

A contemporary survey of dental cervical lesions. Part I: The influence of dentists' qualifications in determining aetiology, frequency of occurrence and diagnosis

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لقد هدفت هذه الدراسة الى تقييم مدى تأثير درجة تأهيل طبيب الاسنان ونوع ممارسته السريرية ومكان العمل على قدرته على تحديد اسباب حدوث ، تكرار وتشخيص الآفات السننية العنقية ، تم اختيار (٢٤٨) طبيب اسنان بشكل عشوائي للمشاركة في هذه الدراسة من خلال تعبئة استبيان خصص لهذه الغاية . لقد شمل الاستبيان اربع صور سريرية ملونه تبين اربعة انواع مختلفة من الاصابات السننية العنقية ، كما احتوى الاستبيان كذلك على عدد من الاسئلة التفصيلية حول المشاركين في هذه الدراسة .تمت الاستجابة من قبل (١٧٦) طبيب اسنان عام و (٤٤) اختصاصي بما مجموعه (٢٢٠) طبيب اسنان يعملون في عمان حيث قاموا بتعبئة واعادة الاستبيان من اصل العدد الكامل وهو (٢٤٨) . تم تحليل البيانات الواردة احصائيا باستخدام برنامج حاسوب متخصص . بينت النتائج ان غالبية المشاركون (٨٤,٥%) قد اكدوا وجود صلة ما بين اللويحة الجرثومية والنخر السنني ، بينما (٧٦,٥%) من المشاركون اشاروا الى الصلة ما بين تناول الاحماض والتحات بينما اكد ما نسبته (٦٢%) ان تفريش الاسنان هو سبب التآكل في حين اعتبرت العوامل الاطباقية سببا للاجهادات الميكانيكية العنقية من قبل ما نسبته (٦١%) من المشاركون . كان التآكل السني اكثر الاصابات مشاهدة تبعه حالات التحات تم التآكل في حين ندرت حالات الاجهادات الميكانيكية العنقية التي صادفها المشاركون . لقد كان هنالك تباين واضح بين المشاركون فيما يتعلق بتشخيص الحالات السريرية الموضحة بالصور الملونه المرفقة للاستبيان ، لقد كان هنالك فروق ذات قيمة احصائية في النتائج وذلك عند الاخذ بعين الاعتبار كل من درجة التخصص ونوعه ومكان الممارسة السريرية للمشاركون . لقد بينت هذه الدراسة ان المشاركون يدركون تكرار مصادفهم لهذا النوع من الاصابات السننية اثناء ممارستهم اليومية في حين ان البعض لديهم درجة من التشكك وعدم اليقين حول التشخيص التفريقي لهذه الاصابات والاسباب المؤدية لها . ان المشاركون بحاجة الى التعرف بشكل افضل على مسببات هذه الاصابات واشكالها السريرية كي يكونوا اكثر قدرة على تطبيق وسائل وقائية مؤثرة وكذلك تقديم

The objective of this study was to evaluate the influence of dentists' qualifications, dental speciality and type of clinical practice in determining the aetiology, frequency of occurrence and diagnosis of dental cervical lesions by dental practitioners. Out of 248 dentists randomly selected to fill self-administered questionnaire, 176 general dental practitioners and 44 specialists working in Amman filled the 220 questionnaires. The questionnaire included four coloured clinical photographs, illustrating four different dental cervical lesions. It also contained a number of questions concerning the details of the respondents. The collected data was analyzed using Chi-square test at $P < 0.05$ using Statistical Package for Social Sciences. The results showed that the majority of respondents (84.5%) associated plaque with caries, acid intake with erosion (76.5%), toothbrushing factors with abrasion (62.0%) and occlusal factors with abfraction (61.0%). Root caries was most frequently seen followed by erosion, abrasion and most of the participating dentists rarely encountered abfraction lesions. There were marked variations among the respondents in respect of the diagnosis made from the clinical photographs. There were significant differences ($P < 0.05$) in results when the highest qualification, type of specialty and the primary type of clinical practice of respondents were considered. The respondents determined that they were coming across all four types of cervical lesions on regular basis. There was uncertainty as to the precise aetiology associated with these lesions and uncertainty regarding the diagnosis. The participants needed to be more familiarized with the aetiology and clinical presentation of cervical lesions to be able to apply more effective preventive measures and proper management.

