

Fissure sealants: Knowledge and practice of Yemeni dental practitioners

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ABSTRACT

Objectives: This study was conducted to evaluate Yemeni dental practitioners' knowledge and practices concerning fissure sealants. **Materials and Methods:** A modified questionnaire consisted of 25-items was distributed to 500 dentists working in Sana'a City. Descriptive statistics and Chi-square/Fisher's exact tests were used for statistical analyses. **Results:** The response rate was 74%. Most of the respondents were male (61.3%), general practitioners (84.2%), and had <5 years of clinical experience (48.3%). The respondents showed a reasonable level of knowledge about sealants, with the majority (88%) believed that there is strong scientific evidence about fissure sealants effectiveness and around 90% showed a good understanding of sealant placement instructions. On the other hand, respondents showed insufficient knowledge about sealants clinical practice. **Conclusion:** Although a high proportion of dental practitioners showed adequate knowledge about dental sealant, following guidelines and standardized procedures in clinical practice is lacking. These emphasize the need for regular continuing education courses for dental professional.

Key words: Dental sealants, knowledge, practice, prevention

INTRODUCTION

Pits and fissures of molar teeth represent the most caries-vulnerable sites because of their morphology.^[1,2] These sites favor plaque retention and account for 88% of all caries in childhood.^[1,3] It has been reported that 70% of all occlusal surfaces of molars develop carious lesion within 10 years after the eruption, particularly in the first 3 years.^[4] Therefore, many interventions such as fluoride application have been

attempted to prevent occlusal decay; however, pit and fissure sealants appear to be more effective than other measures.^[5]

Dental sealant is a term that describes a material applied to occlusal surfaces, which acts as a physical barrier between enamel surface and the

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biofilm to restrict bacterial overgrowth.^[6] This was first introduced to dental practice by Buonocore in 1955.^[7] Fissure sealants should be used as part of caries prevention programs^[8] as their effectiveness in preventing pit and fissure caries has been well documented.^[9] Interestingly, studies have correlated caries-free status among children of age 6–17 years to sealant application,^[10] although their effectiveness is dependent on the caries risk of individuals and national caries prevalence.^[10] Another important point regarding sealant effectiveness is that it has also been shown to manage incipient occlusal carious lesions.^[11]

Although fissure sealant is strongly recommended in preventing occlusal caries, its use by dentists seems to be minimal.^[12,13] In 2010, for example, only one-third of 8-year-old children in the United States and 14.1% of 14-year-old had a dental sealant.^[13] The reasons for underutilization of dental sealants seem to be multifactorial; however, one of the reported main reasons beyond that was insufficient professionals' knowledge.^[12-14] In a national survey in Greece, for example, 61.9% of general dental practitioners reported inadequate knowledge on when and how to use dental sealant and only 35% practiced it routinely.^[14] In addition, studies in India^[2] Spain^[12] and the US^[13] reported also a lack of current knowledge on dental sealants that consequently affected its practice.

In Yemen, data regarding the knowledge and utilization of fissure sealants by dental professionals is lacking, although the prevalence of dental caries in this country has been reported among the highest in the world.^[15,16] Therefore, this study was conducted to evaluate fissure sealants knowledge and practices among practicing dental practitioners in Sana'a, Yemen.

MATERIALS AND METHODS

This descriptive, cross-sectional study was conducted using a self-administered questionnaire involving private dental practitioners, working in the different district of Sana'a City, Yemen. These questionnaires were sent to 500 Yemeni dentists, selected randomly from the Yemeni Dental Association register. The study was conducted in a full accordance with the declared ethical principles of the World Medical Association Declaration of Helsinki (2002). The survey was administered during June 2014.

The self-administered questionnaire was adapted from pretested questionnaires that have been applied in similar studies.^[2,12] Before distributing the questionnaire,

a pilot study was performed on a random sample of dentists ($n = 20$), and the questionnaire was modified according to the feedback obtained. The first section of the questionnaire sought demographic data of the participants including age, gender, qualification, and years of clinical experience. The second section included questions that focused on the dentists' knowledge and practices regarding fissure sealants.

IBM SPSS Statistics for Windows, Version 20.0. (Armonk, NY: IBM Corp.) was used for data entry and analyses. Qualitative data were presented as frequencies and percentages, and the outcomes were analyzed by Chi-square test. The quantitative data were presented as means and standard deviations, and the outcomes were analyzed by nonparametric tests (Mann-Whitney and Kruskal-Wallis). The significance level was set at $P < 0.05$.

RESULTS

A total of 370 questionnaires were collected, giving a response rate of 74%. Of these, 347 had been properly completed and were analyzed. Most of the respondents were male (61.3%), general practitioners (84.2%), and had <5 years of clinical experience (48.3%) [Table 1].

Around, 8.4% of the respondents declared that they have never heard of fissure sealants. Among the participants who reported having knowledge about fissure sealants, education at college (85.3%) was the main source of information [Figure 1].

