

Dietary Habits and Oral Hygiene Practice amongst Dental Students at the College of Dentistry, Princess Nourah University

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Abstract

The aim of the present study was to assess the dietary habits and oral hygiene practice of dental students in a new dental school. A self-administered structured closed-ended questionnaire on demographic characteristics, medical history, oral hygiene and dietary habits was distributed to dental students. Results showed that One third of students indicated that they don't consume low pH beverages (soft drinks) at all, while 48.9% drink a soft drink or two a day. Students took varying amount of time to consume their drinks. The majority of participants consumed citric juices, fruits and/or pickles at least once a day. 91.3% of students use either soft (41.8%) or medium (49.5%) toothbrush. Only a fifth (16.9%) of the students brush their teeth after drinking soft drinks and 58.2% brush their teeth after vomiting. In conclusion, young adults need to be aware about their dietary habits & oral hygiene, and also a proper dental health program needs to be applied.

Keywords

Dietary Habits, Oral Hygiene Practice, Low pH Soft Drinks

1. Introduction

Diet has a direct and local effect on oral health, especially on the pH and composition of saliva, plaque and the

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teeth; it plays a major etiological role in dental caries and dental erosion [1]. Dental erosion is defined as a complex multifactorial condition, characterized by an irreversible loss of dental hard tissue caused by action of chemical influence of extrinsic and intrinsic acids without bacterial involvement [2] [3]. Both incidence and prevalence of dental erosion have increased considerably among children & young adults [4]-[6]. Lifestyles have changed through time with the high consumption of acidic food & carbonated beverages [7]. Dietary acids are one of the most commonly cited causes of erosion [8], and soft drink consumption has been associated with dental erosion [9]. Intervention measures should be taken to prevent or reduce dental erosion from diet factors [10]. Many clinical studies have focused only on schoolchildren, since it is easier to recruit them in trials compared with adults. However, it is important to record erosive wear in all age groups to gather comprehensive information about the prevalence, distribution and incidence of erosive wear among different ages with possible different dietary habits [11] [12]. Geographic location seems to influence the prevalence rates observed in literature, since cultural, ethnical and dietary habits vary according to the region where the study was conducted [13] [14]. Saudi Arabia is one of several countries who underwent an especially rapid development and modernization with food culture changes in the past decades, through adoption of a more westernized diet in lifestyle. These food culture changes are likely to have an effect on oral health among all age classes. The consumption of acidic foods on a daily basis elevates the risks of erosive tooth wear with age advancement. Nevertheless, there has been little consideration of erosive tooth wear in particularly Asian countries; a recent single research (2015) was conducted in Japan to evaluate the association between erosive wear and acidic habits showed that frequent consumption of acidic fruits and drinks was significantly associated with erosive tooth wear at different age groups [15].

Oral health providers are often the first health care professional in primary, secondary and tertiary prevention of oral/systemic health issues [16]. These roles in prevention require the acquisition of numerous cross-disciplinary psychosocial and skill-based competencies ranging from role beliefs and commitment, to collaborative care [16] [17]. A long-standing challenge in dental education is preparing future clinicians to participate in prevention of oral/systemic health issues [14]-[18].

Dental students learn about oral hygiene habits, dietary counseling and dental erosion early on in their dental studies for the purpose of educating their patients about the effect of diet on oral health. As they learn more about the effects of diet and oral hygiene habits, they should internalize and develop good dietary and oral hygiene habits in order to be good role models for their patients. However, knowledge and awareness do not always produce positive behaviors.

The aim of the present study was to assess the dietary habits and oral hygiene practice of dental students in a new dental school.

2. Material & Methods

The research & ethics committee of the College of Dentistry, Princess Nourah bint Abdelrahman University, approved the study (Registered No. 2015/CDS/RD/001). A questionnaire survey was conducted among dental students of College of Dentistry, Princess Nourah University (PNUCD). A self-administered structured closed-ended questionnaire on demographic characteristics, oral hygiene and dietary habits was partial adapted from Chu *et al* was distributed [19]. The questionnaire composed of two sections; first section inquired about the oral hygiene practice (OH) the second section asked about their dietary habits (DH) (**Table 1**). The questionnaire was distributed to all students of the college of dentistry, Princess Nourah bint Abdelrahman University. The data was collected and analyzed by using the Statistical Package for the Social Sciences (IBM SPSS STATISTICS 22, IBM Corporation, USA, 2013) was used for all data analysis. Fisher exact test was used to examine presence of statistically significant association (**Figure 1**).

3. Results

A total of 96 dental students completed the self-administered structured closed-ended questionnaire giving a response rate of 82.1%. The 96 enrolled students were as follows; 31 students from grade 3 (which is the senior class); 33 students from grade 2 while 32 students participated from grade 1. The average age of the students is 18 years (SD \pm 0.9 years).

