

The Influence of Periodontal Courses on Oral Health Knowledge, Attitude and Practice (KAP) among Undergraduates Dental Students in KSU

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ABSTRACT

Purpose: The aim of this study is to determine the impact of periodontal courses on dental student's oral health knowledge, attitude, and practice.

Methods: A269 undergraduate dental students from the college of dentistry, King Saud University (KSU) in Riyadh, were recruited into this cross-sectional study. A multiple-choice questions questionnaire was distributed among the participant. Descriptive statistics were used to describe the categorical variables. Pearson's Chi-square test was used to compare the responses of categorical variables between the subjects who had (group A) and who did not (group B) expose to periodontal course. Level of statistical significance was set at $P \leq 0.05$.

Results: (68.3%) of group A have responded positively (as 'yes') the periodontal courses influenced their daily self-care practices and (66.5%) said that it added to their oral hygiene knowledge which is statistically significant ($p=0.001$; $p=0.018$). A highly statistical significant difference was noticed between the groups in basic knowledge of oral health ($p<0.0001$). Where (78.35%, 84.5% and 76%) of group B have failed to choose the right brushing technique for 3 different oral conditions where (89.5%, 75% and 55.2%) of group A have chosen the correct answers. Also, 86.4% of group B have chosen 'caries' as primary risk factor for periodontal diseases and 90.9% of group A have chosen 'plaque' However, no statistically significant difference was observed practice component between the two groups.

Conclusion: This study demonstrated that there were significant differences in oral health knowledge and attitude among students who had and who did not expose to periodontal course.

Key words: Knowledge, attitude, practices, Periodontal courses, dental student

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INTRODUCTION

Oral health represents an essential part of the overall well-being and has a remarkable impact on a person's self-esteem, quality of life, and overall daily functions.

Although maintaining good oral health through self-care is pretty much achievable, many people still suffer from oral diseases which represent a global public health problem [1].

Many oral diseases including gingivitis and periodontitis can be prevented via mechanical plaque control measures using different oral hygiene methods or professional scaling and periodontal therapy.

The basics of periodontal disease prevention are given in the undergraduate curriculum as an independent core subject in Periodontology, however, it is best to be introduced in earlier years of study [2].

Periodontal courses are one of the main required courses for undergraduate students in dental school. To train them how to identify signs of possible diseases in the periodontal tissues, so they can be able to diagnose and perform treatment plans before starting any clinical procedures and practice different disease prevention methods.

Also, they learn the importance of educating the patients about their oral health and hygiene, proper diet, and brushing techniques depending on different oral conditions. Usually, the didactic and practical educational subject influences the students' knowledge, attitude toward their oral health and self-care practices [3].

Also, dental students are seen as role models for promoting good oral health behaviour by family, friends, and the public [4] as they participate in dental community projects from different academic year levels.

Thus, measuring students' oral health knowledge and behaviour will participate in revealing how much information they have and if exposing dental students to

periodontal courses in the early academic levels is recommended [2].

Many published studies were interested in assessing the oral health knowledge, attitude, or behaviour of dental students towards their own.

And it was concluded that students in advanced academic years had shown superior knowledge and attitude towards their oral health in comparison with the preclinical students [4–12].

Thus, it is important to educate students regarding oral health since they join the dental school [7]. As dental students they had reported how the undergraduate curriculum was influential and beneficial to their oral health knowledge and practices [4].

Also, one of the studies showed that seeking early treatment and preventive care was highly evident in the late years of undergraduate studies. [10] However, another study demonstrated a decrease in oral hygiene level among dental students with the advancement of the education level [9].

In the literature, some studies have assessed the periodontal status of dental students in addition to their knowledge and attitude. And it was found that even though dental students had good oral health knowledge and attitude in general, they have reported gingival inflammation and moderate plaque accumulation [6,12].

Moreover, multiple researchers had compared oral health knowledge and behaviour of dental students with students in other disciplines such as medical and nursing students.

All agreed that dental students had a significant increase in oral health knowledge and attitude [13–15]. As well, dental students showed improvement throughout their studying years, such improvement was not found in other disciplines [15].

In our study, we are aiming to assess the influence of exposing dental students to periodontal courses on their oral health knowledge, attitude, and practice among undergraduate dental students in King Saud University.

