

THE ATTITUDE OF UNDERGRADUATE DENTAL STUDENTS TOWARDS THE USE OF RUBBER DAM

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ABSTRACT

Rubber dam is the most widely used technique for isolation in operative dentistry and endodontics. Despite of its advantages some students may not be convinced of its use. The aim of the present study was to determine the attitude of students regarding rubber dam application, in College of Dentistry, Aljouf University, Saudi Arabia. A structured questionnaire-based survey was conducted on senior dental students. The questionnaire contained different aspects of rubber dam usage, advantages and disadvantages, points of difficulty regarding rubber dam application, agreement and disagreement of the participants towards statements about rubber dam. Seventy three questionnaires were collected out of one hundred distributed questionnaires. The results were statistically analyzed by SPSS software version 21. Most of the students (65%) considered selection of the clamp and its adaptation as the most difficult phase. Most of the participants (70%) agreed that rubber dam improves the success rate. Majority (76%) of the students agreed that rubber dam posed difficulty in taking radiographs while 68% believed that rubber dam application extends the treatment period. Most of the students (66%) indicated that they used rubber dam in dental clinics because it is a helpful tool. The participants have shown a positive response towards rubber dam use in endodontic treatment but were less convinced in amalgam and composite restorations. 34% of the participants think they will not use it in future due to difficulty during application.

Key Words: Attitude, Rubber dam, students.

INTRODUCTION

Rubber dam technique; is a method used in dentistry to isolate the operating field from the rest of the mouth with rubber sheet. Rubber dam has been available to the dental profession over 140 years. Unfortunately, its consistent use has been rejected by many in the dental profession. The literature suggests that rubber dam is not used routinely by dental practitioners for root canal treatment. Many unfounded reasons have been cited for its lack of use, including concerns over patient acceptance, time required for application, cost

of equipment and materials, insufficient training, difficulty in use and low treatment fees. Rubber dam is universally acknowledged as a mandatory adjunct, particularly during endodontic treatment. Many authors advocate its usage and encourage practitioners to adopt it in routine practice in the field of operative dentistry and endodontics.^{1,2}

Endodontics and operative dentistry are the major areas where rubber dam is used. Moreover, rubber dam use should be reevaluated from a medicolegal point of view, considering an increase in malpractices, directed against general practitioners. Failure to use rubber dam has been described as a serious deviation from the standard of care.³

Several advantages can be achieved by using rubber dam, such as clean and higher dry field than cotton roll and high volume evacuation, better access and visibility for the operator, preventing ingestion or aspiration of instruments, materials and irrigants, protection and retraction of soft tissue during operating procedures, safe and more comfortable for the patient.⁴ Most dental schools consider rubber dam is a must for specific procedures, e.g. root canal treatment. Rubber dam increases the treatment efficiency by decreasing

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bacterial contamination of any dental procedures leading to a very good infection control.⁵ More specifically, rubber dam isolate the inner environment of the root canal from the outer environment of the oral cavity preventing any infection to spread. Rubber dam is a standard health care during conservative procedures.⁶ In addition, it provides a barrier between the dentists and patients from any cross-infection between them. Training on rubber dam application has been considered as an integral part of the contemporary dental education. Many dental schools advocate the use of rubber dam by their students from the first meeting with the patient.⁷

In recent years, rubber dam technique has gradually gained more and more recognition among dentists however, the prevalence of using rubber dam technique in our country is still relatively low compared with those in developed countries. This condition involves many factors and need to be paid enough attention.⁸

As surveys among dental students are helpful tools to draw the outline of the future dental workforce, so investigating dental students' perceptions and attitude toward rubber dam use will contribute to the underlining inherent problems related with the implementation of this worldwide acknowledged methodology. Depending on the results, strategies can be developed so that contemporary and high-quality aspects of clinical dentistry are delivered and instilled.

The use of rubber dam was assessed in very few studies in Saudi Arabia among dental students, interns and dentists. Under usage of rubber dam was reported among dentists during placement of restorative procedures. Students are the future generation of dentists. The students' attitude towards rubber dam usage is important because this will shape their trends in future dental practice. The purpose of the current study was to determine the attitude of dental students towards the use of rubber dam in College of Dentistry, Aljouf University, Saudi Arabia.

METHODOLOGY

A structured questionnaire-based study was conducted on the senior undergraduate dental students was conducted, at College of Dentistry, Aljouf University, Saudi Arabia. The study was approved by the college ethical committee. All students working in the clinics were eligible to participate. A self-administered questionnaire was used similar to that used by Tanalp et al.⁹ A pilot study was conducted on a random sample of students (n= 20) to make sure the questions were not difficult to understand, with no changes required. The questionnaire contained 22 close-ended questions on 5 different aspects. During distribution of the question-

naire every participant had the opportunity to decline participating in the study. All questionnaires were collected anonymously. Analysis of the data was done by SPSS version 21 (Chicago, IL, USA) and chi-square test was employed. P value ≤ 0.05 was considered statistically significant.

