PUBLIC HEALTH RESEARCH

Knowledge, Attitude and Practice on Preventive Dentistry among Senior Dental Students in Yemen

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ABSTRACT

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Introduction There is a strong and increased worldwide interest on the aspects of prevention of oral disease and oral health promotion in dental education. However, some studies imply that dental students are not knowledgeable enough in this issue. This study aimed to evaluate the knowledge of, attitude towards and practice on preventive dentistry among senior dental students in Yemen.

Methods Self-administered questionnaires were distributed among senior dental students in six dental schools in Yemen. The questionnaire obtained personal information, and questions about knowledge on preventive dental care, attitudes towards and practice on preventive dentistry.

Results Among 346 students who filled the questionnaire, a total of 91.6% has good knowledge about fissure sealant effectiveness, only 34.7% knows about the importance of fluoride toothpaste compared to brushing technique in preventing caries, with significant gender difference (p=0.005). Odds of good knowledge among non-Qat chewers was 1.9 (95%CI: 1.26-4.42). Multivariable regression analysis indicated that female gender was associated with higher positive attitudes (OR: 2.03, 95%CI:1.21-3.36,p=0.007). Attitudes were significantly associated with Qat chewing (OR = 1.95, 95%CI: 1.04-3.66, p=0.03), type of university (OR = 0.59, 95%CI: 0.36-0.94, p=0.02), and mothers' level of education (OR = 1.91, 95%CI: 1.05-3.47, p=0.03). There was a high percentage of competency in practicing preventive measures among students (80.9%).

Conclusions Dental education should emphasize the overall aspects of preventive dentistry with early exposure of preventive dental training in order to improve students' knowledge and attitudes and consequently practice on preventive care.

Keywords preventive dentistry - attitude - dental students - dental education - Yemen.

INTRODUCTION

Oral diseases are considered as major public health problems due to their high prevalence and incidence in all regions of the world[1]. This is a real challenge to the health workers in the world, especially the World Health Organization that created the global strategy for prevention and control of non-communicable diseases, and the common risk factor approach is a new strategy for managing prevention and control of oral diseases[1].

It is a fact that the prevention of oral disease is the most accepted and efficient method for ensuring oral health[2]. Therefore, preventive dentistry is the main goal of all dental specialties: operative dentistry, periodontics, pedodontics, orthodontics, etc. Furthermore, lack of prevention results in more restorations, periodontal treatment, extractions, and dentures[3]. As mentioned in the Future of Dentistry Report (2001), there is a need for comprehensive training of dental students in practicing preventive measures on their patients [4]; in addition to that, there is a strong and increased worldwide interest on the aspects of prevention of oral disease and oral health promotion in dental education, so that dental education and training has emerged as the most important category to affect dentists' behavior and attitude to their perception on how to conduct their practice[5,6]. As a health care provider, dental students should be a good model to surrounding community including their family members, friends, especially patients for oral health behavior[7], particularly in the preventive practice which has been cited as a reason for caries decline in recent decades[8].

The reorientation of oral health services towards prevention and health promotion is one of the WHO's priority action areas for the continuous improvement of oral health[9]. Knowledge, attitude and practice of senior dental students need to go with this goal of WHO. Because of the importance of prevention in oral health, an attitude should be directed toward prevention before treatment of oral disease[10]. This will reduce the pain and cost of expensive non-preventive dental care. Motivation of the patients about the correct oral habits and raising their awareness on how to prevent oral diseases are important and essential responsibilities of oral health providers. Since dental students are the health professionals of the future, they must adopt a positive oral health attitude, which influence their clinical decision making[11], and practice in their school years for directing and managing their patients properly[10].

In Yemen, majority of the population with high prevalence of caries, gingivitis and treatment needs[12] do not have access to primary dental healthcare and are not being targeted by any dental educational/preventive programmes[13]. Many studies on Qat chewing as a preventable bad habit with high prevalence rate among Yemeni population (up to 90%)[14] revealed that the oral hygiene and periodontal condition is significantly affected by this habit[15] and this habit is also considered as an independent risk factor of clinical attachment loss[16]. In addition, consumption of Qat can lead to adverse oral effects including oral mucosal lesions, dryness of the mouth, discoloration of teeth, poor oral hygiene and periodontal disease[1,17].