MATERIALS AND METHODS

Two hundred and sixty-nine undergraduate dental students from the college of dentistry, King Saud University (KSU) in Riyadh Saudi Arabia, were recruited into this cross-sectional study, to take a KAP model questionnaire on the influence of periodontal courses on dental students' oral health knowledge, attitude, and practice.

The research project was reviewed and approved on 30 December 2020 by the Institutional Review Board (IRB) King Saud University College of Medicine, project No. E-20-5364. Registered in CDRC, No. IR 0382.

The sample included both male and female students from different backgrounds and educational levels from the junior year until senior year. A pilot survey distributed first on 25 Students 5 from each year to check questionnaire reliability and validity.

Questionnaire responses divided into 2 groups, students who have had periodontal courses during their studies and the ones who have not had any yet, to evaluate the influence and beneficence of periodontal courses in the undergraduate curriculum.

The questionnaire was written in English and divided into 4 sections with a total of 29 items (questions). Section 1: Contains 4 questions regarding participants' demographic data (age, gender, academic level, and if they have been exposed to periodontal courses or not).

Section 2: 7 Oral health knowledge questions (recommended brushing techniques for different oral conditions in addition to periodontal disease signs, causes, and manifestations), Section 3: 7 questions on attitude towards oral health (dental visits and treatments, from where they have acquired their knowledge and if it was influenced by the college curriculum, and finally what's their response toward family and friends' questions related to oral health).

Section 4: contains 11 questions about their practice toward oral health such as brush type, brushing techniques, frequency, estimated time of brushing, frequency of changing toothbrush, the use of interdental aids, cleaning of the tongue, rinsing of mouth, if they had participated in any dental health awareness campaign, what was their role and in which year have they participated.

Data were analysed using SPSS 26.0 windows version statistical software. Descriptive statistics analysis was used to describe the categorical variables.

Pearson's Chi-square test was used to compare the responses of categorical variables (items of knowledge, attitudes, and practice of oral health knowledge) between the subjects who had (group A) and who had not (group B) been exposed to periodontal courses. Level of statistical significance was set at $P \leq 0.05$.

RESULTS

Out of 269 study subjects from King Saud university, gender was approximately evenly distributed, but age groups (<20 and >20 years) was not evenly distributed, where 74% were of age > 20 years.

The subjects were evenly distributed across the 5 academic years with 20% each from each of the 5 academic years. About 63.9% of them had responded positively that they had a periodontal course (Table 1).

Table 1: Characteristics of study subjects (n=269).

Characteristics	No. (%)
Gender	
Male	138(51.3)
Female	131(48.7)
Age	
< 20	70(26.0)
>20	199(74.0)
Academic year	
1st	54(20.1)
2nd	53(19.7)
3rd	55(20.4)
4th	53(19.7)
5th	54(20.1)
Have you ever had a periodontal course?	
Yes	172(63.9)
No	97(36.1)

Items of oral health knowledge and exposure to periodontal course

The comparison of responses towards different items of oral health knowledge between the subjects who had and who did not have periodontal course shows highly statistically significant difference for all the items of oral health knowledge. About 88% of subjects chosen 'modified bass technique' as the recommended brushing technique for patients without periodontal diseases had periodontal course, whereas 92.5% of subjects had chosen 'circular technique' as the recommended brushing techniques for patients without periodontal disease did not had periodontal course ,and about 89.6% of subjects chosen 'modified still man technique' as the recommended brushing technique for patients with gingival recession had periodontal course, where 94.1% of subjects had chosen 'circular technique' as the recommended brushing techniques for patients with gingival recession who did not had periodontal course.

For the item of right sequence in gingivitis initiation, 75.2% of subjects has chosen the sequence of ' bleeding, change in color & texture, mild tenderness, had periodontal course whereas 58.8% of subjects chosen the sequence of ' mild tenderness, change in color & texture, bleeding' did not had periodontal course. About 90.9% of subjects chosen the option of ' plaque' as the primary risk factor for periodontal disease had periodontal course, whereas 86.4% of subjects chosen the option of ' caries', did not have periodontal course For two items of oral health knowledge (periodontal disease can be a manifestation of a systemic diseases or conditions & maintaining good oral hygiene can reverse early gum disease), 74.4% and 73.3% of subjects responded positively (as 'yes') had periodontal course, whereas 66.7% and 75.6% of subjects responded as 'I don't know' did not had periodontal course . All the mention answers shows highly statistical significant difference between the responses (p<0.0001) (Table 2).

