Original Article

Khat chewing among parents and their children: A potential transgenerational effect

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Abstract

Background: Khat has a stimulating and addictive effect and can induce consequences on the health and socioeconomic status of khat chewers. **Objectives:** This study aims to assess knowledge, attitude, and practice of khat chewing among parents in Jazan and its consequential effect on their children. **Methods:** This cross-sectional investigation was conducted in the Jazan region of Saudi Arabia. Data was collected via a web-based, self-administered questionnaire measuring demographics, knowledge, attitudes, and practices concerning khat chewing. The Chi-square test or Fisher's exact test was used to assess factors associated with khat chewing among parents and its consequential effect on their children. **Results:** A total of 724 parents were included. The sample had an overall good knowledge about the health hazards of khat chewing and an attitude against khat chewing. Nonetheless, the number of parents who reported that they had ever tried khat chewing was 200 (27.6%) and 106 parents (14.6%) confirmed that their children were khat chewers. Additionally, 98 (13.5%) parents declared that they practiced khat chewing in front of their children. Higher frequencies of parents who reported providing khat to their children were identified among parents with higher attitude levels that favor khat chewing (*P* value = 0.04). **Conclusions:** Efforts should be made to develop targeted preventive and educational strategies to reduce khat chewing among parents who have favorable attitudes toward khat chewing.

Keywords: Addiction, children, Jazan, khat, parents, Saudi Arabia

Introduction

Khat is a plant that has stimulating and addictive effects, as it contains cathinone, which has similar pharmacological characteristics to amphetamine.[1] Khat chewing is common in east African countries and countries southwest of the Arabian Peninsula. Additionally, khat chewing has been reported to be common among immigrants from African countries who are living in Australia,[2] the USA,[3] and European countries.[4-6] The European Monitoring Centre for Drugs and Drug Addiction published a report in 2011 regarding the legal status of khat in European countries. The report found that khat is classified as an illegal drug by 15 European Union members. However, some European countries permit khat to be imported, distributed, and traded as a vegetable.[7]

Although khat is classified as illegal in some countries, khat smuggling can occur despite the control measures. Khat cultivation, transportation, trading, and chewing are prohibited in Saudi Arabia. However, despite this, khat chewing is a socially

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desirable activity. It is commonly practiced in the Jazan region in the southwest of Saudi Arabia, as well as on the northern border of Yemen.

Chewing khat has been reported to have several consequences on its users' health and socioeconomic status. Because khat cultivation and trading are illegal in Saudi Arabia, the high cost of smuggling it negatively affects those addicted to it. Additionally, khat traders and users can face charges that can lead to imprisonment. Furthermore, khat chewing can last for several hours on each occasion, which influences the social life of khat chewers and is usually associated with tobacco product consumption and its overall impact on quality of life.[8-10]

Several investigations have been conducted to assess the psychological and health consequences of khat chewing. A review by Hassan *et al.*[11] reported that khat chewing is associated with mood disturbances, elevated blood pressure, oral and gastric conditions, an increased risk of cancer, and can influence birth outcomes among khat-chewing pregnant mothers. Additionally, psychotic symptoms have been reported to be associated with khat chewing.[12,13] Khat chewing has also been reported to be associated with developing type 2 diabetes[14] and disturbances of glycemic control.[15] Furthermore, khat chewing has been indicated as a risk factor for anemia among pregnant women due to its impact on their dietary practices.[16] Despite the cumulative evidence concerning the negative impacts of khat chewing on its users' health and socioeconomic status, khat chewing remains popular in the Jazan region. Since Khat chewing has been indicated to be associated with several psychological, metabolic, and chronic illnesses, understanding the risk factors of khat chewing initiation is important for primary healthcare physicians, especially in regions where khat chewing is a common habit.