Introduction

The prevalence of non-carious dental cervical lesions increases with age.^{1,2} The maxillary premolars are the teeth most frequently affected by these conditions.^{2,3} Therefore, the increased life expectancy of the population, coupled with prolonged retention of teeth, suggest that dentists are likely to encounter increasing numbers of patients with these lesions.⁴⁻⁶ However, little is known about their occurrences around the world.

Previous studies showed that there was a great variation among dentists in the diagnosis and management of non-carious cervical lesions shown to them by clinical photographs.^{7,8}

Common non-carious cervical lesions are (1) erosion, (2) abrasion, and (3) abfraction (stress-induced defects).⁹⁻¹¹ The criteria used to differentiate between the three types of cervical lesions are based on the morphological characteristics of the lesion.^{9,10,12} However, the possibility of multi-factorial aetiology means that this simple approach could not always be easily applied to individual lesions.¹

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The first step in effective management of cervical lesions is the understanding of their aetiology and the ability to recognize their clinical presentation. Therefore, it was considered useful to evaluate the extent of awareness of a representative sample of dentists in Jordan to the aetiology and clinical presentation of these conditions.

All practicing dentists in Jordan are Jordanian citizens and a small percentage (10%) of them had obtained postgraduate training.¹³ Furthermore, while less than one-third of the general dental practitioners in Jordan are graduates of Jordanian dental schools; the vast majority of graduates are from various Universities across the world.

The aim of the study was to investigate the influence of qualification and primary type of clinical practice on the ability of Jordanian dentists to identify the aetiology, the frequency of occurrence and diagnosis of dental cervical lesions.

Materials and Methods

A list of 1025 Jordanian dentists registered with the Jordanian Dental Association and working in Amman (capital of Jordan) was obtained. The list contained 845 general dental practitioners and 180 dental specialists. The selected sample included 200 general dental practitioners and 48 specialists. The sample was chosen, by a random method, and sampling was stratified with proportional allocation so as to be representative of dentists in the four practicing categories namely private clinics, the Ministry of Health, the Military Medical Services and the Universities.

A questionnaire was developed to allow the participating dental practitioners to determine the aetiology, frequency of occurrence and diagnosis of dental cervical lesions. It was based on the surveys of Bader *et al.*⁷ and Lytle *et al.*⁸ The questionnaires were distributed to the participating dentists in person by the authors. The questionnaire contained a number of questions concerning the profile of the dentists such as age, highest qualification, type of specialty and type of primary clinical practice. The dentists were asked about their understanding of any association between the four types of dental cervical lesions and nine possible aetiological factors namely: tooth brushing; diet; gastric reflux; dental plaque; acid intake; type of toothpaste; hardness of toothbrush, radiation therapy and/or salivary gland disorders and occlusion. The dentists were asked to estimate the extent, to which they

associated each of these nine factors with each type of lesion, using the following 3-point scale:

Association with the factor in 0-25% of instances (referred to in this article as "infrequently associated").

Association with the factor in >25 - <75% of instances (referred to in this article as "moderately associated").

Association with the factor in 75-100% of instances (referred to in this article as "frequently associated").

The dentists were also asked to estimate how many (0-1, 2-5, 6-10, 11-15 or >15) dental cervical erosions, abrasions and abfraction lesions they had come across among the patients they had seen in their regular practice settings each month. For completeness and comparison, and also because of its importance, equivalent information was also sought from the dentists regarding dental root carious lesions.

The questionnaire also contained four clinical coloured photographs showing the four dental cervical lesions (Figures 1-4). The dentists were asked to indicate which of the illustrated lesions represented root caries, erosion, abrasion or abfraction. The questionnaire was prepared in both Arabic and English, and the dentists were asked to choose the language they preferred. The photographs and questions were reviewed initially by a number of restorative dentistry specialists. In addition, the questionnaire including the photographs were tested on a group of 10 general practitioners and necessary modifications were made according to their comments.

