of khat use, manage these effects, and sign postrelevant cases to the appropriate professionals, if necessary. A range of clinically relevant issues, in addition to socioeconomic consequences, is discussed. An attempt has also been made to formulate a care plan that may be of benefit for treatment providers.

Key Words: khat, psychiatric effects, physical effects

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The World Health Organization expert committee on drug dependence[1] views khat as a substance with the potential of abuse and low dependency. The level of abuse and threat to public health is not thought to be significant enough to warrant international control and therefore, World Health Organization does not recommend the scheduling of khat. Hence, depending on the prevalence of its use, public protection issues and health concerns in various countries, regulations of khat control legally vary from country to country. Despite several economic advantages of realizing the adverse effects, khat use has been prohibited in its countries of origin such as Kenya, Somalia, Yemen, Uganda, Ethiopia, and Madagascar. Among the Western nations, while khat use is prohibited in Canada, France, New Zealand, Norway, Poland, Sweden, Switzerland, and USA, in Australia the import of khat is controlled under the customs regulations. In the UK, the plant *Catha edulis* (khat) is uncontrolled. For this reason, the UK remains the main hub for it to be distributed to the other parts of the world where its use is illegal.

In the UK, data on the use of khat comes from the Somali community, which ranges widely between 37% and 78%.[2,3] Khat (*Catha edulis*) is a plant that has been used as a recreational drug for many years. Khat has several names such as chat, quat, qaad, jaad, miraa, mairungi, cat, and catha. It is known mainly for its stimulant action such as euphoria and increasing alertness.

Khat used to be mainly grown in countries around the Red Sea and on the eastern coast of Africa, and hence is predominantly used by Somali, Yemeni, Ethiopian, and Kenyan communities. However, people from these communities have migrated worldwide and continue to use khat, importing it legally or illegally or by growing it locally.

This is a review of the effects of khat use and the associated socioeconomic implications.

PHARMACOLOGY

There are 44 different types of khat; it is a green leafy shrub, the leaves are mainly chewed and its taste varies, depending on the tannic acid content (Figs. 1, 2). The leaves have an astringent taste and an aromatic odor; the young leaves are slightly sweet. Traditionally, khat (socializing drug) chewing has been a social activity for many centuries, particularly within the Somali, Yemeni, and Ethiopian communities. It is also used to increase attention, reduce fatigue, hunger, and counteract the effects of alcohol. It is predominantly chewed over 6 to 8 hours in social groups of 8 to 20 people. Significant amounts (100 to 300 g) of khat can be chewed in a 3 to 4-hour khat session. It is also smoked or dried leaves can be made into a drink.[4]

Khat mainly contains cathinone and cathine, naturally occurring alkaloid

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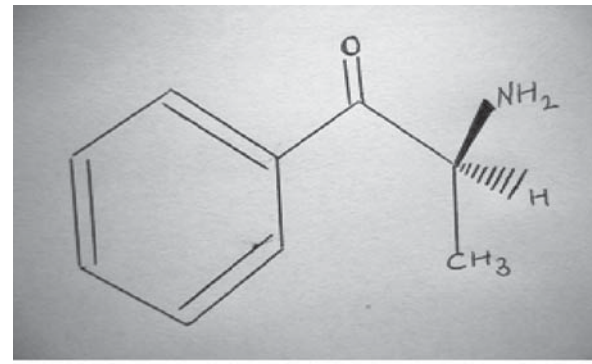
FIGURE 1. Khat bundles.

amphetamines. When the leaves of the plant are chewed, cathinone releases catecholamines from the presynaptic storage sites; this release of cathinone is known to be responsible for the stimulant action. The efficacy of stimulant action is said to be related to the freshness of the plant leaves when chewed. Hence, it is harvested in the early hours of the morning and sold in markets in the mornings as a bundle of twigs and leaves wrapped in banana leaves to preserve freshness. Normally, fresh leaves contain a higher proportion of the desirable cathinone. Khat chewers prefer fresh leaves as they contain higher levels of cathinone to cathine, which gives better stimulant effects with fewer systemic adverse effects. Cathine is responsible for the unwanted systemic effects.

