

Syrian Senior Dental Students' Perception, Educational Satisfaction, and Attitude Regarding the Usage of Rubber Dam

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ABSTRACT

Aim: The study aimed to determine the perception, educational satisfaction, and attitude of dental students (fourth and fifth years) regarding the usage of rubber dam.

Materials and methods: A piloted questionnaire was distributed to fourth- and fifth-dental students in Damascus (governmental) and Syrian private (private) dental schools in August 2019. Information collected included perception, educational satisfaction, and attitude to the usage of rubber dam in different operative and endodontic treatments. A data analysis was carried out using SPSS version 25. A descriptive statistical analysis was done, and a Chi-square test was performed to compare the obtained data. The data evaluation was at a significant level of $p < 0.05$.

Results: Out of 380 questionnaires distributed, 346 were filled and returned, the response rate was 91.05%. Rubber dam was used by 91.62% of the participants ($n = 317$) on child patients. Rubber dam was never used by 47.11% of the participants ($n = 163$) when placing amalgam restorations, and by 5.50% of the participants ($n = 19$) when placing composite restorations. Rubber dam was used by 61.85% of the participants ($n = 214$) after access cavity preparation when performing root canal treatments. A total of 44.22% of the participants ($n = 153$) believed that their use of rubber dam will be in all indicated procedures after graduation.

Conclusion: Within the limits of this study, there was still a high possibility among the undergraduate dental students that they might not practice routine placement of rubber dam after graduation.

Clinical significance: A very important method to improve the clinical dental practicing is by studying how dental students look to the details of each dental procedure, so the academic institutes can change the wrong thoughts of the future dentists from the dental student level. One of these important procedures is the rubber dam application.

Keywords: Amalgam, Dental students, Endodontics, Operative dentistry, Restoration, Rubber dam.

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INTRODUCTION

Moisture control means excluding saliva, sulcular fluid, and gingival bleeding from the operation field and preventing the handpiece spray and restorative materials from being aspirated or swallowed. The creation of dryness by the exclusion of mouth sections and humidity from the operative field is essential for rightly performing most restorative procedures.

The rubber dam has many advantages in most branches of dentistry and is mandatory for legal considerations. The usage of the rubber dam is a must in recent endodontic and operative dentistry practice because it provides a clean operating field, isolating the tooth from salivary contamination, preventing the inhalation or ingestion of dental instruments and materials,¹ and protecting the oral soft tissues and gingiva from contact with solutions used during dental treatments, such as sodium hypochlorite and phosphoric acids. Rubber dam decreases aerosol contamination and cross-infection by up to 98.5% if it is used during conservation procedures,²⁻⁵ and may also reduce transmission of acquired immunodeficiency syndrome, hepatitis, and tuberculosis.^{3,6,7} It is made of latex, but nonlatex rubber dam sheets are available for patients with latex sensitivity.⁸ The use of dental dam is the standard of care.^{9,10} With the understanding of the basic principles and a well-qualified dental assistant, a single tooth can be isolated in only a few seconds. Many reasons have been reported for the lack of rubber dam use which include patient objection, time

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consumption, cost of materials, and shortage in training. In current cariology and endodontics, both undergraduate education in the use of rubber dam and its later practical use should belong to standard knowledge and skills.¹¹ This study aimed to determine

the perception, educational satisfaction, and attitude of dental students (fourth and fifth years) regarding their use of rubber dam.

MATERIALS AND METHODS

Anonymously, a piloted questionnaire was delivered to fourth- and fifth-year dental students in Damascus (governmental) and Syrian private (private) dental schools in August 2019. Survey preparation depended on the study of Mala et al.,¹² Abdulrab et al.,¹³ and Tanalp et al.¹⁴ The pilot study was conducted on a random sample of students ($n = 15$) to be sure that the questions were clear. A total of 380 survey (14 questions) forms were distributed. The questions were closed ended, divided into five groups as following (demographic, utilization of rubber dam, students' opinions about the usage of rubber dam, students' opinion about the difficult sides regarding rubber dam usage, expressions of students regarding various aspects of rubber dam, and opinion of students about postgraduation usage of rubber dam). The mode of answering

the questions was variable [(yes or no), (always, never, rarely, and sometimes), (I agree, I disagree)]. A data analysis were carried out using SPSS version 25. A descriptive statistical analysis was done, and a Chi-square test was performed for qualitative data comparing. Results were evaluated at a significant level of $p < 0.05$.