Table 2 depicted that over 88% of the respondents believed that there is strong scientific evidence about fissure sealants use and approximately 90% showed well understanding of the instructions of sealant placement. Some 84.6% of the dentists showed

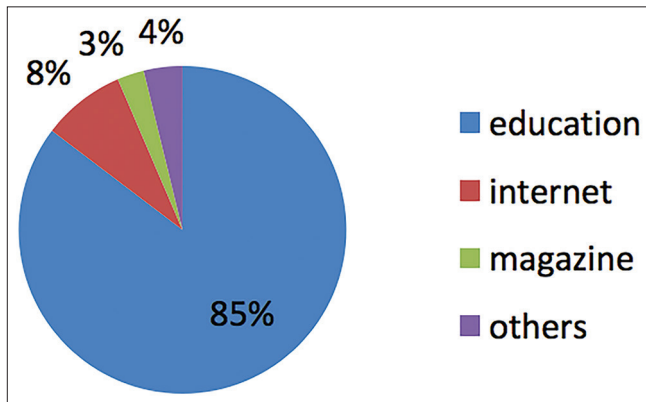
Table 1: Demographic data of the subjects (n=347)

Variables	n (%)
Gender	
Male	215 (62.0)
Female	132 (38.0)
Qualification	
Bachelor	294 (84.7)
Master	34 (9.8)
Board	9 (2.6)
PhD	10 (2.9)
Years of experience	
≤5	171 (49.3)
6-10	128 (36.9)
>10	48 (13.8)

Table 2: Proportion of subjects who answered correctly on Knowledge questions by gender and experience years

Questions	Gender (%)		Years of experience (%)			Total (%)
	Male	Female	1-5	6-10	>10	
I think that the effectiveness of dental sealant is supported by a strong scientific evidence?	90.2	84.7	86.6	87.2	95.3	88.0
I am familiar with the technique of placing dental sealant?	86.9	79.5	80	87.9	88.4	84.1
I understand the instructions for placing sealants?	92.1*	84.7	86.5	92.2	90.7	89.2
The sealant should only be used on newly erupted teeth?	58.7	56.1	58.4	57.4	55.8	57.7
The sealants wear out easily?	46.8	39.0	42.6	42.9	50.0	43.7
Pit and fissure sealant have adverse effect?	54.0	62.6	58.7	61.6	41.9	57.4
The technique of application is the most important aspect to the success of the treatment?	75.5	78.9	75.5	80.3	72.1	67.8
Resin sealants are more effective than glass ionomer sealant?	66.5	56.8	63.1	58.8	71.4	62.6
Apply proper acid etching to get high adhesion is recommended?	80.4	85.5	84.6	78.3	85.7	82.4
I think, the sealant is a preventive method, as well have a restorative effect and can be used on incipient caries?	62.1	62.6	63.3	63.4	55.8	62.3
This sealing technique, when used alongside fluoride application, may reduce the rate of decay more significantly?	84.7	83.1	84.0	85.1	81.4	84.0

Chi-square test; * $P < 0.01$


Figure 1: Source of information regarding fissure sealants

familiarity with the sealant placement technique, and 84% agreed of the importance of sealant use with fluoride. Nearly, 57% of the respondents believed that sealant should only be used on newly erupted teeth and that the fissure sealants have adverse effects.

The total mean score of fissure sealants knowledge was 6.86 ± 1.69 , with no significant differences according to gender ($P > 0.05$). Similarly, there was no significant association between the level of knowledge and years of experience ($P > 0.05$) [Table 3].

The respondents showed a poor level of clinical practice. Only 23.2% of general dentists reported using rubber dam during sealant application. Some 41.4% reported that they always avoid dental sealant for the possibility of sealing over caries, and 68% would recommend reapplication in the case of partial or complete loss of sealant [Table 4].

Table 3: Knowledge scores by gender and years of experience

Variables	Mean \pm SD	P
Gender		
Male	6.84 \pm 1.69	0.737
Female	6.89 \pm 1.714	
Years of experience		
≤ 5	6.89 \pm 1.80	0.624
6-10	6.88 \pm 1.58	
>10	6.69 \pm 1.61	
Total	6.86 \pm 1.69	

Kruskal–Wallis test, Mann–Whitney U-test, SD: Standard deviation

DISCUSSION

This study was conducted in Sana'a, the capital city of Yemen, to assess dental practitioners' knowledge, attitudes, and practice of dental sealants. To the best of our knowledge, this is the first study to explore such topic in Yemen. The provision of dental service in Yemen is primarily private (95%), and therefore, we restricted our survey to dental practitioners working in the private sector.

In general, dental practitioners in this study showed a fairly acceptable level of knowledge about fissure sealants. However, their answers to practice questions were rather unsatisfactory, indicating a lack of current clinical knowledge of sealants usage.