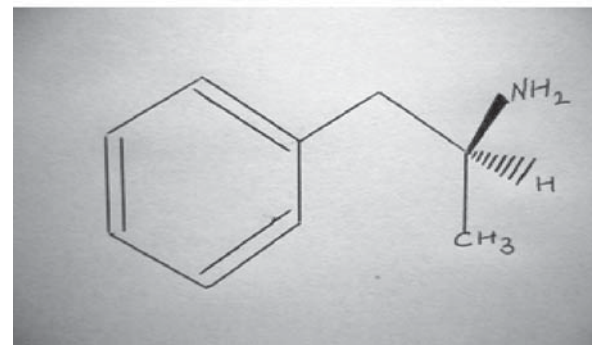
Cathinone has been termed as a ''natural amphetamine'' because it produces sympatho-mimetic (increases blood pressure and heart rate) and central nervous system (CNS) stimulation similar to the effects of amphetamine.[5] Amphetamine-like stimulatory effects are observed after 0.5 mg/kg body weight of cathinone (Fig. 3).[6] Cathinone metabolism is depicted in Figure 4.

It is absorbed by the mucosa of the mouth at first followed by the stomach and the small intestines. Peak plasma levels of cathinone are obtained 1.5 to 3.5 hours after the onset of chewing. Cathinone is detectable in plasma for up

FIGURE 2. Khat leaves.



S (-) Cathinone



S (+) Amphetamine

FIGURE 3. Chemical structure of amphetamine and cathinone.

to 24 hours after khat consumption. The elimination half-life is 4.5 hours. The metabolism of cathinone is rapid. Only 2% of cathinone is unchanged in the urine. Blood pressures are elevated for about 3 hours after 1 hour of chewing. Cathinone is excreted in breast milk and is detected in the urine of breast-fed babies 2 to 4 hours after ingestion.[7]

Central Effects

As explained earlier, the CNS stimulating effects are mainly because of the cathinone content in the fresh leaves. Cathinone releases catecholamines (dopamine and noradrenaline) from presynaptic storage sites and has actions similar to that of amphetamines. It has also been postulated that, like amphetamine, cathinone releases serotonin in the CNS.

More specifically, the CNS effects of cathinone are thought to be because of the enhanced release of dopamines from the nerve terminals; the release of dopamine increases the activity of dopaminergic pathways and the effect of cathinone is thought to be dose dependent on the release of dopamines.[8]

Peripheral Effects

Cathinone has vasoconstrictor activity, increases blood pressure, and has positive ionotropic (increases myocardial contractility) and chronotropic actions (effect on heart rate). Heavy khat use is implicated in increased incidences of hypertension and myocardial infarction.[9]

Constipation and urinary retention are thought to be the most common gastrointestinal effects.

SOCIO-CULTURAL CONTEXT AND ECONOMIC IMPLICATIONS

Worldwide, 10 million people chew khat daily. In the UK, there is no evidence of khat use in the general population; its main use is in communities in which it is prevalent, that is the Somali, Ethiopian, Kenyan, and Yemeni communities. Approximately 6 tons of khat

