

ORIGINAL ARTICLE**Knowledge Regarding Use of Oral Hygiene Aids Among Dental Interns in Saudi Arabia**

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ABSTRACT

Context: Toothbrushes with dentifrice are the most widely used method of self-performed mechanical plaque control. Plaque removal exclusively by tooth brushing is difficult in critical inter-dental areas. Several inter-dental cleaning aids have been developed and are available like dental floss, toothpick, uni-tufted and proxa brush.

Aims: The aim of this study was to assess the knowledge regarding use of oral hygiene aids among dental interns in Saudi Arabia. **Setting and Design:** The present study is a cross-sectional questionnaire based study. **Methodology:** A questionnaire with 12 questions focusing on the application of different oral hygiene aids was developed to assess knowledge among dental interns. Six schools were randomly selected for the study and intern dentists were included in the study. **Statistical Analysis:** The collected responses were analyzed for descriptive statistics. **Results:** A total of 393 (87.5%) out of 449 dental interns participated in the research. The mean knowledge score was found to be 5.45 ± 1.71 . The maximum and minimum score obtained was 10 and 1 respectively. Overall, majority (59.5%) of respondents were found to have average knowledge regarding oral hygiene aids. Knowledge in good and excellent categories together was found in only 27.3%. **Conclusions:** The knowledge regarding use of oral hygiene aids among dental interns was found to be inadequate. There is a need to emphasize significance of maintenance phase of treatment especially by self-care measures. Further research regarding behavior and attitudes of dental interns on oral hygiene aids needs to be investigated.

Key words: dental plaque, periodontium, questionnaire survey

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INTRODUCTION

Oral health is integral to general health and has often been referred as a mirror to general health.^{1,2} A perfect general health is incomplete without perfect oral health. According to the World Health Organization, oral health is “a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing”.³ Dental caries and periodontal disease are most common oral diseases and are prevalent universally.⁴ People are vulnerable to dental caries and periodontal disease all through their lifetime.

Although, multifactorial etiology of dental caries and periodontal disease is known they are primarily initiated by dental plaque.⁵ It is calculated that about 1 cubic millimeter of dental plaque contains approximately 200 million bacteria.⁶ Dental plaque might contain cariogenic bacteria which can ferment dietary carbohydrate to produce acid precipitate leading to demineralization of tooth structure and cavity formation.⁷ The bacterial plaque on tooth surface adjacent to gingiva or gingival crevice can irritate the soft tissue leading to gingivitis.⁸ The inflammation sometimes penetrates into deeper tissues resulting in destruction of supporting connective tissues and alveolar bone called periodontitis. Periodontitis may further progress in severity leading to pain, discomfort, difficulty in chewing, tooth mobility and eventually tooth loss.⁹

Dental plaque control is viewed as the most effective method of preventing periodontal diseases since it addresses the underlying etiology i.e. pathogenic microflora on the tooth surfaces. Evidences suggest that meticulous plaque control can prevent gingivitis and periodontitis in both children and adults.^{10,11} Plaque control methods can be classified as either mechanical or chemical methods which are used as self-care, or procedures professionally done by dentists or dental hygienists. Until now mechanical plaque control seems to be the most dependable form of plaque control method. Chemical plaque control has been used only as an adjunct to mechanical means and not as a substitute.¹²

Toothbrushes with dentifrice are the most widely used method of self-performed mechanical plaque control. Recently, powered toothbrushes are gaining popularity but there is no substantial evidence regarding superiority of powered over mechanical tooth brushing. The effectiveness of toothbrush, however, depends on the acquired dexterity skills of individual, frequency and optimum time.¹³⁻¹⁶ Plaque removal exclusively by tooth brushing is difficult in critical inter-dental areas. Interproximal areas are found to be more vulnerable for gingival inflammation than other tooth surfaces.¹⁵ Several inter-dental cleaning aids have been developed and are available like dental floss, toothpick, uni-tufted and proxa brush. These interdental cleaning aids needs some amount of training and are not recommended for all patients. Irrigation devices are other oral hygiene aids developed to further improve the effect of tooth brushing on reducing interdental plaque.¹⁶ Chlorhexidine gluconate at 0.2% has been considered as gold standard among chemical plaque control agents.¹⁷ Some investigators have reported promising results following the use of Chlorhexidine with oral irrigation devices.¹⁸

It is assumed that oral hygiene aids other than toothbrush are not very popular among general public. The appropriate use of interdental aids is directly related to prescription practices by the dentist. Limited prescription of other oral hygiene aids could be due to trivializing maintenance phase of periodontal treatment or lack of adequate knowledge among dental practitioners. Such prescription practices can be assumed to be generally carried by dental interns to their future practice outside school. There is lack of information on usage and awareness of interdental oral hygiene aids among dental interns in Saudi Arabia. The objective of this study was to assess the knowledge regarding use of oral hygiene aids among dental interns in Saudi Arabia.