Table 2: Comparison of responses of knowledge towards oral health in relation to the study subject's exposure to periodontal course.

Items of oral health knowledge	Had Periodontal course		Z-value	p-value
	Yes(A)	NO(B)		
The recommended brushing technique for patients without Periodontal diseases				
Modified Bass technique*	154(88)	21(12)	138.71	<0.0001
Modified Stillman technique	8(57.1)	6(42.9)		
Charters Technique	0	4(100)		
Horizontal technique	6(26.1)	17(73.9)		
Circular technique	4(7.5)	49(92.5)		
The recommended brushing technique for patients with gingival recession				
Modified Bass technique	32(39)	50(61)	105.99	<0.0001

Modified Stillman technique*	129(89.6)	15(10.4)		
Charters Technique	9(69.2)	4(30.8)		
Horizontal technique	1(7.7)	12(92.3)		
Circular technique	1(5.9)	16(94.1)		
The recommended brushing technique for patients with orthodontic appliances is				
Modified Bass technique	41(49.4)	42(50.6)	31.89	<0.0001
Modified Stillman technique	17(42.5)	23(57.5)		
Charters Technique*	95(80.5)	23(19.5)		
Horizontal technique	7(53.8)	6(46.2)		
Circular technique	12(80)	3(20)		
Which of the following is the right sequence in gingivitis initiation?				
Bleeding, change in color and texture, mild tenderness*	97(75.2)	32(24.8)	16.61	<0.0001
Change in color and texture, bleeding, mild tenderness	61(57.5)	45(42.1)		
Mild tenderness, change in color and texture, bleeding	14(41.2)	20(58.8)		
The primary risk factor for periodontal diseases is				
Caries	3(13.6)	19(86.4)	164.7	<0.0001
Plaque*	160(90.9)	16(6.1)		
Calculus	8(25.8)	23(94.2)		
I don't know	1(2.5)	39(97.5)		
Periodontal disease can be a manifestation of a systemic diseases or conditions				
Yes *	148(74.4)	51(25.6)	36.5	<0.0001
No	2(50)	2(50)		
I don't know	22(33.3)	44(66.7)		
Maintaining good oral hygiene can reverse early gum disease				
Yes*	159(73.3)	58(26.7)	42.42	<0.0001
No	3(27.3)	8(72.3)		
I don't know	10(24.4)	31(75.6)		
* The correct answer				

Source of knowledge and items of attitude towards oral health and exposure to periodontal course

Towards the source of knowledge, 77.3% of subjects, acquired their oral hygiene knowledge from university had periodontal course, when compared with 74.1% of subjects who acquired knowledge from dental health awareness campaign did not have periodontal course which shows highly statistically significant difference ($p < 0.0001$). For the three items of attitudes: 'has the periodontal courses influenced your daily self-care practices', 'has the periodontal courses added to your oral hygiene knowledge' & have you even been asked questions related to oral health by family members or friends', 68.3%, 66.5% & 68.4% of subjects had responded positively (as 'yes') which is statistically

significant ($p = 0.001$; $p = 0.018$; $p = 0.03$). Those subjects who had been asked questions related to oral health by family members or friends, higher proportion of them (79.6%) were able to answer confidently had periodontal course which is highly statistically significant ($p < 0.0001$).

About 84.4% of subjects who had responded positively (as yes) for the item 'have you got a scaling done before' were exposed periodontal course which is highly statistically significant ($p < 0.0001$).

And no statistically significant difference was observed in relation to the frequency of dentist visit and exposure to periodontal course (Table 3).

Table 3: Comparison of responses of attitudes towards oral health in relation to the study subject's exposure to periodontal course.