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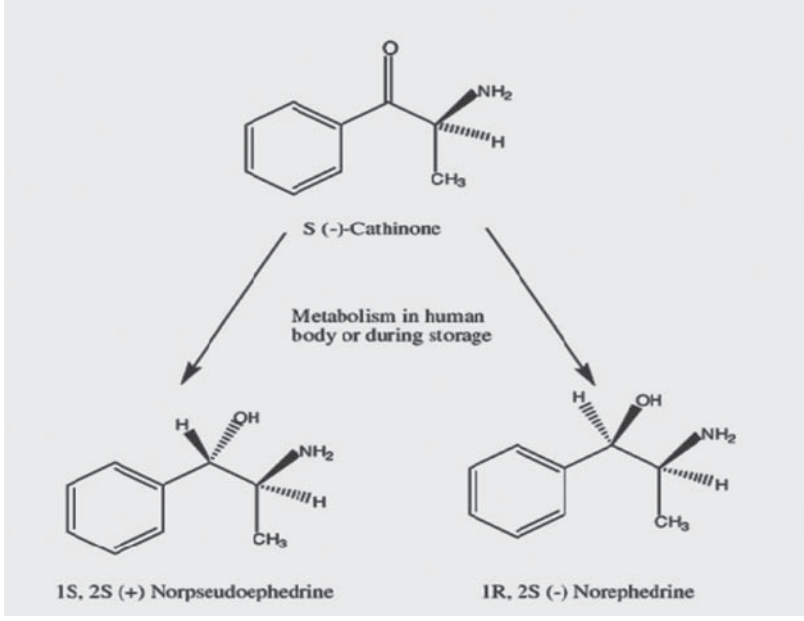

FIGURE 4. Cathinone metabolism.

arrives in the UK per week, mostly by air from Kenya. The bulk of this is usually in transit for supply to the United States. The UK is the base for khat distribution to many countries, including the United States, where its use is illegal.

Khat users mostly buy khat at the mafresh, a meeting place where khat is bought and chewed. It is also bought at local shops, in markets, or through ''mobile traders.'' Men are more likely to use it at the mafresh and women are more likely to use at home, often alone.[10]

Each bundle contains 25 to 30 stalks, weighs around 250 g, usually costs about £5. Each user picks the leaves and shoots from the stalk, and rolls them into a tight wad, which is kept in the cheek. The leaves are chewed for several hours, slowly releasing the psychoactive ingredients and bringing on a gradual high.

Cultivation of khat was a major source of revenue in several countries; its cultivation resulted in the decrease of the much-needed essential food crops resulting in malnutrition and disease in khat users. As its use was causing significant social harm and economic problems, strong movements protesting its use led to prohibition in these countries.

As its use is almost confined to the African communities in the UK, there are movements within these communities to outlaw khat. Traditionally, women are denied entry to the mafresh. Campaigners believe men remain isolated from the mainstream culture and increasingly remain unemployed as the khat sessions can go on for several hours; it becomes habitual for them to spend their time dreaming and chattering on khat, subsequently resulting in increased burden on the women of the house to raise money for the family and also to take care of the family. Although women use khat, it is thought to be mostly a solitary activity and often not disclosed because of cultural stigma. Khat use has been implicated in family instability, breakdown of relationships including divorce, prostitution, and criminal activity. Moreover, the segregated social activity within these communities is thought to have resulted in a form of social exclusion from other communities and mainstream socio-cultural activites.[11]

PSYCHOACTIVE EFFECTS

Immediate Effects

Khat chewing induces a state of euphoria and elation with feelings of increased alertness and arousal. This is followed by a stage of vivid discussions,

loquacity, and an excited mood. Thinking is characterized by a flight of ideas. At the end of a khat session, the user may experience depressive mood, irritability, lethargy, anorexia, and difficulty in sleeping. On occasions, transient anxiety and depressive symptoms are also noted during or after khat sessions. Many khat chewers believe that it improves their sexual drive.

Long-term Effects

Long-term effects can be categorized as effects on mental health and physical health.

Effects on Mental Health

There are a fairly large number of reports of short-lived psychotic symptoms as opposed to any other psychiatric symptom. Of course, there are rare case reports of manic-like psychosis[12]; one of the reasons given for the propensity of inducing manic symptoms is that the pharmacologic structure of cathinone is similar to that of amphetamine. For the same reason, it is also felt that the psychotic symptoms are again the predominant form of psychiatric sequelae after prolonged use of khat.