Investigations conducted in the Jazan region to assess the prevalence of khat chewing and its associated factors are limited. A cross-sectional investigation conducted in 2006 among secondary school and university students in the Jazan region reported that among the 8,965 students who responded, 1,795 (20%) reported having tried khat chewing. Additionally, it was reported that 159 students had participated in khat chewing sessions with their fathers.[9] In a more recent investigation in 2011, in a sample of 3,923 intermediate and secondary school students, it was reported that 20.5% were khat chewers and that khat chewing was higher among males, older subjects, and those with khat-chewing friends.[17] Another study that targeted 4,500 primary healthcare center attendees in the Jazan region indicated that 33.2% of the respondents engaged in khat chewing practice, and the most important predictor of khat chewing among adults was having a khat-chewing friend.[18] Finally, an investigation into familial background and khat chewing among adolescents in Jazan indicated that having a father or sibling who is a khat chewer increases the odds of khat chewing among adolescents.[19]

Similar regional investigations reported high rates of khat chewing among family members and a subsequent influence on their children. A study that targeted 7,343 ever-married women in Yemen revealed that nearly 41% of the responding women reported using khat while pregnant.[20] Similarly, in an Ethiopian study that recruited 1,015 pregnant women, it was noted that the prevalence of khat chewing among pregnant mothers reached 15.5%, where older women and women with a history of abortion were more likely to be among women who practiced khat chewing during pregnancy.[21] Furthermore, another Ethiopian study that targeted 1,688 pregnant women who attended healthcare facilities for delivery services indicated that the odds of premature rupture of membranes were higher among khat-chewing mothers during pregnancy.[22] Similarly, a systematic review and meta-analysis conducted by Bayih *et al.*[23] revealed a higher prevalence of adverse birth outcomes among women who practiced khat chewing during pregnancy compared to the control group.

Khat chewing among family members has been indicated as a predictor of khat chewing among children in some communities. In a systematic review and meta-analysis of 24 studies that assessed Khat chewing among university students in Ethiopia, it was revealed that khat chewing was prevalent among 23% of the students, and family khat chewing practice was indicated as one of the predictors of khat chewing among the students [odds ratio (OR): 2.91 (95% confidence interval (CI): 1.06–7.98)].[24] In another Ethiopian study that involved 1,890 secondary school students, the presence of someone in a student's family who practices khat chewing was associated with higher odds of that student also practicing khat chewing [OR 1.5 (95% CI: 1.07–2.11)].[25]

Although the studies that assess the prevalence of khat chewing in Jazan are limited to university and school students, they suggest that khat chewing is likely to be higher among older subjects. Social acceptance of khat chewing among citizens in the Jazan region may have aided the increased prevalence of this habit. Khat chewing among fathers has been suggested to increase students' risk of khat chewing. However, the prevalence of khat chewing among parents in the Jazan region is currently unknown. Additionally, the knowledge and attitude of parents concerning khat chewing and its potential influence on their children are unknown. This study aims to understand what health effects parents know about khat chewing, their attitude toward it in general, and the factors associated with the practice. Assessing these notions will likely increase our understanding of how parents' knowledge, attitude, and behavior toward khat affect their children's decision to start chewing khat.

Materials and Methods

Study context

This study is a cross-sectional investigation that was conducted in the Jazan region of Saudi Arabia between March and August 2020. This study targeted Saudi parents who were residing in the Jazan region. Parents who were not originally residents of the Jazan region or those who were not Saudis were excluded. Ethical

approval to conduct the study was granted via the Jazan Hospital Institution Review Board, Directory of Health in Jazan (approval number H-10-Z1068). Subjects were included after securing their informed consent, and the study was performed in accordance with the Declaration of Helsinki.

Data collection process

According to the Saudi General Authority of Statistics, the population size of the Jazan region is 1.5 million.[26] A non-random sampling approach was utilized to recruit the study's participants. The study was advertised on social media, including online media that targeted parents in the region and included descriptions of the study's main objectives and the targeted population. It was explained that participation was voluntary and that it would not collect identifiable data. The respondents were encouraged to share the questionnaire web link with acquaintances to facilitate reaching the required sample size.

