

Khat: a literature review



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5 March 2009

Summary

There is an emerging consensus among international health authorities that khat has a low abuse potential. Much of the concern raised about the harmful effects of khat are related to excessive use, associated with adverse social conditions related to displacement and social marginalization. In Australia available evidence suggests that the vast majority of khat import licenses are granted for dried khat suggesting that the majority of khat being imported is low in the most active constituent cathinone. There have been substantial increases in the volume of khat being imported into Australia, however there is little systematic evidence of a consequent rise in harms associated with khat use. Whilst the scientific literature suggests that the social and physical impact of khat is also low there is still concern from elements of the East African communities regarding khat use. This review suggests that whilst importation has increased, evidence of harm is minimal. Most importantly this review suggest that the social and structural settings in which khat is used may provide opportunities for individual, community and regulatory responses to khat use. The review suggests that whilst education campaigns to reduce harmful consumption may be beneficial for some targeted communities, changes to the processes of social marginalization, (i.e. changing the setting of use), among African diaspora communities in Australia may have a greater impact in reducing the harms associated with khat consumption.

This work was commissioned by the Centre for Culture, Ethnicity and Health with funding from VicHealth, the Victorian Health Promotion Foundation.

Cover page image sourced from: UK Advisory Committee on the Misuse of Drugs (2005) *Khat (Qat): Assessment of risk to the individual and communities in the UK*. Home office: London.

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1. Background

In 1993 the Australian Commonwealth Department of Health, Housing and Community Services commissioned research into the social and health outcomes from khat consumption in Australia (Stevenson et al., 1993, 1996). The 1996 report documented the cultural settings for khat consumption in Australia, and noted that attitudes to khat reflected regional (north and south Somalia), religious, and gender-based differences in a longer debate about khat consumption. For those who chewed, khat gatherings were reported to be a means of socialization. For those opposed to khat consumption, khat was analogous to a drug that required prohibition.

Important in the 1996 report were the voices of East African women. In 1996, Stevenson et al., noted that the “range of opinions expressed by women was wide, reflecting khat’s multiple symbolic meanings associated with gender role and status, consumption tradition and modernity”. It was also noted in that report however that the social meaning of khat use was changing, as were the gender-roles for men and women through the experience of migration. Each of these factors are acknowledged as being important in considering the issue of khat.

A public meeting about Khat was convened in Flemington in late 2008. At the meeting the East African Women’s Foundation raised concerns about the harmful effects of khat. Questions were raised again about the harmfulness of khat, its similarities to other known restricted drugs and the social meaning of use.

The purpose of this document is, through a desktop review of the national and international literature, to examine the evidence since 1996 of the harms related to khat consumption. In particular, this document will review the evidence related to khat, the mindset of those chewing and the settings in which khat is used. At the end of the document, issues for further consideration are identified with the aim that these issues could inform further discussion by the community and Government.

The Review

This document emerges from a desktop review, i.e. a review of public documents that can be sourced about the issue. The review did not seek to include commentary, submissions or opinions from the community. An advisory committee for the project was convened and met twice through the course of the project, providing advice on how to communicate the findings from the review to the community.

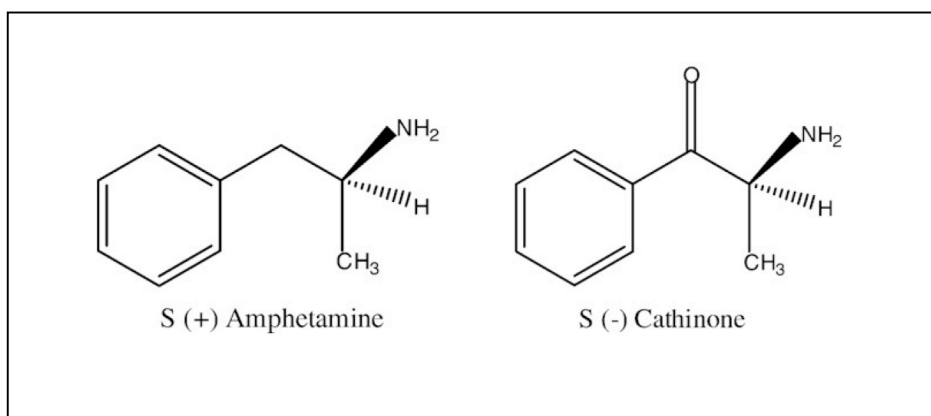
The review focused on human studies and included peer-reviewed and non-peer reviewed literature. The review had an international focus seeking illustrations and wisdom from work conducted across a number of jurisdictions. Some publicly-available data was obtained from regulatory authorities on the number of khat import permits and the volume of khat imported into Australia. This review did not seek further information from the community on the size of the khat using population, the prevalence of chewing, the experience of those who chew, or those impacted by the use of khat.

What is Khat

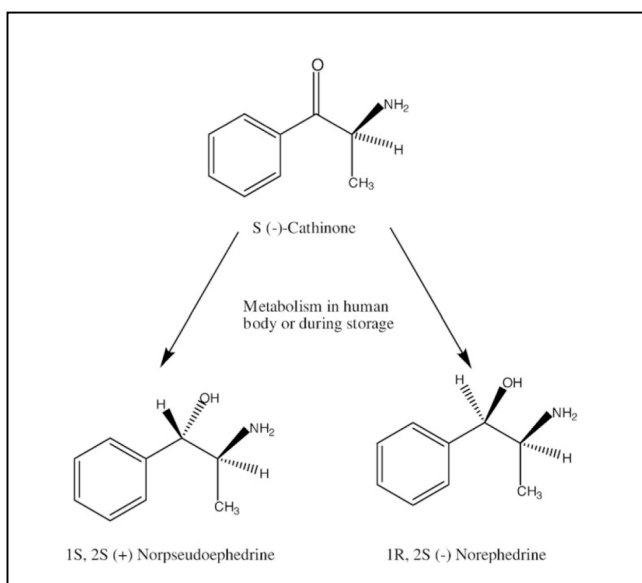
Khat (*Catha edulis*) is a large green shrub that grows at high altitudes in the region extending from eastern to southern Africa, as well as on the Arabian peninsula. Originating in Ethiopia, khat now also grows in Somalia, Kenya, Malawi, Uganda, Tanzania, the Congo, Zambia, Zimbabwe, Afghanistan, Yemen and Madagascar.

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).

Qat 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 (Sawair et al., 2007).



The stimulant effect of Khat is related to the cathinone content of the leaves (Kalix, 1990). Cathinone is metabolized rapidly to cathine (norpseudoephedrine) and norephedrine, which possess weak central stimulant properties because of their less lipophilic character (Geisshüsler and Brenneisen, 1987).



Khat is of interest as it is one of a few plants that are legally consumed for their ethnopharmacological 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 (Klein, 2008).

Local interest

In 1993, it was estimated that 700 to 1000 people in Melbourne enjoyed khat chewing. Most were thought to be from Somalia, Ethiopia, Eritrea, Kenya and Yemen (Stevenson et al., 1996).

Recently, concern has been raised as to the levels of harm khat is producing in the local community (19/08/2008, Moonee Valley Community News, 2008).

The East African Women's Foundation lodged a parliamentary petition containing 1087 signatories to Australia's House of Representatives (22 September, 2008) (<http://www.aph.gov.au/HOUSE/committee/petitions/health.htm>) seeking to prohibit the sale, distribution, use, importation and production of Khat in Australia.

Emerging from these local trends is an appreciation that khat use has become a divisive issue in the community and there is little consensus on the nature and extent of use and related harms.

Recent Local Reports

The following are recent local reports to be considered as part of the literature on khat. These reports document local issues that may assist in understanding the emergence of the debates about khat.

