



Original Article

The impact of protective psychosocial factors on khat chewing among male medical and dental future health-care providers in Yemen



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KEYWORDS

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Abstract *Background/purpose:* Khat chewing, a green leaf with amphetamine effects, is a public health concern. Yet, it is prevalent and evident, in the khat belt region, among male students in health faculties. This study aimed to examine whether psychosocial factors have a protective impact on khat chewing among male dental and medical students.

Materials and methods: A cross-sectional study included all students (1457) in second year and above at a Yemeni university. A self-administered questionnaire was used to obtain sociodemographic data and to assess students' psychosocial characteristics namely, depression, resilience and social support (perceived or received [living with or away from family]). Data analysis included descriptive statistics and multivariable logistic regression modelling.

Results: The response rate was 61% (male = 334, female = 547) and the responding students' mean \pm SD age was 22.95 ± 1.56 years. Of the respondents 185 (21% [95%CI = 18%–24%]) were current khat chewers (7 [4%] females and 178 [96%] males respectively). In the adjusted model, among male students living away from family was significantly associated with khat chewing (adjusted odd ratio [AOR] = 3.15, 95%CI = 1.96–5.07, $p < 0.001$) and perceived social support was inversely significantly related to khat chewing (AOR = 0.98; 95%CI = 0.96–1.00; $p = 0.019$).

Conclusion: Within the limitation of the study of a single institute, social support whether received (living with family) or perceived appeared to be a protective factor from khat chewing among male medical and dental students. Social support should be enhanced and targeted to discourage khat chewing during the preparation of this future health care force.

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Introduction

The use of psychoactive substances and drugs among undergraduate medical students is widely documented in different settings and these include tobacco (smoked or chewed), alcohol and Benzodiazepines.¹ The chewing of khat, a green leaf which has amphetamine effects,² among university students and its implications is widely documented in the current literature in the khat belt region (e.g. Yemen and Ethiopia). A recent systematic review reported the prevalence of khat chewing among university students in Ethiopia, Yemen and Saudi Arabia as 14.16%.³ Generally, medical students reported the use of substance as a relief from psychological stress¹ and students who chewed khat reported that khat helps with concentration, staying awake, relaxing and preventing fatigue when studying during exams.^{4–6}

The chewing of khat among students was linked to socio-demographic and behavior factors. Recent systematic reviews reported that males were more likely to be chewers compared to their female counterparts.^{3,4} Also, the practice of khat chewing in family or among friends was linked to university students being chewers themselves.⁴ The concurrent use of other drugs such as alcohol and tobacco was linked to khat chewing.^{7,8} Finally, medical students' increase in age and seniority were associated with khat chewing.^{6–9} The inclusive data for psychosocial buffers, namely, resilience, and social support alongside risk factor (depression) for khat chewing are scarce in the current literature, specifically among medical and dental students.

Resilience is defined 'as a dynamic process encompassing positive adaptation within the context of significant adversity'.¹⁰ Although resilience has yet to be examined in medical and dental students who chew khat, the extant research showed that resilience associated with a reduction of alcohol use,¹¹ protective of alcohol misuse overtime¹² and negatively associated with both post-traumatic stress disorder and alcohol use disorder.¹³ As for social support, a number of definitions and frameworks were suggested to describe social support and one of them postulated as the amount of assistance one gets through interaction with people.¹⁴ Both the objective/received (e.g. family contacts and living with the family) and subjective social support (emotional and tangible support) are important for health related outcomes of individual well-being.¹⁵ Students who lived away from families (e.g. rented apartments or living in hostels) were found to be more involved in substance abuse.¹⁶ Zhou et al.,¹⁷ reported that both perceived and received social support had positive influences on health related quality of life among individuals receiving methadone maintenance treatment. As for khat chewing and depression, there is nascent data about the association of khat with depression with chewers claiming that khat causes and alleviates the symptoms of depression.¹⁸ Among community khat chewers in Somalia, university staff in Ethiopia, and among student in Saudi Arabia depression was associated with khat chewing.^{19–21}

The current literature emphasized that disease prevention and control requires an integrated approach across disciplines²² and oral health is integral to overall health,²³ specifically, the comorbidities due to common risk factors

(e.g. tobacco) is plausible.²⁴ Khat has been classified as drug of abuse and established as a public health concern nationally and internationally with many countries banning its use.^{25,26} Khat is linked to a number of oral and general health problems.^{27,28}

