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**ORIGINAL ARTICLE**

# Knowledge and Attitudes of Undergraduate Dental Students regarding rubber dam use at Qassim University

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## ABSTRACT

**Background:** Improving our clinical skill and training through the scientific evidence is essential so that one can provide the highest quality of care to the patients. In both, endodontic and restorative procedures, proper isolation is very essential prerequisite for its long term success. Rubber dam is considered as a gold standard for isolation in dentistry hence its preclinical training to dental students is of uttermost importance.

**Aim:** To evaluate the knowledge and attitude of dental students in regard to placement and usage of rubber dam

**Methodology:** This is a questionnaire based descriptive cross-sectional study that was conducted on the third, fourth and fifth year undergraduate dental students at Qassim University College of Dentistry. The questions were based on knowledge and attitude of participants regarding the practicality of rubber dam use. Data was organized and analyzed by utilizing Statistical Package for the Social Sciences (SPSS) version 23.0.

**Results:** Overall response rate was 59.5%. Around 97.7% of the students agreed upon the importance of using rubber dam. 92% gave positive response regarding use of rubber dam in future restorative and operative cases while 72.7% were willing to gain knowledge about rubber dam through workshops and seminars.

**Conclusion:** This study reaffirms the need for educational methods to be formulated to improve the attitude of dental students towards the used of rubber dam during undergraduate training and after graduation

**KEYWORDS:** Attitude, Knowledge, Dental Students, Rubber dam

## INTRODUCTION

The rubber dam system was introduced by Sanford Barnum in 1864, and today, after many evolutions it is considered as a gold standard for isolating the teeth during dental treatment.[1] In the contemporary dental practice rubber dam isolation have become an essential prerequisite for carrying out esthetic restorations particularly composite restorations.[2] It is the necessary component of contemporary dental care but still many dental practitioners are hesitant to use it in the daily practice.[3] As stated, “no other technique, treatment, or instrument used in dentistry is so universally accepted and advocated by recognized authorities and so ignored by practicing dentists,” it is the time for dental experts to self-evaluate and implement the isolation protocol in clinical practice. [4]

Rubber dam system is comprised of three main components including rubber dam sheet, rubber dam frame and holding clamps. Rubber dam sheets are square in shape having sizes of 5x5 or 6x6 inches and are made up of nitrile or latex. The frames are metallic as well as plastic while the clamps are of different sizes and shapes that hold the rubber dam sheet over the anchor tooth.[5]

Rubber dam has very oblivious advantages as it provides safety to the patient and the operator by decreasing the risk of transferring infective agents between dentist and patient. It is important for avoiding the malpractice litigations during endodontic procedures, as it prevents ingestion of instruments, solvents and irrigations materials accidentally and also protect the patients’ soft tissues including gingiva, buccal mucosa and tongue. Anything that obscures the operative field adversely influences operator efficiency and success. Use of rubber dam with proper standardization can definitely help to perform any procedure with convenience which results in improved quality of treatment outcome. Compared to other methods of isolation rubber dam is considered the best method of moisture control.[6]

In 2010 American Association of Endodontics recommended that tooth isolation is the standard of care in any non-surgical endodontic treatment.[5] On the other hand, European Society of Endodontics quality guidelines state that root canal procedures should be carried out only when the tooth is isolated by rubber dam.[3] The British Society of Pediatric Dentistry also recommended the use of rubber dam in order to reduce any potential risk to the patient.[7]

Dental teaching institutes always emphasize on courses and pre-clinical sessions regarding training of dental students about rubber dam application right from the first patient encounter of the student. The important point is that whether students will firmly adopt this practice need to be evaluated periodically. Therefore, it becomes necessary for an institute to evaluate the attitude, knowledge and skills of students towards usage of rubber dam. Such an assessment can be accomplished by simple questionnaire-based surveys.[8] Considering this, the objective of the current study was to evaluate the knowledge and attitude of dental students in regard to placement and usage of rubber dam.

