



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH

An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Research Article

December 2016 Vol.:8, Issue:1

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Socio-Economic and Health Effects of Khat Chewing in Mekelle, Tigray Region, Ethiopia

			
IJPPR		HUMAN	
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH		An official Publication of Human Journals	
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www.ijppr.humanjournals.com

Keywords: Khat Chewing, Perceived Health Impact, Socio-economic

ABSTRACT

Background: Khat chewing practice has increased over the years and chronic khat use is associated with adverse health and socio-economic effects. Thus, this study was undertaken among khat chewers in Mekelle town, northern Ethiopia to investigate socio-economic and health-related effects of khat chewing. **Methods:** A cross-sectional study was conducted in Mekelle from April to May 2016 with the help of a structured questionnaire to collect data. Simple random sampling method was used to select the respondents. Descriptive statistics were employed for summarization and presentation of data. **Results:** Khat chewing was most commonly practiced among male gender (87.1%), productive age group (94.7%), Orthodox Christians (68.0%), unmarried (60.9%), employed (75.7%), educated (53.7%) and high-earned (59.4%) people. Majority of them initiated by peer pressure (34.4%) for academic good performance (24.1%) and continued the practice for entertainment (24.6%) and alertness purpose (24.3%). Just more than half of the respondents (51.6%) chewed khat daily. About three often khat chewers spent at least 500 ETB on khat per week even though more than half of the respondents (55.1%) were unwilling to disclose khat expenditure. Most khat chewers drank alcohol (64.9%) after chewing khat and smoked cigarette (50.8%) and consumed substances such as peanut (60.4%), coffee (75.7%) and soft drinks (59.4%) while practicing khat chewing. Majority of the respondents reported perceived health effects such as sleeping disorder (77.8%), reduced appetite (39.1%), depression (32.7%) and gastrointestinal adverse effect (24.8%). Half of khat chewers believed that they would plan to stop the practice in the future. **Conclusions:** The community, especially youth, need to be aware of negative health and socio-economic consequences of khat chewing through designing educational strategies to bring behavioral change.

INTRODUCTION

Catha edulis (khat, belonging to family: Celastraceae) is an evergreen plant having psychoactive substances such as cathinone and cathine, which have central stimulation effect analogs to amphetamine [1]. The psychostimulant khat is a herbal drug cultivated and chewed as a recreational and socializing drug in East Africa and the Arabian Peninsula for centuries [2]. Increased consumption of khat has serious socio-economic and health consequences [3]. Khat chewing causes adverse effects on health, reduced production of economy, loss of working hours, malnutrition and diversion of income for the purchase of khat, resulting in absenteeism and unemployment [4].

Chronic khat use is associated with adverse health effects such as hypertension, heart rhythm disorders, insomnia, liver toxicity, oral cancer, hypertension, spermatorrhoea and hemorrhoids, loss of appetite and gastrointestinal effects [5,6]. Medical problems associated with khat intoxication include psychiatric manifestations such as deterioration of psychophysical function and schizophreniform psychoses [7,8]. Some other khat chewers also experience anxiety, tension, restlessness, hypnogogic hallucinations, hypomania and aggressive behavior or psychosis [3].

The proportion of people chewing khat in Ethiopia has significantly raised over the years. It was believed that khat use was originated from Ethiopia and previously, it was grown and chewed in the eastern part the country. Nowadays, it is cultivated and chewed in all regions among religious and ethnic groups. The percentage of khat chewing practice among regions of Ethiopia ranges from 1.1% to 53.2% with the overall prevalence of 15.3% [9]. Ethiopia is the world's largest producer of khat with perhaps a third exported to Djibouti and Somaliland, and the bulk consumed within the country [10]. Even though studies conducted among the community and students are available in different regions, no studies were done among khat chewers alone. Therefore, this study was undertaken in khat chewers in Mekelle town, northern Ethiopia to investigate socio-economic and health-related effects of khat chewing.

MATERIALS AND METHODS

Study design and setting

A community-based cross-sectional study was conducted in Mekelle from April to May 2016. Mekelle is the capital city of Tigray region, at a distance of 783km from the Ethiopian capital city, Addis Ababa. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia, the town has a total population of 215,914 and 56,754 households [11]. It is administratively divided into seven sub-cities and 33 kebelles. These sub-cities are Adi Haki, Ayder, Hadinet, Hawelti, Kedamay Weyane, Quiha and Semien. Of these, Kedamay Woyane is the biggest market complex in the city.

