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RESEARCH ARTICLE

The attitude of undergraduate dental students toward the use of rubber dam in College of dentistry, Qassim University

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Abstract

Background/Aim: Rubber dam is the most widely used technique for isolation in nearly all dental procedures. Nevertheless, some students may not be convinced of its efficiency. The aim of this study was to determine the attitude of dental students towards the use of rubber dam in college of dentistry, Qassim University. *Materials and Methods*: A questionnaire was mailed to all fourth and fifth year students in January, 2015. *Results*: The major obstacles reported were difficulty in placement (89.2%) and the extra time needed for placement (77.9%); 46.1% of the students reported that they needed ≥ 5 minutes to place the rubber dam. Patients' objection was also reported as an obstacle toward rubber dam use (87.7%). Female students had significantly more of these responses when compared to male students. On the other hand, significantly more fifth year students preferred to treat adults when compared to children ($P<0.05$). Composite restorations were the top procedures reported to require rubber dam during placement in the general dental field. *Conclusions*: some negative attitude was reported by students regarding rubber dam use among adults and children. Students were only convinced that rubber dam use is necessary while performing composite restorations. Patients' objection and the extra time needed for placement were major obstacles against rubber dam use. More training on rubber dam use is necessary in college of dentistry, Qassim University as this will dictate the future use of rubber dam in the dental field.

INTRODUCTION

Rubber dam is a long-established technique within the dental profession. It is the most widely used and efficient technique to isolate the working field properly. (Whitworth et al., 2000) The reported advantages of rubber dam are numerous and well documented, (Frencesca and Jennifer, 2007; Mala et al., 2009) and include the following: (Table1). These advantages have led to the use of rubber dam being accepted as a standard of care by professional organizations (European Society of Endodontology 1992, 2006, American Association of Endodontists 2004, American Academy of Pediatric Dentistry 2008– 2009). (Mala et al., 2009)Training in the proper use of rubber dam has become a fundamental part of the curriculum for students of dentistry. Undeniably, 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. (Ryan and O'Connell, 2007)Yet, in spite of these advantages and recommendations, rubber dam use is often ignored by practicing dentists in many countries. (Whitworth et al., 2000; Lynch and McConnell, 2007; Lin et al., 2011) It would seem that rubber dam is not routinely used even for root canal treatments, where small instruments and potentially harmful agents are being used. (Jenkins et al., 2001; Lin et al., 2011)In Saudi Arabia, the use of rubber dam was assessed in few studies among dental interns, (Al-Qarni, 2013;

Ahmad et al., 2013) dentists, (Al-Abdulwahhab et al., 2013; Iqbal, 2014) and dental students. (Ahmad et al., 2013) Under usage of rubber dam was reported among dentists during placement of restorative procedures. (Al-Qarni, 2013; Iqbal, 2014)

Students are the future generation of dental practitioners in Saudi Arabia. Knowledge of students' attitudes toward rubber dam usage is important since this will control their trends in dental field. Up to our knowledge, little emphasis was made over the attitude of undergraduate dental students to the use of rubber dam in Saudi Arabia. The aim of this study was to determine the attitude of dental students towards the use of the rubber dam in college of dentistry, Qassim University.

MATERIALS AND METHODS:

A questionnaire was designed containing 10 questions (Table 2). The questionnaire was a modified version from that used by previous investigators. (Ryan and O'Connell, 2007)The questions explored the didactic and clinical experience of rubber dam placement in adults and children. They were also structured to prevent leading to an ideal answer and to avoid appearing judgmental. The questionnaire was sent by email in January, 2015 to all fourth and fifth year students (n=88) who were identified as having maximum clinical exposure during these years. Students were given the opportunity to decline participating in the study. The information and data from the completed questionnaires were entered into an electronic database (SPSS® for Windowsv.20, Chicago, IL, USA) and statistical analysis which consisted of simple frequencies was carried out to interpret the results. Chi square test was used to assess the difference in the response of each question according to gender and academic level of the students. Probability value of < 0.05 was considered statistically significant.