## METHODS

A descriptive cross-sectional study was conducted on undergraduate students of third year, fourth year and final year studying at the Qassim university college of dentistry. Sample size of 83 was deemed acceptable with response rate of 56 percent as calculated by using Qualtrics sample size calculator[9] when the total students’ population was

148, confidence level was set at 90% and margin of error at 6%.

After approval from the ethical committee of College of Dentistry at Qassim University, a non-probability convenience sampling technique was used for data collection by utilizing an anonymous questionnaire. The permission was taken from the designer of the questionnaire for using the questionnaire in the current study.[10] The questionnaire contained two parts. First part was about demographic information of the participants and second part consisted of 13 items focusing on the knowledge and attitude of dental students towards usage of rubber dam in their clinical practice. After taking informed consent from all the participants the e-questionnaires were sent to the 3rd, 4th and 5th year dental students followed by two reminders at weekly interval. The participation of the dental students was voluntary. All the participants were explained about the aim of the study and the secrecy of the participants were assured. All third year, fourth year and final year undergraduate dental students who responded by submitting e-questionnaire were included in the study and the ones who submit incomplete questionnaires or who did not respond to email were excluded from the study.

Data was organized and analyzed by utilizing Statistical Package for the Social Sciences (SPSS) version 23.0. Frequencies were calculated for the categorical data and descriptive analysis was done for the quantitative data obtained from the questionnaire by using Chi-square test with the level of significance set at p≤ 0.05.

## RESULTS

Out of 148 potential respondents, 88 responded with overall response rate being 59.5%. Out of these respondents (50) 56.8% were males and (33) 43.2% were females. As shown in Figure-1 the highest response rate was noted for fourth year and lowest response rate was noted for third year.

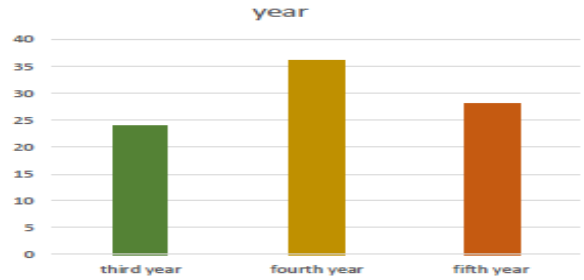


Figure 1: Respondents' academic year-wise distribution

Gender-wise analysis exhibited the significant difference for one attitude question where significantly higher percentage of female students noted that they use rubber dam before starting any restorative or endodontic procedure.

Most of the students 86(97.7%) agreed upon the importance of using rubber dam. According to them the procedures performed under rubber dam are more successful in terms of their longevity and clinical standards. According to them it helps in improving vision and isolation. And when asked about the frequency of their rubber dam usage, 3 (3.4%) stated never, 41 (46.6%) occasionally and 44 (50%) stated regularly.

When the participants asked about the method of isolation that they use; 84 (95.5%) use cotton roll with saliva ejector, whereas 1( 1.1%) use cotton rolls, 2(2.3%)saliva ejector and high volume suction. About 64 (72.7%) participants were willing to gain knowledge about rubber dam through Continuing dental education programs and workshops showing the interest of students towards this.

The knowledge of 3rd year was noted to be significantly lower for the question 1 and 2. On the other hand, final year depicted significantly lower knowledge for the question 4 as shown in Table-1.

In relation to attitude, significantly lower percentage of 3rd year students used rubber dam in pediatric patients and significantly lower percentage of final year students were willing to gain knowledge about rubber dam through Continuing dental education programs and workshops as shown in Table 2.