All the responses were treated anonymously. The data were analyzed by Chi-square analysis at $P < 0.05$ using Statistical Package for Social Sciences (SPSS for Windows, Release 7.5.2. 1997, SPSS Inc.).



Fig. 1. Dental cervical lesion A (arrow in tooth 23).



Fig. 2. Dental cervical lesion B (arrow in tooth 13).



Fig. 3. Dental cervical lesion C (arrow in tooth 43).



Fig. 4. Dental cervical lesion D (arrow in tooth 24).

Results

A total of 220 questionnaires were collected from 176 general dental practitioners (80%) and 44 specialists (20%), respectively. Twenty-two of the specialists were restorative specialists (15 MSc and 7 PhD holders) and 22 had "other specialties" which included 12 prosthodontists, 5 pediatric dentists and 5 specialists in oral medicine (11 MSc and 11 PhD holders). The age of the respondents ranged from 23 to 61 with a mean age of 33.6 years. Regarding the type of clinical practice, 146 (66.4%) of the respondents were working in private clinics, 32 (14.5%) in the Ministry of Health, 27 (12.3%) in the Military Medical Services and 15 (6.8%) in the Universities.

Not all the respondents gave answers to every question in the questionnaire. Accordingly the totals in the results sections do not necessarily add up to 220 for each question. A summary of only the significant differences ($P < 0.05$) between the groups of respondents in respect of the dentist qualifications and type of primary clinical practice, is presented in parts of the results.

Aetiological Factors

The views of the respondents concerning the association between the nine aetiological factors and the four types of dental cervical lesions are shown in Table 1. The results of the aetiological factors showed statistically significant differences when the respondents were grouped according to their specialty and type of clinical practice (Table 2).

Firstly, a significantly higher percentage of "other specialists" (81%) reported that diet was frequently the aetiological factor associated with root caries while only 47.2% of general dental practitioners and 31.8% of restorative specialists did so ($P = 0.011$). Secondly, the significantly higher percentage of respondents (59.3%) who reported that type of toothpaste was the aetiological factor most frequently associated with abrasion were working in the Military Medical Services ($P = 0.003$).

Frequency of Occurrence of Cervical Lesions

The respondents' estimates regarding the number of root caries, erosion, abrasion and abfraction lesions that they come across each month are given in Table 3. Root caries was reported most frequently, with 66.4% of the respondents estimating seeing six or more such

Table 1. The respondents' opinion on the association between the nine possible aetiological factors and the four types of dental cervical lesion. (The figures represent the number and percentage of the respondents)