Motivated dental students in preventive aspects of habit-related oral diseases will increase the awareness of their patients about prevention of those diseases. Insufficient preventive education and motivation might be one of the causes of increased prevalence of dental and gingival diseases among Yemeni people. Overall, Yemeni children suffer from bad oral hygiene and high prevalence of moderate gingivitis, particularly in the older age group[13]. Furthermore, only 4.1% of the study subjects were caries-free[12]. These findings should be used as a basis for planning national preventive programme including preventive dentistry in dental curricula. Furthermore, there is a possibility for improvement in senior dental students' attitudes, dentists' knowledge and attitudes[18] regarding preventive dental care, and this is a challenge for dental education.

In order to create more positive attitudes for future dental professionals, there should be an early and sufficient exposure to preventive aspects of dentistry in the dental curricula[19]. However, there is insufficient or no data about preventive dentistry knowledge, attitude and practice among dental students in Yemen. The assessment of knowledge, attitude and practice on preventive dental measures among dental students will make a base for planning national dental preventive education programme among dental schools and their curricula in relation to preventive and community dentistry. So the present study aims to assess the level of knowledge attitude and practice on preventive dentistry amongst senior dental students in Yemen, and its association with socio-demographic characteristics, especially smoking and Qat chewing.

METHODS

This study conducted during the end of the academic year (2013-2014), it utilized a cross-sectional design to assess the knowledge, attitude and practice on preventive dentistry among senior dental students in Yemen. The protocol of the study was approved by the Research and Ethics Committee of the Faculty of Medicine at the University of Science and Technology, Yemen (USTY). The questionnaire was adapted from previous studies among senior dental students and dentists[12,19], the final questionnaire included 25 questions (11 for knowledge domain, 7 for attitude

domain and 7 for practice domain). Socio-demographic data include questions about age, gender, nationality, Qat chewing, smoking, parent's level of education and type of university. For the reliability and stability, the questionnaire was discussed with three dental educators in dentistry college at the USTY who approved the final one which then piloted among 30 male and female dental students in the same college. Data from pilot study were entered into the Statistical Product for Service Solutions (SPSS) programme and test of reliability of the modified questionnaire was done. The questionnaires were self-administered by final year dental students in each university during mandatory clinical and theoretical sessions. The data were then entered, cleaned and analyzed using SPSS version 20.

Statistical analysis

In addition to descriptive statistics, categorical data was analyzed using chi squared test. Binary logistic regression test was used to test the association between the dichotomous outcomes and socio-demographic characteristics. The students' answers were scored from 5 to 1 using Likert scale ranging from strongly agree to strongly disagree for knowledge and attitude questions and the total score for each student was categorized based on the distribution of theses scores into two categories in knowledge domain; poor (≤40) and good (>40). This is operational definition for total score of knowledge. Attitude questions response scores were categorized into two categories; low (negative) (≤ 20) and high (positive) (>20). Competency in providing preventive dental care questions were ranged as follows: very competent, quite competent, not very competent, not at all competent and I have never done that. The answers were scored 5 for very competent and 1 for I have never done that. Then, the total practice score were summed. Two categories were defined; low (≤18) and high competency (>18).operational definition of practice.

RESULTS

A total of 346 students filled the questionnaire, the age range of the respondents was 20 to 35 years and the median age was 24 years old. Incomplete questionnaires regarding personal data were excluded from the analysis. Descriptive statistics of the overall study subjects are illustrated in Table 1.

Table 1 Descriptive statistics of the overall study subjects.