The web-based questionnaire included the contact information of the research team, which enabled the respondents who required further clarification or assistance to contact the investigators before recruitment. StatCal function of EpiInfo software was used to estimate the sample size of the current investigation. The minimum estimated sample size that was required to achieve the study's objectives was 770 parents, assuming that 50% of the population in the Jazan region had sufficient knowledge of khat chewing, using a standardized knowledge measurement tool with a 5% level of precision and considering a 50% non-response rate. The 50% prevalence of sufficient knowledge was used for the sample size calculation, as no previous studies had assessed the knowledge, attitude, or practice of Saudi parents. A 50% non-response rate was utilized as Khat chewing is considered an illegal act in Saudi Arabia and many subjects may refuse to participate due to security considerations.

Study instrument and measures

A questionnaire was developed as a data collection tool after consulting relevant literature regarding studies that addressed khat chewing in other regional countries. The variables that were collected via the questionnaire included the demographics, knowledge, attitude, and practices concerning khat chewing. The sample demographics were related to age, gender, socioeconomic status, and number of children. The demographic variables were presumed as exposure factors in the current investigation, while knowledge, attitude, and practice concerning khat chewing were presumed as dependent, outcome factors.

The knowledge items regarding khat chewing included were based on the review by Hassan *et al.*[11] and involved the effect on appetite, sleep duration, nutrition, constipation, effect on pregnancy, association with oral problems, association with back pain, effect on neurological disorders, association with hemorrhoids, initiation of behavioral disorders among children, association with anxiety and depression, and influence on blood sugar.

Items measuring attitudes toward khat chewing in general or regarding the use by children, such as an association with the depletion of financial resources; waste of time; impact on alertness; whether khat chewing is a bad habit; overall effect on health; association with laziness; association with the neglect of children and household; impact on mood disorders; increase of focus; whether it reduces stress; attitude toward female khat use; consideration of khat chewing as a social element; association with familial conflicts, such as divorce; association with physical fitness; improved memory or appearances (due to weight loss); whether khat is addictive or reduces the consumption of other drugs; influence on sexual activity; association with boredom, aggression, and crime; and whether khat is considered a drug. Items measuring the practice of khat chewing were related to the consumption of khat; frequency of consumption; duration of each khat chewing session; chewing behavior, such as chewing with friends, children, or during events; and smoking cigarettes or shisha.

The content of the developed questionnaire was reviewed by consultants in preventive medicine with clinical and research experience regarding khat abuse in the Jazan region. Afterward, the questionnaire was piloted on 20 parents of both genders to test the clarity of the questionnaire and their ability to respond to the questionnaire items. The internal consistency of the questionnaire items was calculated and produced a Cronbach's α coefficient of 0.747.

Data analysis

The statistical package for social sciences (SPSS, version 25) was used to conduct the statistical analysis. The binary and categorical data was analyzed using frequencies and proportions, and the continuous data was analyzed via means and standard deviation (SD) if it was normally distributed. Otherwise, the median and inter-quartile range (IQR) were used.

The knowledge score was calculated by summing the correct responses for each participant, where each correct answer was given a score of one. The attitude score was calculated for each item suggesting a favorable attitude toward khat chewing and graded depending on the response. For example, concerning the questions that measured the attitude of the parents and whether khat chewing was one of the best ways to spend time, those who strongly agreed were given a score of five, those who agreed were given a score of four, neutral were given a score of three, those who disagreed were given a score of two, and those who strongly disagreed were given a score of one. Items scoring was reversed if the statement did not favor khat chewing.

Factors that were associated with the probability of khat-chewing parents giving their children khat were assessed via cross-tabulation. To test for the statistical difference of the tested variables between those who reported giving khat to children and those who reported not giving khat to their children, the Chi-square test or Fisher's exact test was used. This cross-tabulation was

restricted to the parents who reported ever chewing khat and excluded those who never practiced khat chewing.

The probability of the parents who ever chewed khat giving their children khat was assessed according to the gender of the parents, their age, their education level, their knowledge, and attitude about khat chewing. The age of the parents was converted to a binary variable by dividing the group according to the mean age as less than 39 years old or older. Education level was converted to a binary variable according to whether one had a bachelor's degree or not. Finally, knowledge and attitude toward khat chewing were converted to binary variables depending on the estimated medians as cut-off points. A *P* value of 0.05 or less was presumed as the statistically significant value for the applied test.