Fadumo Cumar Jamac (19.8.2008) produced a SBS radio report documenting a meeting about Khat at a Flemington community center. (<http://sbs.com.au/elg//somalii-080819-aa0.mp3>)

A Victorian Department of Human Services (DHS) public health trainee scheme report (www.vtphu.org.au/docs/khatSomali.ppt) documents some of the perceived health and social effects. This document reports on a convenience sample of 40 community members regarding the social and health effects of Khat (Aden et al., 2003).

The Australian Drug Foundation (ADF) has a fact sheet (http://www.druginfo.adf.org.au/druginfo/fact_sheets/khat_sheets/khat.html) translated into five languages - Amharic, Dari, Persian, Somali and Tigrinya. The ADF (2005) also produced a community service announcement in Somali.

The Australian Health Minister was recently reported as noting that the Commonwealth Government will not be reviewing its regulatory approach to khat. A recent meeting of the Inter-Governmental Committee on Drugs (IGCD) discussed the issue and decided to maintain the current regulatory regime (Ardeer Advocate, 2008).

International interest

There has been significant interest in khat for some time at an international level. A WHO critical review notes the previous reviews of this plant (Table 1)

Year	Event	Outcome
1933	Advisory Committee on the Traffic in Opium and Other Dangerous Drugs of the League of Nations	Discussion – no action taken
1962	Expert Committee on Addiction-Producing Drugs	clarification on the chemical and pharmacological identification of the active principles of khat was needed
1964	Expert Committee on Addiction-Producing Drugs	"The problems connected with khat and with the amphetamines should be considered in the same light because of the similarity of their medical effects, even though there are quantitative differences and specific socio-economic features; this is all the more desirable since the problems with respect to khat are confined at present to a few countries in one

		region
1971	Committee on Narcotic Drugs	Recommends WHO to review khat
1974-1978	UN Narcotics Laboratory	A series of internal UN documents on the chemistry of khat
1978	Expert group for UN Fund for Drug Abuse Control	No report
1983	International Council on Alcoholism and Addictions	International Conference on Khat: the health and Socio-Economic Aspects of Khat Use (<i>Madagascar</i>)
2002	WHO 33rd Expert Committee on Drug Dependence (ECDD)	Pre-reviewed khat and concluded that there was sufficient information on khat to justify a critical review

Table 1. World Health Organisation (WHO) activities in relation to khat (source: WHO, 2006b).

The increasing spread of East African diaspora, or groups sharing a common ethnic identity, across a number of western countries has increased the awareness of khat use (Patel, 2008; Klein, 2008).

In Africa khat has mixed regulatory status. Khat is legal in Ethiopia, Djibouti, Kenya, Yemen and Uganda, but illegal in Saudi Arabia, Tanzania and Eritrea. According to a leading academic khat has become a scapegoat for social ills in many parts of Africa with khat being attributed for many problems in the absence of substantive evidence (Beckerleg, 2008: 752).

A 2005 review of khat consumption in the United Kingdom (UK Advisory Council on the Misuse of Drugs, 2005) recommended that while the use of khat should be discouraged and could be detrimental the adverse effects of khat can be due to a range of social factors experienced by Somalis and other immigrants to the united Kingdom (ACMD, 2005)

Current Australian regulatory considerations

The current guidelines for important khat are clearly set out.

(<http://www.health.gov.au/internet/main/publishing.nsf/Content/ocs-tc-guidance-imp-khat.htm>).

In Australia, the importation of khat is subject to regulation 5 of the *Customs (Prohibited Imports) Regulations 1956* and is prohibited unless the importer holds a licence and permit issued by the Office of Chemical Safety (OCS).

A request to AQIS for data on khat license permits resulted in the release of aggregate data for license permits for the period 2003-2008. Unfortunately these permits do not contain data on the volume of khat imported. Permits are needed for importation and a licence/permit is required for the importation of khat for personal use. Khat import permits require details on whether the permit is for fresh or dried khat. Figure 1 illustrates the annual number of khat permits issued by AQIS for the importation of khat into Australia

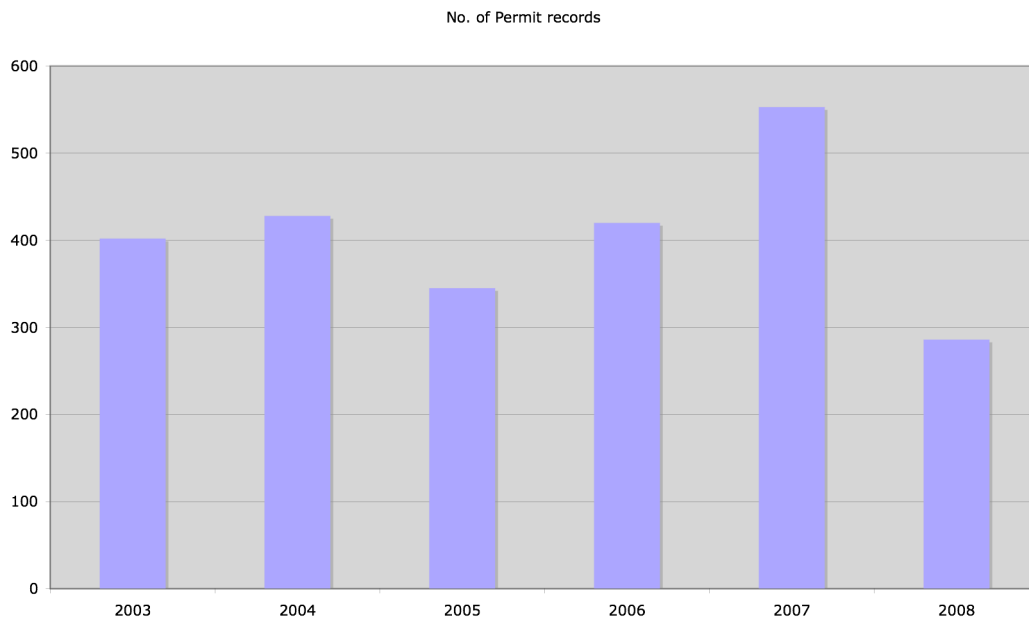


Figure 1. Import permits issued by AQIS for the importation of khat into Australia (Source: AQIS, January 2009)

Caution should be applied when interpreting this data as it is a routine monitoring dataset with very little information regarding the nature of the systems which support the collection and quality assurance of data. For example, it is not clear whether each permit actually represents a unique permit holder or if there are multiple permits for a holder, and how many permits are held by individuals. It is not clear whether the systems for authorising permits have remained stable over time or whether there have been changes in the systems themselves that support the collection of data. It is known that in 2008, two-year permits were introduced and AQIS advises that the conditions of permit issuance changed in 2008. Thus the dramatic reduction in permits in 2008 can be explained by changes in the system of permit production, rather than a change in the demand for khat (Figure 1).

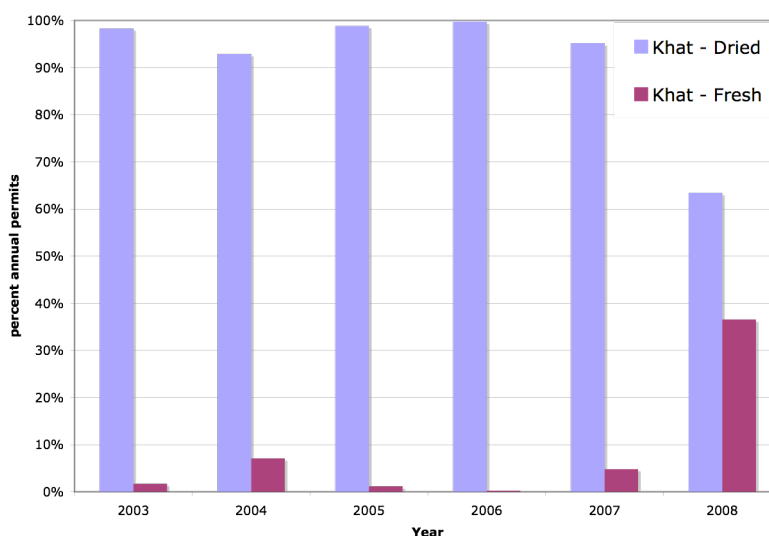


Figure 2. The percentage of khat import permits for both fresh and dried khat. (Source: AQIS, January 2009)

Figure 2 illustrates that the vast proportion of khat licenses that have been issued by AQIS have been for dried khat. In 2008 the proportion of fresh khat licenses has increased, however it is unclear why this has occurred, or whether this reflects a change in data collection techniques at AQIS as a result of changes in the types of permit being offered.