In a critical review of khat use and its relationship to mental illness, Warfa and colleagues[13] described 12 studies, 10 of which were cross-sectional studies. It is worth noting that of the 12, eight studies found that khat use increased psychiatric morbidity, particularly psychotic symptoms. Two studies also showed that the incidence of psychotic symptoms increased with excessive use of khat. However, the causal relationship between khat use and mental disorder was inconclusive as only case studies reported a causal association. The review warned against overemphasizing the significance of case reports as some studies did not show increased incidence of psychotic symptoms. However, several case reports implicating short-lived psychotic reactions have been highlighted by yet another review.[14] Key parameters that might induce psychotic symptoms are thought to be the level of consumption at each sitting, the frequency of use, and the preexisting psychiatric conditions.

Very few studies have addressed the issue of whether khat can trigger psychotic symptoms in a psychotic patient. Odenwald et al[15] reported the case of a 32-year-old Somali with a delusional disorder who killed a man in a state of paranoid delusions, wherein the psychotic exacerbation before the incident was accompanied by the increase of khat intake.

A recent large cross-sectional and case-control study of randomly selected 4854 Somalis with mental health problems showed evidence of a relationship between the consumption of khat and the onset of psychotic symptoms among male Somalis, whereby not khat use per se, but rather early onset and excessive khat chewing seemed to be related to psychotic symptoms. In most cases, a pattern of binge chewing (more than 2 bundles/d) preceded the onset of psychotic symptoms.[16]

Most cases of psychosis reported in the literature seem to resolve quickly without any antipsychotic medications or, at most, needing low doses of antipsychotic medications. The underlying mechanisms of how khat use and specific psychopathology are associated remain inconclusive. Although khat has been known to induce short-lived psychotic symptoms, whether it can trigger psychosis in people with a preexisting psychotic condition or whether it can, on its own, increase susceptibility to psychosis is unclear.

Dependence Potential: There are very few reports of khat dependence, although moderate psychological dependence is reported, physical withdrawal symptoms are mild consisting of lethargy, mild tremors, low mood, and recurrent bad dreams. Discontinuation after prolonged use does not seem to cause major problems in terms of withdrawal symptoms. A mild degree of tolerance seems to occur particularly to increase in blood pressure, heart rate, and insomnia.[17] Studies specifically examining the dependence potential alone seem to have not been reported. An amphetamine metabolite, parahydroxynorephedrine, is suggested to be the cause of tolerance effects in amphetamine abuse. Parahydroxylation of the main cathionine metabolite, norephedrine, is also implicated in the development of tolerance effects of cathinone.[5,18]

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Effects on Physical Health

Cardiovascular Complications: Most of the available literature is in the form of case reports; however, a wide range of significant cardiovascular complications is reported. As mentioned earlier, khat use has been implicated in the development of hypertension and acute myocardial infarction.[19] A 39-fold increased risk of the development of acute myocardial infarction is implicated in heavy khat users. The most frequently reported cardiac complication of amphetamine-like substance is acute myocardial infarction.[9,19]

Vanwalleghem et al[20] reported a 41-year-old Somali man with no comorbidity, who developed left hemiplegia 2 hours after chewing khat. The computed tomography scans taken several hours after the first stroke showed right-sided middle cerebral artery infarction. With treatment, his hemiparesis improved and he was discharged from the hospital. He was readmitted 18 months after discharge with complete left hemiplegia; the patient confirmed that the new episode had occurred shortly after khat use. Proton density images of magnetic resonance imaging of the brain 11 days after the second stroke showed a larger middle cerebral artery infarction and diffuse white matter abnormalities.

Severe ischemic cardiomyopathy in a 33-year-old East African with a history of no regular habit of khat chewing but who chewed khat constantly for 2 to 3 days has also been reported.[21] On investigation after chest pain, his electrocardiogram (ECG) showed acute anterior myocardial infarction. After thrombolysis with recombinant tissue plasminogen activator, his pain resolved but the ECG showed no signs of reperfusion. Anteroseptal akinesis with moderately impaired left ventricle was found on the transthoracic echocardiogram. After treatment, he then returned 27 months later with shortness of breath at rest and intermittent chest pain. He had continued daily khat use during these 27 months. He had signs of biventricular failure. Coronary angiography showed a large 6-cm stenosis in the left anterior descending artery and filling defects consistent with thrombus. In view of the negative stress ECG, coronary intervention was not tried; he was discharged with conservative management. Having stopped all medications, 1 month later, he returned with worsened chest pain, shortness of breath, and showed signs of acute hepatitis; luckily his screening for hepatitis A, B, and C and human immunodeficiency virus were negative. However, his left ventricular function deteriorated extensively, an implantable cardioverter defibrillator was not attempted in view of the risk of embolus. He was eventually discharged with maximal medical treatment to stabilize his biventricular failure.

