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HEALTH EFFECTS AND ASSOCIATION OF DEMOGRAPHIC CHARACTERISTICS WITH KHAT CHEWING FOR RESIDENTS BETWEEN 18 – 50 YEARS IN MOYALE SUB-COUNTY, KENYA

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ABSTRACT

Objectives: To determine the proportions, social demographic characteristics and association of health effects with khat chewing for residents between 18 – 50 years in Moyale Sub-County.

Design: A cross-sectional descriptive study.

Setting: Moyale Sub-County, Marsabit County.

Subjects: Four hundred and twenty two randomly selected persons aged between 18 – 50 years in Moyale Sub-County. Quantitative data was analyzed using descriptive statistics and associations were determined using inferential statistics.

Main outcome measures: Health effects and association of demographics with khat chewing.

Results: The study found that the proportion of khat users in Moyale Sub-County was 81%. Majority of khat users were males (75%) compared to females (25%). Males spend more than 5 hours a day chewing khat. There was a strong association between the number of people who live in the household and chewing khat ($p=0.046$). The study found reasons for chewing khat as; peer pressure (73.2%), stress (10.3%) and idleness (7.2%). The health effects associated with khat chewing were: difficulty in sleep (94%) decreased energy (77.5%) and reduced sexual desire.

Conclusion: Khat chewing affects a large proportion (81%) of the population with 75% being males and 25% females. Prolonged use of *khat* leads to adverse negative effects.

INTRODUCTION

Khat is an evergreen flowering tree or shrub of the *Celastraceae* family that grows in the equatorial climates and high altitudes, mainly in the Arabian Peninsula, the regions around the horn of Africa extending from eastern to southern Africa (1,2).

Khat has a botanical name *Catha edulis*. It is known by various names in the different regions where it is grown, such as Arabian Tea, Abyssinian tea, Tchat, Chak, Chaad, Khat and Qat. In Kenya, it is known as *khat*. *Muguka* etc. Ethiopia, Yemen and Kenya are the three main khat growing Countries. Khat is cultivated or grows wild in Uganda, Tanzania, Rwanda, Zimbabwe and South Africa. Khat is also typically grown among crops such as coffee, legumes, peaches, or papayas (3).

Mastication is the main method of khat use at present, but historical narratives suggest that dry khat leaves may have been used in a similar manner to tealeaves in the past (3). The young buds and tender leaves of khat are chewed to attain a state of euphoria and stimulation (4). Khat chewing produces psycho stimulation effect in the form of euphoria and excitement because of cathinone contents (5).

Chewing khat is both a social and a culture-based activity. It has been used to enhance social interaction, playing a role in ceremonies such as weddings (6). In Yemen, Muslims are the most avid chewers. Some people believe that chewing facilitates contact with Allah when praying. However, many Christians and Yemenite Jews in Israel also chew khat. Khat is a stimulant and it is used to improve performance, stay alert and to increase work capacity. It contains more than forty alkaloids, glycosides, tannins, amino acids, vitamins and minerals (4,7).

The environmental and climate conditions determine the chemical profile of khat leaves.

In the Yemen Arab Republic, about 44 different types of khat exist originating from different geographic areas of the country (1).

In Kenya, *Khat* is predominantly cultivated in Meru and Embu counties whose fresh leaves and soft twigs are chewed to release a juice that alters the mood of the user. *Muguka* is a relatively short shrub and is produced in Embu County while *miraa* is mostly grown in Meru County. A variant of the *khat* plant also grows naturally in parts of Rift Valley region of Kenya.

Khat consumption elicits much debate with regards to its classification as a drug and its socio-economic and health effects to the consumer (8). In 1980, the World Health Organization classified *khat* as a drug of abuse that can produce mild to moderate psychological dependence (9,10).