Therefore, medical and dental students should act as advocates for public health. and they are key elements in prevention, diagnosis and treatment of problems associated with drug use¹⁶ namely khat use. Notably, the use of khat among medical field students, whilst it may have a personal health risks and professional consequences (e.g. impaired fitness)²⁹ it may serve to normalize consumption and thus preventing among future health care providers the detection of khat health related problems (e.g. dependence) among patients as it was reported elsewhere for other drugs.³⁰ The available literature reported that among 536 surveyed doctors (specialists or non-specialists) in four main hospitals in Yemen, 44% were khat chewers³¹ with a number of medical student khat chewers in Yemen accepted khat chewing among medical professionals and of the attitude not to inquire about or advise their patients to quit khat chewing.⁶

This study sought to enumerate male and female khat chewers and investigate the underlying factors (socio-demographic) of khat chewing among male medical and dental undergraduate students with a specific focus on protective and risk psychosocial factors (social support, resilience and depression). It was hypothesized that students with negative psychosocial experiences (less social support, low resilience and depressed) would be more likely to chew khat than those without such experiences.

Materials and methods

Study design, setting and participants' recruitment

This was an analytical cross-sectional study that included a universal convenience sample (Medical students [954] and Dental students [503]). All the undergraduate medical and dental students attending year two and above for the academic year 2015–2016 in a Yemeni public university were approached at the end of their lectures and invited to participate in the study. First-year students were excluded on the basis of the reported literature that this group may encounter psychological disturbances, depression, anxiety and stress due to newly faced social and intellectual challenges.³² The inclusion criteria included being 18 years or older Yemeni students, free from severe health conditions and willing to participate (signing informed consent).

Measures

Data was collected using a self-administered questionnaire composed of socio-demographic section, pre-tested validated psychosocial inventories section and khat chewing section. The socio-demographic questionnaires asked questions about age, gender, faculty of study (Dentistry or Medicine), level of education and socioeconomic status (studying and working or dependent on family financial support). In addition, a question about the living conditions

(living with family or away from family [rented or living in hall of residence]) of the student was asked. This latter was] used as a proxy for received social support.

The psychosocial inventories included the Depression Center for Epidemiologic Studies Depression Scale (CES-D)³³ and this scale composed of 20-items and four factors; depressive affects, positive affect, somatic complaints and interpersonal relations. Responses on each item were on a 4-point Likert-type scale ranging from 0 to 3 [Rarely or none of the time (less than one day) = 0, Some or a little of the time (1–2 days) = 1, Occasionally or a moderate amount of time (3–4 days) = 2, Most or all of the time (5–7 days) = 3]. The possible score for the CES-D ranged from 0 to 60.³⁴ The overall internal consistency reliability (Cronbach's alpha[α]) of the scale) in this study sample was assessed and was good (0.880).

The Multidimensional Scale of Perceived Social Support (MSPSS) was also administered and this scale consisted of twelve items that included three adequate sources of support namely family, friends and a significant other.³⁵ This scale was rated on a 7-point Likert-type scale ranging from 1 to 7 (1-very strongly disagree to 7-Very strongly agree) with higher scores indicating higher perceived social support. The Cronbach's α of the scale in this study was good (0.820).

Finally, resilience was assessed with the 25-item Conner-Davidson Resilience Scale (CD-RISC).³⁶ Responses for each item of the scale was rated on 5-point Likert-type scale (never = 0 to Always = 4). The total score ranged from 0 to 100 with high scores indicating higher levels of resilience. The scale included items such as, "Able to adapt to change" and "When things look hopeless, I don't give up". The Cronbach's α of the scale in this study was excellent (0.930).

The dependent variable current khat chewing was derived from the answers of two questions. The first question was whether the participant had ever chewed khat with an answer of 'Yes' or 'No' and a following question of whether starting khat chewing before the war in Yemen which was used as proxy for the khat chewing in the last three months. Students who answered chewing the khat after the war in Yemen in 2015, during the war or never chewed khat were considered as non-chewers.

Ethics approval

The University Institutional Review Board of Aden University, Yemen and Taibah University Dental College and Hospital, Saudi Arabia reviewed and approved the study (FF-10-2015, TUCDREC/20151123/Kasim). The study was conducted in accordance with the principle of the World Medical Association of Helsinki. Students were briefed about the study and were informed that their participation would be voluntary and can withdraw from the study at any time with no impact on their academic standing. Confidentiality was assured and every questionnaire was anonymous and coded. Students signed an informed consent form before participation in the study.

