

ORIGINAL ARTICLE

RUBBER DAM PLACEMENT: WHY MAJORITY OF SENIOR DENTISTS PRACTICING IN HA'IL, SAUDI ARABIA IGNORES IT?

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ABSTRACT

Isolation of operating site from saliva and other oral fluids prior to commencing a restorative or endodontic procedure via rubber dam is considered as standard healthcare protocol. Numerous studies have been globally conducted including Saudi Arabia to assess use or non-use of this magnificent method of isolation by dental clinicians. To the best of our knowledge, no such study is available about attitude of dentists working in Ha'il i.e. Northern region of Saudi Arabia. This study has been planned to fill the gap by assessing the dentists' attitude towards the use of this imperial isolation technique. A meticulously prepared and pre-piloted questionnaire was used as survey tool. It was distributed among licensed public sector dentists participating in various continuing dental education programs. The young dentists between 24–35 years of age were found using rubber dam in majority (74%) whereas the 75% senior dentists (age above 35 years) responded as not using rubber dam isolation. The most responded reasons for non-use of rubber dam were difficulty in placement and time consumption.

Keywords: Dental operating field isolation, oral operation site isolation, rubber dam isolation, rubber dam placement.

1. INTRODUCTION

Isolation of dental operating field from oral fluids during restorative and endodontic procedures is mandatory in order to gain better-quality vision, best properties of the restorative materials and safety for patients and operating dentists. Routine placement of rubber dam is considered as the standard of care by professional organizations^{1,2}. Use of a rubber dam isolates the tooth under repair from the rest of the patients' oral cavity which allows it to be repaired in a dry environment letting the used materials to bond together more efficaciously. It improves the performance and longevity of the placed restoration³.

Saliva is the profusely found fluid in an oral cavity which obstructs the vision of the operator. It also contaminates the restorative materials used for primary or secondary repair of the damaged teeth. Most common materials used nowadays, are adhesive materials which are highly technique sensitive⁴. Owing to slight

contamination with any of the oral fluids, not only the material loses its optimal properties but its adhesion with the tooth structure is also compromised which makes the restoration life exceedingly unpredictable⁵.

Pervasiveness of use of rubber dam by general dental practitioners in various countries declines intensely after graduating from a dental school ranging between 11 to 90%⁶. A survey reported that 44.5% dentists practicing in United Kingdom never used rubber dam⁷. The prevalence of using rubber dam by dentists practicing under the National Health Insurance system in Taiwan was found merely 16.5%⁸. In a similar survey conducted in Riyadh, Saudi Arabia, just 3% of general dental clinicians were found using a rubber dam during endodontic therapy. To the best of our knowledge, no such study has been performed in Ha'il – the gateway to northern part of the Kingdom. This study has been designed to assess the percentage

of general dentists who routinely place rubber dam and to reveal the obstacles faced by those who do not apply rubber dam.

2. METHODS

This study was a questionnaire-based survey. The face and content validated questionnaire was pre-piloted to test its adequacy to be used as the survey instrument. A 3-point Likert's scale questionnaire having options of 'Yes' 'No' and 'Don't know' was distributed among licensed dentists providing dental services in ministry of health in Hail, Saudi Arabia. The questionnaire was physically distributed among the dentists registered for various continuing educational events organized through December 2016 to February 2017 by the Department of Dentistry, Ministry of Health. The completed survey forms were gathered at the end of each meeting. Participation in this study was restricted to general dental practitioners and filling out of the survey form was considered as consent to participate in the study. For the sake of concealment and secrecy of respondents' name, no personal identifying information was obtained from them. The questionnaire consisted of two parts, the first for demographics and the second part contained simple queries about the use or non-use of rubber dam as a routine clinical practice during operative and / or endodontics procedures. The participants who do not use rubber dam were asked to answer several questions about the reason for not using it.

