



DETERMINATION OF THE PREVALENCE OF KHAT CHEWING AMONG STUDENTS OF THE HIGH SCHOOL IN JAZAN CITY, SAUDI ARABIA

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ABSTRACT

A cross sectional study was carried out among 375 high school male students in Jazan City, Saudi Arabia using a self-administered questionnaire. The objectives of this study were to determine the prevalence and associated factors of Khat chewing among students of the high school in Jazan city, Saudi Arabia and to study its impact of on students' academic performance. The age of the students ranged between 15 and 21 years with a mean (SD) of 17.4±1.2 years. The life time and current prevalence of Khat chewing were 48.8% and 33.9%, respectively. Students ages over 18 years were at almost 2.5-fold risk to chew Khat compared to those ages 17 year or less (OR=2.44, 95%,

CI=1.12-5.33, p=0.026). Approaching half of the students living in rural areas (45.8%) compared to 29.1% of those living in urban areas chewed Khat and the difference was statistically significant (OR=0.49, 95%, CI=0.27-0.90, p=0.021). Regarding reasons for continuing Khat chewing, 49.6% of the students claimed that Khat increased their energy where as 36.2% and 27.6% of them reported that it increased alertness and concentration and made them feel refreshed, respectively. Students whose fathers or brothers were Khat chewer were more significant likely to chew Khat compared to those whose fathers were not Khat

chewer (OR=3.57, 95%CI=1.98-6.46, $p<0.001$; OR=4.11, 95%CI=2.28-17.64, $p<0.001$), respectively.

INDEX TERMS: Khat chewing, adolescence, academic performance.

I. INTRODUCTION

Khat is an evergreen plant, seedless cultivated as a bush and its leaves are characterized by having an aromatic odour, astringent and slightly sweet taste.^[1] Because its chemical contents composed of cathinone which causes psycho-stimulation effect in the form of euphoria and excitement when chewed^[2], it is used by students during examination periods and by drivers of motor vehicles and by soldiers to enhance their performance during wars.^[3] While^[4] considered Khat as an international public concern, its social implications can't be underestimated.^{[5],[6]} reported that khat chewing contributes to family instability and the negligence of family duties.

Adolescence is the critical period where young people are influenced by factors such as economic, social, cultural, and political environments.^[7] Studies conducted in Jazan region indicated that chewing Khat is part of the cultural life.^[8] revealed that the overall Khat chewing prevalence among students in Jazan intermediate and high school students was 20.5%. Another study conducted by^[7] among college and high school students in the same region reported that the overall prevalence of Khat chewing in all the studied population was 21.4%.^[9] who studied the association between family background and Khat chewing behavior among intermediate and upper high school students in Jazan region confirmed the significant impact of peer and familial Khat abuse in adolescent Khat chewing behavior.

Similar studies on Khat chewing among high school students were also conducted at regional and international levels.^[10] studied Khat chewing in Ethiopian students with a life time prevalence of 24.2%, while^[11] studied prevalence of Khat chewing among school ages and above in Yemen with a prevalence of 54.6%.

The objectives of this study were to determine the prevalence and associated factors of Khat chewing among students of the high school in Jazan city, Saudi Arabia and to study its impact of on students' academic performance.

II. METHODOLOGY

- **Study design, setting and population**

This study was carried out in Jazan province in Saudi Arabia. A cross sectional design was used to conduct this study. The study population was the high school male students in Jazan City. There are 18 high schools for boys with 3,327 students enrolled in them.^[12]

- **Sampling and sample size determination**

The minimum sample size for this study was decided according to^[13] as follows.

$$n = \frac{Z^2 \times P \times Q}{D^2}$$

Where

n: Calculated sample size

Z: The z-value for the selected level of confidence = 1.96.

P: The estimated prevalence of using bleaching agents in the population = 33.1%, i.e., 0.331.

Q: (1 – P) = 66.9%, i.e., 0.669

D: The maximum acceptable error = 0.05.

So, the calculated minimum sample size was.

$$n = \frac{(1.96)^2 \times 0.389 \times 0.611}{(0.05)^2} = 340.$$

The sample was increased to 375 to compensate for none or incomplete response of the students.

- **Sampling technique**

The table of random numbers was used to select two high schools. In the selected school, the questionnaires were distributed to all students to fulfill the required sample size.

- **Data collection tool**

A questionnaire as data collection tool was used and it included the following.

Personal characteristics: student's age, scholastic year, parental socio-economic status and residence.

Khat chewing status among participants with its details. Two categories of variables were used in this study. The dependent variable was Khat chewing status of the students. Ever chewed was defined as a student who had ever tried chewed Khat in the past, even once.

Current chewer was defined as a student who had chewed Khat on one or more days in the preceding month (30 days) of the survey. The former was said to be life time prevalence, whereas the latter one was current prevalence rate.