RESULTS

A total of 100 questionnaires were distributed among the students. Only 73 were completely filled and collected, resulting in the response rate of 73%. Table 1 presents responses to questions regarding utilization of rubber dam. Most of the students (54%) were of the opinion that they were adequately educated regarding rubber dam usage.

Table 2 shows the Opinions of students about the usage of rubber dam. 60% of the participants reported that isolation of the operating field is the most important advantage of rubber dam. Table 3 demonstrates in terms of difficulty in application, Majority of the students (65%) considered selection of the clamp and its adaptation, as the most difficult phase of rubber dam application.

Table 4 summarizes agreement or disagreement of students regarding various aspects of rubber dam. The results were not statistically significant except that treatment performed using the rubber dam were more successful than those performed without using it (p= 0.05).

Table 5 shows opinions about the present and future usage of rubber dam. About (66%) of the students stated that they used rubber dam in dental clinics because it is a helpful tool. Only 37% of the students intended that following graduation, they will use rubber dam for all the procedures indicated. Table 6 presents the major reasons for not planning to use rubber dam in future. The most reported reason was difficulty during application.

DISCUSSION

In this study we found that about half of the participants did not ask about latex allergy, before rubber dam application. This finding of the study is lower than that of Mala et al.¹⁰ Inquiry about latex allergy is important because some studies have reported latex allergy in literature. A high proportion of the participants indicated that they don't use rubber dam in pedodontic patients which exceeds the percentage (68%) reported by Mala et al.¹⁰ The reason of low percentage may be due to the uncooperative and anxious behavior of children in dental clinics. However this issue needs further studies from the pedodontic prospective. Students' encouragement and more training is needed in using rubber dam during treatment of children patients.

TABLE 1: RESPONSES TO QUESTIONS REGARDING UTILIZATION OF RUBBER DAM

Statements	Answers		P-Value
	N	%	
Do you ask patients whether they have latex allergy prior to rubber dam use?			0.538
Yes	37	50.7	
No	36	49.3	
Do you use rubber dam in pediatric patients?			0.414
Yes	38	52.1	
No	35	47.9	
Do you use rubber dam during amalgam restoration?			0.477
Never	30	41.1	
Rarely	22	30.1	
Sometimes	15	20.5	
Always	6	8.2	
Do you use rubber dam during composite restoration?			0.222
Never	19	26.1	
Rarely	25	34.2	
Sometimes	27	37	
Always	2	2.7	
In which stage of endodontic treatment you use rubber dam?			0.739
Following anesthesia	23	31.5	
During access cavity preparation	15	20.5	
Following identification of root canal orifices	16	21.9	
During root canal shaping	11	15.1	
During root canal filling	8	11	
Do you think you have been given adequate and satisfactory education regarding rubber dam?			0.876
Yes	39	53.4	
No	34	46.6	

TABLE 2: OPINIONS OF STUDENTS ABOUT THE USAGE OF RUBBER DAM

Statements	Answers		P-Value
	N	%	
What in your opinion is the greatest advantage offered by the rubber dam?			
A-Provision of isolation and an aseptic working area	44	60.3	0.238
B-Prevention of swallowing or aspirating instruments	23	31.5	
C- Prevention of ingestion of irrigants	6	8.2	

TABLE 3: OPINIONS OF STUDENTS ABOUT THE MOST DIFFICULT ASPECT REGARDING RUBBER DAM USAGE

Statements	Answers		P-Value
	N	%	
What is the major factor that makes rubber dam application a difficult procedure?			
Selection of the clamp and its adaptation	47	64.4	0.082
Placement of the rubber dam	24	32.9	
Placement of the frame	2	2.7	

TABLE 4: AGREEMENT OR DISAGREEMENT OF STUDENTS REGARDING VARIOUS ASPECTS OF RUBBER DAM

Statements	Answers		P-Value
	N	%	
Rubber dam eases the restoration stage			0.927
I agree	51	69.9	
I disagree	22	30.1	
Treatment performed using the rubber dam			0.414
are more successful than those performed without using it			0.056
I agree	57	78.1	
I disagree	16	21.9	
An adequate isolation cannot be achieved in case rubber dam is not used			0.813
I agree	37	50.7	
I disagree	36	49.3	
Rubber dam eases access to root canals			0.281
I agree	53	72.6	
I disagree	20	27.4	
Rubber dam makes radiograph taking procedure difficult			0.864
I agree	55	75.3	
I disagree	18	24.7	
Rubber dam is difficult to apply			0.211
I agree	38	52.1	
I disagree	35	47.9	
Rubber dam consists of too many components			0.632
I agree	53	72.6	
I disagree	20	27.4	
Rubber dam shortens/extends treatment period			0.289
Extended	47	64.4	
Shortens	26	35.6	
Rubber dam is more necessary while working in the			0.469
Mandible	50	68.5	
Maxilla	23	31.5	
Assistance is necessary during rubber dam application			0.303
I agree	48	65.8	
I disagree	25	34.2	
Patients do not like the rubber dam			0.23
I agree	54	74	
I disagree	19	26	