Items of attitudes towards oral health	Had Periodontal course		Z-value	p-value
	Yes(A)	NO(B)		
From where have you acquired your oral hygiene knowledge?				
Home	38(50.7)	37(49.3)	34.56	<0.0001
School	8(61.5)	5(38.5)		
University	119(77.3)	35(22.7)		
Dental health awareness campaign	7(25.9)	20(74.1)		
Have the periodontal courses influenced your daily self-care practices?				
Yes	153(68.3)	71(31.7)	11.05	0.001
No	19(42.2)	26(57.8)		
Have the periodontal courses added to your oral hygiene knowledge?				
Yes	157(66.5)	79(33.5)	5.57	0.018
No	15(45.5)	18(54.5)		
Have you ever been asked questions related to oral health by family members or friends?				
Yes	147(68.4)	68(31.6)	9.12	0.03
No	25(46.3)	29(53.7)		
If yes, (n=190)				
I was able to answer their questions confidently	90(79.6)	23(20.4)	36.57	<0.0001
Mostly I had to look it up	12(34.3)	23(65.7)		
I never been asked questions	16(38.1)	26(61.9)		
How often do you visit the dentist?				
Every 3 months	20(66.7)	10(33.3)	1.29	0.731
Every 6 months	86(66.2)	44(33.8)		
Only in case of an emergency	63(60)	42(40)		
Never visited one	3(75)	1(25)		
Have you got a scaling done before?				
Yes	130(84.4)	24(15.6)	65.49	<0.0001
No	42(36.5)	73(63.5)		

Items of practice towards oral health knowledge and exposure to periodontal course

About 85.9% subjects who had responded that they use 'modified bass technique' as a technique while brushing their teeth were exposed to periodontal course, whereas 70%, 60.6% & 67.2% who had responded that they use 'charters technique', horizontal technique, & circular technique were not exposed to periodontal course which indicates highly statistically significant difference in their responses ($p < 0.0001$). Using mouthwash once in a week, and I don't wash was reported by 60.3% and 67.1% of subjects had periodontal courses which are highly statistically significant differences ($p < 0.0001$). Using tongue scraper to clean their tongue was reported by 62.5% of subjects, and 90.3% of them don't clean their tongue, and had periodontal courses which showed highly statistically significant differences ($p < 0.0001$).

The distribution of treating number of periodontitis cases shows a highly statistically significant difference between the subjects who had and who did not have periodontal course ($p < 0.0001$). About 84.6% of subjects who had participated in dental health awareness campaigns were exposed to periodontal courses which is highly statistically significant ($p < 0.0001$). Among those who attended dental health awareness campaigns, 91.8% of them had played a role of organizer and 94.9% of them played a role of public education and as organizer, which is highly statistically significant ($p = 0.0002$). And there is no statistically significant difference in the responses of subjects who had and did not have periodontal course for the practice items (frequency of brushing teeth, how long brushing the teeth, type of toothbrush, how often replace toothbrush and use of interdental aid) (Table 4).

Table 4: Comparison of responses of practice towards oral health in relation to the study subjects exposure to periodontal course.

Items of oral health practice	Had Periodontal course		Z-value	p-value
	Yes(A)	NO(B)		
How frequent do you brush your teeth?				
Once a day	30(73.2)	11(26.8)	5.86	0.21
Twice a day	113(60.1)	75(39.9)		
More than twice per day	20(66.7)	10(33.3)		
After every meal	7(87.5)	1(12.5)		
Never	2(100)	0		
For how long do you brush your teeth?				
10-30 seconds	38(66.9)	19(33.3)	0.23	0.89
30-60 seconds	84(63.2)	49(36.8)		
90-120 seconds	50(63.3)	29(36.7)		
What type of toothbrush do you use for brushing?				
Ultra-soft	22(56.4)	17(43.6)	1.67	0.644
Soft	113(65.3)	60(34.7)		
Medium	36(64.3)	20(35.7)		
Hard	1(100)	0(0)		
Which technique do you use while brushing?				
Modified Bass technique	128(85.9)	21(14.1)	72.98	<0.0001
Modified Stillman technique	6(60)	4(40)		
Charters Technique	3(30)	7(70)		
Horizontal technique	13(39.4)	20(60.6)		
Circular technique	22(32.8)	45(67.2)		
How often do you replace your toothbrush?				
Every 2 month	11(47.8)	12(52.2)	3.58	0.31
Every 3 month	76(62.8)	45(37.2)		
Every 6 month	56(67.5)	27(32.5)		
Once a year	29(69.0)	13(31.0)		
Do you use any interdental aids daily?				
Yes	122(67.4)	59(32.6)	2.88	0.09
No	50(56.8)	38(43.2)		
If yes, what type of inter-dental aid you use?				
Dental floss	127(73)	47(27)	--	--
Toothpick	2(11.8)	15(88.2)		
Miswak	0	8(100)		
Oral irrigator	5(83.3)	1(16.7)		
I Won't use inter-dental aid	33(56.9)	25(43.1)		
others	5(83.3)	1(16.7)		
How often do you use mouthwash?				
Daily	15(50)	15(50)	40.62	<0.0001