Aetiological factor	Type of dental cervical lesion											
	Root caries			Erosion			Abrasion			Abfraction		
	Frequently associated	Moderately associated	In-frequently associated	Frequently associated	Moderately associated	In-frequently associated	Frequently associated	Moderately associated	In-frequently associated	Frequently associated	Moderately associated	In-frequently associated
Tooth brushing	8 (4.3%)	30 (16%)	149 (79.7%)	16 (8.5%)	44 (23.4%)	128 (68.1%)	132 (62%)	66 (31%)	15 (7.0%)	4 (2.3%)	33 (18.8%)	139 (79%)
Type of toothpaste	11 (6%)	42 (22.8%)	131 (71.2%)	25 (13%)	58 (30.1%)	110 (57%)	78 (37.1%)	77 (36.7%)	55 (26.2%)	3 (1.7%)	33 (18.6%)	141 (79.7%)
Hardness of toothbrush	8 (4.3%)	53 (28.8%)	123 (66.8%)	25 (12.8%)	59 (30.1%)	112 (57.1%)	142 (66.7%)	48 (22.5%)	23 (10.8%)	9 (5.2%)	42 (24.1%)	123 (70.7%)
Dental plaque	180 (84.5%)	28 (13.1%)	5 (2.3%)	23 (12.6%)	47 (25.8%)	112 (61.5%)	6 (3.3%)	33 (18.1%)	143 (78.6%)	11 (6.3%)	34 (19.3%)	131 (74.4%)
Diet	99 (49%)	86 (42.6%)	17 (8.4%)	100 (48.3%)	67 (32.4%)	40 (19.3%)	15 (7.8%)	67 (34.9%)	110 (57.3%)	12 (6.7%)	50 (27.8%)	118 (65.6%)
Acid intake	20 (10.9%)	79 (42.9%)	85 (46.2%)	100 (48.3%)	44 (20.7%)	6 (2.8%)	25 (13.1%)	49 (25.7%)	117 (61.3%)	11 (6.4%)	23 (13.4%)	138 (80.2%)
Gastric reflux	15 (7.9%)	80 (42.3%)	85 (46.2%)	163 (76.5%)	40 (19.8%)	15 (7.4%)	11 (5.8%)	47 (24.9%)	131 (69.3%)	1 (0.6%)	28 (16.2%)	144 (83.2%)
Occlusion	3 (1.6%)	38 (20.2%)	94 (49.7%)	147 (72.8%)	40 (21.2%)	135 (71.4%)	75 (37.9%)	47 (23.7%)	76 (38.4%)	122 (61%)	68 (34%)	10 (5.0%)
Radiation therapy and/or salivary gland disorder	99 (44.6%)	91 (44.6%)	147 (72.8%)	77 (39.5%)	81 (41.5%)	12 (6.5%)	55 (29.6%)	119 (64%)	9 (5.1%)	54 (30.5%)	114 (64.4%)	

Table 2. A summary of the significant differences found among the respondents regarding the aetiological factors causing dental cervical lesions when the type of specialty and type of primary clinical practice were considered

Aetiological factor for the type of lesion	Frequency	Frequently associated n (%)	Moderately associated n (%)	Infrequently associated n (%)	P*
Diet for root caries					
1. Type of specialty		7 (31.8%)	14 (63.6%)	1 (4.5%)	0.011
1. Restorative specialists		17 (81.0%)	3 (14.3%)	1 (4.8%)	
2. Other specialists		75 (47.2%)	69 (43.4%)	15 (9.4%)	
2. Primary type of clinical practice		16 (59.3%)	4 (14.8%)	7 (25.9%)	0.003
1. Military Medical Services		14 (50.0%)	6 (21.4%)	8 (28.6%)	
2. Ministry of Health		7 (46.7%)	2 (13.3%)	6 (40.0%)	
3. Universities		41 (29.3%)	65 (46.4%)	34 (24.3%)	

*Chi-square analysis. The total number of respondents may not add up to 220 because a number of the respondents did not answer all questions.

lesions per month, 18.2% estimating seeing more than 15 lesions per month. By contrast, only 2.9% of the respondents estimated seeing more than 15

abfraction lesions per month, while 55.8% estimated seeing not more than just a single abfraction lesion per month. The estimates of the

Table 3. The dentists' estimates of the numbers of the four dental cervical lesions they encountered in a month

Type of lesion	Estimated number of lesions encountered in a month				
	0-1 lesions per month	2-5 lesions per month	6-10 lesions per month	11-15 lesions per month	> 15 lesions per month
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Root caries	23(10.5%)	51(23.2%)	66(30%)	40(18.2%)	40(18.2%)
Erosion	50(22.8%)	111(50.7%)	30(13.7%)	19(8.7%)	9(4.1%)
Abrasion	35(15.9%)	89(40.5%)	68(30.9%)	19(8.6%)	9(4.1%)
	115(55.8%)	56(27.2%)	17(8.3%)	12(5.8%)	6(2.9%)

The total number of respondents may not add up to 220 because a number of the respondents did not answer all questions.