Results

A total of 797 responses were received during the data collection phase, of which 73 were excluded since they did not meet the inclusion criteria at the time of participation. The demographics of the 724 parents who were included are described in Table 1. Among the recruited, the majority were females (60.2%), married (96.3%), had a bachelor's degree (58.6%), owned their residences (71.7%), and were governmental employees (46.7%). The mean number of sons for each parent was 3.1, the mean number of daughters was 2.3, and the mean age of the youngest child was 9 years.

Figure 1 illustrates the correct responses of the parents concerning the conditions that are associated with khat chewing. The most frequently reported condition was sleeping disturbance, followed by oral diseases, and the lowest reported condition was backache, followed by hemorrhoids. The overall mean score for knowledge was 5.6 (out of a total score of 12), with an SD of 3.4.

Table 2 summarizes the attitude of the parents concerning khat chewing. The most frequently agreed upon item was related to the effect of khat chewing on the relationship between the parents and their children. Most of the parents (75.1%) agreed that khat chewing among parents can lead to the negligence of

Table 1: Demographics of 724 parents from Jazan region, southwest of Saudi Arabia

Variables	Values
Age in years: Mean (SD)	39.12 (11.3)
Gender: Frequency (proportion)	
Males	288 (39.8%)
Females	436 (60.2%)
Social status	
Married	697 (96.3%)
Divorced	9 (1.2%)
Widowed	18 (2.5%)
Educational level: Frequency (proportion)	
Elementary	45 (6.2%)
Intermediate	49 (6.8%)
Secondary	126 (17.4%)
University (bachelor's)	424 (58.6%)
University (postgraduate)	23 (3.1%)
Other	57 (7.9%)
Residence: Frequency (proportion)*	
Owned	519 (71.7%)
Rented	147 (20.3%)
Occupation: Frequency (proportion)	
Student	54 (7.5%)
Governmental employee	338 (46.7%)
Private employee	30 (4.1%)
Military	61 (8.4%)
Housewife	170 (23.5%)
Unemployed	52 (7.2%)
Other	19 (2.6%)
Housing type: Frequency (proportion)*	
Flat	293 (44.3%)
Villa	248 (37.5%)
Traditional housing	120 (18.2%)
Number of sons Mean (SD)	3.15 (2.6)
Number of daughters: Mean (SD)	2.37 (1.9)
Age of youngest child in years: Mean (SD)	9 (6.5)

*Valid percent

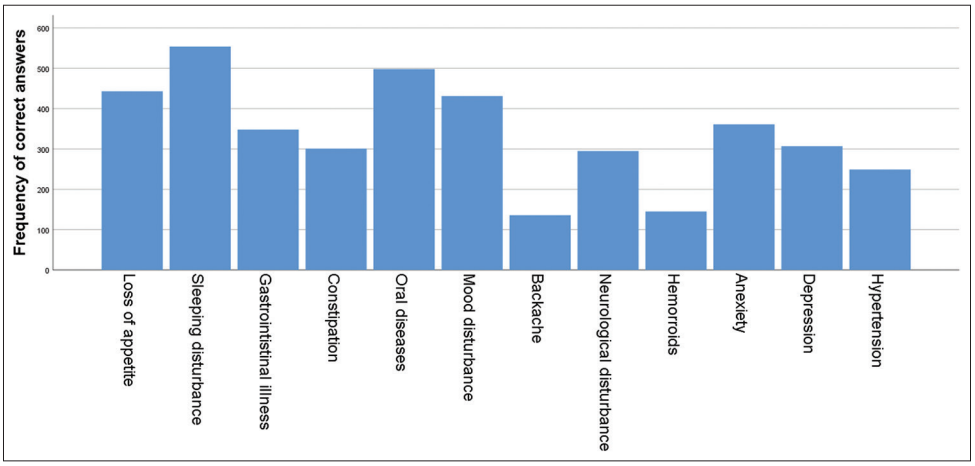

Figure 1: Frequency of parents who answered correctly concerning conditions that can be associated with khat chewing among 724 parents from Jazan region, southwest of Saudi Arabia

their children. Additionally, 68.4% of the parents agreed that khat chewing among the parents can induce a behavioral disturbance among their children. Finally, 67.2% of the parents agreed that khat chewing can disturb the relationship between parents and their children. Figure 2 displays the distribution of the calculated scores toward khat chewing, where higher scores indicated a more favorable attitude. The figure suggests a deviation of most of the sample toward a less favorable attitude toward khat chewing.

