

DENTAL STUDENTS' ATTITUDES TO THE USE OF RUBBER DAM IN UNITED ARAB EMIRATES

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Abstract

The purpose of this study was to assess, by means of structured questionnaire, dental students' attitudes to the use of rubber dam.

Cross-sectional study, with anonymous structured questionnaires was distributed to final year dental students in Ajman University of Science and Technology in Feb 2012. Information sought included attitudes to the use of rubber dam for a variety of operative and endodontic treatment.

The sample consisted of 75 dental students (response rate 83%). Rubber dam was routinely used by 94% of the respondents during root canal treatment on molar teeth of adult patients, but only 73% of respondents had used rubber dam on child patients ($P < 0.05$). Forty five percent of the respondents ($n=34$) who placed composite in anterior teeth never used rubber dam for this procedure. However, 44% of the students felt that the application of rubber dam is difficult. Around 97% of the respondents felt that patients do not like rubber dam.

The findings revealed that our students showed positive attitude towards the use of rubber dam. However there is a room for improvement to overcome the difficulty in rubber dam application by increasing the preclinical training on phantom heads and hands-on training in clinics particularly for operative procedures and in pediatric patients in order to improve treatment quality and patient safety.

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Introduction

Rubber dam was introduced to the dental profession by Barnum in 1864¹, it serves as an invaluable tool to dental practitioners. The use of the rubber dam while performing dental procedures has numbers of advantages such as: control of cross-infection as it results in a significant reduction in the microbial content of air turbine aerosols and moisture control, thereby reducing the risk of cross-infection in the dental practice.² In addition, Protects the patient's oro-

pharynx from the possible aspiration or swallowing of instruments, medicaments, irrigating solutions and tooth/material debris^{3,4} and subsequently the operator from legal responsibility should these accidents occur.^{5,6} It also retracts and protects the soft tissues from rotary and hand instruments and medicaments.^{3,4} Additionally, it enhances treatment efficiency by: improving the access to operating field by retraction of soft tissues, improving visibility by providing a dry field, facilitating the practice of four-handed dentistry during endodontic treatment and encouraging patients to maintain their mouths open.^{3,4} In addition to these advantages, rubber dam improves patient comfort during dental treatment^{7,8} and studies have shown that the use of rubber dam can decrease the amount of time spent performing certain clinical procedures.⁹

These advantages have led to the use of rubber dam being recommended as a standard of care by professional organizations.^{10, 11, 12} The

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majority of dental schools worldwide teach the use of the rubber dam as an important adjunct to restorative dentistry in both adult and child patients.¹³

Dental educators aim to produce competent dental graduates who are fit to practice modern dentistry and provide quality treatment where patient's safety can be assured. The aim of this study is to assess the use of rubber dam and the attitude of our graduates toward it use.

Method

In this cross-sectional survey, structured questionnaires were used. The questions explored the didactic and clinical experience of rubber dam placement in adults and children. The questionnaire was modified from those used in similar studies in the literature^{14,15}, it was structured to prevent leading to an ideal answer and to avoid appearing judgments. The information requested on the distributed questionnaire was: (i) age and gender; (ii) treatments routinely carried out with and without rubber dam; (iii) attitude to the use of rubber dam for a range of clinical procedures.

The final year undergraduate classes were identified as having maximum clinical exposure during this year; therefore, they were targeted for this study. Informed verbal consent from all participants was obtained prior to participation. All students entered the study voluntarily, following an explanation of its purpose and objectives. The participants were assured of the strict confidentiality of the data. The questionnaires were distributed and collected from the undergraduate students on the same day. The survey was estimated to take no more than five minutes to complete. The study was approved by the ethical committee in Ajman University of Science & Technology. All questionnaires were coded and analyzed using SPSS version 18.0 (Chicago, IL). Results were expressed as a number and percentage of respondents for each question. Chi-square test was used to evaluate the differences between the different variables and the level of significance was set at $P < 0.05$.

Results

In the current study, sixty eight percent of respondents (n=51) were female. More than fifty

percent of the respondents (n=39) reported that they did not ask their patients if they have latex allergy prior to the use of rubber dam. There was a significant difference between the use of rubber dam for adult and child patients (P -values 0.00), where rubber dam is used significantly more on adult patients than on child patients. (Data not presented).