In essence, the effects on the heart are diverse and they cannot be ignored. In some people, khat use seems to have significant adverse effects on the cardiovascular system warranting users to be aware of such complications and seek timely medical advice to prevent serious complications. Hence, it is imperative that khat users are required to be educated appropriately.

Oral and Gastrointestinal Complications: Khat is known among regular users for numerous oral diseases. In a study of the comparison of khat nonchewers (972) versus chewers (1528), Aiman Ali[22] reported a significant increase of periodontal pockets and gum bleeding in khat chewers; he concluded that khat can cause damage to the periodontal ligament. Stomatis followed by secondary infection is also found to be a common occurrence. Plasma cell gingivitis is a rare condition; however, massive infiltration of plasma cells into the subepithelial tissue as a result of khat use has been also reported.[23] In mice, khat has been found to damage the DNA and was thereby found capable of causing mutations, suggesting that khat is capable of producing chromosomal aberrations (genotoxic effects).[24] Lastly, a case of oral squamous cell carcinoma has also been reported.[25]

To sum up, it is evident that although not all would suffer from such adverse effects, khat can have serious effects in the mouth.

The most common effects on the digestive system include constipation, urinary retention, and anorexia.[26] Severe cases of chronic khat use has been found to cause hemorrhoids. In a study of 247 khat chewers versus 200 nonkhat chewers, 62% of chronic khat chewers suffered from hemorrhoids, of which

nearly 46% underwent hemorrhoidectomy.[27] Liver also seems to be particularly vulnerable to the harmful effects of khat use. Hepatic cirrhosis and *Fasciola hepatica* infection have been reported with the use of contaminated khat.[28–30] An unusual case of autoimmune hepatitis-A chronic inflammatory disease of the liver, characterized by the presence of hepatitis, circulating antibodies, and hypergammaglobulinemia, has been reported by D'souza et al.[31] Increased risk of human immunodeficiency virus infection has been suspected by some researchers.[32]

Drug Interactions: Very few data are available regarding khat-drug interactions. One Yemeni study[33] found that the bioavailability of ampicillin and amoxicillin reduced significantly within 2 hours of the khat chewing session, suggesting that the 2 antibiotics should be preferably taken 2 hours after khat chewing. Monoamine oxidase inhibitors and khat together may cause increased levels of sympathetic stimulation leading to a hypertensive crisis. Phenylpropanolamine, a constituent of some cough/cold mixtures and appetite suppressants, causes synergistic action with khat.[4]

Effect on Reproduction, Mother, and Baby

Only a handful of studies have examined the effect of khat on the reproductive system. Having compared 65 chronic khat users (range of duration of use 6 to 48 y) with 50 nonkhat users, in a breakthrough study El-Shoura et al[34] found a number of deleterious effects on the sperm. Semen volume, sperm count, sperm motility, and percentage of normal spermatozoa were found to be significantly affected in chronic khat users. In addition, it is worth mentioning that they also found a negative correlation between the duration of khat use and the deleterious effects on these semen parameters. In another study, Hakim[35] found that there was decreased seminal volume, sperm count, motility, and various morphologic changes in 214 khat users. Although research in this area is limited, such findings suggest that chronic khat use could potentially have harmful effects on the seminal parameters. It is imperative that khat users should be made aware of such deleterious effects. In terms of the effect on pregnancy and fetal growth, khat has been found to have a detrimental effect on utero-placental blood flow leading to low birth weight babies (Table 1).[36]