RESULTS:

Of the 88 questionnaires which were sent via email, 66 questionnaires were returned complete, resulting in a response rate of 75%. The distribution of students by academic level and gender is shown in Table 3. The main advantage of rubber dam was correctly identified by students as isolation (96.9%). Students listed difficulty fitting the rubber dam as the main disadvantage (89.2%). Students also listed the additional clinical extra time required to fit the rubber dam as a major disadvantage (76.9%). Both of these disadvantages were significantly affected by gender ($P=0.05$ and <0.001) as more of female students reported these as disadvantages to rubber dam use compared with male students.

The great majority of the students believed that patients do not prefer treatment under rubber dam (87.7%). This belief was significantly affected by gender as more of female students had it when compared to male students ($P=0.03$).While the majority of the students were confident in placing the rubber dam (80%), only 64.6% reported having adequate training in rubber dam use. Almost half of the students (49.2%) reported that they need more training. This need was marginally affected by gender as more male students reported the need for training when compared to female students ($P=0.05$).Approximately 58.5% of students believed they could achieve adequate moisture control without rubber dam. When the students were asked about the time they needed in placing the rubber dam, almost 46.1% of the students reported that they needed ≥ 5 minutes. Gender significantly influenced the response of the students as female students reported that they needed more time when compared to male students ($P=0.007$). A range of responses was reported when students were asked about use of the rubber dam for similar procedures in adults and children. It appears that students have a slight preference towards adults with regard to the use of the rubber dam as 70.8 % would use the rubber dam more often with adults than with children for the same procedure. This preference was significantly influenced by academic level as more of fifth year students reported this preference when compared to fourth year students.

When the students were asked to predict their use of the rubber dam in general dental practice, posterior composite restorations were the top procedures requiring rubber dam placement as perceived by the students (83.1%) followed by anterior composite restorations (60%), Crowns/bridges/veneers/inlays and amalgam restorations (23.1 and 21.5%, respectively). Both gender and academic level significantly influenced the responses of the students in this question as more of fourth year students reported that they would use rubber dam for crown/bridge/veneer/ or inlay ($P=0.035$), whereas more of male students would use rubber dam for amalgam restorations ($P<0.0001$).

Table 1: Advantages of rubber dam.

1. Maintenance of an aseptic field during treatments.
2. Reduction of the potential risk of transferring infective agents between dentist and patient.
3. Prevention of ingestion or aspiration of instruments, materials, solvents or irrigants during dental treatment.
4. Protection of gingival and other oral soft tissues from contact with deleterious materials, particularly liquids used during dental treatments, such as sodium hypochlorite or phosphoric acids.
5. Retraction of soft tissues during certain operative procedures.
6. Improved patient comfort during dental treatment due to the sense of isolation.
7. Time saving in doing certain clinical procedures.
8. Reduction of nitrous oxide gas levels in room air caused by reduced mouth-breathing.
9. Reduced microbiological content of aerosols produced during dental procedures.

Table 2: The questionnaire form.