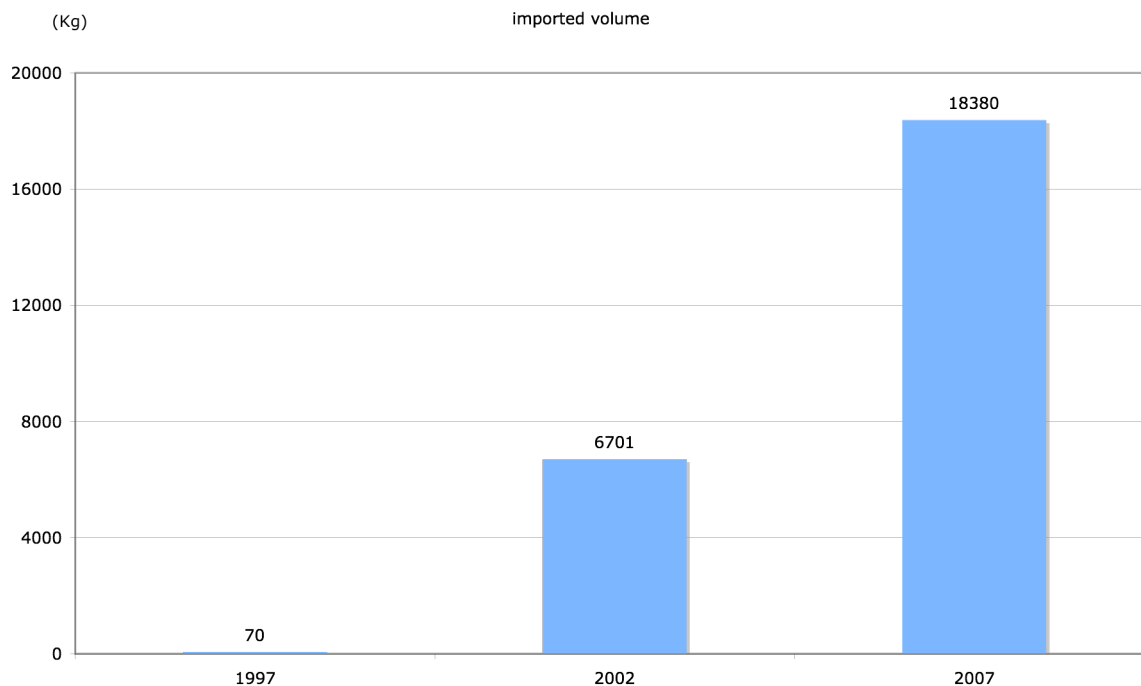


Figure 3. Volume (Kg) of Khat imported into Australia in years 1997, 2002 and 2007 (source Victoria Police, unpublished data)

It is clear from Figure 3, that there has been a dramatic increase in the volume of khat being imported into Australia over the period 1997 to 2007. It is however unclear how much khat is imported fresh and how much is dry. The extraordinary increase in the volume could be real or it could represent changes in the reporting of licensing practices.

The current licensing arrangements allow for the importation of 5kg of khat under one permit each month. Using the 2007 data, it is estimated that an average of 33 kg was imported per permit in 2007. It is possible that if permits were renewed each month, on average it suggests that each permit could be responsible for 2.8 kg of imported khat each month in 2007. As a projection of what could have been imported using the current licensing arrangements, it is possible that the market could have risen to 33,180 kg in 2007 if every permit was used to import 5 kg each month.

The expansion of the marketplace is substantial in the Australian community. On the basis of this evidence, if there were significant harms (eg mental health, crime and acute health) associated with fresh khat it certainly would have become evident in health and criminological data in this time period.

The only data on the levels of fresh/dried khat indicates that the vast proportion of licenses are for dried khat. Unless there are other mechanisms for the importation of fresh khat, this data suggests that the majority of khat being imported is dried khat and thus is low in potency as it would have low levels of cathinone.

Sub-Saharan Africa	1997	2002	2007	percent increase (97-07)
Eritrea	1521	1960	2448	161%
Ethiopia	3078	4372	6981	227%
Ghana	1905	2384	3497	184%
Kenya	6102	8126	12361	203%
Liberia	110	293	2123	1930%
Mauritius	18837	18962	21773	116%
Nigeria	1503	2118	3161	210%
Seychelles	2824	2753	2957	105%
Sierra Leone	189	848	2434	1288%
Somalia	2951	4524	5286	179%
South Africa	66091	95311	126283	191%
Tanzania	1768	1944	2984	169%
Uganda	1341	1418	2246	167%
Zambia	2978	3635	4970	167%
Zimbabwe	10255	14645	24663	240%
Total Sub-Saharan Africa	125321	168525	234253	187%

Table 2. Estimated Resident Population, Country of Birth, (source: ABS, cat. no. 3412.0 Migration, 2006-07, Australia (Detailed Migration Tables)

([http://www.abs.gov.au/websitedbs/cashome.nsf/4a256353001af3ed4b2562bb00121564/6dc9726b97f03f07ca2574590002a69c/\\$FILE/ATTZKE9Z/Country%20of%20birth%20ERP.xls](http://www.abs.gov.au/websitedbs/cashome.nsf/4a256353001af3ed4b2562bb00121564/6dc9726b97f03f07ca2574590002a69c/$FILE/ATTZKE9Z/Country%20of%20birth%20ERP.xls))

Australian Bureau of Statistics (ABS) data on the resident population of people from sub Saharan Africa, shows substantial increases in resident populations with a cultural history of khat consumption or khat production (Table 2). The increases in population from Kenya (203%), and Ethiopia (227%) are substantial. It should also be noted that combined, the Kenyan and Ethiopian diaspora is approximately three times the size of the Somali diaspora in Australia. Whilst it is unclear what proportion of these population groups consume khat, it is an important consideration in understanding the changing consumption patterns of khat. With the population of likely khat consumers approximately doubling over the ten-year period, the disproportionate increase in khat importation suggests that consumption cannot simply be explained by changing population size. No doubt the increases in population of likely khat consumers has an important role to play, however it by no means explains the dramatic rise in khat importation into Australia.

In summary, the data available for this desktop review is insufficient for a full analysis of the Australian khat marketplace. Further examination of the import volumes, value chains, price variation and distribution of consumption are needed before any comment can be made about the nature of the Australian khat marketplace. This may well be a beneficial avenue to explore as the population of east African immigrants is growing in Australia and an economic analysis would assist in planning for a growing demand for this commodity. Further research focussing on the market dynamics in Australia would be very helpful in establishing a rational basis for regulating the khat market. It may also provide a rational basis for relevant taxation regimes.

For example, a rudimentary analysis of the import data suggests that in 2007, the importation of khat supported a retail market of around \$2.2 million (18,380 kg producing 73,520 two hundred and fifty gram bundles at \$35 a bundle). This estimate is based on an average import weight per permit per month of 2.8 kg. The market could expand under the current regulatory regime to \$3.9 million annually, if every permit was used to import the maximum amount allowed under federal regulations. Compared to other psychoactive drug markets, this is a very small marketplace. As a comparison, the retail heroin market in Smith Street Fitzroy alone was estimated in 2000 to be

worth approximately \$10 million annually (Fitzgerald unpublished data). For such a small, marginalised community however the khat retail market is substantial and has the capacity to grow. For those members of the diaspora who are able to participate in the market there is an opportunity for a small but significant income. Whether the demand for khat in Australia is subject to the normal price point pressures is unknown. For example, it is unclear whether price elevation through taxation may have an impact on demand in the Australian context.