		Frequency	%
Gender	Male	144	41.6
	Female	202	58.4
Qat chewing	Yes	73	21.1
	No	273	78.9
Smoking	Yes	39	11.3
	No	307	88.7
Type of university	Public	211	61.0
	Private	135	39.0
Father's education	Illiterate	32	9.2
	School education	103	29.8
	University education	211	61.0
Mother's education	Illiterate	87	25.1
	School education	164	47.4
	University education	95	27.5

Knowledge and its related questions and responses

A total of 91.6% of students answered correctly that the sealant is effective in the prevention of pit and fissure caries in newly-erupted molars, which is the highest percentage among knowledge questions, compared to the least correct one (34.7%) which is the use of fluoride toothpaste is more important than brushing technique in preventing caries. Examining a newly-erupted tooth with a sharp explorer will damage enamel rods and predispose the tooth to caries was correctly answered by 50.9% of the students. Majority (89.4%) of respondents did agree that frequency of sugar consumption plays a greater role in producing caries than does the total amount of sugar consumed, 66.8% agreed that restored tooth is more likely to be lost than is a sound one, 75.1% agreed that rinsing teeth with less water after tooth brushing will increase the effect of fluoride that is in toothpaste. In addition, 42.5% agreed that white- or brown-spot lesion that is visible on a wet tooth surface has penetrated all the way through the enamel, having dental problems can lead to general health problems (79.5%), qat chewing is a risk factor of periodontal tissue destruction (89.6%), and oral mucosa non-painful lesions might progress to malignant lesions (71.7%). A total of 198 (57.2%) dental students have good knowledge compared to 148 (42.8%) have poor knowledge in regard to preventive dentistry. Results of knowledge domain with gender difference are summarized in Figure 1.

There was a statistically significant gender difference in the response 'examining a newly-erupted tooth with a sharp explorer will damage enamel rods and predispose the tooth to caries' (p=0.005), 'Qat chewing is a risk factor of periodontal tissue destruction' (p=0.001) and 'oral mucosa non-painful lesions might progress to malignant lesions' (p=0.001): more females agreed with these statements. There was no gender difference observed in responses of other statements. Table 2 shows a higher percentage of good knowledge among Qat non-chewers and the odds ratio for the association between knowledge and Qat chewing was 1.9 (95%CI: 1.26-4.42) (p=0.007). There was no significant association between type of university and level of knowledge. Correlation test shows that there was a significant association between knowledge of students and both practice and attitudes with the same p value (p=0.001).