Data analysis

The Statistical Package for Social Sciences Software (SPSS) for windows version 24 (IBM Corp, Armonk, New York, USA)

was used for data analysis. Descriptive analysis was undertaken and categorical data (e.g. gender) were reported as frequency and percentage (%) and continuous variables as mean/Standard deviation (SD). Chi-square bivariate analyses and two sample t-test were run to identify any statistically significant association between explanatory categorical and continuous variables with the dependent variable khat chewing 'Yes' or 'No'.

The multivariable logistic regression was run to underscore the potential significant ($p < 0.05$) psychosocial factors (e.g. depression) of khat chewing among male dental and medical students accounting to age and other factors. The variable selection from the Chi-square and t-test into the multivariable regression was based on the statistical significance ($p < 0.2$). This was based on lax criteria proposed by Altman³⁷ that suggested variables may have contributed to the logistic regression in unforeseen ways that related to complex interrelationships among the variables. The resilience variable was forced into model to be explored further though was in bivariate analysis with a statistical significance $p > 0.2$.

Results

The response rate for the distributed questionnaires (1457) was 61% (881). The respondents were 334 (37.9%) males and 62.1% (547) females with a mean/SD age of 22.95 ± 1.56 years. Of the 881 respondents 185 (21% [95%CI = 18%–24%]) were current khat chewers distributed by 7 (4%) and 178 (96%) for females and males respectively. Among male respondents, khat chewers consisted 53%. Table 1 shows the characteristics of male khat chewers alongside the bivariate analysis of factors associated with khat chewing.

As shown in Table 2, only two explanatory variables (received and perceived social support [MSPSS]) made a statistically significant contribution to logistic regression model after controlling to other variables. Living away from family was the strongest predictor of khat chewing. Students who lived away from family (rented or living in hall of residence) were 3.15 (1.96–5.07, $p = < 0.001$) times more likely to self-report khat chewing than those who lived with their families. Perceived social support (MSPSS) was negatively associated with khat chewing, i.e. an increase in MSPSS associated significantly with decrease in khat chewing (OR = 0.98, 95%CI = 0.96–1.00, $p = 0.019$).

Discussion

In this cross-sectional study the relationship of protective and risk psychosocial factors with khat chewing alongside other sociodemographic factors was examined among male medical and dental students in a Yemeni university. The estimate of khat chewing collectively amongst both dental and medical male and female groups within the estimate of the current literature, notably, male khat chewers outstripped female chewers as reported repeatedly in the current literature.^{3,4}

As for the sociodemographic factors of khat chewing, among male although increase in age and seniority were reported to be associated with khat chewing,^{6,9} in our study were non-significant factors for khat chewing. One should

Table 1 Total sample characteristics and bivariate analysis for khat chewing with the socio-demographics and psychosocial factors among male medical and dental students, academic year 2015-2016, Yemen ($n = 334$).

Variable	F (%) / Mean \pm SD			<i>p</i> -value ^a
	Total sample	Current khat chewing		
		No	Yes	
Age (years), Mean \pm SD	23.29 \pm 1.64	23.04 \pm 1.63	23.52 \pm 1.62	0.001
Marital status				
Other status	280 (83.8)	132 (47.1)	148 (52.9)	0.716
Married	54 (16.2)	24 (44.4)	30 (55.6)	
Faculty				
Dentistry	90 (26.9)	48 (53.3)	42 (46.7)	0.140
Medicine	244 (73.1)	108 (44.3)	136 (55.7)	
Education level				
None senior (level 2–3)	168 (50.3)	68 (51.2)	82 (48.8)	0.098
Senior (4–6 level)	166 (49.7)	70 (42.2)	96 (57.8)	
Received social support)				
living with family	182 (54.5)	109 (59.9)	73 (40.1)	<0.001
Living away from family (rented or living in hall of residence)	152 (45.5)	47 (39.1)	105 (69.1)	
Socio-economic status				
Dependent on family financial support	283 (84.7)	136 (48.1)	147 (51.9)	0.244
Working and studying	51 (15.3)	20 (39.2)	31 (60.8)	
Resilience (CD-RISC)	73.36 \pm 15.92	73.63 \pm 15.50	73.12 \pm 16.31	0.773
Perceived Social Support (MSPSS)	58.53 \pm 12.14	60.92 \pm 10.42	56.43 \pm 13.27	0.001
Depression (CES-D)	19.76 \pm 9.30	18.58 \pm 8.99	20.80 \pm 9.47	0.029

^a Chi-square test and Student's *t*-test were used for comparisons; **CD-RISC**: Conner-Davidson Resilience Scale; **MSPSS**: Multidimensional Scale of Perceived Social Support; **CES-D**: Depression Center for Epidemiologic Studies.