2. The effects of khat

Kennedy et al (1983) noted over 25 years ago that few of the allegations of health effects made against khat were substantiated in controlled studies in humans. In a wide-ranging review Pennings et al., (2008) recently came to a similar conclusion:

“the abuse potential of khat is low and khat dependence is low. Mild craving and tolerance to khat effects exists but there is no definite withdrawal syndrome. There is no strong, and even contradictory, evidence for a causal relation between khat use and psychiatric morbidity”.

Whilst there have been more specific data gathered and there have been improvements in research into the social impacts of Khat, there still remains a lack of data demonstrating clear deleterious social and health effects associated with moderate khat use.

Some authors estimate that 10 million people chew khat daily, worldwide (Stefan & Mathew, 2005; Pennings et al, 2008). 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 (Griffiths et al., 1997 Nabozoka & Badhadhe, 2000; UK Advisory Council on the Misuse of Drugs, 2005; Patel, 2008; Pennings et al., 2008). Further, the perception of the status of khat can have an impact on the social impact of its use. Carrier (2008) notes the wide disparity of views on the status of khat and its social impact in Africa:

“Perceptions are colored by various local and global discourses, and it is argued that of great importance is “war on drugs” rhetoric, which allows the conflation of miraa with other substances also termed “drugs”; much of the Kenyan miraa debate revolves around just how miraa should be categorized and to whether it can be labeled a “drug.” War-on-drugs rhetoric is countered by those more enamored of the substance by discourse in which its use is labeled “traditional,” “cool,” and an “economic miracle.”

The importance of the social context in shaping psychoactive drug effect is well understood and characterised in the academic literature. Zinberg’s (1984) famous framework for understanding this relationship between the drug, the mindset of the user and the setting in which a drug is used has been summarized in the term – “Drug, set, setting”. In this report the drug set setting framework will be used to examine the evidence surrounding the effects of khat.

In terms of the drug, fresh khat is reported to contain an average of 36mg cathinone, 120mg cathine and 8mg norephedrine per 100g of leaves (Geisshusler & Brenneisen, 1987).

As a plant containing amphetamine-like substances, the main effects of khat are on the cardiovascular system, gastrointestinal system, and nervous system (WHO 2006b). According to a critical review by the World Health Organization (WHO) there is inconsistent data regarding the dependence potential of khat (WHO 2006a). According to Nutt et al., (2007) khat was ranked the lowest of 20 of the most well known licit and illicit psychoactive substances (Nutt et al., 2007) in terms of physical harm, dependence and social harm. Griffiths et al (1997) report in a study of khat use by Somali immigrants in the United Kingdom that medical problems associated with khat use were rare.

At the 34th meeting of the WHO Expert Committee on Drug Dependence (ECDD) it was determined that the potential for khat abuse and dependence was low. In the 2006 report of the committee it was also noted that “The level of abuse and threat to public health is not significant enough to warrant international control. Therefore, the Committee did not recommend the scheduling of khat” (WHO, 2006b).

As a consequence of the “drug-set-setting” approach to understanding the effects of psychoactive drugs, the literature on khat is reviewed in terms of the pharmacology, the setting of use and the mindset of users. This literature review utilizes the most recent reviews of the evidence (see identified reviews in the references section of this report) and delves into detail where appropriate to further understand or articulate the evidence base.

2.1 Pharmacology

This review of the pharmacology of khat is limited to human studies. There is a substantial literature from animal studies on khat and cathinone, which have been recently reviewed (Feyissa & Kelly, 2008).

Pharmacokinetics

According to several early studies, on average around 100–300g of khat can be chewed in a 3-4 hour khat session (Nencini & Ahmed 1989; Kalix, 1990; 1994). The most detailed account of Khat pharmacokinetics is reported by Toennes et al., (2003). In that study, Toennes et al., (2003) conducted a pharmacokinetic study following administration of 36–59 g of khat or approximately 0.5 mg/kg body weight.

The mucosa of the mouth is thought to be the first absorption segment, where most of the active constituents are absorbed (mean \pm SD $59 \pm 21\%$ for cathinone and $84 \pm 6\%$ for cathine). The extraction of the active constituents from the leaves by chewing is very effective with only $9.1 \pm 4.2\%$ remaining as a residue after chewing (Toennes et al., 2003). Similar findings were reported in Brenneisen et al (1990) who examined the pharmacokinetics of cathinone (0.6 mg/kg body weight). The second adsorptive segment is the stomach and small intestine.

Peak plasma levels of cathinone are obtained 1.5–3.5 h after the onset of chewing khat (Feyissa & Kelly, 2008). After 1-hour of chewing, plasma levels range from 40 to 140 ng/ml (mean 83 ng/ml)., Cathinone is detectable in plasma for up to 24 hours after khat consumption. The elimination half-life is 260 min (Widler et al., 1994). Metabolism of cathinone is rapid. Only 2% of administered cathinone was found unchanged in the urine (Brenneisen et al., 1986; Nencini & Ahmed, 1989).

Blood pressures are elevated for about 3 hours after 1 hour of chewing of 0.6 g/kg, about one quarter of the amount consumed in a traditional khat session (Toennes et al., 2003). This dose is comparable with a mean oral dose of 45 mg cathinone.

Cathamines are excreted in breast milk and detected in the urine of breast-fed babies 2-4 hours after ingestion (Graziani, et al., 2008).

Cardiovascular effects

Khat has direct effects on the cardiovascular system causing clear increases in heart rate and blood pressure in humans (Brenneisen et al., 1990). As an illustration of the cardiovascular effects the results of Brenneisen et al., (1990) are reproduced in more detail.

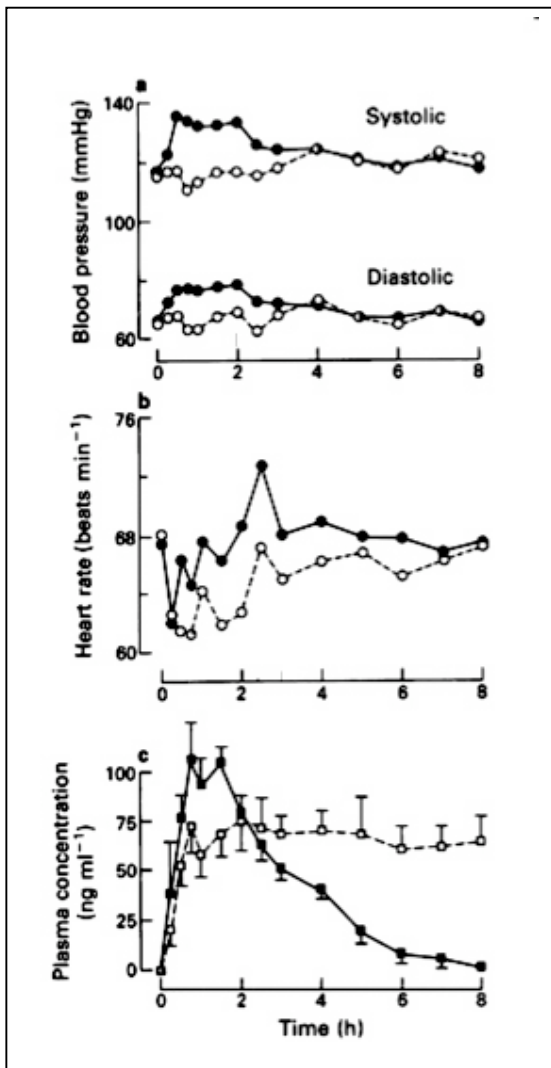


Figure 4. Pharmacokinetic and cardiovascular profile of cathinone among human volunteers (source: Brenneissen, et al., 1990).

A general population survey of approximately 4000 urban Ethiopians reports current khat chewing to be significantly associated with elevated mean diastolic blood pressure (Tesfaye et al., 2008).

