

# Attitude and knowledge of isolation in operative field among undergraduate dental students

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## ABSTRACT

**Objective:** The purpose of this study was to evaluate the general attitude of undergraduate dental students toward rubber dam use, specifically focusing on operative procedures before starting to serve community. **Methods:** Questionnaires were distributed to undergraduate clinical years' students of two private colleges; Al-Farabi Dental College, Riyadh, KSA and Buraidah Private Colleges, Qassim, KSA. Questions were asked about areas where the students used rubber dam in operative procedures, in which types of caries classes, and in which type of restoration they frequently used the rubber dam. **Results:** We found that students of both private dental colleges agreed with the opinions that proper isolation cannot be achieved for the restoration of operative procedures without using rubber dam and restoration placed under rubber dam have a greater longevity than those placed without. **Conclusions:** Within the limitations of the present study, it can be concluded that the perceptions of dental students on rubber dam need to be improved and strategies should be developed so that this valuable adjunct will comprise one of the indispensable elements of dental care.

**Key words:** Isolation, operative dentistry, rubber dam

## INTRODUCTION

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 including operative dentistry field.<sup>[1]</sup> Rubber dam offers the practitioners with a wide variety of advantages such as isolation of the operative area, provision of aseptic field, improving infection control, preventing ingestion or aspiration of burs or instruments, as well as protection and retraction of soft tissue.<sup>[2-5]</sup> Other advantage is increased patient comfort with a positive opinion about rubber dam application.<sup>[6]</sup>

Operative dentistry field is a major area where rubber dam is used.<sup>[7]</sup> 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 departure from the standard of care.<sup>[8]</sup>

With all these advantages as well as the legal aspects favoring rubber dam, but many practitioners still resist its use in routine care. They claim that it is time consuming and uncomfortable for

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the patients.<sup>[9-14]</sup> 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.<sup>[2]</sup>

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

The purpose of the present study was to determine the general attitude of Saudi dental students' groups enrolled in two different private colleges toward rubber dam application, specifically focusing on operative field treatment and evaluates the problems they encounter related with this tool.

## METHODS

Anonymous survey questionnaires were distributed to undergraduate clinical students enrolled in two private dental colleges in Saudi Arabia; (a) Al-Farabi Private College, Riyadh, KSA and (b) Buraidah Private Colleges, Qassim, KSA. Before the study, anonymity of the respondents was confirmed. A total of 294 survey forms were printed and delivered to the students. Two hundred copies were directed to the undergraduate clinical years' students (A) and 94 copies (B). The students were not held obliged to return the forms. In the questionnaire, students were asked about areas of dental practice in operative field where they used rubber dam. The survey continued with questions regarding students' opinion about rubber dam's advantages as well as difficulties. They were asked if they agreed or disagreed with certain aspects of rubber dam and whether they use it because they believe that the restorations placed under rubber dam have a greater longevity or not. They were also asked whether they frequently use the rubber dam for isolation in maxillary anterior Class V restoration or just they isolate using the cotton roll. They were asked if they integrate rubber dam as a mandatory tool in both adults and children and during which procedures or cavity type, they will plan to use it. The printed questionnaires were delivered to the students at the beginning of the practical session and

collected back at the end of the session with response rate of 100%.

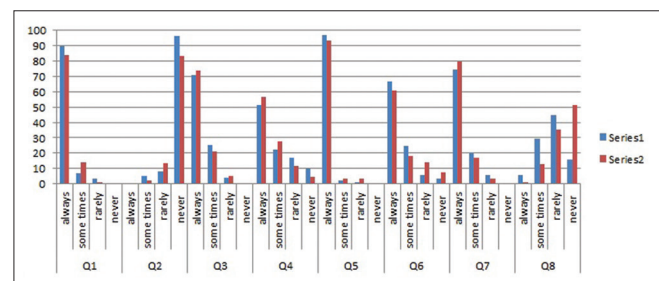
Statistical analysis was performed using Number Cruncher Statistical System 2007 Statistical Software (Utah, USA) pocket program. In addition to descriptive statistical methods, Chi-square test was used for the comparison of qualitative data. Results were evaluated at a significance level of  $P < 0.05$ .

## RESULTS

The final results were summarized in Tables 1 and 2 and illustrated in Figures 1 and 2. The majority of the students of both colleges responded negatively to use rubber dam for children (96.59%). On the other hand, most of them confirmed the use of rubber dam with adult patients in restorative procedures (97.61%). Application of rubber dam in posterior esthetic restoration was highly recommended by the students of both colleges, while this is not true regarding amalgam. Regarding anterior restorations, the students of both colleges advocate the use of rubber dam, with a higher percentage for resin composite comparing with glass ionomer cement.

Regarding preclinical training, most of the school A students believed they received satisfactory education regarding rubber dam usage, whereas only two-thirds of school B students agreed with that opinion. This difference in response was statistically significant ( $P < 0.05$ ), also there is a significant difference regarding the use of rubber dam in maxillary anterior Class V with a higher percentage for school A compared to school B students.

