

## A REVIEW ON HAZARDS OF KHAT CHEWING

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**ABSTRACT**

Khat goes by numerous names: Khat, qat, chat, qaadka, kus-es-salahin miraa, tohai, tschat, Abyssinian tea, African tea, African salad, and brown cows (in tablet form). Cathinone, one of khat's psychoactive chemicals, affects the central nervous system like a mild amphetamine. This review summarizes the action, constituents and hazards of khat chewing. There is a major association between khat chewing and the health hazards like diminished sexual performance, HIV infection, sexual violence, elevated diastolic blood pressure, affecting urinary and digestive system, periodontitis, liver injury, psychiatric problems, ophthalmological problems. Various complex factors underlie the use of khat. Frustration, poverty and/or dislocation make people susceptible to khat. The reason which even the government failed to protect the public from the usage of khat is because, the use of Khat is an established cultural tradition for many social situations in the areas of primary cultivation, East Africa and the Arabian Peninsula. Hence strong measures need to be taken for creating a greater awareness among the most common users as poor peoples, taxi and auto drivers, school students, college students, and general public.

**Keywords:** Khat, Cathinone, Hazards.

**INTRODUCTION**

Khat goes by numerous names: Khat, qat, chat, qaadka, kus-es-salahin miraa, tohai, tschat, Abyssinian tea, African tea, African salad, and brown cows (in tablet form). Khat leaves are crimson-brown and glossy but become yellow-green and leathery as they age. The leaves are up to 5 cm wide and up to 10 cm long and emit a strong aromatic smell and have astringent and slightly sweet taste [1]. Khat is found in the flowering evergreen tree or large shrub of Celastraceae family. It consists of whole fresh leaves and buds of a plant known as *Catha edulis*. It is indigenous to Ethiopia, Kenya, and Yemen [2].

More than 20 different compounds including, Cathinone/aminopropiophenone/, Cathine/nor pseudoephedrine/ and nor ephedrine have been isolated from Khat [3]. According to pharmacologists, cathinone is one of the khat's psychoactive chemicals which affect the nervous system "like a mild amphetamine" [4]. Cathinone is metabolized rapidly to cathine (norpseudoephedrine) and norephedrine, which possess weak central stimulant properties because of their less lipophilic character [5].

The use of Khat is an established cultural tradition for many social situations in the areas of primary cultivation, East Africa and the Arabian Peninsula. Several million people may be chewing Khat worldwide, with an estimated 10 million people chewing Khat leaf daily [6]. Although largely viewed as a social habit, long-term heavy chewing has been recently reported to induce a degree of dependence [7]. Khat is of interest as it one of a few plants that are legally consumed for their ethno pharmacological properties. Debates over the legal status and health effects related to consumption of this plant are currently underway in many parts of the world on account of the spread of consumption from eastern Africa resulting from migration among East African communities [8]. Up until a few decades ago, khat chewing was mainly restricted to older men or members of Muslim communities who used it in lieu of alcohol on religious grounds and, therefore, the habit did not pose serious public health or socio-economic problems [9]. Similarly, khat use in many European countries and Canada has been restricted or made illegal and is as such classified as a controlled substance. In the United States, the Drug Enforcement Agency (DEA) has asserted that the plant itself, *Catha edulis*, is a Schedule I substance on a par with opiates for the period it has cathinone in it, i.e. within the first 48 hours of harvest [10]. Studies of khat consumption in the United Kingdom suggest that the context of consumption (i.e. displacement and social marginalization) may have significant effects in shaping the outcomes from khat consumption [11] [12] [13]. But some

advocates of khat, however, alleged that khat leaf is rich in ascorbic acid and, therefore, the undesirable side effects of khat chewing are minimal. Of course, by modulating catecholaminergic activity or transmission of dopamine, ascorbic acid acts as an antidote to the effects of amphetamine [14] [15].

The main objective of the study is to create awareness among the readers worldwide especially in the societies of Yemen, Ethiopia and Somalia about hazards behind the khat chewing.