Table 3 illustrates the family history of khat chewing and the practice of the parents concerning khat chewing. All recruited parents reported that at least one of their parents were khat chewers. This suggests that khat chewing was strongly practiced in Jazan, and the illegalization of khat chewing might have a significant impact on khat chewing in the region. The proportion of parents who reported that they had ever tried khat chewing was 200 (27.6%).

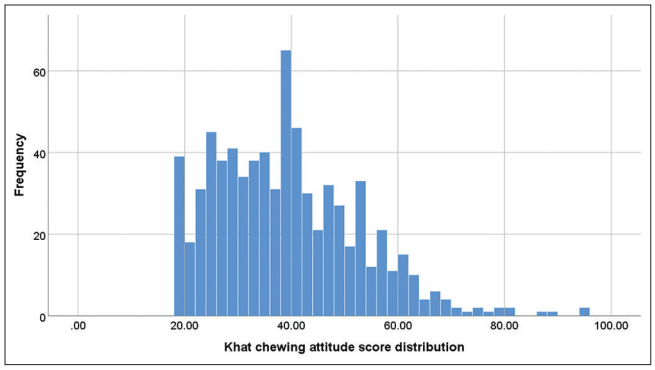

Figure 2: Khat chewing attitude score distribution among 724 parents from Jazan, Saudi Arabia

Twenty-five parents (3.5%) declared that they chewed khat on a daily basis, and the average duration of each khat chewing session was 5 hours. One hundred and six parents (14.6%) confirmed that their children were khat chewers. Additionally, 98 (13.5%) parents declared that they practiced khat chewing in front of their children.

Table 4 is a cross-tabulation that assesses the differences regarding the demographic characteristics and knowledge and attitude levels concerning khat chewing between groups of parents who declared that they were khat chewers and classified based on the provision of khat to their children. Among the assessed variables, higher frequencies of parents who reported providing khat to their children were identified among male parents, parents older than 39 years, parents with education levels less than a bachelor's degree, parents with lower knowledge scores regarding khat chewing, and parents with higher attitude levels that favor khat chewing. Nonetheless, the only difference according to the level of attitude was statistically significant among the recruited sample (*P* values = 0.04).

Discussion

This study was conducted in the Jazan region, Saudi Arabia, to investigate parents' knowledge regarding khat chewing, their attitude toward khat chewing, in general, and the khat chewing practice and its consequential influence on their children. The findings of the investigation indicate that the recruited cohort of parents had a good overall knowledge of the health conditions that are associated with khat chewing and a good overall attitude

Table 2: Attitude of 724 parents from the Jazan region, southwest of Saudi Arabia, toward statements related to khat chewing