Once in a week	41(60.3)	27(39.7)		
I don't use	112(67.1)	55(32.9)		
Other	4(100)	0		
Which among the following do you use to clean your tongue?				
Tongue scraper	30(62.5)	18(37.5)	21.57	<0.0001
Toothbrush	95(56.5)	73(43.5)		
I don't clean my tongue	47(90.3)	6(9.7)		
How many periodontitis cases did you treat during your clinical courses?				
None	42(55.3)	34(44.7)	88.32	<0.0001
3-Jan	66(94.3)	4(5.7)		
6-Mar	36(85.9)	6(14.3)		
>6	10(100)	0		
I didn't start the clinical courses yet	20(28.2)	51(71.8)		
Have you ever participated in any dental health awareness campaign?				
Yes	110(84.6)	20(15.4)	46.47	<0.0001
No	62(44.9)	77(55.1)		
If yes, what was your role				
Public education	26(65)	14(35)	16.72	0.0002
Organization	45(91.8)	4(8.2)		
I have done both	37(94.9)	2(5.1)		

DISCUSSION

Knowledge component

The results of comparison of responses towards different items of oral health knowledge indicates that group A have a higher level of knowledge than group B and this had been noticed in some studies where it showed that students' knowledge and attitude increase as the education level increases [16]. Which might be due to implementing of multiple periodontal and preventive dentistry courses from the 3rd year.

The questionnaire started with questions regarding the recommended brushing techniques for different oral conditions, the recommended brushing technique for patients without periodontal diseases, patients with gingival recession and patients with orthodontic appliances as many types of brushing techniques have been recommended by various researchers over the past years [17]. A great percentage of Group B has failed to choose the right answer where the majority of group A were able to answer each question correctly.

Also, they were asked about the primary causative factor for periodontal disease and it is widely known to be plaque [16]. However, 86.4% of subjects who chose 'caries' as primary causative factor for periodontal disease were from group B.

Research also shows that gingival inflammation resolves after removal of bacterial biofilm, hence, maintaining

good oral hygiene can reverse early gum diseases [18]. However, approximately half of the respondents from group B were unaware of that. The same was observed when we asked the participants about the right sequence in gingivitis initiation.

And although the literature has proven that a periodontal disease can be a manifestation of a systemic disease and have an important impact in the diagnosis and treatment [19], our study results have stated that the majority of group B were unaware of this information.

These findings are probably because early year's dental students did not receive sufficient education on preventive measures in oral health education.

Attitude component

Our study showed highly significant results regarding the source of oral hygiene knowledge, where it indicated that students from group A have acquired their knowledge from school and university. Unlike the students from group B, as they reported acquiring their knowledge from dental health awareness campaigns. Nevertheless, it is of great importance to obtain accurate information from proper educational facilities. And our results showed that students are acknowledging that, where they significantly agreed that periodontal courses have influenced their daily self-care practices and added to their oral hygiene knowledge. Similar findings were found in the study done by Singh et al. [4] this also supported by this finding About 84.4% of subjects who

have got scaling done for them before were exposed to periodontal course.

Moreover, dental students are seen as role models by the public even if they don't feel they are competent enough and our study supports that. Where most of the dental students from both groups have been asked questions related to oral health before, and approximately 80% of those who were able to answer confidently, were from group A only.

Practice component

In general, the study showed no statistically significant difference in the responses of subjects from group A & B for the practice items (frequency of brushing teeth, how long brushing the teeth, type of toothbrush, how often to replace toothbrush and use of interdental aid), except for the technique they use while brushing. Where group A seemed to be more familiar with 'modified bass technique' as it is the recommended brushing technique since the majority of them were using it according to their responses. Unlike group B where only a small percentage were aware of this technique. Also, some inconsistency was observed between the level of knowledge and one of the practice items where 90.3% of subjects who didn't use a tongue scraper to clean their tongue, were from group A. Similar to our results, the study carried out by Lujo [9] also showed that final-year students had good knowledge and attitudes and lower oral hygiene practices.