Regarding the use of rubber dam for root canal treatments the current study showed that: 75% (n=56) performed root canal treatment on anterior teeth under rubber dam; 90% (n=67) performed root canal treatment on premolar teeth under rubber dam; 94% (n=70) performed root canal treatment on molar teeth under rubber dam. The frequency of use of rubber dam for root canal treatment is presented in (Table 1). There was significant difference in the use of rubber dam between anterior, premolar or molar teeth.

Reported use of rubber dam	Anterior teeth n (%)	Premolar teeth n (%)	Molar teeth n (%)
Never	1 (1)	0 (0)	0 (0)
Occasionally	6 (8)	1 (1)	0 (0)
Often	5 (7)	1 (1)	1 (1)
Mostly	7 (9)	6 (8)	4 (5)
Always	56 (75)	67 (90)	70 (94)

Table 1. Reported use of rubber dam for root canal treatment

Information on the use of rubber dam for selected operative procedures in the anterior and posterior teeth reported in (Table 2) and (Table 3) respectively.

Reported use of rubber dam	Anterior composite n (%)	Anterior glass ionomer cement n (%)	Anterior amalgams n (%)
Never	34 (45)	42 (57)	57 (76)
Occasionally	28 (37)	25 (33)	13 (18)
Often	9 (12)	5 (6)	3 (4)
Mostly	2 (3)	2 (3)	1 (1)
Always	2 (3)	1 (1)	1 (1)

Table 2. Reported usage of rubber dam for certain operative procedures in the anterior teeth

Forty five percent of those respondents (n=34) who placed composite in anterior teeth never used rubber dam for this procedure. Sixteen percent of those respondents (n=12) who placed composite in posterior teeth never used rubber dam during this procedure. While, nineteen percent of those respondents (n=14) who placed amalgam in posterior teeth never used rubber dam.

Reported use of rubber dam	Posterior composite n (%)	Posterior glass ionomer cement n (%)	Posterior amalgams n (%)
Never	12 (16)	17 (23)	14 (19)
Occasionally	29 (39)	30 (40)	31 (42)
Often	12 (16)	12 (16)	13 (17)
Mostly	14 (19)	13 (17)	13 (17)
Always	8 (10)	3 (4)	4 (5)

Table 3. Reported usage of rubber dam for certain operative procedures in the posterior teeth

In relation to respondents' attitudes to the use of rubber dam, the respondents were given a series of nine statements to which they were asked to agree/ disagree. The statements and the responses are illustrated in (Table 4). More than three quarter of respondents (83%) felt that rubber dam did allow posterior restoration to be placed more easily. The majority of the respondents agreed that rubber dam application provide clearer access when placing restoration and it enable a higher clinical standard to be achieved; 93% and 95% respectively. However, 44% of the respondents felt that the application of rubber dam is difficult. In addition, more than 97% of the respondents felt that patients do not like rubber dam.

Statement	Agree n (%)	Disagree n (%)
"Posterior restorations can be placed more easily when rubber dam has been applied"	62 (83)	13 (17)
"Proper isolation cannot be achieved without use of rubber dam"	46 (61)	29 (39)
"Root canal fillings placed without rubber dam are as successful as those isolated with rubber dam"	18 (24)	57 (76)
"Less time is needed to perform dental procedure when rubber dam is used"	56 (75)	19 (25)
"Rubber dam enables clearer access when placing restoration"	70 (93)	5 (7)
"Rubber dam enable a higher clinical standard to be achieved"	71 (95)	4 (5)
"Restorations placed under rubber dam have greater longevity than those placed without"	52 (69)	23 (31)
"Rubber dam is difficult to apply"	33 (44)	42 (56)
"Patients do not like rubber dam"	73 (97)	2 (3)

Table 4. Attitudes of respondents to the use of rubber dam

Discussion

To our knowledge, this is the first published study conducted in the UAE assessing dental students' attitudes' toward the use of rubber dam. In our dental college, the use of the rubber dam is mandatory for adult patients during endodontic therapy. Within the sample examined up to 94% of the respondents always use the

rubber dam while performing root canal treatment for adult patients depending on the tooth under treatment with the highest percentage (94%) for molar teeth. Mala *et al.*¹⁵ have shown that up to 98% of their dental students routinely used rubber dam while performing root canal treatment on adults while Ryan & O'Connell¹⁶ have shown up to 100% use.