Mwenda *et al.* (11) shows that *khat* chewing lowers libido in humans and may lead to sexual impotence following long-term use in a study showing association of khat use on reproductive functions. In pregnant women, consumption affects growth of fetuses by inhibiting utero-placental blood flow leading to impaired growth. *Khat* consumption affects the potency of male sexuality by lowering spermatogenesis and plasma testosterone concentration. However, the authors' points out that the precise mechanisms by which *khat* may affect the male reproductive physiology have not been elucidated. Other medical studies have associated *khat* consumption with impairing both cognitive flexibility and the updating of information in working memory (12,13).

In a previous study, long term *khat* use has been associated with insomnia, anorexia, gastric disorders, depression, liver damage and cardiac complications, hallucinations, paranoia, manic delusional behavior, violence as well as *khat*-induced psychosis (2,3,14).

According to the World Health Organization (15), the main effects of *khat* are on the cardiovascular system, gastrointestinal system and the nervous system.

A study by Nut *et al.*, (16) shows that *khat* was ranked 20 lowest of the most well-known licit and illicit psychoactive substances. It has low physical harm, dependence and social harm. Griffiths *et al.*, (8) indicated that use of *khat* by Somali immigrants in the United Kingdom, rarely did result to medical problems associated with *khat* chewing.

The research problem addressed in this study is that despite the many negative effects of *khat* chewing, a large number of people in Moyale Sub County still engage in the practice. This has resulted in a lot of negative consequences the effects of *khat* chewing in the area has not been given much attention and majority of the local population may not be aware of the negative consequences of *khat* chewing. This study therefore attempted to find out the reasons for the continued use of *khat* in the area and evaluate the negative effects of *khat* chewing to the users, which are not well known.

METHODS

The study was conducted in Moyale Sub-County, Marsabit County using cross sectional survey design. Moyale Sub-County has an area of 9,390 km². It has its headquarter is Moyale town (17). The town is on the border of Ethiopia and Kenya. According to the 2010 census, the sub county had a population of 103,799 people (18). The sub county lies between latitudes 02°11" North and 02° 4" North and longitude 38° 16" East and 39° 21" East. It borders Ethiopia to the north and Wajir County to the southeast. The main vegetation types of the districts are bushes and shrubs, which are quite scanty in most parts due to high evapo-transpiration, which exceeds the

annual precipitation rate leading to moisture deficiency (19). The main ethnic groups in the sub county are Boran, Gabbra, Rendille, Turkana, Samburu, Ariaal, Burji, Waata, Konso and a few Somalis and their main economic activity is pastoralism.

The study targeted residents who are aged 18 to 50 years old (both men and women) in Moyale Sub-County. Further, health service providers from the local public health facilities were targeted to provide an insight into the effects of *khat* abuse, frequency of cases handled on *khat* addiction, and difficulties associated with the use of *khat* or the withdrawal from them.

Three wards were selected randomly through balloting. Through Convenience random sampling, household were selected from each of the three (3) wards. Number of study participants from each category in the study areas were further selected through proportionate allocation to population. A semi-structured questionnaire was pre-tested outside the study area and revised for consistency. Local interviewers were trained to administer the questionnaire and to collect data. Collected data included basic demographics and social economic factors as well as social behavior and *khat* chewing.

Approval for the study was sought from the KNH-UON ethical and research committee, National Council for Science, Technology and Innovation (NACOSTI) for the research permit and other relevant authorities from the Moyale Sub County Health Committee. (551/07/2016) Data was collected at two levels-from the residents of Moyale Sub-County aged 18-50 years; these included both men and women who were either *khat* users or non-*khat* users. It was also collected from health providers (nurses and clinical officers) to get an insight into harmful effects of *khat* use.

The processing and analysis of data was achieved using a statistical package for social

sciences (SPSS version 20). Descriptive statistics such as frequencies and percentages were used to summarize quantitative variables and present data inform of frequency tables, bar charts and pie charts, figures and narration.

The inferential statistics used was used to determine the strength of association between variables. Logistic regression analysis were performed on all independent variables and p-value of less than 0.05 was considered significant.