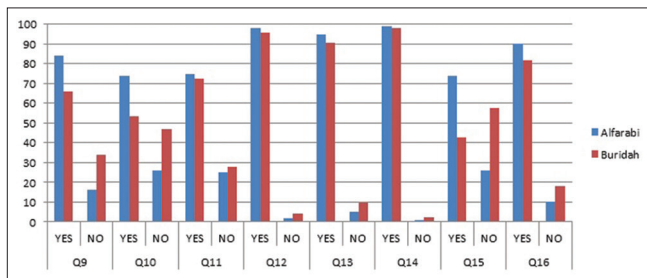
Most students agreed with the opinion that operative procedures and treatments performed using the rubber dam were more successful in both cavity preparation and restorative material properties than those where it was not used. Not only the students shared the opinion that proper isolation cannot be



**Figure 1:** Bar chart showing the percentage of answers given by students to questions regarding utilization of rubber dam

**Table 1: Answers given by students to questions regarding utilization of rubber dam**

Questions	School A, n (%)	School B, n (%)
Q1. Do you use rubber dam on adult?		
Always	180 (90)	80 (84.10)
Sometimes	14 (7)	13 (14)
Rarely	6 (3)	1 (1.20)
Never	0	0
Q2. Do you use rubber dam on child?		
Always	0	0
Sometimes	8 (5)	2 (2.40)
Rarely	12 (7.8)	11 (13.55)
Never	180 (96.2)	81 (83.15)
Q3. Do you use the rubber dam during operative procedures for anterior composite?		
Always	142 (71)	69 (73.55)
Sometimes	50 (25)	20 (21.25)
Rarely	8 (4)	5 (5.20)
Never	0	0
Q4. Do you use the rubber dam during operative procedures for anterior glass ionomer?		
Always	102 (51)	53 (56.38)
Sometimes	44 (22)	26 (27.65)
Rarely	34 (17)	11 (11.70)
Never	20 (10)	4 (4.20)
Q5. Do you use the rubber dam during operative procedures for posterior composite?		
Always	194 (97)	88 (93.61)
Sometimes	4 (2)	3 (3.19)
Rarely	2 (1)	3 (3.19)
Never	0	0
Q6. Do you use the rubber dam during operative procedures for posterior glass ionomer?		
Always	133 (66.50)	57 (60.63)
Sometimes	49 (24.5)	17 (18.08)
Rarely	11 (5.5)	13 (82)
Never	7 (3.5)	7 (7.44)
Q7. Do you use the rubber dam during operative procedures for posterior compomer?		
Always	149 (74.5)	75 (79.78)
Sometimes	40 (20)	16 (17.02)
Rarely	11 (5.5)	3 (3.19)
Never	0	0
Q8. Do you use the rubber dam during operative procedures for posterior amalgam?		
Always	11 (5.50)	1 (1.06)
Sometimes	59 (29.50)	12 (12.76)
Rarely	99 (45)	33 (35.10)
Never	31 (15.50)	48 (51.06)



**Figure 2:** Bar chart showing the percentage of answers given by students to questions regarding attitude of students to the use of rubber dam

achieved for the operative field without using rubber dam, but also they shared the opinion that restorations placed under rubber dam have a greater longevity than those placed without. On the other hand, more than one-half of school B disagreed with the opinion that rubber dam use would give good visibility and enables clearer access during both cavity preparation and placing restoration, whereas only one-quarter of school A students adopt this opinion. This difference was statistically significant ( $P < 0.05$ ). There was an agreement between the two dental colleges' student

**Table 2: Answers given by students to questions regarding attitude of students to the use of rubber dam**

Questions	School A, n (%)	School B, n (%)
Q9: Did you receive training in rubber dam placement during your preclinical studies?		
Yes	168 (84)	62 (65.95)
No	32 (16)	32 (34.05)
Q10. Do you frequently use the rubber dam for isolation in maxillary anterior class V restoration or just isolate using the cotton roll?		
Yes	148 (74)	50 (53.19)
No	52 (26)	44 (46.81)
Q11. Did operative procedures in posterior teeth and treatment perform using the rubber dam was more successful in both cavity preparation and restorative material properties than those where it was not used?		
Yes	150 (75)	68 (72.34)
No	50 (25)	26 (27.65)
Q12. Do you agree that proper isolation cannot be achieved for restoration of operative procedures without rubber dam		
Yes	196 (98)	90 (95.74)
No	4 (2)	4 (4.26)
Q13. Do you agree that patient do not like rubber dam		
Yes	190 (95)	85 (90.42)
No	10 (5)	9 (9.57)
Q14. Do you agree that restorations placed under rubber dam have a greater longevity than those placed without		
Yes	198 (99)	92 (97.87)
No	2 (1)	2 (2.13)
Q15. Do you agree that rubber dam use would give good visibility and enables clearer access during both cavity preparation and placing restoration		
Yes	148 (74)	40 (42.55)
No	52 (26)	54 (57.45)
Q16. Do you agree that rubber dam is difficult to apply		
Yes	180 (90)	77 (81.91)
No	20 (10)	17 (18.09)

for the opinion that application of the dam was difficult and patients dislike it.