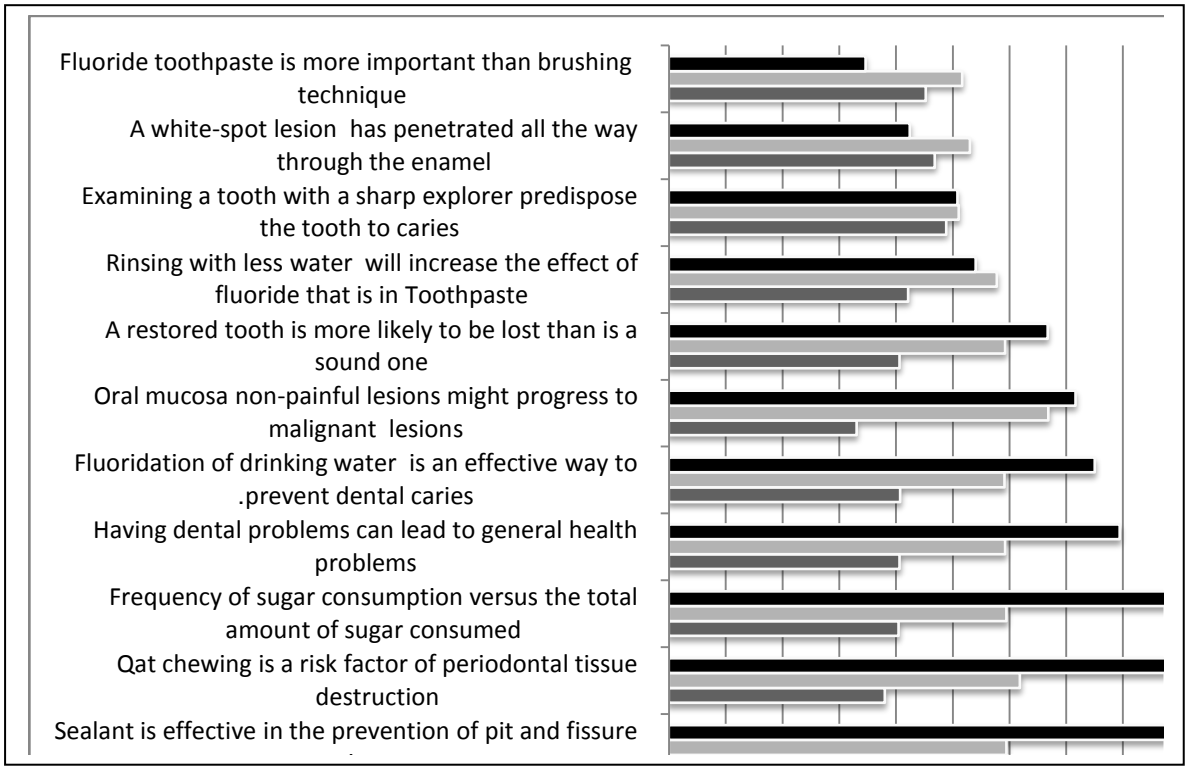

Figure 1 Percentages of dental students who correctly answered the knowledge questions regarding preventive dentistry.

Attitude and its related questions and responses

Scores of the students based on the 7 adjectives describing preventive dentistry showed that the highest percentage of positive attitude was regarding its effectiveness (93.4%), efficient (89.0%), essential (91.0%), scientific (88.7%), attractive (82.4%), simple to do (78.3%) and valuable (79.2%). Logistic regression analysis (Table 3) indicated that female gender was associated with more than two folds increase in positive attitudes (OR: 2.03, 95%CI: 1.21-3.36, p=0.007). Attitudes toward preventive dentistry were significantly associated with Qat chewing (OR = 1.95, 95%CI: 1.04-3.66, p=0.03), type of university (OR: 0.59, 95%CI: 0.36-0.94, p=0.02) and mothers' level of education (OR: 1.91, 95%CI: 1.05-3.47, p=0.03). There was a significant association between attitudes and practice on preventive dentistry among participants (p=0.001). Participants with high scores (positive attitude) were 212 (61.3%), and those with lower scores (negative attitude) were 134 (38.7%).

Table 2 Bivariable and multivariable analysis of participants' socio-demographic characteristics as predictors for knowledge.

	Knowledge							
	Good		Poor					
	f	%	f	%	Unadjusted odds ratio (95%CI)	p-value	Adjusted odds ratio (95%CI)	p-value

Gender									
	Male	77	53.5	67	46.5	1.30 (0.84,2.00)	.233	0.99 (0.60,1.65)	.995
	Female	121	59.9	81	40.1				
Qat chewing									
	Yes	31	42.5	42	57.5	2.13 (1.26,3.60)	.004**	1.95 (1.26,4.42)	.007**
	No	167	61.2	106	38.8				
Smoking									
	Yes	22	56.4	17	43.6	1.03 (0.53,2.03)	.913	0.85 (0.29,1.39)	.268
	No	176	57.3	131	42.7				
Type of university									
	Public	126	59.7	85	40.3	0.77 (0.49,1.19)	.242	0.59 (0.51,1.26)	.348
	Private	72	53.3	63	46.7				
Father's education									
	Illiterate	21	65.6	11	34.4	0.67 (0.31,1.45)	.313	0.54 (0.24,1.39)	.230
	Educated	177	56.4	137	43.6				
Mother's education									
	Illiterate	49	56.3	38	43.7	1.05 (0.64,1.71)	.844	1.91 (0.59,1.86)	.874
	Educated	149	57.5	110	42.5				

Significant at p<0.01*

Table 3 Bivariable and multivariable analysis of participants' socio-demographic characteristics as predictors for attitudes.

		Attitude							
		Positive		Negative					
		f	%	f	%	Unadjusted odds ratio (95%CI)	p- value	Adjusted odds ratio (95%CI)	p- value
Gender									
	Male	68	47.2	76	52.8	2.77 (1.77, 4.33)	<0.001***	2.03 (1.21,3.36)	.007**
	Female	144	71.3	58	28.7				
Qat chewing									
	Yes	29	39.7	44	60.3	3.08 (1.81,5.25)	<0.001***	1.95 (1.04,3.66)	.036*
	No	183	67.0	90	33.0				
Smoking									
	Yes	20	51.3	19	48.7	1.58 (0.81,3.09)	.174	0.85 (0.39,1.83)	.681
	No	192	62.5	115	37.5				
Type of university									
	Public	141	66.8	70	33.2	0.55 (0.35,0.85)	.008**	0.59 (0.36,0.94)	.029*
	Private	71	52.6	64	47.4				
Father's education									
	Illiterate	20	62.5	12	37.5	0.94 (0.44,2.00)	.881	0.54 (0.22,1.32)	.179
	Educated	192	61.1	122	38.9				
Mother's education									
	Illiterate	44	50.6	43	49.4	1.80 (1.10,2.95)	.018*	1.91 (1.05,3.47)	.034*
	Educated	168	64.9	91	35.1				