Periodontal effects

There is evidence of increased risk of periodontal cancer associated with khat consumption. Recent reviews of the evidence suggest however that there are numerous complications with the evidence. Pennings et al., (2008) suggest conflicting evidence regarding periodontal disease, a findings supported by the WHO (WHO, 2006b). Al-Hebshi & Skaug, (2005) suggest that there is only weak evidence that khat chewing is a risk factor for oral cancer. However the ECDD (WHO, 2006b) and ACMD (2005) suggest that there is a growing evidence that oral cancer may be a significant issue related to khat chewing due the widespread development of pre-cancerous growths in the mouths of regular khat chewers (ACMD, 2005).

Brenneissen et al (1990) examined the effects of cathinone (0.6 mg/kg body weight). This dose is equivalent to approximately 25% of a normal dose.

This dose produced pressor effects (increased blood pressure) over a 2-hour period consistent with the pharmacokinetic profile for cathinone. At this dose level the pressor effects whilst statistically significant are relatively mild. It is unclear to what extent these changes are dose dependent.

Figure 4 (Panel a) shows the effects of cathinone on systolic and diastolic blood pressure revealing a change of around 15- 20mmHg in response to the low dose of cathinone. Figure 4b shows a less pronounced increase in heart rate in response to low dose cathinone. Figure 4c shows the changes in plasma concentrations in cathinone (filled circles) and metabolite cathine (open circles) for up to 8 hours after the administration of cathinone.

These findings have been reproduced in other pharmacokinetic studies that also monitored cardiovascular changes. Significant increases in systolic and diastolic blood pressures persist for between 3 and 4 hours after the onset of chewing khat (Toennes et al 2003; Widler et al 1994).

There is evidence of increased risk of myocardial infarction among khat users (Al-Motarreb et al., 2005), however other studies show less convincing evidence of the links between cardiac dysfunction and khat use (Al-Hebshi & Skaug 2005: p304).

Psychopharmacological effects

Cathinone has markedly stronger effects than cathine and norephedrine. For example, cathinone has been reported to be 7-10 times more potent than cathine on a behavioral measure of food intake (Peterson, Maitai, & Sparber, 1980). For this reason, distinctions will be made in this review when findings are in relation to cathinone or for fresh/dried khat.

In a comprehensive study of the relationship between Khat consumption, war trauma and psychosis in Somaliland, Odenwald et al., (2002) report:

“The mental suffering brought about by traumatic experiences augments drug intake to overcome the painful memories, the symptoms of post-traumatic stress disorders, grief, and depression”.

When weighing the evidence for the relationship between mental illness and khat use, the ACMD note the importance of the social and psychiatric context of khat consumption. Although khat use is widespread amongst communities in East Africa and the Middle East it causes low levels of psychiatric illness in those places. However, in the United Kingdom and other developed countries those left vulnerable from traumatic life experiences may be more likely to suffer mental illness related to khat use. The considerable stress experienced during the process of immigration may further contribute to the risk of harm (ACMD, 2005: p21).

This observation has been developed in a review from the United Kingdom, where it has been suggested that khat has a role in community building through forming communities around community-based behaviours (Patel et al., 2005).

Alternatively, there is evidence that heavy khat consumption can result in acute psychiatric problems (Pantelis et al., 1989). In moderate users there was no excess morbidity associated with khat consumption, however consumption of more than two bundles per day was associated with increased psychiatric morbidity (Dhadphale & Omolo 1988).

Low levels of irritability, sleeplessness and fatigue, or “let down” after khat consumption has been reported previously (Stevenson et al., 1996). Table 3 (last column) notes that whilst there is little evidence of causal links between khat consumption and psychiatric morbidity, there is evidence of links between sub-clinical depression, irritability and other associations between khat and mental health.

Warfa et al (2007) note the lack of evidence supporting causal links between mental illness and khat consumption. Whilst there are numerous case studies, anecdotal and clinical reports of associations between khat use and psychosis the causal link between khat use and psychosis is often overstated and often driven by social, economic, religious and political concerns manifest in a “war on drugs” rhetoric (Warfa et al., 2007). Similarly, Odenwald (2007) notes that the majority of published reports on the link between khat use and mental illness are case reports and expert commentaries rather than controlled empirical studies. With regard to psychosis there is still not sufficient evidence to conclude that khat causes psychosis, regardless of dose. Odenwald et al., (2005) suggests :

“khat consumption precipitates psychosis by either increasing the risk in already vulnerable individuals or affecting the course of a psychotic disorder and the maintenance of symptoms”.

Anderson et al., (2007) similarly note the inadequacy of data that can establish a causal link between khat use and psychiatric disorders. Their summary of the psychiatric data is reproduced in Table 3.

Study	Hypothesis related to khat and mental health reported	Sample size representative of population	Validity and reliability issues discussed	Controlled for known confounders	Causative link between khat use and psychiatric disorders found	Other associations between khat use and mental health found
Kennedy et al 1983	Yes	Yes	Yes	Yes	No	Partial
Dhadphale and Omolo 1988	No	No	No	No	No	Yes
Elmi 1982	No	Yes	No	No	No	
Litman 1986	Yes	Yes	Yes	Yes	No	No
Griffiths et al., 1997	No	No	Yes	No	No	Yes
Woods 2005	No	N/A	Partial	Yes	No	Yes
Odenwald et al., 2005	Yes	Yes	Partial	No	No	Yes
Kebede et al., 1999	No	Yes	No	Yes	No	No
Bhui et al., 2003	No	Yes	Yes	Yes	No	Yes
Numan 2004	No	Yes	No	No	No	No
Alem et al., 1999	No	Yes	No	No	No	
Bhiu et al., 2003	No	Yes	Yes	Yes	No	Yes

Table 3. Summary of studies examining the relationship between khat use and mental health (Source : Anderson et al., 2007).

Abuse potential

Using a systematic framework to assess the harm of current and future drugs of abuse, Nutt et al., (2007) ranked a range of 20 psychoactive substances in terms of social harm, physical harm and dependence potential.

As can be seen in figure 3, the ranking system positioned khat as the least harmful substance in the group of substances evaluated in the United Kingdom by a panel of experts. Khat is not a scheduled drug in the United Kingdom. Following from the recommendation of the Advisory Council on the Misuse Of Drugs (ACMD, 2005) khat remains a nonscheduled substance in the United Kingdom.

Although the ACMD (2005) suggested that dependence on khat was likely, the nature of this dependence was compared to a dependence on caffeine. The ACMD noted that:

“ the vast majority of people who chew khat do not use in a dependent fashion and there is no evidence of more widespread drug misuse amongst khat users”.
(ACMD, 2005: p22)