Our study as well has revealed that group A possesses the greater percentage in the participation in dental health awareness campaigns which is practical. However, even though only a minority from group B are participating in such activities, more than 70% of them have played a role in public education which is an issue since they don't have sufficient information regarding oral health etc. And as it has been said earlier, dental students are seen as role models hence, it will not have a very beneficial impact if younger students were banned from participating in health awareness campaigns and other informative gatherings because they are trusted by the public regardless of which level they are in.

CONCLUSION

This study demonstrated that there were significant differences in oral health knowledge and attitude among students who had and who were not exposed to periodontal courses with no statistically significant difference in the practice. This indicates the need for implementing basic oral health knowledge in the periodontal course from early years of study.

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REFERENCES

1. Peres MA, Macpherson LM, Weyant RJ, et al. Oral diseases: A global public health challenge. *Lancet* 2019; 394:249-260.
2. www.efp.org/publications-education/undergraduate-education/.
3. Vangipuram S, Rekha R, Radha G, et al. Assessment of oral health attitudes and behavior among undergraduate dental students using Hiroshima university dental behavioral inventory HU-DBI. *J Indian Assoc Public Health Dent* 2015; 13:52-57.
4. Singh S, Pottapinjara S. Dental undergraduate students' knowledge, attitudes and practices in oral health self-care: A survey from a South African university. *Afr J Health Prof Educ* 2017; 9:2.
5. Al-Wesabi AA, Abdelgawad F, Sasahara H, et al. Oral health knowledge, attitude and behaviour of dental students in a private university. *BDJ Ope* 2019; 5:16.
6. Ahmad F, Alotaibi M, Baseer M, et al. The effect of oral health knowledge, attitude, and practice on periodontal status among dental students. *Eur J Dent* 2019; 13:437-443.
7. Daya D, Teja U, Paturu DB, et al. Evaluation of oral-hygiene awareness and practice among dental students. *J NTR Univ Health Sci* 2017; 6:24-28.
8. Neeraja R, Kayalvizhi G, Sangeetha P. Oral health attitudes and behavior among a group of dental students in Bangalore, India. *Eur J Dent* 2011; 5:163-167.
9. Lujo M, Meštrović M, Ivanišević Malčić A, et al. Knowledge, attitudes and habits regarding oral health in first- and final-year dental students. *Acta Clin Croat* 2016; 55:636-643.
10. Cavaillon J, Conge M, Mirisch D, et al. Longitudinal study on oral health of dental students at Paris VII University. *Community Dent Oral Epidemiol* 1982; 10:137-143.
11. Gupta S, Saxena S, Sikka N, et al. Oral health attitude, knowledge, and behaviour of dental students of Jaipur, Rajasthan: A comparative study. *J Indian Assoc Public Health Dent* 2015; 13:459.
12. Rahman B, Kawas SA. The relationship between dental health behavior, oral hygiene and gingival status of dental students in the United Arab Emirates. *Eur J Dent* 2013; 7:22-27.
13. Dogan B. Differences in oral health behavior and attitudes between dental and nursing students. *J Marmara University Inst Health Sci* 2013; 1.
14. Kumar H, Behura SS, Ramachandra S, et al. Oral health knowledge, attitude, and practices among dental and medical students in eastern india-A comparative. *J Int Soc Prev Community Dent* 2017; 7:58-63.

15. Rong W, Wang W, Yip H. Attitudes of dental and medical students in their first and final years of undergraduate study to oral health behaviour. *Eur J Dent Educ* 2006; 10:178-184.
16. Guthmiller JM, Novak KF. *Periodontal diseases*. ASM Press 2002.
17. Poyato-Ferrera M, Segura-Egea J, Bullon-Fernandez P. Comparison of modified bass technique with normal toothbrushing practices for efficacy in supragingival plaque removal. *Int J Dent Hygiene* 2003; 1:110-114.
18. Silness J, L oe H. Periodontal disease in pregnancy. Correlation between oral hygiene and periodontal condition. *Acta Odontol Scand* 1964; 22:121.
19. Albandar JM, Susin C, Hughes FJ. Manifestations of systemic diseases and conditions that affect the periodontal attachment apparatus: Case definitions and diagnostic considerations. *J Periodont* 2018; 89:S183-S203.