

ATTITUDE AND PRACTICE OF DENTAL INTERNS TOWARDS THE USE OF RUBBER DAM IN DIFFERENT DENTAL COLLEGES OF KATHMANDU

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ABSTRACT

Rubber dam application during routine clinical procedures enhance the dental treatment. Attitude and practice of rubber dam application among dental interns during clinical procedure plays an important role in providing quality treatment and avoiding medicolegal consequences. The aim of this study was to determine the attitude and practice of dental interns towards rubber dam use. A questionnaire-based study was conducted using pre-structured questionnaire among 138 dental interns of three different colleges affiliated to Kathmandu University of Kathmandu District. The results showed that 97.1% study participants believe rubber dam gives good isolation, moisture control and safety. Positive attitude was shown by 55.1% of intern toward rubber dam use during all procedures and 64.5% during root canal treatment. Of the total, 73.2% believed they lacked training and 92.2% were willing to take more training. Most of the interns (85.5%) believe rubber dam as helpful tool. In conclusion, majority of the interns believe rubber dam gives good isolation, moisture control and safety but their lack of rubber dam use in clinical practice could be due to insufficient training, patients' objection and extra time needed for placement. To overcome this, more trainings, preclinical and clinical demonstration and mandatory use during all clinical posting should be done in dental colleges.

KEYWORDS

Attitude, dental interns, practice, rubber dam

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INTRODUCTION

Rubber dam was introduced to the world by Dr. Sanford Christie Barnum in 1864 AD. Rubber dam is considered as an ideal and most widely used isolation device for all dental procedures.¹ Rubber dam application is essential during all routine dental procedure. Its application helps enhance dental procedure by allowing better access, improved operator visibility, patient safety and dry isolated field allowing the dentist and assistant to focus more on tooth and procedure.²⁻⁴ In dentistry the practitioners have to work in close proximity to the patient, always risking the dentists to microbial infections, via transmission through direct contact or by atmospheric aerosols.⁵⁻⁷

The Centre for Disease Control and Prevention (CDC) recommends the use of high velocity suction and rubber dam during any dental procedures to reduce the aerosols generated during rotary dental procedure.⁸

From medicolegal aspect, it is very important to use rubber dam to avoid malpractices.⁹ Rubber dam application failure can also be described as a serious departure from a standard oral health care.¹⁰ Cases of aspiration of endodontic instruments into the gastro-intestinal tract or respiratory tract during root canal treatment have been reported^{11,12} which can effectively be prevented by the use of rubber dam during clinical procedures.

Despite the advantages as well as legal aspects favoring rubber dam use, dental practitioners still seem to be reluctant to use it during routine dental treatment.¹³ Practitioners believe that rubber dam is time consuming and cumbersome and moreover patients do not like rubber dam experience.¹⁴

Since dental school is the platform to practice general and recent trends, students and interns should be made familiar with the practice, advantages, disadvantage and complications of rubber dam before leaving the dental school.

Over the coming years of future dental workforce, dental school is the place for emerging future generation of dental practitioners. Investigating dental students' attitude and practice related opinions towards rubber dam use will contribute to acknowledge the inherent problems related with implementation of this accepted worldwide methodology. Depending on the result of interns' attitude and practice, strategies can be developed to enhance the contemporary and high-quality aspects of clinical dentistry.

MATERIALS AND METHODS

This study is a questionnaire based cross-sectional study. The questionnaire was distributed among 150 interns of three different dental colleges of Kathmandu District affiliated to Kathmandu University. This study was conducted between January to July, 2022. List of dental interns from all the dental colleges of Kathmandu District in internship program affiliated to Kathmandu University, was obtained from the concerned authorities of the concerned colleges. The dental interns were chosen as the study participants since they have adequate clinical exposure after completion of final year. The questionnaire consisted of 20 attitude-based questions and six practice-based questions related to rubber dam, adopted from various studies.^{10,15}

The participation of the students was voluntary. A pilot study was conducted on a random sample of 10 interns to ensure those questions were not difficult to understand and changes were not required.

All the relevant data were entered and coded in Microsoft Excel and then exported for analysis with the help of SPSS version 20. The statistical analysis consisted of frequencies, percentage, mean and standard deviation. The study was approved by Institutional Review Committee of Nepal Medical College (Ref no: 054-078/079).

RESULTS

A total of 138 dental interns from different dental colleges participated in this study. The mean age of the students was 25.01± 1.86 years. Most of the respondents, 111 (80.43%) were females, and 27 (19.6%) were males.

In attitude-based questions, 134 (97.1%) participants thought rubber dam gives good isolation and moisture control, 134 (97.1%) believed it gives safety, 133 (96.4%) better access and visibility to tooth and whereas 130 (94.2%) thought it needs extra time to place. Majority of the participants believe that when they qualify, they will routinely use the rubber dam in all procedures 76 (55.1%), in amalgam restorations 64 (46.4%), in anterior composite restorations 86 (62.3%), in posterior composite restorations 88 (63.8%), in root-canal treatment 89 (64.5%) and during crown/bridge, bleaching, veneers, post core and crown cementation 73 (52.9%).