Significant at p<0.05*, p<0.01**, p<0.001***

Self-perceived competency in practicing preventive dentistry.

Collectively; respondents who reported high competency in providing preventive dental care were 280 (80.9%) whereas the rest (n=66) reported low competency level. As shown in Table 5, there was a high percentage of competency in giving oral hygiene instructions (93.9%), dietary counseling regarding sugar intake, soft food intake and applying fissure sealants for newly erupted teeth (72.3%), applying topical fluoride for deciduous and permanent teeth (76.9%), managing patients at high risk of developing caries (81.2%), patient motivation about smoking, smokeless–tobacco usage side effects (82.7%), and motivation regarding effects of Qat chewing on oral health (83.5%). Among non-smoker students, there was a high percentage of high practice (81.8%). Binary logistic regression (Table 4) indicated that no Qat chewing was associated with more than two folds increase in competency of practicing preventive dentistry (OR = 2.67, 95%CI: 1.31-5.42, p=0.007).

Spearman's correlation tests showed that there was a significant association between knowledge and attitude, attitude and practice, and knowledge and practice, with p=0.001 for each one.

Table 4 Bivariable and multivariable analysis of participants' socio-demographic characteristics as predictors for practice.

		Practice							
		Good		Poor					
		f	%	f	%	Unadjusted odds ratio (95%CI)	p- value	Adjusted odds ratio (95%CI)	p- value
Gender									
	Male	105	72.9	39	27.1				
	Female	175	86.6	27	13.4	2.40 (1.39,4.16)	.001**	1.72 (0.91,3.26)	.094
Qat chewing									
	Yes	47	64.4	26	35.6		<0.001***		
	No	233	85.3	40	14.7	3.22 (1.79,5.78)		2.67 (1.31,5.42)	.007**
Smoking									
	Yes	29	74.4	10	25.6				
	No	251	81.8	56	18.2	1.54 (0.71,3.35)	.268	0.75 (0.31,1.82)	.532
Type of university									
	Public	174	82.5	37	17.5				
	Private	106	78.5	29	21.5	0.77 (0.45,1.33)	.362	0.91 (0.51,1.62)	.348
Father's education									
	Illiterate	28	87.5	4	12.5				
	Educated	252	80.3	62	19.7	0.58 (0.19,1.71)	.320	0.49 (0.14,1.64)	.251
Mother's education									
	Illiterate	70	80.5	17	19.5				
	Educated	210	81.1	49	18.9	1.04 (0.56,1.92)	.898	0.93 (0.45,1.93)	.858

Significant at p<0.01**, p<0.001***

Table 5 Percentages of competency in practicing preventive measures among dental students.

Approaches of preventive dentistry applied by dental students	Competency Category	f	%
Giving oral hygiene instructions	High	325	93.9
	Low	21	6.1
Dietary counseling (sugar intake, soft food intake)	High	266	76.9
	Low	80	23.1
Applying topical fluoride for deciduous and permanent teeth	High	266	76.9
	Low	80	23.1
Applying fissure sealants for newly erupted teeth	High	250	72.3
	Low	96	27.7
Managing patients at high risk of developing caries	High	281	81.2
	Low	65	18.8
Patient motivation about smoking , smokeless –tobacco usage side effects	High	286	82.7
	Low	60	17.3
Motivation regarding effects of Qat chewing on oral health	High	289	83.5
	Low	57	16.5