Attitude Items	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Khat chewing is one of the best ways to spend time	473 (65.3%)	136 (18.8%)	52 (7.2%)	49 (6.8%)	14 (1.9%)
Khat chewing can improve alertness	222 (30.7%)	89 (12.3%)	112 (15.5%)	232 (32.0%)	69 (9.5%)
Khat chewing can improve memory	359 (49.6%)	155 (21.4%)	152 (21.0%)	41 (5.7%)	17 (2.3%)
Khat chewing can improve attention	310 (42.8%)	152 (21.0%)	135 (18.6%)	103 (14.2%)	24 (3.3%)
Khat chewing can improve relationships between individuals	362 (50.1%)	155 (21.4%)	104 (14.4%)	82 (11.3%)	20 (2.8%)
Khat chewing can aid in solving social issues	433 (59.8%)	168 (23.2%)	78 (10.8%)	30 (4.1%)	15 (2.1%)
Khat chewing can improve fitness level	417 (57.6%)	168 (23.2%)	90 (12.4%)	35 (4.8%)	14 (1.9%)
Khat chewing can protect against drug abuse	385 (53.2%)	139 (19.2%)	114 (15.7%)	60 (8.3%)	26 (3.6%)
Khat chewing can increase the level of activity	285 (39.4%)	138 (19.1%)	116 (16.0%)	146 (20.2%)	39 (5.4%)
Khat chewing can make you attractive due to weight loss	350 (48.3%)	172 (23.8%)	133 (18.4%)	54 (7.5%)	15 (2.1%)
Khat chewing can be easily stopped	243 (33.6%)	172 (23.8%)	176 (24.3%)	82 (11.3%)	51 (7.0%)
Khat chewing is acceptable for males	512 (70.7%)	122 (16.9%)	42 (5.8%)	33 (4.6%)	15 (2.1%)
Khat chewing is acceptable for females	546 (75.4%)	105 (14.5%)	36 (5.0%)	22 (3.0%)	15 (2.1%)
Khat chewing can enhance sexual activity	339 (46.8%)	110 (15.2%)	170 (23.5%)	77 (10.6%)	28 (3.9%)
Khat chewing among parents can cause financial difficulties for families*	295 (40.7%)	308 (42.5%)	38 (5.2%)	16 (2.2%)	67 (9.3%)
Khat chewing among parents can lead to negligence of their children*	67 (9.3%)	47 (6.5%)	66 (9.1%)	300 (41.4%)	244 (33.7%)
Khat chewing among parents can lead to behavioural disturbance among their children*	62 (8.6%)	56 (7.7%)	111 (15.3%)	310 (42.8%)	185 (25.6%)
khat chewing among parents can disturb relationship between parents and their children*	74 (10.2%)	55 (7.6%)	108 (14.9%)	280 (38.6%)	207 (28.6%)
Khat chewing can lead to divorce*	89 (12.3)	77 (10.6%)	175 (24.2%)	227 (31.4%)	156 (21.6%)

*Reversed items

Table 3: Familial history and practice of 724 parents from the Jazan region, southwest of Saudi Arabia concerning Khat chewing and associated habits

Items	Values
Respondents with parents who were khat chewers: Frequency (proportion)	
Father	708 (97%)
Mother	5 (0.7%)
Both	11 (1.5%)
None	0 (0%)
Parents who confirmed that they had ever been khat chewers: Frequency (proportion)	200 (27.6%)
Parents who confirmed that their offspring are khat chewers: Frequency (proportion)	106 (14.6%)
Age at initiation of khat chewing among parents who reported to ever chewing khat in years: Mean (SD)	22 (7.3)
Frequency of khat chewing among those who reported to ever chewing khat: Frequency (proportion)	
Daily	25 (3.5%)
Weekly	50 (6.9%)
On occasions only	78 (10.8%)
Average number of hours spent chewing khat in each session in hours: Mean (SD)	5 (2.3)
Parents who reported chewing khat in front of their children: Frequency (proportion)*	98 (13.5%)
Average amount of money spent on Khat chewing in each session in Saudi Riyals: Median (IQR)	200 (100–300)

*Proportions among those who reported being ever khat chewers

Table 4: Factors associated with the probability of 200 parents who had ever chewed khat giving khat to their children in the Jazan region, Saudi Arabia

Variable	Provision of khat to the children		Total	*P*
	Yes	No		
Total	43	145		
Gender				0.257**
Male	41 (24.4%)	127 (75%)	168 (100%)	
Female	2 (10%)	18 (90%)	20 (100%)	
Age				
<39 years	16 (20%)	64 (80%)	80 (100%)	0.385*
39 years or more	27 (25.7%)	78 (74.3%)	105 (100%)	
Education				0.772*
Less than bachelor's level	18 (24.7%)	55 (75.3%)	73 (100%)	
Bachelor's or more	25 (21.7%)	90 (78.3%)	115 (100%)	
Knowledge				0.215*
Lower score	21 (28%)	54 (72%)	75 (100%)	
Higher score	22 (19.5%)	91 (80.5%)	113 (100%)	
Attitude				0.04*
Less favoring attitude	6 (10%)	45 (86.9%)	60 (100%)	
Higher favoring attitude	37 (28.9%)	91 (71.1%)	128 (100%)	

*Chi-square test. **Fisher's Exact test

regarding khat abuse. However, a few of the parents had an attitude that favored khat chewing and performed harmful practices that could motivate their children to practice khat chewing, such as chewing khat in front of them and providing them with khat leaves.