Table 1: Attitude related responses of study participants on rubber dam use

Attitude -based questions		n	(%)
Do you think the rubber dam gives good isolation and moisture control?	Yes	134	97.1
	No	4	2.9
Do you think the rubber dam gives safety?	Yes	134	97.1
	No	4	2.49
Do you think the rubber dam gives better access and visibility of tooth?	Yes	133	96.4
	No	5	3.6
Do you think sometimes it is difficult to place rubber dam?	Yes	10	7.2
	No	128	92.8
Do you think rubber dam needs local anesthesia for some clamps?	Yes	28	20.3
	No	110	79.7
Do you think rubber dam needs extra time to place?	Yes	130	94.2
	No	8	5.8
Do you think rubber dam clamps decrease access to tooth sometimes?	Yes	59	42.8
	No	78	56.5
Do you think you can achieve adequate moisture control without conventional rubber dam?	Yes	47	34.1
	No	90	65.2
Do you think that when you are qualified you will routinely use the rubber dam in all procedures indicated?	Yes	76	55.1
	No	62	44.9
Do you think that when you are qualified you will routinely use the rubber dam in amalgam restorations?	Yes	64	46.4
	No	74	53.6
Do you think that when you are qualified you will routinely use the rubber dam in anterior composite restorations?	Yes	86	62.3
	No	52	37.7
Do you think that when you are qualified you will routinely use the rubber dam in posterior composite restorations?	Yes	88	63.8
	No	50	36.2
Do you think that when you are qualified you will routinely use the rubber dam in root canal treatment?	Yes	89	64.5
	No	49	35.5
Do you think that when you are qualified you will routinely use the rubber dam during crown/bridge bleaching, veneers, post core, crown cementation)?	Yes	73	52.9
	No	65	47.1
Do you think rubber dam is necessary while working in mandible?	Yes	123	89.1
	No	15	10.9
Do you think rubber dam is necessary while working in maxilla?	Yes	89	64.5
	No	49	35.5
Do you think you are confident in using the rubber dam?	Yes	60	43.5
	No	78	56.5
Do you think you have had adequate training in the use of the rubber dam?	Yes	37	26.8
	No	101	73.2
Would you like more training in the use of the rubber dam?	Yes	127	92.0
	No	11	8.0
In your experience, do you think your patients prefer treatment under rubber dam	Yes	26	18.8
	No	112	81.2

Table 2: Practice related responses of study participants on rubber dam use

Practice based Questions		n	%
Do you use rubber dam during amalgam restorations?	Yes	22	15.9
	No	116	84.1
Do you use rubber dam during anterior composite restorations?	Yes	55	39.9
	No	83	60.1
Do you use rubber dam during posterior composite restorations?	Yes	47	34.1
	No	91	65.9
Do you use the rubber dam?	More often children	5	3.6
	More often adults	113	81.9
	Same for both	20	14.5
How long does it take you to fit a rubber dam?	2 min	5	3.6
	3 min	7	5.1
	4 min	14	10.1
	5 min	112	81.2

Table 3: Opinion of students about the present reason for usage of rubber dam

I use the rubber dam, because	n	%
Helpful tool	118	85.5
Obligated to	20	14.5

Furthermore, majority of interns (92.8%) believed rubber dam placement is not difficult, 79.7% believed no need of local anesthesia and clamp decreases access to tooth (56.5%) while 65.2% stated that without rubber dam adequate moisture control cannot be achieved.

Of the total respondents, 55.1% showed positive attitude towards the routine use of rubber dam during all procedures, while 64.5% said they will routinely use the rubber dam during root canal treatment, 62.3% during anterior composite, 63.8% during posterior composite but only 53.6% during amalgam restoration.

The result showed 89.1% preferred rubber dam placement while working in mandible and 64.5% than in maxilla.

From the result obtained, 56.5% of total interns were less confident during rubber dam placement, mainly due to inadequate training (73.2%) and 92% (127) of them would like to have more training on rubber dam application.

Among total participants 81.2% believed patients do not prefer rubber dam application during routine treatment.

In practice related questions only 15.9% interns used rubber dam during amalgam restoration, whereas 39.9% use rubber dam during anterior composite restoration and 34.1% while doing posterior composite restoration. But majority admitted they do not use rubber dam for both anterior or posterior composite restoration (83% and 91%, respectively).

Interns used rubber dam isolation mainly on adult patients (81.9%) and it took an average of five minute to place rubber dam. Only 3.6% were able to place it within two minutes.