Table 2 Logistic regression predicting likelihood of self-reporting khat chewing among medical and dental male students, academic year 2015–2016, Yemen, ($n = 334$).

Explanatory Variables	B	Wald	OR (95%CI) ^a	<i>p</i> -value
Age	0.127	1.560	1.14 (0.93–1.39)	0.212
Faculty				
Dentistry			Reference	
Medicine	0.105	0.149	1.11 (0.65–1.89)	0.699
Education level				
None senior (level 2–3)			Reference	
Senior (4–6 level)	0.167	0.255	1.18 (0.62–2.26)	0.614
Received social support				
Living with family			Reference	
Living away from family (rented or living in hall of residence)	1.148	22.420	3.15 (1.96–5.07)	<0.001
Resilience (CD-RISC)	0.004	0.217	1.00 (0.99–1.02)	0.641
Perceived Social Support (MSPSS)	–0.025	5.508	0.98 (0.96–1.00)	0.019
Depression (CES-D)	0.021	2.299	1.02 (0.99–1.05)	0.129

^a OR: Odds ratio, CI: Confidence interval; **CD-RISC**: Conner-Davidson Resilience Scale; **MSPSS**: Multidimensional Scale of Perceived Social Support; **CES-D**: Depression Center for Epidemiologic Studies.

consider that the reported aforementioned association in previous studies was reported from bivariate analysis. Our findings aligned with Deressa and Azazh⁸ who reported from the multivariable analysis that both age and seniority were non-significant factors for khat chewing.

In addition, the socioeconomic status/financial conditions of the students was not significantly associated with khat chewing and this finding was consistent with the relevant literature.³⁸ Also, participating students in this study were not significantly different in khat chewing regardless

of faculty of study (Dentistry or Medicine). These findings, in the absence of data to compare these two group within the context of khat chewing, were supported by relevant world wide literature.³⁹

As for the study hypothesis, interestingly, both objective/received (living with the family) and perceived (MSPSS) social support were protective from khat chewing among this study groups. Living away from the family was the most important factor in khat chewing, and could be related to freedom from family supervision, self-decision

making and peer pressures⁸ compared with counterparts who lived with their families. These findings were supported by literature reported from e.g. Brazil, Pakistan, Northern Ireland, Wales and England) i.e. students who rented apartments or living in hostels were more involved in substance abuse.^{16,1,40} As for perceived social support, although the MSPSS was not tested among khat chewers, it was found a protective factor from khat chewing among male medical and dental students as was reported for other pertinent research.¹⁷

Moreover, depression though associated with khat chewing in different settings,^{18–21} in the present study depression lost significant association with khat chewing when modelled with social support (received and perceived) and this could reflect the prominence of social support over and above the depression factor. Finally, resilience was not associated with khat chewing and due to the paucity of research assessing the association of resilience with khat chewing it was difficult to compare our findings with other similar studies. However, resilience was found associated negatively with both alcohol use and misuse overtime and post-traumatic stress disorders.^{11–13} Future research is required to take into account the role of other factors (e.g. self-control, self-esteem, self-efficacy and emotional intelligence) and the pathways by which these factors influence the depression and resilience in the uptake of khat chewing.

Few limitations should be acknowledged in interpreting the findings. First, all participants were recruited from one institute in Yemen as such the findings were not generalizable to all students. Second, khat chewing was self-reported without objective validation, i.e. social desirability bias and non-responses were possible⁴¹ particularly among this group. However, the use of self-administered questionnaire may have offset such findings bias. Third, self-selection to participate in the study might have biased the results. Last but not least, this was a cross-sectional study; thus causality was not possible. The strengths of the study based on being the first study that examined simultaneously the relationships of both the protective and risk factors with khat chewing among future health care force using well established and validated inventories.

As for future directions, the findings of this study whilst it shaded light on the risk and protective factors of khat chewing among future health care providers, it laid the basis for gaining deep understandings of the protective and risk factors of khat chewing in a representative sample. With respect of the clinical implications, the findings of this study would properly inform university strategies aiming at discouraging the khat chewing among these future health care providers, taking into considerations the role of social support as a proactive tool to discourage khat chewing.

In conclusion, within the limitations of a study of a single institute medical and dental faculty, social support (received and perceived) appeared to be a protective factor from khat chewing among medical and dental future health workforce in Yemen. Whilst the findings of this study should be replicated in a representative sample of medical and dental students, the preliminary findings of this study highlighted that social support should be enhanced and targeted specifically among male chewers to discourage

khat chewing during the preparation of this future health care force.

Declaration of Competing Interest

The author has no conflicts of interest relevant to this article.

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