- **Data collection technique**

Within each class, the researcher with the help of teachers distributed the study questionnaire to all students and supervised them and replied to their inquiries. Then the filled questionnaires were received and revised.

- **Pre-test pilot study**

A pre-test pilot study was performed on 25 high school students from another school, whose responses were excluded from the main study.

- **Administrative and ethical considerations**

All the necessary official permissions were fully secured before data collection. The personal consents of the students were asked prior to distribution of the data collection tools. They were clearly informed that their participation in this study is completely optional and that their responses will be used only for research purposes.

- **Statistical analysis**

Collected data were verified and coded prior to computerized data entry and the Statistical Package for Social Sciences (SPSS version 22.0) for data entry and analysis was used. Percentages mean and standard deviation (SD) were used as descriptive statistics. Bivariate analysis and multivariate logistic model analysis were applied to test for risk factors for Khat chewing. Chi-square and adjusted odds ratios (ORs) with their 95% confidence intervals (CI) were computed. A p-value less than 0.05 were considered as statistically significant.

III. RESULTS

This study included 375 high school students in Jazan city, Saudi Arabia. The study revealed that the life time and current prevalence of Khat chewing were 48.8% and 33.9%, respectively among male high school students in Jazan city.

Khat chewing was more reported among students aged over 18 years compared to those aged 17 years or less (49.3% versus 28.9%) and the difference was statistically significant ($P=0.010$). Similarly, it was more reported among students of the third grade compared to

those of the first and second grades (41.7% versus 22.8% and 37.2%, respectively) and the difference was statistically significant ($p=0.004$). Approaching half of the students living in rural areas (45.8%) compared to 29.1% of those living in urban areas chewed Khat and the difference was statistically significant ($P=0.002$) (Table 1).

Table 1: Socio-demographic factors associated with Khat chewing among male high school students, Jazan city.

Demographic and socio-cultural explanatory variables	Khat chewing		χ^2	p-value
	Yes N=127 N (%)	No N=246 N (%)		
Age in years				
≤17 (n=204)	59 (28.9)	145 (71.1)	9.31	0.010
18 (n=104)	35 (33.7)	69 (66.3)		
>18 (n=67)	33 (49.3)	34 (50.7)		
School grade				
First (n=121)	45 (37.2)	76 (62.8)	11.01	0.004
Second (n=127)	29 (22.8)	98 (77.2)		
Third(n=127)	53 (41.7)	74 (58.3)		
Residence				
Rural (n=107)	49 (45.8)	58 (54.2)	9.51	0.002
Urban (n=268)	78 (29.1)	190 (70.9)		

Regarding reasons for continuing Khat chewing, 49.6% of the students claimed that Khat increased their energy, whereas 36.2% and 27.6% of them reported that it increased alertness and concentration and made them feel refreshed, respectively. About one-fifth of them (18.9%) reported that they were addictive and used it to prevent withdrawal (Table 2).

Table 2: Pattern of chewing Khat habit among high school male students in Jazan City (n=127).

Characteristics	Frequency	Percentage
Reason/s for continuing Khat chewing*		
Increase alertness and concentration	46	36.2
Taste	26	20.5
Increase energy	63	49.6
Relieve the stress	27	21.3
I am addictive and use it to prevent withdrawal	24	18.9
Makes me feel refreshed	35	27.6
Promote social discussion	12	9.4

* More than one answer was acceptable.

Factors associated with Khat chewing

Table (3) shows that students whose fathers were Khat chewer were more significantly likely to chew Khat compared to those whose fathers were not Khat chewers (49.1% versus 21.9%) ($P < 0.001$). Also, students whose brothers were Khat chewer were more significantly likely to chew Khat compared to those whose brothers were not Khat chewers (50% versus 27.3%) ($P < 0.001$). Students who had other Khat chewer family members living with them were more likely to chew Khat compared to those who had other family members not chewing Khat (55.6% versus 30.9%) ($P = 0.010$). Students whose mothers were Khat chewer were more likely to chew Khat compared to those whose mothers were not Khat chewers (62.5% versus 32.2%). However, this difference was not statistically significant.

Table 3: Association between family history of Khat chewing and Khat chewing behavior among male high school students, Jazan city.

Family history of Khat chewing	Khat chewing		χ^2	p-value
	Yes N=127 N (%)	No N=246 N (%)		
Father				
Yes (n=165)	81 (49.1)	84 (50.9)	30.49	<0.001
No (n=210)	46 (21.9)	164 (78.1)		
Mother				
Yes (n=8)	5 (62.5)	3 (37.5)	2.99	0.084
No (n=367)	122 (32.2)	245 (66.8)		
Brothers				
Yes (n=108)	54 (50.0)	54 (50.0)	17.63	<0.001
No (n=267)	73 (27.3)	194 (72.7)		
Others living with students				
Yes (n=45)	25 (55.6)	20 (44.4)	10.74	0.001
No (n=330)	102 (30.9)	228 (69.1)		

Table (4) describes the patterns of Khat chewing among students who are currently Khat chewers. Almost one-fifth of them (19.7%, 20.5, 18.9) chewed Khat on daily basis, twice weekly and once weekly, respectively, whereas 40.9% did it once monthly.