RESULTS

Out of 380 questionnaires, 346 were completed and returned with response rate of 91.05%.

As it is shown in Table 1, 170 (49.13%) were female respondents, whereas 176 (50.87%) were male respondents, 80 (23.12%) were in the fourth year, and 266 (76.88%) in the fifth year. The majority (70.23%) always did not ask their patients about latex allergy, with a significant statistical difference between the studied two dental school ($p < 0.05$). A total of 317 (91.62%) did not use rubber dam for pediatric patients, 163 (47.11%) never used it in case of amalgam restoration, but 185 (45%) always used it with composite

Table 1: Responses to questions regarding utilization of rubber dam

	Damascus university		Syrian private university		Total		Significance
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Gender							
Male	95	43.2	81	64.3	176	50.87	$\chi^2 = 14.277$
Female	125	56.8	45	35.7	170	49.13	$p = 0.0002$
Academic year							
Fourth	35	15.9	45	35.7	80	23.12	$\chi^2 = 17.679$
Fifth	185	84.1	81	64.3	266	76.88	$p = 0.00001$
Do you ask your patients whether they have latex allergy prior to rubber dam use?							
Yes	54	42.5	49	38.9	103	29.77	$\chi^2 = 7.884$
No	166	75.5	77	61.1	243	70.23	$p = 0.005$
Do you use rubber dam in pediatric patients?							
Yes	202	91.8	115	91.3	317	91.62	$\chi^2 = 0.031$
No	18	8.2	11	8.7	29	8.38	$p = 0.859$
Do you use rubber dam during amalgam restorations?							
Always	6	2.7	10	7.9	16	4.62	$\chi^2 = 5.356$
Never	104	47.3	59	46.8	163	47.11	$p = 0.148$
Rarely	36	16.4	21	16.7	57	16.47	
Sometimes	74	33.6	36	28.6	110	31.80	
Do you use rubber dam during composite restorations?							
Always	99	45	86	68.3	185	53.47	$\chi^2 = 17.647$
Never	15	6.8	4	3.2	4	3.2	$p = 0.001$
Rarely	7	3.2	3	2.4	3	2.4	
Sometimes	99	45	33	26.1	33	26.2	
During which stage of endodontic treatment do you use rubber dam?							
After access cavity preparation	143	65	71	56.3	214	61.85	$\chi^2 = 11.448$
Before access cavity preparation	51	23.2	48	38.1	99	28.61	$p = 0.022$
During root canal cleaning and shaping only	7	3.2	3	2.4	10	2.90	
During root canal filling only	19	8.6	4	3.2	23	6.65	
Do you think you have been given adequate and satisfactory education regarding rubber dam?							
Yes	106	48.2	62	49.2	168	48.55	$\chi^2 = 0.034$
No	114	51.8	64	50.8	178	51.45	$p = 0.854$
During endodontic treatment of teeth with extensive tissue loss							
I don't use rubber dam	147	66.9	66	52.4	213	61.56	$\chi^2 = 7.473$
I perform a restoration so that I can place the rubber dam	73	33.1	60	47.6	133	38.44	$p = 0.024$

Table 2: Opinions of students about the usage of rubber dam

	Damascus university		Syrian private university		Total		Significance
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
What in your opinion is the greatest advantage offered by the rubber dam?							
Prevention of ingestion of irrigant	15	6.8	15	11.9	30	8.67	$\chi^2 = 21.183$
Prevention of swallowing or aspirating instruments	14	6.4	14	11.1	28	8.09	$p = 0.0001$
Provision of isolation and an aseptic working area	191	86.8	97	76.98	288	83.24	

Table 3: Students' opinion about the most difficult aspect regarding rubber dam usage

	Damascus university		Syrian private university		Total		Significance
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
What is the major factor that makes rubber dam application a difficult procedure?							
Placemen of the frame	10	4.5	2	1.6	12	3.47	$\chi^2 = 11.805$
Placement of the rubber dam	34	15.5	38	30.2	72	20.81	$p = 0.003$
Selection of the clamp and its adaptation	176	80	86	68.3	262	75.72	