DISCUSSION

The results of this study showed that dental students of Yemeni universities had sufficient and acceptable level of knowledge about the effect of sealant, Qat chewing, sugar on dental and oral health and diseases; however, they were not informed about the importance of fluoride in the prevention of dental caries, in line with the results from a study among Iranian dentists[18]. Although the highest percent of knowledge was found in the 'effect of sealant in newly erupted teeth' question, it is important to emphasize its role in detecting or suspecting enamel caries lesions instead of sealing sound teeth[20]**.** In addition, risk of a white spot lesion and effect of sharp explorer in examining newly erupted tooth and prognosis of oral mucosal

non-painful lesions were under estimated. In contrast with a previous study which evaluated dental students' awareness about preventive dentistry[21], female students seemed to be more informed about preventive dentistry than their male counterparts**.** Smoking as another bad habit was about 22% among dental students in the present study; this percent is slightly smaller than that of other study among 400 dental students at King Saud University (27%), and Turkish dental students (26%). It can be concluded that public tobacco use is not well addressed in the dental college curriculum from the students' point of view[22]. A total of 91.0% dental students reported that preventive care is essential for the health of the community. This study provides an important information about the prevalence of smoking among dental students adding to the established international review of tobacco smoking among dental students in 19 countries not including Yemen[23]. Overall results of current study support the statement that preventive dentistry and periodontology courses should be started from the first year of dental education, since it is proven that attitudes and behavior was improved significantly with the increased level of study[24].

Although the clear results from studies[15] on Yemeni population about the effects of Qat chewing on oral health, the awareness of dental students in this study about these effects were low. The surprising finding in the current study is that about one fourth (21.1%) of the dental student participants are Qat chewer (Table 1). This may be due to the social and familial influence on the students who live in a surrounding community where Qat chewing is a common habit[15], this is an important indicator for the university to provide education to the students about the health effect of this bad habit. The bad habits of dental students can also subsequently influence the community. This is a real challenge for dental schools in Yemen in which they must emphasize on preventive dentistry aspects among dental students.

This study found a two times higher odds of having high knowledge among non Qat chewer dental students compared to their Qat chewer colleagues. This finding disagrees with the common concept among students mentioned in previous study[15] that this habit helps them to increase the scientific achievement during exams. It is important to include all aspects of preventive dentistry in any future study to provide us with overall knowledge about this section of public health. In contrast with similar previous studies, the present study included questions about oral disease other than dental caries; this gives more information about the aspect of prevention in oral health. Knowledge of dental students in the current study about mucosa non-painful lesions which might progress to malignant lesions was good. In addition, their practice regarding patient motivation about smoking, smokeless-tobacco usage side effects, and effects of Qat chewing on oral health was high, and this is very important for the surrounding community where the bad habits are common and most oral cancers in Yemen are diagnosed at late stages[25]. In addition, the high percentage of patient motivation about smoking and smokeless-tobacco usage side effects is a good indicator supporting the fact that smokers exhibited a willingness to quit if suggested by the dentist[26].

Senior dental students in this study have a high positive attitude towards preventive dentistry, this may explain the high practice level in regard to competency in providing preventive care assessed in this study. This high competency in practicing preventive dentistry is in the same line with Khamis et al. study[18] and most previous studies on dental students[27], in which female student was more competent in practice than male.

In agreement with the fact that the background and socio-demographic characteristics influence the behavior of a person; current study results found that non Qat chewing was associated with significant increase in high competency among dental students. Knowledge and attitude are considered factors that predispose to practice[10]. In the present study, good knowledge of preventive dental care was associated with high level of competency in giving preventive care. Majority (60.3%) of dental students with low attitudes toward prevention are Qat chewers. It can be concluded from this significant results that positive attitude is associated with better oral health behaviors[28]. The study samples included all universities in Yemen having dental schools and comprised of both public and private dental schools with different social and demographic environment. This is quite a large sample size, therefore increases the representativeness of the study. The dental curricula in regard to dentistry prevention must be improved to include prevention of oral diseases related to bad habits like Qat chewing and smoking. It will be interesting to conduct the same study among dentists in Yemen.

CONCLUSIONS

Knowledge, attitude and practice regarding preventive dentistry should be improved by emphasizing preventive dental care subjects in dental curricula starting from the first year of study and comprising of all prevention aspects of oral diseases in order to enable and encourage future dentists to provide their community with preventive care.

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