Q1	What do you like about the rubber dam? Item 1: Good isolation/moisture control: (Yes/ No). Item 2: safety: (Yes / No). Item 3: Access/visibility of tooth: (Yes: / No).
Q2	What don't you like about the rubber dam? Item 1: Difficult to place sometimes: (Yes/No). Item 2: needs local anesthesia for some clamps: (Yes/ No). Item 3: needs extra time to place: (Yes/ No). Item 4: clamps decrease the access to the tooth sometimes: (Yes/ No).
Q3	In your experience, do you think that patients prefer treatment under rubber dam? (Yes/No).
Q4	Do you feel confident in using the rubber dam? (Yes/No).
Q5	Do you think you have had adequate training in the use of the rubber dam? (Yes/No).
Q6	Would you like more training in the use of the rubber dam? (Yes/No).
Q7	Do you think you can achieve adequate moisture control without conventional rubber dam or dry dam? (Yes/No).
Q8	How long does it take you to fit a rubber dam? Item 1: 1minute. Item 2: 2 minutes. Item 3: 3 minutes. Item 4: 4 minutes. Item 5: ≥5 minutes.
Q9	For a similar procedure would you use the rubber dam? Item 1: More often for children than adults. Item 2: More often for adults than children. Item 3: Same for both adults and children.
Q10	Do you think that when you are qualified you will routinely use the rubber dam in the following situations? Item1: Amalgam restorations: (Yes / No). Item 2: Anterior composite restorations: (Yes / No). Item 3: Posterior composite restorations: (Yes / No). Item 4: Crown/bridge/veneer/inlay, prep or fit: (Yes / No).

Table 3: Results of the questionnaire according to academic level and gender.

Question #	Response	All sample (%)	Academic level (%)		P value	Gender (%)		P value
			4th	5th		Male	Female	
1	Item 1: Yes	96.9	100	94.6	0.32	93.9	100	0.254
	No	3.1	0	5.4		6.1	0	
	Item 2: Yes	81.5	71.4	89.2	0.067	87.9	75	0.154
	No	18.5	28.6	10.8		12.1	25	
	Item3: Yes	75.4	78.6	73	0.413			
	No	24.6	21.4	27				
2	Item 1: Yes	89.2	89.3	89.2	0.656	81.81	96.9	0.05*
	No	10.8	10.7	10.8		8.2	3.1	
	Item 2: Yes	50.8	57.1	45.9	0.26	45.5	56.2	0.267
	No	49.2	42.9	54.1		54.5	43.8	
	Item 3: Yes	76.9	85.7	70.3	0.121	54.5	100	<0.001*
	No	23.1	14.3	29.7		36	0	
	Item 4: Yes	47.7	53.6	43.2	0.283	48.5	46.9	0.547
	No	52.3	46.4	56.8		51.5	53.1	
3	Yes	12.3	10.7	13.5	0.522	21.2	3.1	0.03*
	No	87.7	89.3	86.5		78.8	96.9	
4	Yes	80	78.6	81.1	0.521	75.8	84.4	0.289
	No	20	21.4	18.9		24.2	15.6	
5	Yes	64.6	67.9	62.2	0.417	66.7	62.5	0.463
	No	35.4	32.1	37.8		33.3	37.5	
6	Yes	49.2	50	48.6	0.557	60.6	37.5	0.05*
	No	50.8	50	51.4		39.4	62.5	
7	Yes	58.5	64.3	54.1	0.283	57.6	59.5	0.542
	No	41.5	35.7	45.9		42.4	40.6	
8	Item 1	3.1	3.6	2.7	0.431	3	3.1	0.007*
	Item 2	13.8	7.1	18.9		27.3	0	
	Item 3	18.5	10.7	24.3		6.1	31.2	
	Item 4	18.5	21.4	16.2		15.2	21.9	
	Item 5	46.1	57.1	37.8		48.5	43.8	
9	Item 1	6.2	0	10.8	0.009*	3	9.4	0.566
	Item 2	70.8	60.7	78.4		72.7	68.8	
	Item 3	23.1	39.3	10.8		24.2	21.9	
10	Item 1 Yes	21.5	17.9	24.3	0.377	39.4	3.1	<0.0001*
	No	78.5	82.1	75.7		60.6	96.9	
	Item 2 Yes	60	64.3	56.8	0.361	51.5	68.8	0.122
	No	40	35.7	43.2		48.5	31.2	
	Item 3 Yes	83.1	85.7	81.1	0.441	81.8	84.4	0.523
	No	16.9	14.3	18.9		18.2	15.6	
	Item 4 Yes	23.1	35.7	13.5	0.036*	18.2	28.1	0.256
	No	76.9	64.3	86.5		81.8	71.9	
*: P< 0.05								