TABLE 1. Main Effects of Khat

Acute Effects	Long-term Effects
Increased energy	Periodontal disease
Increased alertness	Constipation and hemorrhoids
Excitement	Gastritis
Increased verbal communication	Hepatitis
Irritability followed by depression at the end of khat session	Gastrointestinal malignancy
Loss of appetite	Myocardial infarction
Tachycardia	Stroke
Hypertension	Impaired sexual function
	Impaired fetal growth
	Impaired lactation
	Psychosis
	Anorexia

ASSESSMENT AND MANAGEMENT OF KHAT USERS

Assessment

The aim of the assessment is to determine the physical, social, and mental health needs and to formulate interventions to meet them. The identification of substance misuse and the substance misuse-related risks should be the foremost task. Eliciting this vital information and developing a professional relationship is easier when the professional begins with open-ended questions and gradually focuses on closed questions to elicit specific information. Such a process is generally helpful in gaining information and developing a professional relationship. Besides identifying their needs, assessment is also a useful intervention in itself and provides an opportunity for people to reflect on their circumstances.

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Risk Assessment

Identifying immediate substance-related risks is vital to ensure people's well-being and ensure that interventions to reduce substance-related risks are prioritized. Throughout the course of the assessment process, the practitioner should be vigilant to identify risks and, in particular, must be able to recognize the immediate and significant risks and be able to take steps to reduce the risks as soon as possible. Even if there are no immediate risks, multiple risk factors may be cumulative in increasing the overall risk.

Risks Specific to Khat Use

Ethnically, we know that the high prevalence of khat use is in people of African and Arab origin. When someone presents with a clinical symptom, we should be alert to enquire about khat use in these populations to rule out the potential cause of such symptoms.

By lowering the age of onset of khat use, especially when there is persistent and chronic use in large quantities, there could be a higher risk of physical and mental health problems.

Furthermore, polysubstance use, alcohol use, and cigarette smoking could increase the risk of adverse reactions; potentially, it could also increase the risk of overdose.

Preexisting mental health problems, such as psychosis, and physical health problems, such as heart problems, may increase the risk of harm to the individual.

The risk of low birth weight babies cannot be ruled out with khat use in pregnancy. Women of child-bearing age need special consideration, especially pregnant khat users, whose detailed history has to be taken and where risks are noted, appropriate timely action needs to be taken.

In addition, any history of mental health problems and substance misuse problems in the family could have an impact on the presenting complaints of a khat user.

If children are khat users a detailed drug history and associated medical psychiatric history including finding out details of performance and peer relationships at school is essential.

HISTORY TAKING

History of Presenting Problems

Often, physical or mental health problems could be the main presentation. Taking a detailed history of onset, duration and exact details of the presenting complaint offers clues to the illicit substances used. It may be the case that the person often mainly uses khat, alone or in addition, use other substances. It is important to ascertain the impact of use of each different substance. Hence, a detailed account of each type of substance used has to be recorded. Age at onset of substance misuse, current, past substance use, frequency, and quantity of each substance use and method of use should be recorded. It is important to establish physical/psychological dependence if there are any of the substances used by the person.

History of any physical or mental health problems should be elicited in detail. Khat use can contribute to compound physical and mental health problems. Major physical health problems that khat can cause could include oral diseases, heart conditions, liver problems, and effects on the nervous system. Mental health problems that khat can cause or adversely affect include depression, anxiety, paranoia, and psychosis.

Recording any attempts to change or stop substance misuse behavior could guide in recognizing the level of motivation to consider stopping substance misuse. The assessment of current psychological motivation is essential to find out the level of readiness to change their habit of khat use. It is important to ask what do they recognize as the main problem? Whether they wish to change? If so, what in particular do they wish to change, are they ready for the change? An understanding of their coping mechanisms and whether they are willing to adopt strategies for change? In this way, one will also be able to assess their level of insight into the current problem and find a niche to introduce those services that can offer psychological therapies such as cognitive-behavioral therapy, family-focused interventions, or group therapies based on what the assessment outcome demands.