Table 4. A summary of the significant differences found among the respondents regarding the occurrence of dental cervical lesions when their qualifications and types of primary clinical practice were considered

Respondents categories	Estimated number of lesions encountered in a month					P*
	0-1 lesions per month <i>n</i> (%)	2-5 lesions per month <i>n</i> (%)	6-10 lesions per month <i>n</i> (%)	11-15 lesions per month <i>n</i> (%)	>15 lesions per month <i>n</i> (%)	
1. Highest qualification						
Occurrence of root caries lesion						
a. BDS respondents	15 (08.5%)	44 (25.0%)	59 (33.5%)	33(18.8%)	25 (14.2%)	<0.0001
b. MSc respondents	3 (11.5%)	3 (11.5%)	1 (03.8%)	6 (23.1%)	13 (50.0%)	
c. PhD respondents	5 (27.8%)	4 (22.2%)	6 (33.3%)	1 (05.6%)	2 (11.1%)	
2. Highest qualification						
Occurrence of erosion lesion						
a. BDS respondents	42 (24.0%)	92 (52.6%)	19 (10.9%)	17 (09.7%)	5 (02.9%)	0.010
b. MSc respondents	1 (03.8%)	15 (57.7%)	6 (23.1%)	1 (03.8%)	3 (11.5%)	
c. PhD respondents	7 (38.9%)	04 (22.2%)	5 (27.8%)	1 (05.6%)	1 (05.6%)	
3. Type of specialty						
Occurrence of erosion lesion						
a. Restorative specialists	1 (04.5%)	4 (18.2%)	4 (18.2%)	5 (22.7%)	8 (36.4%)	0.001
b. Other specialists	7 (31.8%)	3 (13.6%)	3 (13.6%)	2 (09.1%)	7 (31.8%)	
c. General dental practitioners	15 (08.5%)	44 (25.0%)	59 (33.5%)	33 (18.8%)	25 (14.2%)	
4. Type of clinical practice						
Occurrence of abrasion lesion						
a. Military Medical Services	2 (07.4%)	2 (07.4%)	14 (51.9%)	7 (25.9%)	2 (07.4%)	<0.0001
b. Ministry of Health	2 (06.3%)	22 (68.8%)	6 (18.8%)	1 (03.1%)	1 (03.1%)	
c. Universities	2 (13.3%)	5 (33.3%)	5 (33.3%)	1 (06.7%)	2 (13.3%)	
d. Private clinics	29 (19.9%)	60 (41.1%)	43 (29.5%)	10 (06.8%)	4 (02.7%)	

*Chi-square analysis. The total number of respondents may not add up to 220 because a number of the respondents did not answer all questions.

numbers of erosion and abrasion lesions seen were fairly similar to one another, with 64.4% and 71.4% of the respondents, respectively reporting seeing 2-10 of these lesions per month. Only 4.1% of the respondents estimated seeing more than 15 erosion or abrasion lesions per month, while 22.8% and 15.9%, respectively estimated coming across these lesions only 0-1 time per month.

Few significant results were obtained on the frequency of occurrences of cervical lesions as reported by the groups of respondents (Table 4). The MSc respondents reported significantly higher frequency of occurrence of root caries ($P<0.0001$) and erosion lesion ($P=0.010$). The restorative specialists reported seeing significantly higher frequency of occurrence of erosion lesion

Table 5. A summary of the diagnoses of conditions A-D as reported by the respondents and the significant differences found between the respondents regarding the diagnoses of the lesions when the respondent qualification was considered

Type of lesion	Root caries n (%)	Erosion n (%)	Abrasion n (%)	Abfraction n (%)	P*
1. Results of all dentists					
a. Condition A	163 (74.1%)	30 (13.6%)	19 (08.6%)	8 (03.6%)	
b. Condition B	6 (02.7%)	82 (37.4%)	54 (24.7%)	77 (35.2%)	
c. Condition C	8 (03.7%)	36 (16.7%)	137 (63.4%)	35 (16.2%)	
d. Condition D	109 (50.9%)	49 (22.9%)	34 (15.9%)	22 (10.3%)	
2. Highest qualification and condition "A"					
a. BDS respondents	135 (76.7%)				<0.0001
b. MSc respondents	19 (73.1%)				
c. PhD respondents	9 (50.0%)				
3. Type of specialty and condition "A"					
a. Restorative specialists	18 (81.1%)				<0.0001
b. Other specialists	10 (45.5%)				
c. General dental practitioners	135 (76.7%)				
4. Type of specialty and condition "B"					
a. Restorative specialists		15 (68.2%)			0.009
b. Other specialists		10 (45.5%)			
c. General dental practitioners		57 (32.6%)			
5. Type of specialty and condition "D"					
a. Restorative specialists				6 (27.3%)	0.007
b. Other specialists				4 (18.2%)	
c. General dental practitioners				12 (07.1%)	