The majority of the dental students (91.3%) used either soft (41.8%) or medium (49.5%) toothbrush. Normal toothpaste was used by 51.1% of the participants while 30% were using whitening toothpaste and only 10% use

Table 1. Oral hygiene practice.

What type of toothbrush do you use?	Soft	41.8%
	Medium	49.5%
	Hard	2.2%
	Don't know	6.5%
	Total	100.0%
What type of toothpaste do you usually use?	Whitening	30.0%
	High-strength Fluoridated	10.0%
	Normal	51.1%
	Don't know	8.9%
	Total	100.0%
After drinking soft drinks do you brush your teeth?	Yes	16.9%
	No	83.1%
	Total	100.0%
Do you brush your teeth after vomiting?	Yes	58.2%
	No	41.8%
	Total	100.0%

Q1. Questionnaire No: _____

Age in years _____

Grade: _____

ORAL HYGIENE

OH

OH 1. What type of tooth brush do you Use?	Soft..... 1 Medium..... 2 Hard 3 Don't know 4
OH 2. What type of tooth paste do you usually use?	Whitening 1 High-strength Fluoridated 2 Normal 3 Don't know 4
OH 3. After drinking soft drinks do you brush your teeth?	Yes 1 No..... 2
OH 4. Do you brush your teeth after vomiting?	Yes 1 No..... 2

DIET HABIT

DH

OH 1. In a day, how often on average do you drink low pH soft drinks beverages (i.e. Pepsi, Coca-Cola, sport drinks) Please include the frequency in between your breakfast and lunch, lunch and dinner, and after dinner until you go to bed?	None..... 1 1 - 2 times 2 3 - 4 times 3 5 - 6 times 4 7 - 8 times 5 9 - 10 times 6 More than 10 times 7	If None → OH 3
OH 2. Length of time taken to consume drink	Immediately 1 1 - 5 minutes 2 6 - 10 minutes 3 11 - 15 minutes 4 Above 15 minutes 5	
OH 3. In a day, how often on average do you take any one of these citrus juices, Orange, Grape fruit, yoghurt and pickled.	None..... 1 1 - 2 times 2 3 - 4 times 3 5 - 6 times 4 7 - 8 times 5 9 - 10 times 6 More than 10 times 7	

Figure 1. Dietary behavior among dental students at PNU questionnaire.

high strength fluoridated toothpaste. Only 16.9% of students brush their teeth after consuming soft drinks and 58.2% brush their teeth after vomiting (Table 1).

One third of students indicated that they don't consume low pH beverages (soft drinks) at all, while 48.9% drink a soft drink or two a day. Students took varying amount of time to consume their drinks. The majority of participants consumed citric juices, fruits and/or pickles at least once a day (Table 2).

The type of toothbrush and toothpaste, the participants used were associated significantly with students level (Table 3).

4. Discussion

The increase in the population of the Kingdom, along with an awareness of people about the importance of dental care, opened the option for the establishment of more dental schools. Right now the Kingdom of Saudi Arabia has almost 24 dental colleges distributed all over the Kingdom. The participants were students of a new dental College in Saudi Arabia and the first and only college for female students in the largest female university in the world.

Dental erosion is becoming increasingly prevalent especially among young generations and its damaging effect is emerging as a serious public health issue. In the present study, more than half of the participants brush their teeth after vomiting. Moreover, tooth-brushing frequency has been associated with dental erosion in some studies [20] [21] while other reports have not verified this conclusion [22] [23].

Dietary factors, particularly acidic food and drinks, contribute to the development of dental erosion [24]-[26]. If measures are not taken to prevent the loss of dental tissue there are no doubt that excessive erosive tooth surface loss can lead to complications such as pain, dentin hypersensitivity or even pulpal inflammation which might lead to loss teeth. It is not only students knowledge that is important to prevent this phenomenon, but actual dietary and oral hygiene habits based on this knowledge, In the present study, most of students indicated

Table 2. Dietary habits of the dental students.

Question	Frequency	Percentage (%)
In a day, how often on average do you drink low pH soft drinks beverages	None	33.0%
	1 - 2 times	48.9%
	3 - 4 times	12.8%
	5 - 6 times	4.3%
	7 - 8 times	0.0%
	9 - 10 times	1.0%
	More than 10 times	0.0%
	Total	100.0%
Length of time taken to consume drink (in minutes)	Immediately	7.1%
	1 - 5 minutes	27.1%
	6 - 10 minutes	28.6%
	11 - 15 minutes	14.3%
	Above 15 minutes	22.9%
	Total	100.0%
In a day, how often on average do you take any one of these citrus juices, Orange, Grape fruit, yoghurt and pickles (frequency).	None	17.2%
	1 - 2 times	67.7%
	3 - 4 times	14.0%
	5 - 6 times	1.1%
	7 - 8 times	0.0%
	9 - 10 times	0.0%
	More than 10 times	0.0%
	Total	100.0%

Table 3. Association between selected practices and student grade.