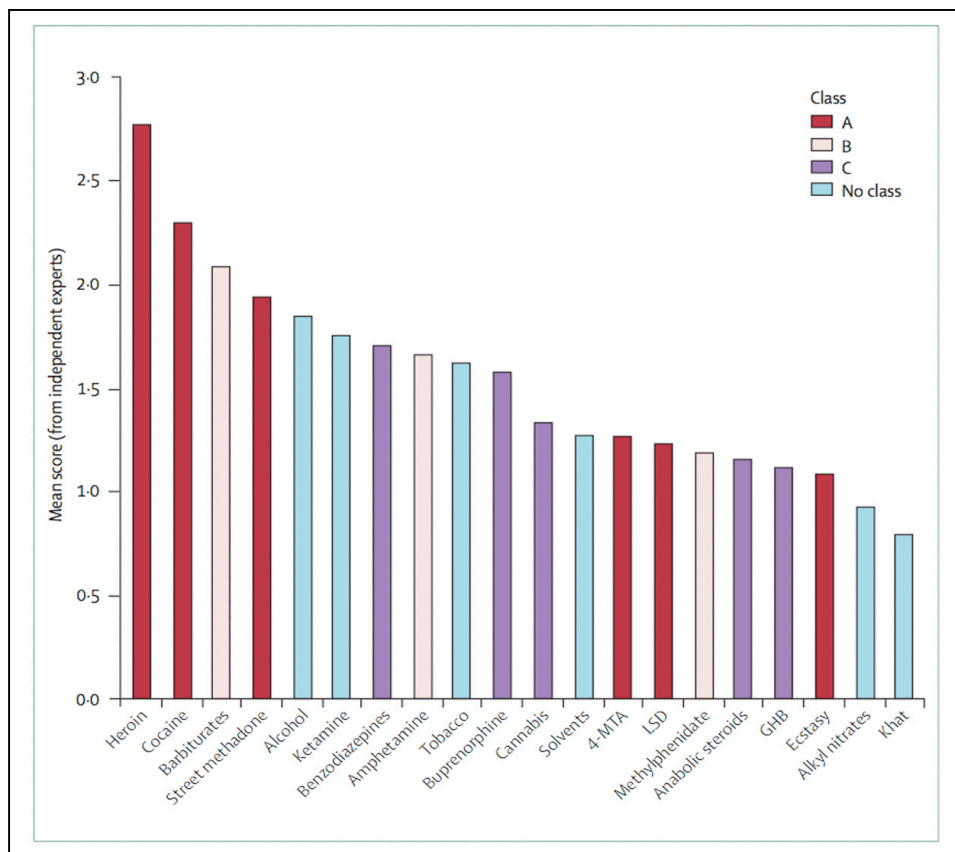


Figure 5. Psychoactive drugs ranked in terms of harm. (Source: Nutt et al., 2007). Drugs are colour-coded according to the UK system of drug classification (A, B and C). Drugs not classified are coded blue.

Social impacts

There has been much speculation on the negative impacts of khat consumption on family and social life (Aden et al., 2006; Warfa et al., 2007; Gebissa, 2008). The ACMD suggests however

that whilst there is some evidence that Khat can have a negative impact on family relationships it is just as likely that khat may be a “convenient scapegoat” for family disruption (ACMD, 2005: p19). This strong conclusion emerging from the most senior UK advisory body on misuse of drugs needs to be understood in context. The ACMD documented numerous accounts of family disruption associated with khat use, however came to the conclusion that family disruption, although associated with khat use was rarely found to be caused by khat use. The emphasis here is that whilst the ACMD report was very sympathetic to the lived experience of families and the potential harm associated with khat, they found little evidence of khat being directly responsible for harm. The report noted that it was most likely reports of family disruption were related to a number of factors, of which khat may be just one.

In an attempt to both account for the severity of domestic violence and to illustrate the multi-factorial nature of the source of this conflict Anderson et al., (2007) describe a typical scenario of khat related domestic conflict:

“Informants have indeed described scenarios where domestic disputes deteriorate into violence related to khat. The one that best fits with the typology of drug-driven violence is the gradual erosion of domestic harmony as husbands, fathers, sons return from their “khat spree” feeling tired, irritable and morose. They no longer have either the energy or the confidence to contribute to running a household or raising the children. Instead they lock themselves in their bedrooms to catch up with sleep. Fights often ensue over the sharing of tasks, or getting families to keep quiet. Such disagreements may come to revolve around the notion of authority and command within the home, and the distribution of responsibilities and privileges”.

Anderson et al., (2007: p176)

According to Anderson et al., (2007) khat therefore is implicit to conflict, however is not a sole cause.

Although there is some evidence of khat having a role in motor vehicle accidents, the analysis of these reports reveals few causal links between khat consumption and poor motor vehicle performance (ACMD, 2005). It is possible that intoxication with khat may impair driving however ACMD concluded that “it seems that using khat alone causes very little impairment in an individual’s ability to drive” (ACMD, 2005: p19).

In a review of the social impact of khat use in the Netherlands, Pennings et al., (2008) reported that there were no recorded incidents of aberrant behaviour, organized crime or health effects related to khat consumption in the Netherlands (Pennings et al., 2008).

A brief examination of media reports associated with khat and violence produces few results internationally. There is evidence of a 2004 murder associated with khat in Minnesota, however the presiding judge in the case noted there was little evidence of violence associated with khat use (http://news.minnesota.publicradio.org/features/2004/11/30_williamsb_khat/). Judging from press reports on the case, it is likely the murder was related to the illicit marketplace rather than the direct effects of the substance itself. In this sense the murder could be said to be related to the criminalization of khat rather than as a direct consequence of its pharmacological properties.

Anderson et al., note in a summary report from a 2005 UK Economic and Social Research Council review of khat and its use suggest:

“Findings on the effects of khat on consumers rank it as a mild stimulant, not a hard drug. Nor is there evidence to suggest that khat use can be linked to crime or violence among the immigrant groups who use it, despite the continuing tone of newspaper coverage in the UK and elsewhere.”

<http://www.esrcsocietytoday.ac.uk/ESRCInfoCentre/ViewOutputPage.aspx?data=v9XrjLJ6xhFp57wgJy2iqFbTYv1sUspoaXdi2VeIDc5mO9Dc9tsYyNf9D5hJKP79KIMbJ66muNrab9KP1AylvagsQyUjqo9VvFr8fbOQLEA%3d&xu=0&isAwardHolder=&isProfiled=&AwardHolderID=&Sector=>

Although there may be a temptation to compare the alleged impact of khat on families with the impact of alcohol, comparisons of khat to alcohol should be avoided as the harm profile of khat is vastly different to that of alcohol. Although khat use has been implicated in instances of domestic violence, there is little evidence that khat *itself* at a population level has a similar potential for harm. Given the observations of Oldenwald et al. (2002; 2005, 2007) on the complicated relationships between mental illness, displacement, trauma and khat use, it is more helpful to consider khat as one factor among a number of factors that can exacerbate family disruption.

Other effects

Khat is reported to have genotoxic and has teratogenic effects on the foetus if regularly consumed by pregnant mothers (Mwenda et al., 2003). The UK Advisory Council on the Misuse of Drugs (ACMD, 2005) however reports mixed evidence of the detrimental effects of khat use during pregnancy and reproductive health:

“A large study of 1,141 pregnant mothers in Yemen showed that khat chewing mothers were older and had a greater number of pregnancies than non-khat using mothers. The khat chewing mothers had more low birth weight babies than non-chewers but there was no difference between the groups in stillbirth or congenital abnormalities” (ACMD, 2005: p.24).

ACMD also reported that other than one case report of cardiovascular complications during pregnancy, there are no other published data of any adverse incidents associated with khat chewing during pregnancy (ACMD, 2005: p.24).

It has been asserted that khat use during pregnancy produces reduced birth weight in offspring (Abdul-ghani et al. 1987). There is however contrasting evidence at a population level, where the positive economic impact of the khat industry has resulted in increased birthweight in khat production areas in Africa (Seyoum, et al., 1986 (<http://www.unu.edu/unupress/food/8F083e/8F083E07.htm>)).

The effects on the male reproductive system are also mixed. There are reports of increased sperm capacitation (<http://www.abc.net.au/science/news/stories/s1142762.htm>) and reports of reduced sperm motility (Mwenda, et al., 2003).

According to Patel et al., (2005) although 75% of khat users in the United Kingdom reported problems associated with khat use, only 15 percent reported these problems to be moderate or severe in nature. Again this reinforces the profile of the substance as a mild intoxicant.

Adverse effects –summary

Cox & Rampes (2003) and WHO (2006b) reviewed the adverse effects associated with khat consumption. It should be noted that there is no distinction in this list of adverse effects according to dose. The adverse effects are listed in table 4.