METHODOLOGY

Questionnaire Development

A draft questionnaire was constructed to assess knowledge on oral hygiene aids among dental interns. A total of 12 questions focusing on the application of different oral hygiene aids were developed. The

questionnaire was checked several times and verified for face validity. The responses for each item in the questionnaire carried score weightings (score 1 for every correct answer). The total score obtained by all items in the questionnaire indicated a measure of knowledge on oral hygiene aids for an individual. The range of possible scores was 0 to 12, with higher total scores indicating better knowledge on oral hygiene aids. The knowledge status of respondents was categorized using quartile values for the total score: Score 0 to 3 (First Quarter) = Poor Knowledge, Score 4 to 6 (Second Quarter) = Average Knowledge, Score 7 to 9 (third Quarter) = Good Knowledge and Score 9 to 12 (Forth Quarter) = Excellent Knowledge categories respectively.

Study Population and Data Collection

The present study targeted intern dentist from various dental schools in Saudi Arabia. Ethical approval was obtained from the Institutional Review Board at King Khalid University, College of Dentistry (SRC/ETH/2015-16/010). A list of all dental schools was obtained from the Ministry of higher education, and six schools were randomly selected for the study. Informed consent was obtained from intern dentists after explaining them the importance of the study. The questionnaire was self-administered and anonymous to ensure confidentiality of information collected. The respondents were asked to give their responses as tick mark on the options provided with each item. The data were entered into the computer (MS-Excel) and statistical analysis carried out using SPSS version 16.0 (Chicago, SPSS Inc). Descriptive statistics was done

and the results were presented as mean, standard deviation, frequencies and percentages.

RESULTS

A total of 393 (87.5%) out of 449 dental interns participated in the research. The mean knowledge score was found to be 5.45 ± 1.71 . The maximum and minimum score obtained was 10 and 1 respectively. Table 1 shows responses to questionnaire items. Majority (61.6%) of the respondents correctly answered that interproximal areas are more vulnerable for periodontal disease. 45.3% of respondents recommended toothbrush with soft bristles for patients in maintenance therapy of periodontitis and almost equally about 40.2% recommended ultra-soft bristles. Most (85.2%) respondents were aware about classification of interdental embrasures. Only 36.9% selected the correct interdental aid for the type of interdental embrasure. Majority (78.9%) of respondents advised dental floss for patients complaining of food lodgment. Only few (18.3%) among the respondents answered indication of dental floss to patients before complete scaling and root-planing. The mechanism of action of chlorhexidine and its concentration and dosage was correctly answered by 35.6% and 21.4% respondents. Nearly half (52.2%) of the respondents recommended chlorhexidine mouth rinse after tooth brushing. 63.1% of respondents said that oral irrigation device are used in addition to professional scaling and polishing. Overall, majority (59.5%) of respondents were found to have average knowledge regarding oral hygiene aids. Knowledge in good and excellent categories together was found in only 27.3% (Graph 1).

Table 1: Responses to questionnaire items

Questions	Options	Frequency (N)	Percentage (%)
1. The site of periodontium more vulnerable to periodontal disease:	Buccal	74	18.8
	Lingual	64	16.3
	Palatal	13	3.3
	Interproximal	242	61.6
2. The recommended time for tooth brushing is:	2 Minutes	164	41.7
	5 Minutes	114	29.0
	10 Minutes	50	12.7

	15 Minutes	65	16.5
3. Type of tooth brush advised to the patients in maintenance therapy of Periodontitis:	Soft Bristles	178	45.3
	Ultra Soft Bristles	158	40.2
	Medium Bristles	57	14.5
4. Do you know how interdental embrasures are classified?	Yes	335	85.2
	No	58	14.8
5. Select the correct interdental aid for the type of interdental embrasure.	Type I: dental floss Type II: uni-tufted brush Type III: proxa-brush	145	36.9
	Type I: uni-tufted brush Type II: dental floss Type III: proxa-brush	103	26.2
	Type I: dental floss Type II: proxa-brush Type III: uni-tufted brush	145	36.9
6. Dental floss is advised:	To all the patients	53	13.5
	To patients who are complaining of food lodgment	310	78.9
	To the patient with open interdental contact	30	7.6
7. Can we prescribe dental floss to the patients before complete scaling and root planing?	Yes, we can	127	32.3
	No, we cannot	72	18.3
	Yes, if the patient insists	194	49.4
8. Chlorhexidinemouthwash in periodontal maintenance therapy helps:	To flush out the food debris	173	44.0
	To inhibit the bacterial binding on the tooth surface	140	35.6
	To reduce the calculus formation	72	18.3
	Don't know	8	2.0
9. What is the correct concentration and dose of Chlorhexidine as a mouthwash?	0.2 % of 10 ml solution (without dilution)	84	21.4
	0.2 % of 20 ml solution diluted in 10 ml of water	237	60.3
	0.2 % of 10 ml solution diluted in 100 ml of water	72	18.3
10. What is the recommended frequency of Chlorhexidine as mouthwash?	Once a day	96	24.4
	Twice a day	243	61.8
	As per convenience of the patient	25	6.4
	After every meal	39	9.9
11. Chlorhexidine is recommended to use:	Before tooth brushing	118	30.0
	After tooth brushing	205	52.2
	According to patient's convenience	70	17.8