Data from the completed questionnaires were analyzed using SPSS® for Windows (v. 20, Chicago,

USA). Simple frequencies and cross-tabulation was performed to interpret the results. Chi square test was used to assess the difference in the use of rubber dam according to age and *p*-value of < 0.05 was considered significant.

3. RESULTS

Of the 120 distributed questionnaires, 73 dentists completed the questionnaire and returned at a response rate of 61%. The age range was 25–50 years, and the mean ages for all participants were (31.7 ± 5.9 years), males (32.8 ± 6.9 years), and females (30.1 ± 3.7 years). Forty-two (57.5%) respondents were male and 31 (42.5%) were female (Table 1).

Table 1. Demographic characteristics of the participants (n = 73)

Variable	n (%)
Gender	
Female	31 (42.5)
Male	42 (57.5)
Age (years)	
24-35	57 (78.1)
36 and above	16 (21.9)

Rubber dam was found to be used by 46 (63%) of the respondents whereas 27 (37%) of them do not place it for isolation of operating field. It was interesting to note that out of 46 rubber dam users, 42 (74%) dentists belonged to the younger age group (25-35 years) whereas only 4 (25%) to the older age group (36 years and above). There was no significant

Table 2. Dentists who used rubber dam^a

Variables	Yes	No	Marginal Row Total
	n (%)	n (%)	
24-35 years of age	42 (74%)	15 (26%)	57
36 years and above	4 (25%)	12 (75%)	16
Marginal column total	46 (63%)	27 (27%)	73

^a The chi-square statistic is 12.7049. The *p*-value is 0.000365. This result is significant at *p*<0.05.

difference between males and females of using or not using rubber dam (Table 2).

The most common reason of not using the rubber dam in routine dental practice was responded as the time factor. A total of 52% of the respondents who do not apply rubber dam believe that it is time consuming while the remaining 48% feels that it is difficult to place despite the fact that majority of non-users considers it an effective way of isolation and has sufficient training during undergraduate studies (Table 3).

4. DISCUSSION

Rubber dam isolation is considered as an integral part of a restorative dental procedure in order to provide standard healthcare to the under treatment patients. It is very encouraging to note that majority of younger age group respondents of this study working with ministry of health in Ha'il region applies rubber dam to carry out a restorative dentistry / endodontics procedure. This finding is consistent with the finding of a study done in Riyadh, Saudi Arabia where practices of rubber dam use by dental intern is evaluated and majority (90%) of the

Table 3. Participants response to the reasons of not using rubber dam (n = 27)

Variables	Yes n (%)	No n (%)	Don't Know n (%)
It is difficult to place	13 (48.1)	12 (44.4)	2 (7.4)
It is time consuming	14 (51.8)	13 (48.1)	0 (0)
It is ineffective	2 (7.4)	25 (92.6)	0 (0)
Cotton rolls and gauze perform isolation as good as rubber dam	9 (33.3)	17 (63.0)	1 (3.7)
It frequently tears	5 (18.5)	22 (81.5)	0 (0)
It leaks very often which causes failure of isolation	4 (14.8)	22 (81.5)	1 (3.7)
Patients feel fear or do not like it	7 (25.9)	20 (74.1)	0 (0)
I fear, patient may ingest the slipped rubber dam clamp	3 (11.1)	24 (88.9)	0 (0)
I have insufficient training for its placement	3 (11.1)	23 (85.2)	1 (3.7)
It increases the treatment cost	4 (14.8)	22 (81.5)	1 (3.7)

responding interns were found fond of placing rubber dam⁹. Another study done in western province of Saudi Arabia reveals that majority of general dental practitioners of younger age group uses rubber dam¹⁰. The logical reason behind it may be that the recently graduated dentists are probably better trained with more emphasis on rubber dam placement as compared to older-age practitioners.