RESULTS

The mean age of the respondents was 34.5, majority of the respondents (27%) were aged between 18-25 years, 12% aged between 26-30 years, 23.5% aged between 41-45 years and 15% of them were aged above 45 years.

The respondents' gender was, 75% male and 25% female. The level of education was reported at 60.5% of the respondents with no education, 25% attained some level of education in college and universities, 9.5% secondary school and 4.5% primary level of education. Majority of the respondents (63%) were Muslims, 30.5% Catholics and 5.5% said they were protestants.

Level of occupation by majority of the respondents was (29.1%) traders/business owners, 27.6% had no work, 21% were government employees, 13% farmers and 9% casual laborers.

Ethnically, majority of the respondents (34%) were from Borana ethnicity, 22% Burji, 20% were Gabra, 8% Garre and 13% were others including Rendille and Somalis. This is shown in table 1.

Table 1

Summary of Social demographic characteristics of respondents of Moyale sub-county

Characteristics	Category	Frequency (n=422)	Percent (%)
Age (Mean age=34.6)	18-25	114	27
	26-30	51	12
	31-35	44	10.5
	36-40	51	12
	41-45	99	23.5
	45>	63	15
Gender	Male	317	75
	Female	105	25
Education level	Primary	19	4.5
	Secondary	41	9.5
	College/ university	106	25.0
	None	254	60.5
	Others	2	0.5
Religion	Muslim	266	63.0
	Catholic	129	30.5
	Protestant	23	5.5
	Others	4	1.0
Occupation	No work	116	27.6
	Farming	57	13.1
	Trading/Selling	122	29.1
	Government employee	89	21.1
	Labourer/Casual worker	38	9.1

Marital status	Single	131	31.0
	Married	243	57.5
	Divorced	36	8.5
	Widowed	13	3.0
Ethnic group	Borana	145	34.0
	Gabra	84	20.0
	Burji	93	22.0
	Garre	34	8.0
	Sakuye	11	2.5
	Others	55	13.0

Majority of the respondents 39.4% reported that their monthly household income ranged between Ksh. (15,000-30,000), 20.6% reported between (Ksh. 5,000-15,000), 18.3% between (Ksh. 30,000-50,000) and 15% said their monthly income is between (Ksh. 1000-5000). Most the respondents (70%) reported they dwell was in blockhouses, 17% in mud houses,

8% in huts and about 5% in Grass thatched houses. About 73.2% said that peer pressure was the main reason for indulging in khat chewing, 10.3% due to stress, 7.2% as a result of idleness, 6.7% say they found their parents also chewing khat. This is shown in the graph 1.