All khat chewers aged 15 years and older, and who lived for at least 6 months in the town were included in this study while khat chewers who were unwilling to participate and not mentally fit were excluded.

Sample size determination and sampling technique

The sample size of the study was calculated using the formula for a single population proportion by considering the following assumptions: A 95% confidence level, margin of error (5%), and 50% of proportion of khat chewing practice. The final sample size calculated was 422 after considering 10% non-response rate.

From Kedamay Woyane market complex of Mekelle town, three kebelles 14, 15 and 12 were purposefully selected because of their prominent activities in khat market and chewing practice. Approximately there were 40, 30 and 8 khat chewing houses in kebelles 14, 15 and 12, respectively. Moreover, chronic khat chewers who sold khat at their own shops were also involved in the study. Study participants were selected proportionally from all khat chewing houses in the chosen kebelles by simple random sampling method.

Data collection and analysis

A structured questionnaire for quantitative data was developed by reviewing previously relevant literature. The questionnaire was developed in English; then translated into the local language (Amharic) and back into English to check the accuracy by an independent translator. The questionnaire includes socio-demographic characteristics (gender, age, religion, marital status, monthly income, occupational and educational statuses of

respondents), khat chewing practice (initiators to and reasons of chewing khat, frequency of chewing khat, amount of money spent on khat per week and substances used along with and after the practice), perceived negative consequences and future plan of khat chewing practice. Data were entered into the Statistical Package for Social Sciences (SPSS) version 20.0 to generate descriptive statistics. The results were shown in absolute figures and percentages as described in Tables.

Ethical considerations

Ethical clearance was obtained from the Health Research Ethics Review Committee of Health Sciences, Mekelle University. Informed consent was obtained from each respondent after explanation of the objectives of the study and confidentiality was assured.

RESULTS

Socio-demographic characteristics

Of the total 422 questionnaires distributed to be filled during the survey period, about 419 (99.3%) were filled completely and collected. Around 7 in 8 study participants who chewed khat were males. The mean age (standard deviation, SD) of the respondents was 30 (7.79) years and most (48.4%) of them were in the age group of 25-34. Majority of the respondents were Orthodox by religion (68%), unmarried (60.9%) and employed (75.7%). More than half of the respondents earned an average income of more than 1000 Ethiopian Birr (1 USD = 21.13 ETB) (59.4%) and graduated from college or university (53.7%) (Table 1).

Table 1. Socio-demographic characteristics of the study participants in Mekelle 2016 (n = 419)

Characteristics	Category	Frequency	Percentage
Gender	Male	365	87.1
	Female	54	12.9
Age	15-24	109	26.0
	25-34	203	48.4
	35-44	85	20.3
	≥45	22	5.3
	Mean (SD)	30 (7.79)	
Religion	Orthodox	285	68.0
	Muslim	97	23.2
	Protestant	16	3.8
	Others	21	5.0
Marital status	Single	255	60.9
	Married	138	32.9
	Divorced	23	5.5
	Separated	3	0.7
Employment status	Employed	317	75.7
	Unemployed	102	24.3
Monthly income (ETB)*	<500	90	21.5
	500-1000	80	19.1
	>1000	249	59.4
Education level	Illiterate	4	1.0
	Read & write	33	7.9
	Primary education	34	8.1
	Secondary education	123	29.4
	Tertiary education	225	53.7

* Exchange rate: 1 USD = 21.13 Ethiopian Birr (ETB).

Khat chewing practice

Most of the khat chewers initiated by peer pressure (34.4%) followed by academic purpose (24.1%) and ceremony of khat (15.2%). Majority of the study participants continued khat chewing practice since then for pleasure and recreation (24.6%) and alertness (24.3%) reasons while some influenced by their colleagues (18.4%) and used to increase their concentration on studies (17.6%). Just more than half of the respondents (51.6%) chewed khat daily. About three often khat chewers spent at least 500 ETB on khat per week even though more than half of the respondents (55.1%) were unwilling to disclose khat expenditure. Majority of the participants (64.9%) drank alcohol after practicing khat chewing every time and smoked cigarette (50.8%) while chewing khat. Respondents used additional

substances such as peanut (60.4%), coffee (75.7%) and soft drinks (59.4%) while practicing khat chewing (Table 2).