Rubber dam was used significantly less (73%) on child patients. Our comment towards less use of rubber dam while treating children may relate more to behavior management of the child patient than to specific problems with the rubber dam. However, students' encouragement and more training in placing the rubber dam while treating children is needed.

Studies from international literature indicate that the use of the rubber dam in the general practice is limited.^{14, 17} A survey of UK general dental practitioners reported that only 19% of respondents used rubber dam routinely¹⁸, another study showed rubber dam was not used by between 26% and 39% of practitioners when performing root canal treatments.¹⁴ The current survey shows greater use of the rubber dam during the root canal treatment in comparisons with reported trends in the general dental practice in other countries.^{14, 18} Another point to be considered in this regard is that dental students are generally protected from considerations such as cost and fees for treatment in the dental school environment, these facts might have an influence on their use of rubber dam once they start to work independently in their general practice.

Whether the enthusiasm of dental students toward the use of rubber dam will drop off while the respondents are out of the educational environment of dental school this can hardly be predicted. Whitworth *et al.*¹⁸ noted that rubber dam was used more frequently by newly qualified graduates in comparison with older practitioners this might be attributed to the fact that modern approaches in teaching and training had a positive impact on the new graduates.

In a recent study of undergraduate dental school in Ireland, it was found that over 90% of the students would use rubber dam isolation for posterior composites, and around 60-70% of students would use rubber dam isolation for anterior composite or amalgam restorations.¹⁹ In the current survey the rubber dam was less often

used during operative procedures, around 45% of the respondents never used rubber dam while performing anterior composite restoration and 30% occasionally used the rubber dam for posterior restorations. For us this is a worrying finding as all those are technique sensitive procedures. A greater emphasis on the importance of moisture control and the use of rubber dam on the quality of the future restorations has to be placed.

Reasons for not using rubber dam in practice generally reported include patients discomfort, insufficient time, difficulty in use, insufficient training, cost and low fees for treatment.²⁰ In the current survey around 44% of the respondents reported that rubber dam is difficult to apply, similar finding has been reported by Mala *et al.*¹⁵ The ability to successfully and efficiently place a rubber dam in a variety of clinical situations comes with clinical experience and can be taught.¹⁶

The majority (97%) of respondents reported that patients do not like rubber dam. This is in contrast to the evidence in the literatures which show that many patients prefer to have it placed.^{7, 8} However, Wolcott & Goodman²¹ reported that dentists may rationalize their failure to use rubber dam by claiming patient resistance. On the other hand, the dentists' motivation and positive attitude towards rubber dam is one factor which has an influence on patient's attitude towards rubber dam application and in increasing the level of their acceptance.⁷

It is encouraging to note the majority of the respondents felt that rubber dam allows a more successful root canal treatment, this is in keeping with evidence in the literature that root canal systems that become infected with bacteria are associated with a higher prevalence of post-treatment disease than those that contain fewer or no culturable bacteria⁹ therefore, rubber dam use during root canal treatment would seem logical. In addition, it was very promising to note that the majority of the dental students agreed that rubber dam use allows restorations to be placed more easily, provides clearer access and enables a higher clinical standard to be achieved.

Conclusions

This survey has shown that the our undergraduate students had reasonable

confidence and training to place a rubber dam for adult patients while performing root canal treatment. In general, our students showed positive attitude towards the use of rubber dam. The survey also highlighted negative falls and areas need to be attended. We would suggest increased preclinical training on phantom heads and increased hands-on training in clinics particularly for operative procedures and in pediatric patients.

Students must be convinced of and confident in rubber dam isolation prior to graduation to increase the likelihood of its use being continued in practice. The results reported here can be used in the future to highlight any changes in the attitude towards the use of rubber dam while in the general practice.

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