**Problems associated with khat chewing****Effects of khat chewing associated with gastrointestinal tract**

The digestive tract is mainly affected by the presence of tannins in this plant. Gastritis and constipation are some of the main complaints of its users; loss of appetite is also a characteristic of khat. The malnutrition and constipation are attributed to both tannins and nor pseudoephedrine. Toxicity has been evaluated in laboratory animals, and khat extracts have been reported to contain mutagenic factors [16] [17] [18]. Khat chewing has also been shown to be a risk factor for duodenal ulcers [19].

**Effects of khat chewing associated with dental problems**

The first individuals suggested a possible effect of khat chewing on periodontal tissues [20]. Since then, many attempts to explore this further were made. Several studies did show a significant association between khat chewing and periodontal destruction based on comparisons between chewer and nonchewer groups [21] [22]. On the contrary, studies have frequently demonstrated decreased gingival inflammation, decreased pocket depths, or/and lower level of clinical attachment loss on the chewing sides compared to the nonchewing sides [23] [24]. Adding to this contradiction, khat chewing has also been repeatedly found to interfere with plaque accumulation and to result in sub gingival microbial shifts that are compatible with periodontal health [25] [26] [27] [28].

**Effects of khat chewing associated with psychiatric disorders**

The use of khat among youths can be harmful, leading to decreased academic performance, increased risk of psychiatric disorders such as lethargy, hopelessness and insomnia [29]. In some cases it can progress to a stage of hypomania. Toxic psychosis may also result from its consumption, and a number of such cases have been described [30] [31]. Some khat chewers experience anxiety, tension, restlessness, hypnologic hallucinations, aggressive behavior or psychosis [32] [33]. Also a group of expert in WHO has concluded that khat consumption may induce "moderate but often persistent psychic dependence" the

withdrawal symptoms after prolonged khat use seem to be limited, however, to lethargy, mild depression, slight trembling and recurrent bad dreams [34].

#### **Effects of khat chewing associated with oral cancer**

A study reported that about 50% of khat chewers develop oral mucosal keratosis [35]. This pathological change is considered as pre-cancerous lesion that may develop into oral cancer [36]. The prevalence of this lesion and its severity increased with frequency and duration of khat use. The importance of khat after finding that most of the oral squamous cell carcinomas in a study patients were located in the buccal mucosa and lateral sides of the tongue, which come into direct contact with khat during chewing [37]. In a survey in Saudi Arabia, about 50% of the patients with head and neck cancer presented with a history of khat chewing and all of them had used khat over a period of 25 years or more [38]. In some cases, the malignant lesion occurred at exactly the same site as where the khat bolus was held. Hence generally most of the studies concluded that a strong correlation existing between khat chewing and oral cancer.

#### **Effects of khat chewing associated with liver injury**

A study published in 2010 reported a series of six patients with chronic khat use that was associated with severe acute hepatitis that resulted in death (1 patient) or liver transplantation (five patients) [39]. A study reported from the Netherland in 2011 described a 26-year-old East African man who developed acute liver failure secondary to khat-induced necrotic hepatitis requiring liver transplantation [40]. Another study reported six cases of long term khat users who migrated from East Africa to The Netherlands who presented with liver injury. Four presented with jaundice and hepatitis; one of these and two others had variceal bleeding and hepatic encephalopathy; two had clinical ascites. Three patients died from spontaneous bilateral peritonitis, sepsis and one case receiving liver transplant died post-transplantation [41]. Also another study reported about the unusual adverse effects on liver of chewing khat was a parasitic infection of the liver by *Fasciola hepatica* as a contaminant of the khat leaves [42].

#### **Effects of khat chewing associated with elevated diastolic blood pressure**

Khat typically is ingested while chewing the leaves. After ingesting Khat, the chewer experiences an immediate increase in blood pressure and heart rate [43]. Various reasons have been given for chewing Khat. Most chewers used Khat to gain good level of concentration for prayer [44]. Some chewers reported that Khat intake results in increased energy levels and alertness, enhances imaginative ability and the capacity to associate ideas, and improves the ability to communicate [45] [46].