The most surprising result of the study was that around 8.4% of dentists reported that they never heard of fissure sealant, indicating that a considerable percentage of

Table 4: Questions regarding fissure sealants practices

Questions list	Always (%)	Sometimes (%)	Rarely (%)	Never (%)
I sometimes avoid dental sealant for the possibility of sealing over caries?	41.4	32.7	13.3	12.6
In case of partial or total loss of sealant, I would recommend reapplication?	68.3	19.1	7.8	4.9
The most important factor for adhesion to occur in sealant placement is proper isolation?	85.6	8.3	3.2	2.9
The most important factor for adhesion to occur in sealant placement is proper acid etching?	74.0	19.0	4.5	2.6
The benefit of using sealant should be considered with regard to the patient's risk?	62.1	26.8	6.9	4.2
I clean the tooth surface before placement of fissure sealant?	82.7	11.5	3.8	1.9
I follow the manufacturer instructions for placing light cure on tooth while putting sealant materials?	75.2	19.1	3.8	1.9
I apply bonding agent after acid etching on the occlusal surface?	72.6	12.9	3.5	11.0
I use rubber dam in the time of placing fissure sealant?	23.7	15.4	15.1	45.8
I use conventional way such as cotton rolesto isolate adjacent soft tissue while placing sealant?	76.7	14.4	6.1	2.9
I put an extra amount of sealant in pits and fissure to reach maximum retention?	60.6	21.2	6.1	12.2
I remove the excess of sealant material to ensure good occlusal contact?	82.5	11.1	3.2	3.2
I repeat doing fissure sealant if there is technical mishap has occurred?	70.5	20.6	5.4	3.5
I apply prophylaxis paste without fluoride before placing sealant?	42.3	26.9	12.8	18.0

practicing dentists in Yemen are completely unaware of fissure sealant. Such alarming result can be attributed to inadequate university education or lack of continuing education after graduation. Several studies have revealed insufficient or outdated fundamental knowledge of fissure sealant use, but a total lack of knowledge has not been reported previously. This emphasizes the urgent need for continuing education courses about indications and clinical practice of fissure sealants. Furthermore, dental schools need to include and/or update their curriculum regarding fissure sealants to reflect modern dental education that concentrates on evidence-based practice (EBP) in Pediatric Dentistry and Dental Public Health. In this era of modern dentistry, it is important to integrate the principles of evidence-based dental practice to the dental curriculum.^[17-19] In our findings, at least, 12% of dentists were concerned about insufficient evidence of fissure sealant effectiveness which further validates the importance of teaching EBP to dental students. Similar opportunities for education focusing on evidence-based clinical guidelines should be made available to all practicing dental professionals through workshops, seminars, and continuing education courses.^[13]

Encouragingly, the majority of dentists in the present study believed that there is some scientific evidence of fissure sealants as a preventive measure, and they also showed a well understanding of the instructions of sealant placement. Moreover, over 80% of the participants showed familiarity with fissure sealant placement technique. These findings are consistent with previous studies.^[2,12-14]

In this study, a large proportion of our respondents (84%) preferred using sealant along with fluoride and strongly believed in their synergistic effects to reduce decay. A similar result was observed by Asawa *et al.*^[2] who found that 85.3% of respondents believed that they get a better result in caries prevention when fluoride and sealant are used together. It has been recognized that using fluoride prior to sealant application could potentiate caries protection, without compromising properties of the sealant. Furthermore, the addition of fluoride to a sealant has been reported to be cariostatic not only to areas close to sealant surface but also to the distant enamel area.^[20,21]

In this study, we did not observe any significant association between the level of knowledge about dental sealants and the number of years since graduation. Similar results were reported in one previous study.^[13] However, other authors have reported a negative association between knowledge and years of clinical experience as more recent graduates showed a better level of knowledge.^[2,14]

An important finding in our study was that a very small proportion of our sample reported using rubber dam in isolation, whereas the vast majority reported using cotton rolls. This was in accordance with a previous study among Greek dentists which reported a high preference of cotton rolls use over rubber dam for isolation.^[14] It is worth noting that a systematic review by Muller-Bolla *et al.*^[22] showed no scientific evidence for preference of rubber dam over cotton rolls.

There is some controversy regarding resealing partially or totally missing sealant. While some studies reported very low caries experience under sealants, others reported the opposite.^[23,24] In line with the findings among Spanish dentists, a high percentage of our sample preferred reapplication of sealant in case of partial or complete loss.^[12] On the contrary, Asawa *et al.* reported that 85.3% of Indian dental practitioners did not reapply sealants regardless of retention status.^[2] Such conflicting results among different studies could be attributed to lack of consensus in the literature about the procedure and also to the absence of universally accepted guidelines.

The effectiveness of fissure sealants in the management of existing early noncavitated lesions has been proven under certain conditions in many studies. Recent reviews have shown that when fissure sealants are retained on incipient noncavitated lesions, and thus access to the fermentable substrate is prevented, bacteria seem incapable of a cariogenic potential and therefore reduced caries progression is evident.^[11,24]

CONCLUSION

The present study showed that a high proportion of dental practitioners had a reasonable level of knowledge about dental sealants. Despite this, their levels of evidence-based clinical knowledge about the appropriate use of sealants were low. The findings suggest an urgent need for regular continuing education courses to improve the current knowledge of fissure sealants among dental professionals.

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Conflicts of interest

There are no conflicts of interest.

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