Assessing the Social Impact

Assessing the social impact is one of the core components of addressing the issue of any substance misuse and so it is for the use of khat. Peer relationships, family history, and relationships, including significant events, such as divorce or bereavement, employment/financial situation, and housing situation would give an indication of the effect of substance use on the living circumstances. Often, disruption in the domestic life, unemployment, and financial problems could be the main reason for seeking help.

In addition, it is important to elicit whether there is any criminal history and current offending risks. Recording any criminal activity is an essential part of the assessment. For example, the sources to fund the drug habit, outstanding charges, current probation conditions, and problems faced in the prison could give clues to the patterns of life style and the level of impact of the habit on the family. Such information is essential as they can, on some occasions, warrant important psychosocial stressors/symptoms requiring immediate action. Eventually, the intention of all the history taken is to formulate a coherent sense of the physical/psychosocial problems faced by the person because of the use of khat, or any other drugs and to find out ways of dealing these issues.

MEDICAL EXAMINATION AND TESTS

Physical examination should be guided by the core presenting physical complaint, and a detailed appropriate systemic examination has to be conducted. A detailed mental state examination is required in all cases. Screening for drug use should be carried out in all suspected cases of drug use including screening for khat use in people in whom khat is suspected to be the main causal factor for a presenting problem. Routine medical tests, such as liver function tests, full blood count, and cholesterol levels are necessary as we know that khat use has the potential to affect almost all systems. Depending on the symptoms extended, specialized tests may also be necessary.

Detection of Khat

Immunoassay methods can detect amphetamine-related compounds, but not khat specifically. Gas chromatography mass spectrometry can detect norephedrine, a cathinone metabolite for up to 48 hours after consuming khat. Hence, detection of khat in the form of its metabolite, is a long-winding process and in most places this testing is not available. Although the test is highly sensitive, it is not highly specific as there could be some cross-reactions with other metabolites. In any case, urine testing should be treated as an additional confirmatory finding of khat use when investigating the suspected adverse effects of khat.

MANAGEMENT

Care planning should include 6 domains:

- Drug and alcohol use
- Physical and psychological functioning
- Social functioning
- Criminal involvement
- Safeguarding children
- Monitoring health in pregnant women using khat

Goals within a care plan should be clearly defined. It is important that there are not too many initial goals—too many will be overwhelming and unachievable. The principle of a hierarchy of goals is useful in helping individuals to look at treatment objectives in a systematic manner.

INTER AGENCY CARE PLANNING

Depending on case involvement with other agencies, such as social services, housing providers, criminal justice system, and specialists such as psychologists may be required. Collaborative work between the agencies is required to address the issues of care planning.

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INTERVENTIONS

Immediate interventions may include:

Giving advice and information on the effects of khat.

Brief intervention techniques could be designed to encourage reflection on the use of khat and its effects, address issues such as whether substances are being used to control thoughts or behavior, expectations of how substance use affects their lives and hopes and fears in relation to substance misuse, and being free from the use of such substances.

Motivational interviewing techniques to increase engagement in the assessment and subsequent treatment process.

Adequate resources for providing the necessary psychosocial help should be available in the primary care, secondary care, and tertiary care settings, in addition to the much-needed integration and liaison of these services for certain cases.

Specific physical health problems would need appropriate physical investigations to confirm the physical condition; management is by addressing the specific physical problem. It is advisable to seek appropriate medical/surgical specialist opinion as required.

With the psychiatric presentations, expert opinion and management could be sought through local psychiatric and substance misuse services as such services may be better placed in having aptly trained professionals who can deliver further psychosocial interventions. Psychotic symptoms often respond to a short course of antipsychotic medications; other psychotropic medications are rarely needed.