DISCUSSION:

The majority of dental schools worldwide teach the use of the rubber dam as an important adjunct to restorative dentistry in both adults and children. (Koshy and Chandler, 2002) In Qassim University, the regulations of college of dentistry dental teaching center imply that rubber dam use is mandatory for all students during endodontic therapy and adhesive procedures in adults and all pediatric restorative procedures. This study surprisingly revealed that there was some negativity regarding rubber dam use by students among adults and even children. Students generally believed that patients do not prefer treatment under rubber dam. This belief was greater among female students. This is in contrary to the recent evidence provided that patients are not generally averse to rubber dam application. (Stewardson and McHugh, 2002) Students also had less preference toward rubber dam use in children when

compared to adults. This finding was reported among fifth year students more than fourth year students. Same finding was reported in previous studies. (Ryan and O'Connell, 2007; Mala et al., 2009) The reason may be related to students' clinical experience in pediatric dentistry within the undergraduate programme, where students see adult patients more often than children. Some of the reluctance to place the rubber dam may also relate to the time taken to successfully place it. A considerable percentage of the students reported that they needed ≥ 5 minutes to apply the rubber dam (46.1%). In addition, female students reported spending more time in rubber dam application when compared to male students. However, five minutes application time does not seem to be a long period as it was reported to be needed by many undergraduate students worldwide, (Stewardson and McHugh, 2002; Ryan and O'Connell, 2007) therefore it seems that the reluctance is because some students perceive the time used in rubber dam placement as wasted while they rush to finish their requirements necessary for graduation. It is strongly believed that operator's experience in application time and duration of the rubber dam plays an important role in patient satisfaction along with a greater preference for rubber dam application during subsequent visits. (Stewardson and McHugh, 2002)

It is interesting to note in this study that although the great majority of the students identified the advantages of rubber dam, more than half of the students reported that isolation can be effectively done without a rubber dam (58.5%). Other means of moisture control, however, are rarely as successful as rubber dam especially when no assistance is available. Dental students at Qassim University's dental teaching center rarely have one-to-one nursing assistance while performing clinical procedures. In addition, although the students were confident in rubber dam placement in this study, 35.4% of the students reported having inadequate training and 49.2% of the students were willing to have more training in rubber dam placement. These findings highlight a pitfall in the teaching of the use of the rubber dam in the undergraduate curriculum, and suggest increased preclinical training for the students on phantom heads together with increased hands on training in the clinic. Greater emphasis should be placed by the educational process on the reasons for rubber dam use while ensuring efficiency in its placement since the ability to successfully and efficiently place a rubber dam in a variety of clinical situations comes with clinical experience and can be taught.

In this study, the majority of the students reported that they will continue to place rubber dam when performing posterior composite restorations followed by anterior composite restorations. Crowns, bridges, veneers, inlays and amalgam restorations received little priority for rubber dam placement by students. These findings are in agreement with previous studies. (Ryan and O'Connell, 2007; Al-Abdulwahhab et al., 2013) This may be due to the students' belief that other moisture control means can be satisfactory with these procedures, or may indicate lack of students' experience. It is worth-mentioning that this study did not assess the predicted use of rubber dam for endodontic treatment by students post qualification, which can be considered a limitation.

CONCLUSIONS:

This study found some negative attitude by students in Qassim University College of dentistry regarding rubber dam use among adults and children. Students were only convinced that rubber dam use is necessary while performing composite restorations. Patients' objection and the extra time needed for placement were major obstacles against rubber dam use as was reported by students. However, adequate isolation is impossible without the rubber dam especially when one-to-one nursing assistance is not available. Greater emphasis and training on rubber dam use is necessary in the undergraduate curriculum by the educational process as this will dictate the future use of rubber dam in the general dental field.

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