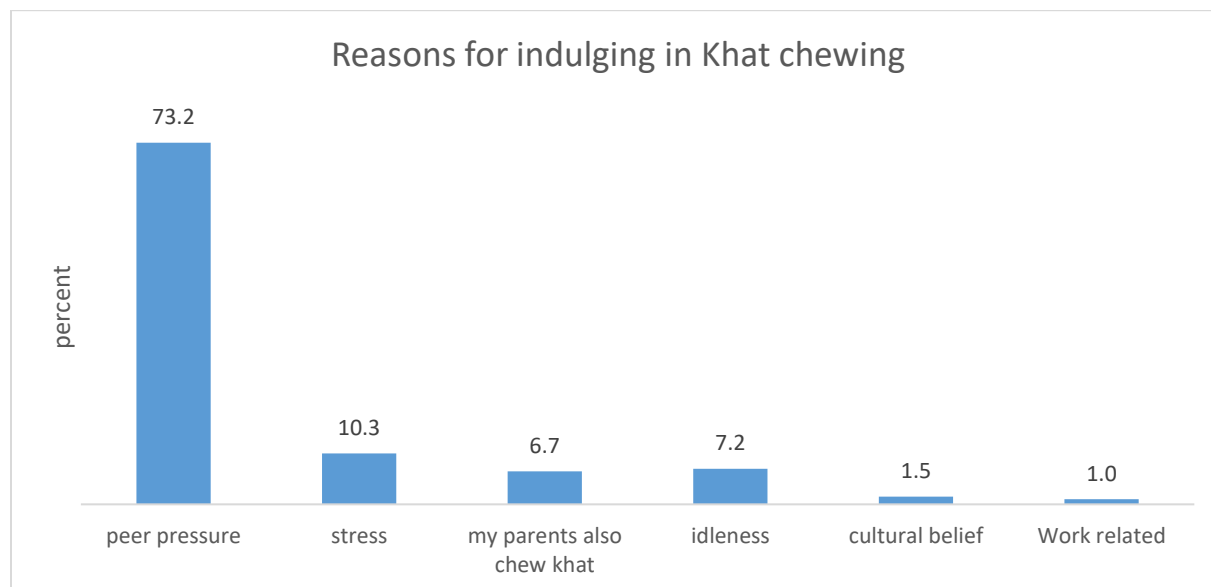


Figure 1. Summary of reasons for indulging in Khat chewing (n=422)

Majority of the respondents (98%) know that khat chewing has negative effects and only 2% said that khat chewing has no negative effects at all. Health issues associated with khat chewing indicated that majority, (94%) reported that they had trouble falling asleep,

77.5% said that they experience decreased energy, 41.5% reduced sexual desire, about 34.5% said increased sexual desire, 28.5% said mental fatigue and about 12.5% said decreased libido.

Table 2

Health problems associated with Khat chewing (n=422)

Health issues/problems	Frequency (n)	Percent (%)
Increased energy	106	25
Decreased energy	327	77.5
Reduced sexual desire	175	41.5
Increased sexual desire	146	34.5
Difficulty to sleep	397	94
General poor health	181	43
Mental fatigue	120	28.5
Decreased libido	53	12.5

Table 3

Association of health problems to Khat chewing with social demographic characteristics using Chi-square

		Khat use		χ ² - value (df) P-value
Variable	Category	Yes n	No. n	
Age	18-25	95	19	χ ² =0.079
	26-30	21	30	
	31-35	20	19	
	36-40	43	9	
	41-45	44	55	
	45>	29	27	
Gender	Male	275	42	χ ² **=11.405 (2) p=0.003
	Female	69	36	
Education	Primary	16	3	χ ² **=0.001
	Secondary	35	6	
	College	85	21	
	None	204	50	
Religion	Muslim	220	46	χ ² =0.884
	Catholic	104	25	
	Protestant	17	4	
	Others	4	0	
Occupation	No work	93	19	χ ² =0.250
	Farming	42	15	
	Trading/selling	107	15	
	Gov't employee	66	23	
	casual	29	9	
Marital status	Single	101	30	χ ² **=0.0002
	Married	203	40	
	Divorced	32	4	
	Widowed	9	4	
Ethnic group	Borana	124	21	χ ² =0.842
	Gabra	65	19	
	Burji	78	15	
	Garre	28	6	
	Sakuye	9	2	

	Others	40	15	
No. of people in the HH who chew <i>khat</i>	0	2	4	P=0.046
	1	145	43	
	2	112	15	
	3	40	9	
	4	24	4	
	5	15	0	
Economic effects of <i>khat</i> chewing	Waste of time and resources	95	26	P=0.00315
	Less production	45	8	
	No saving	13	1	
Social effects of <i>Khat</i> chewing	Social perils such as unwanted pregnancy	61	18	P=0.00782
	School dropout	21	4	
	Causes crime	32	7	
	Mental conflict	31	5	
	Increased interactions with other <i>khat</i> chewers	7	1	

DISCUSSION

This study explored *khat* chewing practice, and its perceived negative health and socio-economic consequences. In accordance with traditions, *khat* is used as socializing substance and is widely consumed among males. Culturally, women are prohibited to chew *khat*. It was evident that in this study, 3 in every 4 of people chewing *khat* were male. This corresponds with reports by NACADA, (9) which reported that the male gender constitutes more than two-thirds of the surveyed population (66.3% males against 33.7% females).