TABLE 5: OPINIONS ABOUT THE PRESENT AND FUTURE USAGE OF RUBBER DAM

Statements	Answers		P-Value
	N	%	
I use the rubber dam in the clinic, because:			0.269
I strongly believe that it is a helpful tool	48	65.8	
I only use it because I am obliged to following graduation	25	34.2	
Following graduation:			0.448
I intend to use the rubber dam during all procedures indicated	27	37	
I intend to use it only during restorative procedures	13	17.8	
I intend to use it only during root canal treatment	28	38.4	
I will never use it	5	6.8	
Do you think you have been given adequate and satisfactory education regarding rubber dam?			0.876
Yes	39	53.4	
No	34	46.6	

TABLE 6: MAJOR REASONS FOR NOT PLANNING TO USE THE RUBBER DAM IN FUTURE

Statements	Answers		P-Value
	N	%	
I do not believe that it is a helpful adjunct	16	21.9	0.666
I experience difficulty during application	25	34.3	
I believe that it consumes time	16	21.9	
I believe that patients do not like it	16	21.9	

Our study revealed that 41% of the respondents never used rubber dam in amalgam restorations, while 26% never used it in composite restorations. These findings were not encouraging because these procedures are technique sensitive and required adequate moisture control. One of the reasons may be that the participants believed that they could achieve moisture control through cotton roll and high volume evacuation.

In the current study majority of the students considered that clamp selection and its adaptation is the most difficult aspect of rubber dam application. These findings were similar to other studies^{11,12} which could be partly attributed to the lack of experience in selecting and application of the clamp. Furthermore, it may be due to lack of armamentarium with suitable number and types of clamps for each particular case.

It is encouraging to note that majority of the respondents felt that rubber dam allows restorations to be placed more easily, a result which is consistent with the literature,¹³ which recognize that rubber dam makes the operative procedure simple and it decreases the chances of swallowing or aspiration of foreign body during the treatment.

Another disadvantage of rubber dam reported in this study was the difficulty of taking radiograph in the proper positions when rubber dam was in place, while removal of the dam during radiography is not acceptable as this step is specifically performed with the instruments within the root canal to determine the working length. In this phase of treatment, intervention should be avoided to prevent hazards therefore the radiograph must be taken while the rubber dam is in place.¹⁴

This is encouraging to note that majority of the respondents believed that rubber dam facilitates a more successful root canal treatment. This is evident from the literature that root canal systems that become infected with bacteria are associated with high prevalence of post-treatment disease than those which contain lesser or no bacteria.^{15,16}

Majority of the students responded that patients disliked rubber dam usage. This statement was contradictory to other studies,^{17,18} which concluded that many patients prefer to have rubber dam. It has been reported that the negative perceptions regarding patients' dislikes, towards rubber dam may be related more strongly to the practitioner attitude. These studies further suggest that the experience of the dentist and

their level of efficiency influence the patients' opinion. Proficiency regarding the use of rubber dam can be gained through frequent usage.

It is encouraging to note that in this study majority of the students felt that adequate isolation cannot be achieved without rubber dam application, and treatment performed with rubber dam is more successful than those performed without it. These findings were consistent with the literature.¹⁹

As evident from the studies that usage of rubber dam in general practice is unsatisfactory. Limited rubber dam usage has been attributed to many factors, such as patient's discomfort, difficulty in use, low fee for treatment.²⁰ However, Whitworth¹⁹ reported that rubber dam was more frequently used by new graduates as compared to older graduates. In the current study about half of the respondents felt that rubber dam is difficult to apply as it is comprised of too many components, a similar finding was revealed by Male et al.¹⁰ The ability to apply rubber dam efficiently can come with experience and can be learnt.

Another disadvantage cited by the respondents was additional time taken in placing rubber dam. However the literature²¹ revealed that even the inexperienced operator can apply the rubber dam in just a few minutes. Furthermore, the additional time is compensated by better operating field, offered by rubber dam including, controlling saliva contamination, eliminating the frequent change of cotton roll and limiting the moments of tongue and lips.

CONCLUSION

Within the limitations of the current study, in general, the students showed positive attitude towards the use of rubber dam in endodontic treatment. They were less convinced to the use of rubber dam in amalgam and composite restorations.

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| 1 Iftikhar Akbar: | Principal author, design of the study, introduction, discussion and final approval. |
| 2 Fayyaz Alam: | Data collection and methodology. |
| 3 Beenish Qureshi: | Statistics and compiling results. |
| 4 Mohammed Abulhamid Almayouf: | Data collection. |