#### **Effects of khat chewing affecting urinary system**

Khat affects the urinary system by relaxation of bladder wall and closure of internal sphincter. Urine retention may also occur and maximum urine flow rate is reduced [47].

#### **Effects of khat chewing associated with ophthalmological problems**

Khat chewing causes mydriasis [48] and conjunctival congestion. A study reported that the intraocular pressure is decreased which resembled caused by amphetamine [49]. A report of 2 cases has described bilateral optic atrophy in 2 khat users who consumed amounts larger than usual. This may have been an idiosyncratic reaction to khat [50].

#### **Effects of khat chewing affecting pregnant women**

Khat affects pregnant women by reducing maternal daily food intake and mean birth weight of the off spring [51]. In a study of 65, khat addicts compared with 50 non khat addicted subjects, statistically studies of full-term human newborns have shown that khat use by the mother is associated with lower birth weight [52], but no differences in the rates of stillborns or congenital malformations were observed [53].

#### **Khat consumption associated with diminished sexual performance**

There are suspected effect of khat on various reproductive health parameters which can lead to diminished sex performance. Khat consumption may lower libido and sexual performance [54]. An animal study revealed that the testicles, epididymis and seminal vesicles of rats were smaller than controls [55]. Also Khat consumption has been found to reduce semen volume and sperm malformation [56] [57].

#### **Khat chewing habit as possible risk behavior for HIV infection**

Different varieties of khat are perceived to enhance sexual arousal among khat chewers. This was corroborated by pharmacological tests in male experimental animals that were administered with oral treatment of cathinone though there is still no evidence that the resulting increased sexual activity is accompanied by erectile and ejaculatory responses [58]. The overwhelming evidence, however, suggests that the habit causes a high frequency of spermatorrhoea and decreased libido and, at a later stage, impotence as observed in Somalia and Djibouti, where as high as 60% of the male chewers in those countries were reported to be impotent [59] [60] [61]. Whether khat chewing induces excessive sexual arousal, impotence or spermatorrhoea, the end result of the habit is believed to lead to strained relations between spouses or married couples and most likely to precipitate family fragmentation and/or multiple sexual practices. Khat chewing habit may thus be postulated as one of those risky behaviors that could fuel the spread of HIV. In this regard, a link has been shown to exist between khat use and increased exposure to HIV/AIDS among prostitutes in Djibouti [62]. Therefore, it can be surmised that khat chewing habit, like many other drugs of abuse could constitute risky behavior contributing to the spread of HIV infection [63].

Various complex factors underlie the use of khat. Frustration, poverty and/or dislocation make people susceptible to khat. Khat is commonly used for social recreation and occasionally as a medicine. Most importantly, Khat is a relevant source of income for farmers and marketers in Yemen, Ethiopia and Somalia. Secondly, khat use is widely accepted even for children in Yemen, Ethiopia and Somalia, and strongly intertwines with cultural and gender identity and local customs. It has mostly replaced the famous Yemeni coffee and seriously damaged the coffee economy. For consumers, much of the day is spent buying and chewing khat, severely affecting working hours and thus family income.

#### **CONCLUSION**

This review highlights the hazards of khat consumption and it is one of the serious global burdens. The reason which even the government failed to protect the public from the usage of khat is because, the use of Khat is an established cultural tradition for many social situations in the areas of primary cultivation, East Africa and the Arabian Peninsula. In the present situation, several millions of people may be chewing Khat worldwide. The association of regular Khat chewing with various problems like sexual violence, HIV exposure, digestive tract problems, periodontitis, libido and elevated blood pressure levels. Hence strong measures need to be taken for creating a greater awareness among the most common users as poor peoples, taxi and auto drivers, school students, college students and general public.

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