Table 4: Pattern of chewing Khat habit among high school male students in Jazan City (n=127).

Characteristics	Frequency	Percentage
Frequency of chewing Khat		
Daily	25	19.7
Twice weekly	26	20.5
Once weekly	24	18.9
Once monthly	51	40.9

The study confirmed that there was a statistically significant association between Khat chewing behavior and academic performance among student. Table (5) demonstrates that there was a statistically significant association between Khat chewing behavior and academic performance among students. To measure the academic performance, the table students academic performance was negatively correlated with Khat chewing status as all failed students were Khat chewers compared to only 18.8% of those who got excellent grade and 28% of those who got very good grade ($P < 0.001$).

Table 5: Association between Khat chewing and school performance among male high school students, Jazan city.

School performance	Khat chewing		χ^2	p-value
	Yes N=127 N (%)	No N=246 N (%)		
Excellent (n=154)	29 (18.8)	125 (81.2)	73.16	<0.001
Very good (n=125)	35 (28.0)	90 (72.0)		
Good (n=62)	33 (53.2)	29 (46.8)		
Pass (n=28)	24 (85.7)	4 (14.3)		
Fail (n=6)	6 (100)	0 (0.0)		

IV. DISCUSSION

This study revealed that the life time and current prevalence rates of Khat chewing among male high school students in Jazan city were lower than the previously reported prevalence rate by^[14] in the region (48.7%). This could be due to the increased awareness towards the harmful effects of Khat. However, the current prevalence was higher than that reported by^[7] among high school and college students in Jazan (21.1% and 19.2%), respectively and^[15] who reported a prevalence of 20.5%. Comparing the findings of this study to those reported in Ethiopia among intermediate and high school students, the life time and current prevalence rates of Khat chewing scored lower prevalence (15.4% and 13.3%), respectively.^[16] The differences between the figures recorded in this study and others could be attributed to variations in culture among study population as well as availability of Khat.

The results of this study revealed a high percentage for the age at which students started Khat chewing (age of 13 years or below). This is comparable with studies conducted in Ethiopia by^[17] who reported 36.4% for 10-15 years age group and^[18] who reported 14.6 and 16.4 years age groups in Agaro and Gondar regions in Ethiopia, respectively. Higher results were reported by^[12] who showed that the prevalence of Khat chewing among Yemeni age group 12

years and above was 54.6%. This indicates that the future of this larger productive segment of the community may be negatively affected by the Khat chewing habit.

In this study, the most frequent answers for students when asked about the reason/s for continuing Khat chewing were the desire to increase energy, alertness and concentration and to feel refreshed. These findings were supported by^[19] who stated that there is a positive physiological feeling to Khat chewing in the form of strong energizing effect.

Students who live in rural areas were more likely to chew Khat compared to those living in urban areas. This finding is in accordance with that reported in studies that estimated the highest overall prevalence of Khat use in Jazan region was reported in rural areas compared to urban areas (61.7 versus 45.7%).^[20]

The results of the current study highlighted the significant influence of peer and familial Khat chewing in student Khat chewing behavior. Similar findings were reported by^[9] in the survey carried out in Jazan region.

It is reported that Khat chewing is used among students, drivers and workers in an endeavor to enhance their performance.^[21] The present study confirmed that there was a statistically significant association between Khat chewing behavior and academic performance among students. A combination of different factors such as wasting time, absence from schools, and impaired activity on the morning following Khat chewing sessions and sleep disturbance caused by Khat chewing could be behind this negative result.

The long sessions of more than 5 hours spent on Khat chewing as revealed by the current study is comparable to other studies^[22] where Khat chewing sessions lasted for an average of six hours, ranging from one to twenty hours. These findings were also supported by^[23] who reported that Khat affected the performance of university students and there was significant association between being non chewer and higher academic performance as demonstrated by the differences in Cumulative Grade Point Average. The poor academic performance among Khat chewers was also reported by^[15] and^[22] in Ethiopia.

An alarming result from this study is the deficient health education regarding Khat and its dangerous impacts as almost half of the students who were current Khat chewers claimed that they did not receive education regarding Khat and its negative impacts.

V. CONCLUSION AND RECOMMENDATIONS

In conclusion, Khat chewing habit currently affected almost one-third of male high school students in Jazan city, Saudi Arabia. Khat chewing habit influenced negatively the scholastic performance of the students and adversely impacted their health status. It is recommended that education about Khat shall be integrated into the curricula of the primary, intermediate and high schools.

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