In spite of the agreement of the students of both colleges that adequate isolation cannot be achieved without rubber dam, there was a significant difference ( $P < 0.05$ ) between the two colleges with a higher percentage to Al-Farabi College compared to Buraidah College. On the other hand, more than one-half of the students of Buraidah College disagreed with the opinion that rubber dam use would give good visibility and enables clearer access during both cavity preparation and placing restoration contrary to the student of Al-Farabi College who believe in this opinion. This difference between the two colleges was statistically significant ( $P < 0.05$ ). No statistically significant differences were determined between the two colleges in terms of the other evaluated parameters ( $P > 0.05$ ).

## DISCUSSION

There is no doubt that rubber dam is generally preferred during endodontics, but its usefulness

during restorative treatment cannot be overlooked. The present study basically directed toward the use of rubber dam in operative procedures as the use of rubber dam in operative procedures is still questionable.

This survey was conducted on undergraduate students as they seem to give more honest answers compared to the general practitioners who subjected to the stress of challenging environment. This is in accordance with Hill and Rubel.<sup>[15]</sup> Most of the dental schools emphasize the importance of rubber dam application, especially during endodontic and adhesive procedures.<sup>[16]</sup> In spite of the undoubted advantages of rubber dam, it is still believed to be controversy issue among general practitioners.<sup>[17]</sup> The results obtained from this study support this hypothesis. Moreover, the trend of these two dental colleges to stress on the usage of rubber dam in endodontic field rather than operative field may positively affect this finding. In addition, extended treatment period, patients dislike, and decreased clear access during both cavity preparation and placing restoration also considered as disadvantages that



may decrease the use of rubber dam. This strongly supported by Whitworth *et al.* who found the majority of UK dentists never used the rubber dam for both endodontics and operative procedures.<sup>[12]</sup>

In our study, the percentage of routine uses of rubber dam for adult patient was 90% and 84% for the students of Al-Farabi and Buraidah, respectively. This result is in disagreement with Unal *et al.*<sup>[18]</sup> who found only 5.1% of Turkish general practitioners use rubber dam. Furthermore, Peciulienė *et al.* and Slaus and Bottenberg found that two-thirds of the general practitioner do not use rubber dam.<sup>[19,20]</sup> Hill and Rubel related the low percentage of general practitioners using rubber dam to the inconvenience and their belief it is unnecessary.<sup>[15]</sup> To overcome this opinion, the role of rubber dam plays in safety measures during dental care can be further emphasized by showing complications arising from lack of usage.

On the other hand, another study supported our result as he found the high percentage of American general practitioners use rubber dam.<sup>[21]</sup> They refer this result to the strict malpractice regulations executed in the USA. In our study, the reason of the high percentage of students using rubber dam may be attributed to the close supervision of well-trained staff members in the different clinical sessions as well as the rules and regulation implemented by the colleges for the work in the undergraduate clinics.

In this study, a general belief among dental practitioners that patients dislike rubber dam usage was observed. However, this result is contradicted by studies concluding that rubber dam is an accepted element of dental care by patients.<sup>[6,22,23]</sup> This result may be related to insufficient experience of the surveyed undergraduate student in dealing with the patients. This is supported by Whitworth *et al.* who found a great correlation between the negative practitioner attitude and patient behavior toward rubber dam.<sup>[12]</sup> Furthermore, Stewardson and McHugh found that the experience of the dentist influences the patient's opinion.<sup>[6]</sup>

The percentage of students who did not use rubber dam for child patients in both schools was 88.77% this exceeded the 68% reported by Mala *et al.*<sup>[2]</sup> This issue, however, needs to be considered from a pedodontic standpoint, probably in a future study focusing on this group of patients.

Most of the surveyed students in both colleges respond positively to the use of rubber dam for

esthetic restoration either anterior or posterior. Terry explained the importance of rubber dam on the basis of technique sensitivity of resin composite.<sup>[24]</sup> He stated that isolation of the operative field is very important before the placement of esthetic restoration as contamination with saliva, blood, or crevicular fluid may adversely affect the material property or the bond strength.

The use of rubber dam for maxillary anterior Class V was the least percentage among the surveyed students. The students of Al-Farabi College use it more frequently than Buraidah, and the difference was statistically significant. This may be explained by sufficient isolation with cotton rolls due to the absence of major salivary glands at this area.

It is also noteworthy to mention that dental students may display more idealistic views about contemporary methodologies before graduation. With the progression of years of dental service, there might be some alterations in their views.

## CONCLUSIONS

Under the limitation of this study, we can conclude that rubber dam application has a wide acceptance among undergraduate students. However, we cannot depend completely on the result of the survey, but it is acceptable tool to give an indication of what will be the clinical practice in the near future.

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### Conflicts of interest

There are no conflicts of interest.

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