Question	Responses	Level			P Value
		D1	D2	D3	
What type of toothbrush do you use?	Soft	34.5%	18.2%	75.9%	0.000*
	Medium	55.2%	66.7%	24.1%	
	Hard	0.0%	6.1%	0.0%	
	Don't know	10.3%	9.1%	0.0%	
	Total	100.0%	100.0%	100.0%	
What type of toothpaste do you usually use?	Whitening	30.0%	36.4%	22.2%	0.040*
	High-strength Fluoridated	0.0%	9.1%	22.2%	
	Normal	56.7%	42.4%	55.6%	
	Don't know	13.3%	12.1%	0.0%	
	Total	100.0%	100.0%	100.0%	
After drinking soft drinks do you brush your teeth?	Yes	20.7%	15.6%	14.3%	0.825
	No	79.3%	84.4%	85.7%	
	Total	100.0%	100.0%	100.0%	
Do you brush your teeth after vomiting?	Yes	71.4%	57.6%	46.7%	0.162
	No	28.6%	42.4%	53.3%	
	Total	100.0%	100.0%	100.0%	

that they drink low pH soft drinks at least once a day, even though they should be knowledgeable of the detrimental effect these acidic drinks have on their teeth. The development of dental erosion had shown a significant association with the consumption of low pH soft drinks and fruit juices [27]-[29].

In the present study, more than one third of the participants (37.3%) consume low pH drinks for more than 10 minutes. The frequency and time the teeth are in contact with the acidic beverage and maybe an important behavioral factor contributing to the development of dental erosion [29] [30]. It has been suggested that retaining the drink in the mouth, prior to swallowing, causes a greater pH drop at the tooth surfaces compared to swallowing it immediately [30]-[32].

Different research groups have pointed out sour sweets as a new type of erosive challenge [33]. A very recent study showed that not only the pH of the drinks but also the high intake of sour sweets could increase the risk of dental erosive wear [34].

Due to the very acidic pH and prolonged oral contact, sour sweets could represent a high risk of damage to the dentition [35] [36]. It is also an interesting observation that the Food Standards Agency issued a warning of its damaging effects to the oral mucosa due to its acidic pH (21-Food standards agency 2014). Although not widely documented regarding dental erosive wear, sour sweets have been suggested to be a contributor too important to disregard [35] [36]. Some researchers have not found a relationship between dental erosion and fruit and acidic drinks [37] [38]. There was growing evidence in the UK, that a major cause of tooth erosion is gastroesophageal reflux, [39]. In addition, a large proportion of people with anorexia and bulimia nervosa develop dental erosion from repeated vomiting [40]. Before appropriate public education programs can be designed, prevalence data are needed to understand the scope of the problem for different countries, different age groups, and different conditions or diets. There was a clear association between selected oral hygiene practice and student level, higher level student were aware about the oral hygiene practice more the first grade students. In order to provide patients with a proper oral health care, young adults must be aware of all issues involved in dental erosion through dental health education which will essential help in the understand dental erosion and its damaging effects.

Low pH Soft drinks can cause damage to the teeth for two reasons: Firstly, the high acidity due to the low pH. Secondly the generated organic acids that brings about demineralization. Dental Erosion is usually due to the loss of the outermost surface of enamel and occurs when the surface pH falls below 5.5 [31]. Low pH together with low calcium and fluoride ion concentration indicate the high erosive potential [32]. A meta-analysis study conducted 2012 by Li *et al.* showed that erosions are mainly caused by excessive consumption of erosive food

and drinks especially among children [10].

With regard to prevention of eating disorders, studies have found that training oral health professionals in such practices as assessment, patient approach/communication, behavior change strategies, and referral resources is lacking in their educational preparation [41] [42]. In recent years there have been several suggestions aimed at improving dental training in regards to knowledge of oral/systemic topics, higher order thinking skills, attitudes, interpersonal skills, personal values, and multidisciplinary training [43]-[45]. Despite growing literature and a call for dental education reform in 2010 [46], dental educators had just recently begun advocating for education reform [44]. Nonetheless, there is still a lack of standardized, comprehensive curriculum regarding disordered eating behaviors and communication/interpersonal skills. Dental students should be more aware and knowledgeable about the outcome of the effects of diet and oral hygiene habits since this will be one of their main tasks as oral health providers. The limitation of the present study was the small number of participants also other dietary habits such as snacks and sweets intake needed to be more investigated.

5. Conclusion

Internalizing the dietary habits associated with good oral care will definitely influence the motivation of students to propagate oral health education for their patients in the future.

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Competing Interests

The authors declare that they have no competing interests.

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