Table 2. Khat chewing practice in Mekelle

Variable	Reason	Frequency	Percentage	
Initiators to chewing khat	Peer pressure	206	34.4	
	Academic purpose	144	24.1	
	Ceremony of khat	91	15.2	
	Unemployment	52	8.7	
	Religion purpose	31	5.2	
	Family chewing habit	30	5.0	
	Production of khat	28	4.7	
	Others	16	2.7	
Reasons for chewing khat	Enjoyment	153	24.6	
	Alertness	151	24.3	
	Peer pressure	114	18.4	
	Academic purpose/ concentration	109	17.6	
	Social life	40	6.4	
	Religion purpose	35	5.6	
	Energy	11	1.8	
	Others	8	1.3	
	Frequency of chewing khat	Every day	216	51.6
		Thrice a week	58	13.8
Twice a week		47	11.2	
Once a week		47	11.2	
Variable		51	12.1	
Money spent per week(ETB)	<500	63	15.0	
	≥500	125	29.8	
	Missing data	231	55.1	
Substance use	Alcohol	272	64.9	
	Cigarette	213	50.8	
	Cannabis	33	7.9	
	Others	11	2.6	
Additive substance	Peanut	253	60.4	
	Coffee	317	75.7	
	Soft drinks	249	59.4	
	Juice/orange	91	21.7	
	Sugar	76	18.1	
	Others	100	23.9	

Perceived health effects of chewing khat

The most frequently perceived general negative effect of khat chewing among the respondents was an economical crisis (79.2%) followed by socio-cultural (39.4%) and psychological (26.5) consequences. Sleeping disorder (77.8%) was the most commonly perceived health effect followed by reduced appetite (39.1%), depression (32.7%) and gastrointestinal adverse effect (24.8%) (Table 3).

Table 3. Perceived health effects reported by khat chewers in Mekelle

Variable	Perceived effect of khat chewing	Frequency	Percentage
General negative effects	Physical health	78	18.6
	Psychological	111	26.5
	Economical	332	79.2
	Socio-cultural life	165	39.4
In detail negative health effects	Sleeping disorder	326	77.8
	Reduced appetite	164	39.1
	Depression	137	32.7
	Gastrointestinal adverse effect	104	24.8
	Anxiety	72	17.2
	Hallucination	37	8.8
	Hypertension	17	4.1
	Others	25	5.9

Future plan of khat chewing practice

Majority of the respondents (63.5%) were chewing khat because of addiction while about half (49.9%) could not quit practicing khat chewing though they had tried. However, around half of khat chewers (50.4%) believed they would plan to stop the practice in the future even if some (30.8%) were in dilemma (Table 4).

Table 4. Future intention of khat chewing practice among respondents in Mekelle

Variable	Category	Frequency	Percentage
Chewing khat because of addiction	Yes	266	63.5
	No	153	36.5
Tried to quit khat chewing in the past	Yes	209	49.9
	No	210	50.1
Intention to stop khat chewing	Planned to stop	211	50.4
	Never planned to stop	72	17.2
	Undetermined	129	30.8

DISCUSSION

The present study explored khat chewing practice, and its perceived negative health and socio-economic consequences. In accordance with tradition, khat is utilized as socializing substance widely consumed among males and culture restricts females to chew khat compared to males [12,13]. This survey also confirmed this concept that about seven of eight khat chewers were males, which was in agreement with other studies conducted in different parts of Ethiopia [13-18]. Orthodox Christians were the prominent khat chewers in this study, which contradicted with other studies done in the country [13,15,17,19] where Muslims were the predominant khat chewers for the concentration purpose during praying time even though this concept is not accepted in other nations such as Saud Arabia due to lack of base in Islam [20,21]. The low proportion of Muslim chewers in the study area is associated with the significant higher Orthodox and lower Muslims population in Tigray administrative region.

In terms of religion, 95.5% of the population are Orthodox Christians, 4.1% and 0.4% are Muslims and Catholics respectively [22].