12. Oral irrigation device like Water Pik is used:	In addition to scaling and polishing	248	63.1
	As an alternative to scaling and polishing.	68	17.3
	To polish the tooth surface after scaling and polishing.	77	19.6

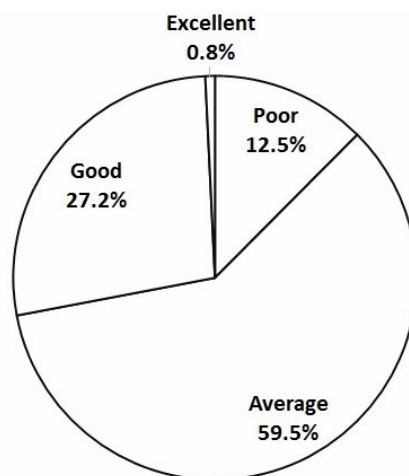


Figure 1: Knowledge regarding use of oral hygiene aids among dental interns

DISCUSSION

The etiology of periodontal disease has been explained by several theories starting from mid-1900's where periodontal disease was correlated with both age and amount of plaque.¹⁹ In the year 1976, Walter Loesche suggested *Non Specific Plaque Hypothesis* according to which the bacterial flora in plaque produce noxious substance which leads to periodontal breakdown.²⁰ However, *Specific Plaque Hypothesis* suggested the role of specific microorganisms in specific periodontal disease.²¹ In 1986, Theilade suggested the *Updated Non Specific Plaque Hypothesis* and said most "specific-pathogens" were indigenous bacteria and sometimes common bacteria in health.²² More recently in 1994, Marsh explained the *Ecological Plaque Hypothesis* where the occurrence of periodontal diseases is attributed to imbalance in the total microflora due to ecological stress, resulting in an enrichment of some oral pathogens.²³ Despite the acceptance of *Specific Plaque Hypothesis* over *Non*

Specific Plaque Hypothesis, prevention and control strategies for periodontal diseases are still based on *Non Specific Plaque Hypothesis*. Mechanical plaque control at home with toothbrush and dental floss remains the most common method.²⁴

Self-care by tooth brushing alone has shown to have limited effect on reducing gingivitis.²⁵ Although, toothbrushes can successfully remove plaque from facial, lingual and occlusal surfaces, it is difficult to reach interproximal areas.²⁶ Various products are available which are designed to achieve plaque control in such critical areas including floss, wood sticks, rubber-tip simulators, interdental brushes and single-tufted brushes. In young individuals in whom there are tight proximal contacts, only dental floss can reach this area. The interdental space increases as the interdental papilla recede. The size of recommended interdental brush should fit snugly in this interdental space. Interdental brushes when used appropriately and as an

adjunct are shown to reduce more plaque than tooth brushing alone.²⁷

Understanding the pathophysiology of periodontal disease helps in correct diagnosis and management. The oral hygiene instructions and recommended oral hygiene aids are tailored to suit individual patient. Dental students in their internship program are well informed about various periodontal conditions and deemed to have adequate skills in managing such conditions. Surprisingly, in our study majority of the dental interns were not sure about indications of dental floss and interdental brushes. Our study also revealed that dental interns had inadequate knowledge on usage of chlorhexidine mouth rinse. This finding could be due to dental interns who might perceive self-care measures as less significant than professional treatment in managing periodontal conditions. The prescription habits developed during internship or at the last year of dentistry program is more likely to continue in later years of professional career. Maintenance phase i.e. oral hygiene instructions for self-care and periodic recall is very critical for patients with periodontal problems. Hence, emphasis needs to be put in ensuring adequate knowledge among graduating dentist regarding indications of various oral hygiene aids together with prescription practice for specific patients. One of the limitations this study was that information on prescription practices of oral hygiene aids among dental interns were not considered. This study being first study of its kind in Saudi Arabia highlights relevance of the topic and calls for further research to investigate knowledge and prescription habits related to oral hygiene aids among dentists including comparison among genders, different universities at both undergraduate and post-graduate program levels and factors influencing utilization of such products could be explored.

CONCLUSIONS

The knowledge regarding use of oral hygiene aids among dental interns was found to be inadequate. There is a need to emphasize significance of maintenance phase of treatment especially by self-care measures. Further research regarding behavior and attitudes of dental interns on oral hygiene aids needs to be investigated.

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