On the contrary, most of the responding senior dentists ignore this imperative clinical step in their practices. Results of this study show that 75% of the dentists above 35 years of age do not place rubber dam. These findings oppose the findings of a study which claims that senior general dentists use rubber dam more often than younger practitioners⁷. Many studies done globally reveal that general dental practitioners generally avoid using rubber dam¹¹⁻¹⁴. In this context, findings of the current study matches with the mentioned studies but contradict with the results of a USA based study which reported that 60% of the respondents always use rubber dam, 16% often use it, 13% sometimes use it, and only 11% do not use it¹⁵. There is notably huge contradicting difference between the findings of this study and USA based study. One reason for this contradiction may be the variability of sample sizes used in the two studies. Our sample size is much smaller than the other study and smaller sample size is less representative and more prone to statistical miscalculations. One more sensible argument for wider use of rubber dam by USA general dentists could be the ruling of Supreme Court of Arkansas which states that the general dental practitioner performing endodontic procedure must apply the same precautions as those employed by an endodontist¹⁶. A survey conducted in Republic of Czech states the disgusting use of rubber dam by dental practitioners. It found merely 8% of Czech dentists using rubber dam¹⁷. This finding is in agreement with our findings. Similarly, general dentists in Nigeria, like senior dentists in Ha'il, are not fond of using rubber dam; only 18% of them use it whereas 77% even do not know how to place it¹⁸.

In this study, all of the respondents were those who work in the government tertiary care hospitals or primary healthcare dispensaries. Among all those respondents, 63% responded in favor of using rubber dam. The same results were achieved in another study done in Saudi Arabia¹⁰. Lin et al.⁸ found that rubber dam usage in public hospitals was significantly higher than that of private dental clinics in Taiwan. The probable reason for highly prevalent use of rubber dam among the dentists working in public sector in Ha'il, may be the strict vigilance from authorized officials to follow standard care protocols during health delivery assignments.

For the use or non-use of rubber dam, no unanimity is found among dental professionals universally. Numerous factors may affect the practice of using rubber dam, such as the practitioner's gender, time involved, difficulty of placement, patients' fear, training of the dentists and cost effectiveness. There was no statistical significance found presenting that gender of the dentist affects rubber dam placement. The similar results were obtained in two similar studies performed separately in Turkey and India^{19,20}. Difficulty of placement and subsequent time involved in placing a rubber dam has been the major response in this study from the non-users of rubber dam. In a previous Saudi Arabian study⁹, the comparable findings have been achieved. Moreover, many international studies also reported that the common reasons for not applying rubber dam were its difficulty in placement and time consumption²⁰⁻²³. A study done to calculate the time involved to obtain isolation through the rubber dam discloses that less than five minutes are required for it²⁴. The advantages of using the technique are multifold as compared to time consumed. To overcome the problem of placing rubber dam and to save time, many dentists use alternative isolation techniques. Some practitioners claim that Isolite (Benbrook Dental, USA) is able to improve visibility, reduce risk of damage to ceramic crown surfaces, reduces risk of root perforations during endodontic therapy and can be convenient in young patients with incompletely erupted teeth^{25,26}. Some researchers reported that the patients' fear to allow the dentists to place rubber dam can be a major obstacle in placing it. The result

of this study, however, negate such findings and many other studies support these findings^{27,28}. A very small number of patients may be unwilling to allow rubber dam application. For such patients, the operating dentist must spend some time to convince them by explaining the importance, safety and effectiveness of rubber dam. According to findings of a study, general dentists do not use a rubber dam because of increased cost in addition to time loss and patient pain²⁹. Majority of non-using respondents of present study does not acknowledge the findings of Christensen's study²⁹ and attributes the non-use of rubber dam to other reasons than increase of treatment cost. This study has been conducted among the public sector dentists attending the seminars which limited the sample size as compared to actual targeted population. More comprehensive studies involving licensed dentists working in private and public sector in Ha'il region are suggested to gather more representative data.

5. CONCLUSION

In the region of Ha'il, the public sector young dentists are practicing rubber dam isolation to carry out restorative dentistry procedures but the senior dentists miserably ignore the available imperial isolation method.

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