SERVICE DELIVERY STRATEGIES

Primary Care

Professionals such as healthcare workers, counselors, nurses, and doctors in the primary healthcare settings should be able to identify the psychosocial problems of khat use; education and training regarding the potential problems because of khat use should be incorporated in their continuous professional education programs and in other platforms on which such information can be disseminated. In addition, doctors and nurses should be trained to initiate antipsychotic or other psychotropic medications, if necessary.

Children, young persons, and pregnant women are special populations at risk requiring prompt recognition of the symptoms and the management of the resulting health/psychiatric condition. If needed, khat users could be referred to secondary and tertiary care centers for further management, but not all cases may need further input. However, khat use per se has no particular medical treatment; medical and psychiatric management remains treating the resultant condition symptomatically;for example, psychosis often is successfully treated by low-dose antipsychotic medications.

Community-oriented Education Programs

Primarily, community-oriented education programs should be spread across the areas, especially where segregated use is predominant in localized places and where the populations who use khat predominantly live. This should be extended nationally too as the use is now spreading throughout the nation gradually.

The Advisory council on the misuse of drugs (ACMD) 2005[10] highlights several public health measures.

It stresses the need for education in these following areas:

- The health risks associated with khat use.
- The dangers of khat use.
- Risk reduction and safer khat use; for example, encouraging the sellers and users to wash the leaves before use.
- Treatment options for khat use for the associated physical, psychological, or social consequences.
- Prevention of khat use, especially in children and young adults, as the habit tends to continue for many years and the associated effects are more pronounced with added years

of use. The ACMD 2005 also recommends that the local retailers and authorities should be encouraged to explore voluntary agreements to exclude khat sale to those under 18 years of age.

Such measures should be facilitated in local communities through primary care services and not exclusively through addiction services, although khat users should be encouraged to seek advice and, if necessary, treatment from the addiction services.

Awareness-raising campaigns of the health and safety implications of chewing khat should specifically target marfreshi settings, addressing the health risks associated with poorly ventilated and smoky environments. Mafreshi owners should be encouraged to adhere to the current health and safety regulations on ventilation, lighting, fire escapes, etc. The risks of khat use are exacerbated by poor hygiene and self-neglect among users.

CONCLUSIONS

In conclusion, it is hard to ignore the fact that khat is a substance that can cause a degree of psychological dependence, possibly because of its euphoric effects. Evidence suggests that some of them who chew khat could be prone to increased cardiovascular risk with effects ranging from increased blood pressure to reported increased risk of stroke. In addition, the local effects on the mucosa of the mouth, orodental effects, gastrointestinal effects, including hepatitis and carcinogenic effects, are a matter of concern.

The strength of the case for a suppression of khat use is largely based on reported mental disorders, including psychotic reactions with an inherent risk of antisocial behavior and violence. However, this is based on a combination of case study reports, anecdotal observations, and by drawing parallels between khat and the etiologic significance of other illicit substances, particularly amphetamine. There is a similarity in the structure of cathine and cathinone, the 2 most powerful known psychoactive alkaloids in khat and amphetamine. Yet, it is important to take home the message that we learn that khat has a potential of inducing mood disturbances ranging from short-lived euphoria, depression to aggression, and psychosis. Socioeconomic effects are the major concern, which has driven policy makers to reexamine the regulations of khat use from time to time. Although khat is largely common in African population and Arab countries, stricter regulations in their home countries has led to an increase in illicit importation to their countries and liberal use in these populations in countries, such as the UK, where there is no strick legislation. Currently, the ACMD, UK believes that the evidence of harm from khat use is insufficient to classify khat under the Misuse of Drugs Act, 1971. However, the UK Somali community, particularly women lobbying, continues to voice concerns regarding its harmful socioeconomic effects on the family unit and the community at large. Similar concerns are also raised at the international level as currently khat is not subject to international control, although increasingly, more and more countries are now experiencing the migration effects of the selective use of khat in African and Arab population in their countries and imposing local clinical guidelines and legislation restricting its use.

In effect, it is hoped that the collaboration between the legislative authorities and the healthcare systems is robust enough to tackle the risks posed by spreading khat use globally.

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