The survey also revealed that majority (61%) of the *khat* chewers had no formal education at all, many of whom were youth aged between 18-25 years. This shows that the majority of the youth have no formal education and have no jobs thus engaging in *khat* chewing to pass time. It also indicated that the level of idleness by the youth had no meaningful economic contribution and the outcome was significantly associated with *khat* chewing.

This study established that 81% of the people interviewed reported to be using/chewing *khat*. This number was quite high and alarming considering the health and socio-economic effects of *khat* use. Family influence played a major role in the initiation into the *khat* chewing habit, since most of the chewers had one or more family members who was chewing *khat*.

In this study, it was found that in about 44% of the households, there was at least one-person consuming *khat*. The number of people who live in the household was significantly associated with *khat* use ($p=0.046$) an indication that the habit is predominant in the area.

These findings were similar to other studies conducted in North Eastern Kenya by (Aden et al, (8)) which found that eighty percent (80%) of respondents were *khat* chewers, and the majority had family members who engaged in the *khat* habit.

Majority of *khat* chewers in our study were influenced by peer pressure, stress, idleness and the influence by their parents. Other

respondents cited that khat chewing helps in socializing. Our data indicated that 3 in 4 respondents chewed khat in groups. These results are similar to the previous reports and it indicated that khat has similar effect to that of amphetamine and other psycho stimulants. The respondents additionally cited that the benefits of khat chewing included relieving stress, reduction of boredom and reducing tiredness. Some of the respondents said that khat chewing does not help them at all. *Khat* chewers take more than 5 hours sitting and chewing which has a direct impact on the economy of the County and the Country because of the people that chew become less productive. Additionally, this gives rise to the high poverty levels experienced in the County as the act of khat-chewing practice does not help in any economic contribution directly.

Poverty is further, exacerbated by expenditure on *khat* with about 50% of khat users reporting that they use between ksh.200-500 on a daily basis leading to wastage of resources and exhausting the little savings. Our findings resonates well with the study by Aden et al, (8), which observed that majority of khat chewers spent more than half of their domestic budget on their daily habit, at the expense of vital needs such as education and medical care.

Khat chewing started in the afternoons of most social gatherings. People in Moyale sub county believe that on these occasions, *miraa* has given rise to low productivity, inefficiency and absenteeism at work. About 98% of khat chewers have reported that they experienced negative health effects of *khat* chewing. The general health effects experienced include difficulty in sleep, mental fatigue, decreased energy, decreased sexual desired/decreased libido and general poor health. *Miraa* chewing has serious psychosocial effects on the users.

Majority of the respondents reported: morning irritability, tendency to talk too much,

late arrival at work and aggressive behavior. Chronic use of *khat* has been shown to lead to depressed mood and psychiatric disturbances. Previous studies by Al-motrreb *et al.*, (1) found that a large proportion of khat users reported increased levels of energy and enhanced mood. NACADA, (9) reported more than eighty percent (80.9%) of the khat users reported having experienced insomnia which is a common effect of khat use and the users overcome by using sedatives or alcohol. Over 70% of other studies, *khat* chewers reported having experienced reduced appetite and anorexia follows (20)

Khat chewing has is associated with social perils such as unwanted pregnancies, crime as a result of high poverty, marital conflicts, school dropouts and idleness.

CONCLUSION

Khat chewing habit affects fairly a large proportion of Moyale population with majority being of the male gender. The common health effects associated with chewing of *khat* include both increased and decreased energy, alertness, insomnia, enhanced mood and reproductive health effects. Khat chewing also leads to economic loss to the household, community and the county due to wastage of resources that are meant for other meaningful purposes, unproductivity due to idleness and lack of savings. Based on these results, efforts and awareness programs are required to provide change to the behavior of new generations.

The focus should involve religious leaders and the government in guiding on creating formal and informal job opportunities as well as providing micro financing and income generating projects.

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