This survey revealed that the habit of khat chewing was most commonly practiced by unmarried, employed, educated and high-earned people, and 95% of them were in the age group of 15-45 years. Furthermore, about some khat chewers spent much money for purchasing khat, which was consistent with other findings [15]. The survey from Jimma town, southwestern Ethiopia showed a strong association of khat chewing with age, education and occupation [13]. Other studies also indicated khat chewing affects a majority of the educated [23], unmarried [15] and most productive age group in Ethiopia [15,23]. However, a study done in Mana District, Jimma zone, southwestern part of Ethiopia indicated high proportion of khat chewing behavior among illiterates [15]. This could be related to the variation in the educational status of the population and growth of Mana District and Mekelle city of Tigray regional administrative. Involvement of the most educated and productive age group in khat chewing practice may lead to a fall in economic productivity as well as health related problems. Therefore, minimizing the use of khat among productive age group of the community may have a crucial impact on their health and economic development [9,24].

Majority of the khat chewers in the present study initiated by peer pressure for academic good performance and continued the practice for entertainment and alertness purpose while some influenced by their colleagues. The study done in Dera Woreda, Amhara region, Ethiopia reported that peer pressure, family chewing habit, religion purpose and production area of khat initiated people to chew khat and kept on using khat to be alert, for enjoyment, and to avoid sleeping during praying [19]. A similar study conducted in the north-eastern province of Kenya also revealed familial influence played a crucial role in initiation into the khat habit and this habit was thought to increase levels of alertness, happiness and activity among khat chewers [6]. The study conducted at Jimma University, Ethiopia showed a significant negative effect of khat use on students' academic performance, which is proportional to the extent or dose of khat [14]. Hence students need awareness about the negative consequences of khat chewing practice on their academic performance.

Just more than half of the study participants chewed khat on daily bases in the present study, which was in agreement with the findings of other studies [13,15]. Traditionally, cigarette smoking and coffee drinking accompany khat chewing in order to get excitement [13] while alcohol is used to neutralize the stimulating effect and sleeplessness caused by the khat [4].

The results of this study indicated majority of the participants drank alcohol after practicing khat chewing and were smoking cigarette and taking peanut, coffee and soft drinks while chewing the khat. Other studies reported a strong link between khat chewing and alcohol consumption [16,25]. The study done in Mana district, Jimma zone, southwestern Ethiopia investigated a significant association of khat use with cigarette smoking, and consumption of coffee, alcohol beverages and soft drinks [15]. Similarly, it was reported that the habit of khat chewing strongly related to cigarette smoking and coffee drinking [13].

In this survey, majority of the respondents reported perceived health effects such as sleeping disorder, reduced appetite, depression and gastrointestinal adverse effects. Zeleke *et al.* reported perceived health effects of khat chewing practice such as sleeping disorder, hallucination, tooth staining, anxiety, and loss of appetite, depression, constipation, gastritis, hypertension and psychosis [19]. Similarly, results such as sleeping disorder, depression, hallucination and anxiety were obtained from community-based studies in different origins [26,27]. Chronic use of khat can cause more serious adverse neurological, psychiatric, cardiovascular, dental, gastrointestinal and genitourinary effects in addition to its socio-economic adverse effects [24]. The increasingly widespread of khat chewing habit increases the burden of non-communicable diseases and development of unhealthy risky behaviors in Ethiopia [9].

Majority of the study participants in this survey had a persistent practice of khat chewing as a result of addiction while half made unsuccessful efforts to quit chewing khat. These findings were in line with the results of the study conducted in Addis Ababa, Ethiopia [28]. Studies showed khat has addictive potential [29] and cathinone is the dependence-producing constituent of khat leaves [4]. In the present study, half of the khat chewers intended to quit the practice in the future. Correspondingly, other studies reported the proportion of khat chewers who had tried to stop khat chewing and wanted to stop khat chewing [30,31]. Appropriate intervention programs and policies are required to tackle khat chewing habits in Ethiopia and target the most at risk populations [9].

CONCLUSION

This study investigated khat chewing was most commonly practiced among male gender, productive age group, Orthodox Christians, unmarried, employed, educated and high-earned people. Most of them initiated by peer pressure for academic good performance and continued the practice for entertainment and alertness purpose while some influenced by their

colleagues. Some spent much money for buying khat and half chewed khat daily. Majority of the respondents reported perceived health effects such as sleeping disorder, reduced appetite, depression and gastrointestinal adverse effect as well as socio-economic consequences. The community, especially youths, need to be aware of negative health and socio-economic consequences of khat chewing through designing educational strategies to bring behavioral change.

ACKNOWLEDGMENTS

We would like to acknowledge the study participants for their precious time. We are also grateful to the School of Pharmacy, College of Health Sciences, Mekelle University, Ethiopia, for the cooperation in facilitating the study.

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