*Chi-square analysis. The total number of respondents may not add up to 220 because a number of the respondents did not answer all questions.

($P=0.001$). Considering the primary type of clinical practice, the respondents of the Military Medical Services reported seeing a significantly higher frequency of occurrence (68.8%) of abrasion lesion ($P<0.0001$).

Diagnosis of Dental Cervical Lesions

Regarding the diagnosis of the four conditions ("A" to "D") presented in the coloured photographs as Figures 1 to 4, 74.1%, 63.4%, 37.4% and 10.3% of the respondents agreed on the diagnosis of "A", "B", "C" and "D" as root caries, abrasion, erosion and abfraction, respectively (Table 5).

When the highest qualification was considered, significant higher percentage of BDS (76.7%) and MSc (73.1%) respondents diagnosed the condition "A" as root caries ($P=0.001$) compared with the PhD (50%) respondents (Table 5).

When the type of specialty was considered, significantly higher percentages of the restorative dentistry specialists (81.1%, 68.2% and 27.3%) diagnosed the conditions "A", "B" and "D" as root caries, erosion and abfraction ($P<0.0001$, $P=0.009$ and $P=0.007$, respectively) (Table 5).

Discussion

The response rate obtained in the current investigation (89%) was higher than previous studies.^{7,8} Bader *et al.*⁸ reported a 47% response rate whilst Lyttle *et al.*⁷ reported a 67% response rate. The high response rate may be attributed to the personal communication between the author and the respondents whereby questionnaires were distributed in person to build up the interest of the participants in the study.

The role of dental plaque in the development of root caries is well established.¹⁴ Most of the respondents (84%) recognized a frequent association between the two. However, 16% of the respondents considered the association between plaque and root caries moderate or infrequent. In addition, less than half of the respondents (49%) appreciated the significant role of diet in the development of root caries whilst 51% reported moderate or infrequent association between the two. An even smaller percentage of the restorative dentistry specialists (31.8%) reported a frequent association between diet and root caries. Those figures may reflect an alarming misunderstanding of the aetiology of root caries which may be

reflected negatively on the management of patients with this condition hence, the emphasis on dietary counseling and plaque control might not be up to the standards required. Approximately, 49% of the respondents reported "frequent" and 45% reported "moderate" association between root caries and radiation therapy and/or salivary gland disorders. Such percentage is considered an over estimation of the role of these conditions in the frequency of occurrence of root caries. Although most of the patients suffering from reduction or cessation of salivation as a result of radiation therapy and / or salivary gland disorders developed cervical caries.^{15,16} However, the number of those patients formed a small percentage of the patients that developed root caries and cervical lesions.^{15,17} The citation of each of the nine factors in relation to root caries ranged between 13.1 to 42.9% of the respondents reflecting the multi factorial nature of the disease. It is interesting to note that 76.5% of the respondents reported that acid intake was frequently associated with erosion whilst gastric reflux came as close second with 72.8% followed by diet with 48.3%. Gastric reflux particularly affects the palatal surfaces of anterior and posterior maxillary teeth.¹⁸ Acid intake is likely to affect the labial surfaces of anterior and occlusal surfaces of posterior teeth more than its effect on the cervical root region.¹⁹ As acid intake is mostly of dietary origin this might explain the similar percentage of respondents who associated erosion with diet and acid intake.