DISCUSSION

This study was done among dental interns as they are the future workforce in the field of dentistry, and their attitude and practice will impact the use of rubber dam during clinical practice. Rubber dam is a very popular tool in clinical dentistry to obtain proper isolation in all dental procedures for better success rate.^{16,17}

Majority of the participants 97.1% reported rubber dam gives good isolation, moisture control and safety. Similar finding was seen in other studies^{17,18} in which 96.9% of the participants reported good isolation and 98% of the participants reported moisture control respectively. Among the total participants, 96.4% believed rubber dam gives better access and visibility and this finding is similar to another study.¹⁸ However, a lower proportion of study participants (75.4%) agreed for it in another.¹⁷ In the current study, 92.8% of interns

believed it is easy to place a rubber dam. This is in contrast to previous studies^{10,17} where lower proportion (81% and 89.2%) believed it was difficult.

In the present study, 94.2% interns believed rubber dam placement needs extra time, a finding higher than other studies.^{15,17} Regarding whether rubber dam clamp decreases access to tooth, 56.5% gave negative response and this finding is also supported by a study,¹⁷ but is higher than other study (19%).¹⁵

In this study, 65.2% believed adequate moisture cannot be achieved without rubber dam application which is supported by various studies.^{10,15,17,19} Of the total, 55.1% of participants agreed to use rubber dam routinely during all clinical procedure which was in accordance to a study by Abdulrab *et al.*¹⁹ After being qualified, 53.6% think they will not use rubber dam during amalgam restorations. This finding was in contrast to various studies^{17,18} (78.5% and 82.6%). Regarding the use of rubber dam for anterior and posterior composite restorations after qualification, 62.3% and 63.8% study participants believed to use rubber dam, a similar finding reported in other literature.^{17,18}

In this study, majority of study participants (89.1%) believed rubber dam is necessary while working in mandible which is supported by studies by Tanalp *et al.*¹⁰ and Abdulrab *et al.*¹⁹ (90% and 93.3% respectively). But 64.5% of the participants also believed rubber dam is equally necessary while working in maxilla which was in contrary to a finding (10%) by Tanalp *et al.*¹⁰

Majority of the participants (73.2%) believed they have inadequate rubber dam training and 92% liked to receive more training, which is similar to study by Olatosi *et al.*¹⁸ in which 62% believed they had inadequate training and 98% liked to receive more training. But this finding is in contrast to another study where 98.5% believed they received adequate training and only 38% thought they needed more training in use of rubber dam.¹⁵

In this study, majority (81.2%) thought patients do not prefer treatment under rubber dam which is also supported by various other studies^{17,19,20} (87.7%, 79.3% and 82.6%). Patients' dislike and negative perception towards rubber dam use may be related to practitioner's attitude, application time, and duration of the rubber dam during each visit.

In practice based questions, 84.1% of participants responded that they do not use rubber dam during amalgam restoration,

similar to other studies^{4,17} where 75% and 78.5% of participants do not use rubber dam. Only 39.9% responded positively regarding the use of anterior composite and 65.9% on posterior composite. On the contrary, some studies showed higher proportion (60% anterior, 83.1% posterior and 71% anterior, 97% posterior, respectively).^{17,21} Time taken to fit rubber dam was 5 min as responded by 81.2% of the participants, which was supported by various other studies.^{15,17,22}

Of the total, 81.9% used rubber dam more often in adult patients, and only 3.6% used rubber dam in child patients. Studies by Mala *et al.*⁴ and Fuad Abdo *et al.*²¹ showed preference of rubber dam by higher proportion of study participants for adult patients (98% and 90%, respectively) than for child patients (32% and 8%, respectively). Among general practitioners of Nepal, only 56.6% like to use rubber dam in adult.²⁰ Low interest of use of rubber dam in children may be due to low clinical exposure of students to child patients and their non compliance. Also, more patience is required for behaviour management of the child patient before performing any specific treatment and rubber dam application.

Although majority of dental interns believed rubber dam is a helpful tool that provides good isolation, moisture control and safety, they still avoided application of rubber dam during clinical procedure. This might be due to the reason that extra cost will be added to the treatment. And the other reason might be the extra time needed for rubber dam application which will delay their clinical procedure.

Almost half of the interns reported lack of confidence, two-thirds reported not having adequate training and almost 90% of them desired to receive more training. These findings highlight insufficiency in teaching learning activity of rubber dam during undergraduate curriculum. And these circumstances suggest the need for more preclinical training for the students on phantom heads and increased hands on training during clinical posting.

In conclusion, this study shows that dental interns have positive attitude for most of the questions regarding the use and application of rubber dam and have keen interest and desire to receive further training on rubber dam. They have understood the importance of rubber dam

use and are convinced that it is a helpful tool. Inadequate training, additional time needed for the placement, patients unwillingness, and non compliance in pediatric age groups were the major obstacles and discouraging factors against the use of rubber dam. Teaching with effective method of rubber dam application

can boost students' confidence and minimize the time required for rubber dam placement, hence enhance their clinical skill, patient safety and quality of treatment.

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