Table 4: Agreement or disagreement of students regarding various aspects of rubber dam

	Damascus university		Syrian private university		Total		Significance
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Rubber dam eases the restoration stage							
I agree	172	78.2	94	74.6	266	76.87	$\chi^2 = 0.577$
I disagree	48	21.8	32	25.4	80	23.13	$p = 0.447$
Treatment performed using the rubber dam are more successful than those performed without using it							
I agree	194	88.2	112	88.9	306	88.44	$\chi^2 = 0.039$
I disagree	26	11.8	14	11.1	40	11.56	$p = 0.843$
An adequate isolation cannot be achieved in case of rubber dam is not used							
I agree	117	53.2	84	66.7	201	58.1	$\chi^2 = 5.984$
I disagree	103	46.8	42	33.3	145	41.9	$p = 0.014$
Rubber dam eases access to root canals							
I agree	125	56.8	72	57.1	197	56.9	$\chi^2 = 0.003$
I disagree	95	43.2	54	42.9	149	43.1	$p = 0.953$
Rubber dam makes radiograph-taking procedure difficult							
I agree	197	89.5	115	91.3	312	90.12	$\chi^2 = 0.269$
I disagree	23	10.5	11	8.7	24	9.88	$p = 0.604$
Rubber dam is difficult to apply							
I agree	91	41.4	63	50	154	44.51	$\chi^2 = 2.419$
I disagree	129	58.6	63	50	192	55.49	$p = 0.120$
Rubber dam consists of too many components							
I agree	98	44.5	64	50.8	162	46.8	$\chi^2 = 1.256$
I disagree	122	55.5	62	49.2	184	53.2	$p = 0.262$
Rubber dam extends treatment period							
I agree	100	45.5	66	52.4	166	47.98	$\chi^2 = 1.540$
I disagree	120	54.5	60	47.6	180	52.02	$p = 0.215$
Rubber dam is more necessary while working in the maxillary teeth							
I agree	16	7.3	23	18.3	39	11.3	$\chi^2 = 9.660$
I disagree	204	92.7	103	81.7	307	88.7	$p = 0.002$
Assistance is necessary during rubber dam application							
I agree	148	67.3	80	63.5	228	65.9	$\chi^2 = 0.510$
I disagree	72	32.7	46	36.5	118	34.1	$p = 0.475$
Patients do not like the rubber dam							
I agree	202	91.8	116	92.1	318	91.9	$\chi^2 = 0.006$
I disagree	18	8.2	10	7.9	28	8.1	$p = 0.936$
I only use rubber dam because I am obliged to following graduation							
I agree	106	48.2	61	48.4	167	48.27	$\chi^2 = 0.002$
I disagree	114	51.8	65	51.6	179	51.73	$p = 0.967$

Table 5: Opinion of students about postgraduation usage of rubber dam

	Damascus university		Syrian private university		Total		Significance
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Following graduation:							
I intend to use it only during restorative procedures	7	3.2	8	6.3	15	4.34	$\chi^2 = 8.324$
I intend to use it only during root canal treatment	89	40.4	41	32.5	130	37.57	$p = 0.040$
I intend to use the rubber dam during all procedures indicated	88	40	65	51.6	153	44.21	
I will never use it	36	16.4	12	9.5	48	13.9	

restoration ($p < 0.05$). A total of 214 (61.85%) of the students used to apply rubber dam after access cavity preparation ($p < 0.05$). A total of 178 (51.45%) of the students did not take an adequate education regarding the use of rubber dam. Furthermore, 213 (61.56%) never used rubber dam during working on teeth with large tissue loss ($p < 0.05$).

The most important advantage for rubber dam was creating isolation and an aseptic field as reported by 83.24% of the participants ($p < 0.05$; Table 2). Most of the students (262, 75.72%) reported that choosing the clamp and its adaptation was the most difficult stage of rubber dam usage ($p < 0.05$; Table 3).

Table 4 summarizes agreements or disagreements of students toward different aspects of rubber dam. The Chi-square test revealed that no statistically significant effect was present among responses in Table 4 except for the inability to establish an adequate isolation without using rubber dam and the opinion about rubber dam is more necessary in maxillary teeth ($p < 0.05$). Table 5 shows the opinions about the postgraduation usage of rubber dam. A total of 153 (44.22%) of the students intended that following graduation, they will use rubber dam for all the procedures indicated ($p < 0.05$).