Currently, no similar studies that measure khat chewing habits among parents have been detected. Nonetheless, the findings of our investigation can be compared to similar local and regional investigations that assess khat-chewing habits among populations with different demographic characteristics. In a study conducted in the Jazan region involving a sample of 3,923 intermediate and secondary school students, it was reported that the students were more likely to report khat chewing if their fathers were khat chewers (OR 1.45, *P* value <0.001).[19] Similarly, Fiidow *et al.*[27] conducted a systematic review of risk factors for initiation of khat chewing among adolescents in the countries in the African and Arabian peninsula revealed that having a family member, friends, or peer, who chewed khat, was associated with higher odds of khat chewing among adolescents. Along with the findings that were detected in our investigation concerning those parents who were willing to provide khat leaves to their children, parents who are khat chewers should be targeted for khat-chewing prevention programs.

Other studies that were conducted in neighboring countries assessed familiar influences on initiating khat chewing among women. In a study conducted in Yemen by Al-Abed *et al.* involving a sample of 692 Yemeni women, it was concluded that khat chewing by husbands was associated with higher odds of khat chewing among wives (OR 2.00, 95% CI: 1.42 – 2.79).[28] Similar findings from

another Ethiopian study that targeted pregnant women indicated higher odds of reporting khat chewing among pregnant women who had a partner who is a khat chewing.[29] The findings of these investigations, though not similar in design to ours, indicate the importance of addressing the familial context when targeting interventions that aim to reduce khat-chewing habits.

The findings of this investigation indicate that nearly half of the parents who reported khat chewing chewed khat in front of their children, and some even provided khat to their children. These findings suggest a strong familial influence that might normalize khat chewing as a cultural practice and lead to children chewing khat from a younger age. The normalization of khat chewing among family members can be argued to be stemming from the social desirability of khat chewing. For example, a survey that targeted 500 university students in Yemen revealed that the most frequently cited reason for khat chewing was because it was a commonly practiced social habit.[30]

Strengths and limitations

This investigation has several strengths and weaknesses. One of the main strengths of the current investigation is targeting parents to identify factors associated with the parents that might lead to the initiation of khat chewing among their children. One of the possible limitations of this investigation is the probability of parents refusing to participate due to security concerns regarding declaring their khat-chewing practice. Although the provided questionnaire did not involve any identifiable data, it can be postulated that the number of khat chewers among the parents is higher than what was declared. However, it is possible to argue that using an anonymous online questionnaire might encourage more parents to participate compared to other recruitment options. However, we cannot neglect the probability of selection bias, since older or illiterate parents might be less likely to be included in the current investigation.

Conclusion

The recruited cohort of parents had an overall good knowledge of the influence of khat chewing on health and a positive attitude regarding khat abuse. However, nearly half of the parents who reported khat chewing indicated that they chewed khat in front of their children, and some provided khat to their children. Additionally, parents advising their children or preventing them from befriending khat chewers were the two most frequently reported actions to prevent khat chewing among their children. This indicates a need to initiate institutional programs to assist parents with preventing the khat-chewing habit among their children. These programs can be related to educational and procedural programs that assist parents with preventing khat chewing among their children.

Authors contribution

All authors contributed to the study concept, design, data acquisition, analysis, and drafting and approving the final form of the report.

Availability of data and materials

The datasets used and/or analyzed during the current report are available from the corresponding author upon reasonable request.

Ethical approval and informed consent

Ethical approval was granted by the Jazan Hospital Institution Review Board, Directory of Health in Jazan (approval number H-10-Z1068).

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Conflicts of interest

There are no conflicts of interest.

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