System	Adverse effects
Cardiovascular system	tachycardia, palpitations, hypertension, arrhythmias, vasoconstriction, myocard infarction, cerebral hemorrhage,

	pulmonary edema
Respiratory system	tachypnoea, bronchitis
Gastro-intestinal system	dry mouth, polydipsia, dental caries, periodontal disease, chronic gastritis, constipation, hemorrhoids, paralytic ileus, weight loss, duodenal ulcer, upper gastro-intestinal malignancy
Hepatobiliary system	fibrosis, cirrhosis
Genito-urinary system	urinary retention, spermatorrhoea, spermatozoa malformations, impotence, libido change
Obstetric effects	low birth weight, stillbirths, impaired lactation
Metabolic and endocrine effects	hyperthermia, perspiration, hyperglycaemia
Ocular effects	blurred vision, mydriasis
Central nervous system	dizziness, impaired cognitive functioning, fine tremor, insomnia, headaches
Psychiatric effects	lethargy, irritability, anorexia, psychotic reactions, depressive reactions, hypnagogic hallucinations

Table 4. Adverse effects of khat (Sources: WHO, 2006b; Cox & Rampes, 2003)

2.2 Setting of use

Cultural settings - Diaspora

It has been suggested that a feature of diaspora communities is the re-creation of country-of-origin power relations in resettlement countries. Klein (2007) suggests in the United Kingdom that Khat use in the United Kingdom has served in this function to re-create a tradition of khat consumption in Somalia. Patel also noted that both khat users and non-users said that coming together to chew khat reinforced their sense of identity in England (Patel 2008). This does not necessarily mean that everyone agrees or supports khat use, rather that khat use reinforces those debates and tensions about khat that existed in the country of origin.

It should also be noted that diaspora communities have placed khat into new cultural settings. Khat use in Australia is different from khat use in Africa and in other countries (Stevenson et al., 1996) by virtue of a range of social, policy and economic conditions. The consequence of this is that whilst lessons can be learned from other settings, there are specific outcomes from khat use in Melbourne that may differ markedly from those in other settings. There are however lessons to be learned from different diaspora.

In a study of Somali diaspora in London and Toronto, Hopkins (2006) notes that Somali diaspora often struggle to develop a united voice in countries of resettlement. Factors that inhibit the development of unified voices include the persistence of clan dynamics, failings in services through fragmentation of community service organizations and exclusionary dynamics based on clan distinctions. There were differences between Toronto and London, with those groups in Toronto having a more unified voice for the Somali community however it was noted for both sites:

“ Established relations have an underlying sense of division and allegiance which is hard to avoid ... [the] politics of country of origin permeates and influences community organizations in countries of resettlement” (Hopkins, 2006: p376).

It was noted that the debate about khat use was an illustration of those tensions that get reproduced in countries of resettlement.

It is not clear to what extent clan divisions may be structuring community organizations in Australia and subsequently whether these divisions may be structuring community debates

about the impact of khat in Australia. This is an issue that should be taken up and examined in more detail in subsequent work.

2.3 Mindset of users

Griffiths et al., (1997) in an early study of khat use in the United Kingdom reported that khat was perceived to be a “facilitator of social activity and plays an important role in the social life of the community”. This observation was reiterated in a later study by Patel who, although noting the predominance of negative attitudes towards khat in UK Somali communities, also noted some interesting community perceptions. Patel et al., (2005) notes that khat use was perceived more positively than both cigarettes and alcohol by members of the Somali community in the United Kingdom. The comparison between khat and alcohol was also noted in an Australian context by Stevenson et al., (1996).

In this section the mindset of users will be examined in light of two important social factors, the experience of transition/migration and the importance of gender relations

Transition and migration

It is well documented that the experience of re-settlement for African diaspora communities can shape social outcomes for community members (Matsuoka & Sorenson, 2001). In a study of Somali diaspora immigration experience in Norway, Fangen (2006:p86) suggests that the use and over-use of khat by Somali men in Norway is in response to experiences of hopelessness, depression, frustration and anger.

In a commentary on mental health needs of Somali immigrants in New Zealand Guerin et al (2004) note that many Somali immigrants suffering from post traumatic stress disorder fail to attribute mental health problems to their experiences of trauma and conflict. Individual mental health issues are often attributed to family dislocation. It is possible that the highlighting of khat noted earlier in other countries, may be related to the transference of mental health issues away from the consequences of war trauma, to debates around khat. Further work with diaspora communities would need to explore this issue.

In a study of the relationship between trauma and psychiatric symptomology among Somali immigrants in the UK, Bhui et al., (2003) report that Khat use was associated with suicidal ideas. Other factors also contributing to suicidal ideas included pre-migration shortage of food, serious injury in country of origin and feeling close to death. The immigrant Somali population faces significant challenges from pre-migration trauma. Understanding khat use and its relationship to mental health in the settlement country requires a deep and sensitive understanding of the interrelationships between trauma, mental health, identity and substance use (Guerin et al 2004).

Anderson et al., (2007) conducted an interesting comparative analysis of the impacts of different legislative regimes on Somali diaspora in United Kingdom, Canada and Sweden. In the United Kingdom, there are some problems with the khat market both related to the size of the market and the market relationships between financiers, importers, wholesalers and retailers (Anderson et al., 2007:p165-179). Alternatively, Anderson et al (2007) note that there are significant problems created by the criminalization of khat in Canada and Sweden, such as net-widening, poor police-community relations and the further stigmatization of the Somali community. Overall, the authors seem to gauge the harms associated with criminalization of khat in Sweden and Canada to be of greater significance than market-related harms seen in the United Kingdom.

Gender relations

Stevenson et al., (1996) in Australia and ACMD (2005) in the United Kingdom write extensively on the importance of understanding gender relations when examining the social dimensions of khat use. It is notable that East African women have led discussions in Melbourne, the United Kingdom and Sweden about for legislative change relating to khat use. Understanding the role of gender is central to understanding the position of khat in diaspora communities. There is however a paucity of literature exploring the relationships between gender and khat use in settlement counties.

Gender-relations are not fixed. They are mobile, responsive to the environment and more importantly, they can be a force for change in the social environment of diaspora communities. As a consequence, gender relations need to be contextualized within their social, religious and institutional settings. As the settings change, so too do the roles of women and men.

According to McMichael, Somali women who resettle in Melbourne after war, trauma and displacement, can experience loneliness, anxiety, sadness, and depression (McMichael, 2002: p172). In this social environment, religious experience, and in particular Islam provides a "home" for those who feel displaced and Islam (indeed any religion) provides a moral framework for understanding life. McMichael (2002) observed that Islam provided a meaningful "framework of practice and ideology that sustains women during the hardships of exile, displacement and resettlement". Thus as the setting changes, religion can be a factor in structuring gender roles in new environments. The links between gender and Islam in diaspora community need however to be examined carefully when they are related to attitudes towards khat.

It has been well documented that Khat has an ambiguous status in relation to Islam. More conservative elements of Islamic thought hold khat to be either forbidden (*haram*) or even "the devil's work" (*'aml jinn*) (Stephenson et al., 1996). In an environment where Somali women are taking on the moral framework of Islam (which can be prohibitive towards khat), chewing khat may increasingly be construed as detrimental to the individual and the community, not solely on empirical grounds, but on religious grounds. It may not be surprising therefore that Somali women, resettled in Australia who find solace in Islam, may also, as a consequence find an intolerance for khat. This by no means reduces or invalidates the experience or opinion of women who seek the prohibition of khat on religious grounds. Like any social policy issue, there are multiple dimensions to understanding the reasons why an issue has importance to a community.

In a controversial analysis of religious symbolic behaviour among Somali immigrants in the United States, De Voe (2002) suggests that the use of symbolic religious behaviour can be used by Somali women in an attempt to define and enforce ethnic boundaries and to reinforce or create traditional, conservative gender roles among women. Whilst the social, political and immigration context is vastly different between USA and Australia, questions should be raised as to the role of religious behaviour in constructing arguments about the impact of khat in the community.

It should also be noted however that in Australia, Somali women are experiencing "home" in a new context, one where they are assuming new roles, new voices, new economic freedoms and new opportunities for change. Gender roles and gendered-relations are changing and these changes bring about different expectations and different behaviours within diaspora communities.