The current study has shown that there was no unanimity among the respondents in relation to the association of the factors in question with any of the cervical lesions under investigation. Whilst 66.7%, 62.0% and 37.1% associated cervical abrasion with the hardness of the toothbrush, tooth brushing and the type of toothpaste, respectively, it was somewhat surprising to find that 10.8%, 7.0% and 26.2% of the respondents considered these factors to be infrequently associated with cervical abrasion. Looking at these findings in more detail, it was revealed that 70.7% of the respondents in private practice reported moderate to infrequent association between cervical abrasion and the type of toothpaste used (Table 2). It shows that a large number of private practitioners underestimate the importance of toothpaste as a contributing factor to cervical abrasion which might compromise the preventive oral care advice for those patients suffering of tooth abrasion. This is particularly important considering that a large percentage of dental

patients in Jordan receive their treatment in private practices.

The percentage of respondents who correctly identified the association between the occlusal factors and abfraction was high (61%) in the current study compared with previous studies that reported 36% (Lyttle *et al.*⁸) and 57% (Bader *et al.*⁷), respectively. Considering that the aetiology of abfraction is associated only with occlusal factors, the 39% of the respondents who moderately or infrequently associated abfraction with occlusal factors showed that a significant sector of the dentists in Jordan were unaware of the aetiology of such lesions.

On the frequency of cervical lesions seen, a number of significant findings were detected. Respondents with the MSc qualification reported significantly higher number of erosion lesions and root caries whilst the restorative dentistry specialists reported significantly higher number of erosion lesions. This was not surprising, as most of the MSc respondents were restorative dentistry specialists. This finding may reflect a true difference in the number of patients seeking treatment for those lesions with the restorative dentistry specialists or it might indicate a higher awareness of the restorative dentistry specialists in the diagnosis of those lesions when compared with general dental practitioners and other specialists. This was further emphasized as the restorative dentistry specialists showed a significantly higher ability to correctly identify lesions "A", "B" and "D" in comparison with other specialists and general dental practitioners. In addition, a significantly higher percentage of the BDS and MSc respondents identified lesion "A" correctly compared with PhD holders, which may be attributed to the fact that most of the PhD holders were from specialties other than restorative dentistry where they might not be familiar with such lesions. It is important to note that even though restorative dentistry specialists showed higher ability to correctly identify condition "D" when compared with the rest of the respondents, only 27.3% of them managed to identify the lesion correctly.

The results also showed that significantly higher percentages of the respondents correctly identified root caries (74.1%), abrasion (63.4%) and erosion (37.4%) in comparison with abfraction (10.3%). Most of the respondents wrongly identified abfraction as erosion (35.2%) or abrasion (16.2%) which is consistent with the findings of Bader *et al.*⁷ and Lyttle *et al.*⁸ However, in the current study 61% of the

respondents correctly identified occlusal factors as the prime cause of abfraction in comparison with 36% of the respondents in the study of Lyttle *et al.*⁸ Our findings differed from those of Lyttle *et al.*⁸ who implied in their report that the theory of Spranger²⁰ suggesting occlusal forces as being responsible for abfraction lesions was not well known or accepted. The findings of the current investigation suggested that the theory of Spranger²⁰ is fairly well known and accepted. However, the problem lies in the ability of the dentists to recognize the clinical presentation of the lesion. The results of the current investigation clearly identified the uncertainty among the participants regarding the classification and aetiology of cervical lesions.

Conclusions

1. The respondents indicated that they came across the four types of cervical lesions on regular basis, however, the current survey showed that determination of the etiological factors, estimation of the frequency of occurrence and diagnosis of cervical lesions varied considerably among the respondents.
2. While the majority of the respondents associated plaque, acid intake, toothbrushing and occlusal factors with root caries, erosion, abrasion and abfraction, respectively, a notable percentage of the dentists appeared to lack appropriate knowledge of the diagnosis of these conditions.
3. Whilst most of the participants failed to identify abfraction, 61% of them were however familiar with the aetiology of the lesion.
4. The participants need to be more familiarized with the aetiology and clinical presentation of cervical lesions to be able to apply more effective preventive measures and proper management.

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