DISCUSSION

The goal of recent dental schools is to introduce well-qualified dentists on graduation. This is a challenge because of huge number of students and dental schools, and decreased numbers of qualified dental educators.^{15,16} Almost all dental schools teach the students that the use of rubber dam is obligatory for most restorative treatments in children and adults.¹¹ So, this will have a significant positive effect on its usage after graduation. A total of 70.23% of the students in the recent study did not investigate latex allergy among their patients; this percentage is higher than in Abdulrab et al.'s study¹³ and Tanalp et al.'s study.¹⁴ This means proper orientation of students should be present to focus on the possibility of latex allergy prior to application of the rubber.¹⁷ A high number of students (317, 91.62%) do not use rubber dam in pedodontic patients, which is close percentage to some previous studies.^{13,14} A total of 47.11% never used rubber dam in cases of amalgam restoration as in Akbar et al.¹⁸ but higher than the result of Abdulrab et al.¹³ However, the results regarding the use of rubber dam with composite restoration were compatible with Tanalp et al.¹⁴ Only 28.61% of the students apply rubber dam before access cavity preparation in root canal treatment; this value is low when compared with other studies.^{13,19} Approximately 50% of the respondents declared that they did not have adequate and satisfactory education regarding rubber dam as in the study of Akbar et al.¹⁸ and Al-Haj Ali et al.²⁰ The majority of students in this study preferred not to use rubber dam when a tooth was with extensive tissue loss agreeing with Tanalp et al.,¹⁴ and this

could be explained by the fact that large loss of tooth structure may cause a difficulty in adapting a regular clamp. The greatest advantage gained from rubber dam from the students' point of view (83.24%) was to perform suitable isolation and an aseptic field, and this is similar to Abdulrab et al.'s study. The most difficult step in the rubber dam application was clamp choosing and application (75.72%), while in other studies (Abdulrab et al. and Tanalp et al.), this reached 73% and 84%,^{13,14} respectively. This may be because students may not have adequate sizes and types of clamps, suitable for different cases as students in these schools buy the instruments by themselves. A total of 77% of the students in this study agreed that rubber dam eases restoration stage, and this result matches with that of Akbar et al.¹⁸ The majority of our students agreed that rubber dam allows a more successful treatments, a result which is consistent with many studies.^{13,14,18} A total of 58% of the students felt that intended isolation cannot be found without rubber dam application comparing with high percentages of other studies.²¹ Rubber dam makes it easy to access the root canals; this thought were supported by 56.9% of the contributors, which is slightly more than the response in Tanalp et al.'s study.¹⁴ It is difficult to take a radiograph in the suitable position with the dam in place, and this is another disadvantage as reported by 90% of the students, and it is known that removing rubber dam during radiography is an accepted behavior as this step is performed with an instrument within the root canal, and the patient generally stays alone in the X-ray room. In this study, around 44.51% of the respondents agreed that dental dam is difficult to apply; a similar finding has been reported by Abdulrab et al.¹³ About half of the study sample reported that the too much components of rubber dam disturb them, but this percentage is still the lowest when compared with other studies.^{13,14,18} The majority (91.9%) of students went with the statement "Patients do not like the rubber dam," so this is contradictory to the dental literature.^{22,23} Dental students may show ideal views about recent methodologies upon graduation; 48.27% of the students reported that they apply rubber dam only because they are obliged to following graduation, so additional efforts should be made to change this mistaken thoughts about the importance of rubber dam in safety measures in dental practice by showing students the happened accidents from ignoring the usage of dental dam and aftermath.¹⁴ Another study should be conducted to evaluate the efficacy of teaching plan modification.

CONCLUSION

Within the limits of this study

- Efforts should be paid to assure dental students to ask their patients about latex energy.

- Dental student should be oriented to use rubber dam in pediatric dentistry.
- It is necessary to persuade the students of the importance of rubber dam application in different procedures including amalgam and composite restoration, and this will guarantee the use of it after graduation.
- Providing suitable and impressive education regarding rubber dam usage should be revised in the syllabuses of the studied two colleges.

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