An important gender-based scenario is described by Anderson et al., (2007). In a more nuanced account from Somali diaspora in the United Kingdom, these authors suggest that there is a crisis of masculinity among immigrant Somali men in the United Kingdom. Ethnographic

accounts of khat consumption among the Somali diaspora suggest that by virtue of the capacity of Somali women to adapt to the new social conditions in the United Kingdom, these women have altered the power relations with men. Combined with the fact that Somali women and children in the main arrived well before male immigrants, Somali men were faced with changed social and economic conditions that did not place them at the head of economic relations. Anderson et al (2007: p175-179) argue strongly that these changing power relations and the consequent rise of the voice of Somali women in community settings are causal in establishing the discourse of discontent about khat among Somali women in the United Kingdom. Thus the gendered setting for khat use has a definite role in shaping the social impact of the use of the drug.

Carrier (2005 a,b) notes the role of social change on the gendered relations among male khat users in Kenya. Rather than khat being a traditional cultural symbol, khat was a symbol of modernity and commoditization among young men in Kenya involved in the global miraa trade.

In the United Kingdom, the male-only local *mafrish*, (the khat café) is a source of tension among Somali men and women. Anderson et al (2007:p157) suggest that the *mafrish*, by excluding women is at the heart of the debate about khat. *Mafrishes* are popular among men because they allow men to relax, and "... crucially, to express themselves in their own language", the *mafrish* is a "site of Somali discourse, a way of preserving continuity between lives lived in exile in London and that of their fathers and forefathers back in Somalia". Anderson et al., suggest that women's opposition to khat has its origins in the *mafrish* acting as an oasis away from the family, distancing the men from their obligations, and relationships. The more that somali men find the *mafrish* an oasis of comfort, the more chewing becomes a source of domestic friction (Anderson et al., 2007:p159).

With a changed setting comes altered use patterns. In the United Kingdom, both men and women reported using for enjoyment and "to socialize" as the most frequent reason to chew (65% of men and 62% of women) (ACMD, 2005: p8). In the past, women chewers in Australia were subject to significant stigma (Stevenson et al., 1996). Whether this is still the case is unknown in Australia. Certainly the evidence from the United Kingdom suggests that with the changing role of women, and the gender-based tensions that surround khat use it is likely that gender will have a role to play in structuring the social settings and mindsets of khat chewers, be they men or women.

There is little evidence of these contextual factors in an Australian context. The most recent study of khat use in Melbourne (an exploratory public health study of 40 key informants) was mostly descriptive (Aden, et al., 2003). It is important however to consider and account for the role of gender relations (and the impact of religion in shaping these gender relations) in the formation of debates about khat in diaspora communities.

3. Summary

Anderson et al., (2007) reflect on the processes through which the controversy on khat has developed. They suggest that in the United Kingdom, debates on khat have been structured around the alliance of advocates for khat prohibition. The authors identified two key “positions” undertaken by these stakeholders. The first positional effect was that of those coming from the “cognitive perspective” ie those who believed that khat had deleterious effects on cognitive functioning and mental health. The coalition of clinicians and psychiatrists draw predominantly on the experiences of those who have experienced problems associated with khat use, rather than from those who experience no harm. Thus this positional effect is to characterize khat in pathological terms drawn from direct experience.

The second positional effect is “evidence hardening” or the process of turning observations into “evidence” and subsequently into the establishment of causal relationships. Three illustrations are salient from this review. The first, noted by Anderson et al., (2007) is the establishment of the causal link between khat use and psychiatric illness. As noted in this review, there is a substantial literature that doubts such a link exists. A second illustration of the process of creation of causal linkages is the link between khat use and social disruption. There is little evidence internationally of criminality associated with khat use. A third positional effect is definitional. By establishing that khat is a drug, then by definition it must cause harm and therefore be bad. As Nutt et al., (2007) established through their ranking of socially-used psychoactive drugs, khat was ranked the lowest of 20 popular psychoactive drugs in the UK in terms of social harm, physical harm and dependence potential. The debates on khat, often by focusing on the clinical science and case reports often fail to account for the broader trends, population level evidence and most importantly fail to count for the important role of context in shaping the effect of the drug.

More detailed work will need to be undertaken to establish the contribution of different position-taking within the Australian debate about khat. No doubt there are similarities, however there are distinct differences in the debate associated with the migration patterns, community characteristics and social conditions for the diaspora.

In conclusion, there is an emerging consensus among international health authorities that khat has a low abuse potential. Much of the concern raised about the harmful effects of khat are related to excessive use, associated with adverse social conditions related to displacement and social marginalization. In Australia available evidence suggests that the vast majority of khat import licenses are granted for dried khat suggesting that the majority of khat being imported is low in the most active constituent cathinone. The scientific literature suggests that the social and physical impact of khat is also low. This review suggests that whilst educational campaigns to reduce harmful consumption may be beneficial for some targeted communities, changes to the processes of social marginalization among African diaspora communities in Australia may have a more impact in reducing the harm associated with khat consumption.

4. Issues for consideration

The following issues are provided to assist further discussion.

For the individual

The UK Advisory Council on the Misuse of Drugs (ACMD, 2005) suggested that “there is great value in education and information about khat use and its impact”. The literature suggests that at the individual level, more informed understanding of the relationships between mental health, wellbeing, family disruption and khat use among men may be well received. A simple information-based education campaign is perhaps least likely to be effective. A more contextualized peer-led set of strategies delivered through primary care services and explicitly not delivered through drug treatment services (ACMD, 2005: p29) was recommended. Precisely what education and information is most appropriate in an Australian context needs to be explored.

For the community

Emerging from the work of Anderson et al (2007) is an appreciation that in the UK, the community needs to acknowledge the importance of gender relations in shaping how the community deals with khat. Many of the social harms being discussed have their roots in changing gender roles which can be manifest in gender-based harms such as economic isolation, domestic violence and family disruption. For example, on the one hand khat chewing provides a space and a social opportunity for the performance of a gendered identity among men. On the other hand chewing places pressure on money and time within communities where time and money are under great pressure. A key issue for the community is how to manage khat use through these changing gender relations.

For the regulators

Emerging from this review is a broad framework through which to approach the khat issue. The international evidence suggests that it is a changing context that provides the greatest challenge to safe khat consumption. Regulating the setting in which khat is situated may well deliver the most effective regulatory approaches. There are two settings which together require some consideration; the market setting and the legal setting.

The evidence so far suggests that the market for khat is worth approximately \$2.2 million annually in Australia. This is a small market, however for such a small, disadvantaged community it is substantial. A key question for regulators is how to regulate the market without creating untoward harm.

There are three approaches from precedent and a fourth by logic, that are available to regulators. The first option is the criminalization of khat use. Evidence from Canada and Sweden would suggest that criminalization produces few benefits and may increase costs to the community. The second approach is to allow an unrestricted khat market such as that in the United Kingdom. This approach also has some downsides, however it does avoid some of the negative outcomes from criminalization. The third option of doing nothing is also available, however increasingly, it can be seen that the global market for khat is growing as the size of diaspora grow. The fourth approach not implemented anywhere is the introduction of a regulatory regime that levies the commodity and where the proceeds of the levy contribute to community building and reducing khat-related harm. This final regulatory response may offer an alternative to the current regulatory regime and requires some thought and discussion with the community.

Further consultation

If further consultation is to be conducted, it would be wise to avoid the kind of processes through which the controversy on khat developed in the United Kingdom (Anderson et al., 2007). A question worth considering in this regard is to what extent consultation should be framed around deeper issues such as building community capacity, reducing family disruption, and addressing mental health problems rather than on khat itself. The issue of khat may be a good way to engage with some of these issues, however to focus on khat could be a distraction from the deeper social determinants of good health.

Finally, a well-constructed consultation process could pose to the community the potential legal and market regulatory options considered in the previous section.

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