Table-1: Knowledge of the respondents with Gender-wise and Academic year wise comparison by using Chi-square test

| **Questions** | **Responses N (%)** | | **Gender[1]** | **Academic Year[1]** |
|---|---|---|---|---|
| **Knowledge** | **Yes** | **No** | | |
| **1. Have you performed supervised restorative procedures after placement of rubber dam on Patients at undergraduate level?** | 83 (94.3) | 5(5.7) | 0.63 | **0.001** |
| **2. Have you been comprehensively taught regarding placement of rubber dam for restorative and endodontic treatment?** | 74 (84.1) | 14(15.9) | 0.38 | **0.013** |
| **3. Does use of rubber dam improve vision?** | 87 (98.9) | 1(1.1) | 0.432 | 0.482 |
| **4. Does use of rubber dam improve access?** | 70 (79.5) | 18(20.5%) | 0.445 | **0.039** |
| **5. Does use of rubber dam improve isolation?** | 87 (98.9) | 1(1.1) | 0.432 | 0.482 |
| **6. Do you think procedures performed under rubber dam are more successful in terms of their longevity and clinical standards?** | 86(97.7) | 2(2.3) | 0.320 | 0.112 |
| **7. Should rubber dam be used during procedures requiring multiple X-Rays?** | 62 (70.5) | 26 (29.5) | 0.273 | 0.170 |

[1]Chi-square test

Table-2: Attitude of the respondents with Gender-wise and Academic year wise comparison by using Chi-square test

| Questions | Responses N (%) | | | | Gender[1] | Academic Year[1] |
|---|---|---|---|---|---|---|
| Attitude | Yes | | No | | | |
| 8. Do you use rubber dam in pediatric patients? | 45 (51.1) | | 43 (48.9) | | 0.512 | **0.019** |
| 9. Do you ask your patients regarding latex allergy prior to the use of rubber dam? | 30 (34.1) | | 58 (65.9) | | 0.054 | 0.358 |
| 10. Are you willing to gain knowledge about rubber dam through Continuing dental education programs and workshops? | 64 (72.7) | | 24 (27.3) | | 0.472 | **0.012** |
| 11. In future clinical practice do you intend to use rubber dam in all restorative and endodontic procedures? | 81(92) | | 7 (8) | | 0.345 | 0.611 |
| 12. Do you use rubber dam before starting any restorative or endodontic procedure? | **Never** | **Sometimes** | **Always** | | **0.007** | 0.989 |
| | 3(3.4) | 41(46.6) | 44(50) | | | |
| 13. What other modes of isolation are you using? | **None** | **Cotton Rolls** | **Suction** | **Cotton Rolls and Suction** | 0.188 | 0.215 |
| | 1(1.1) | 1(1.1) | 2(2.3) | 84(95.5) | | |

[1]Chi-square test

## DISCUSSION

Rubber dam use in dentistry is considered as a gold standard as it helps in achieving best outcomes of restorative and endodontic procedures. It helps in improving access, vision and maintaining isolation as well as provides safety for both the practitioner and patient. The present study was a questionnaire-based study in which 84 dental students participated to answer 13 structured questions related to attitude and 7 questions related to knowledge of using rubber dam. The objective of the current study was to determine the knowledge and attitude of dental students in regard to placement and usage of rubber dam.

Among 88 dental students majority of them were males while a study conducted in Nepal by Chaulagain R showed predominance of females in dental college.[11]In the present study majority of the dental students (94.3%) performed supervised restorative procedures after placement of rubber dam on Patients at undergraduate level while another study done in Saudi Arabia reported that most of their studied dentists never use rubber dam while some use it occasionally.[12] Reason behind this may be the lack of training during their undergraduate period. Likewise, researchers in Pakistan noted that only 59.1% respondents performed supervised restorative procedures after placement of rubber dam on patients at undergraduate level.[10]

Regarding placement of rubber dam during any procedure majority (84.1%) of the participants agreed on that they have been taught and trained about rubber dam importance and placement techniques. Conversely, a study on Sudanese dentists reported that 69% of the dentists received training in rubber dam use during undergraduate period.[12] Similarly, a study conducted in Pakistan among house officers regarding rubber dam showed that only 67.3% had been comprehensively taught regarding placement of rubber dam for restorative and endodontic treatment in their respective colleges.[10]

When asked about rubber dam usage during procedures requiring multiple radiographs, 70.5% of the participants agreed while 29.5% disagreed on this. Another study done in Nepal showed that 80% of dental practitioners reported difficulty in taking radiographs with rubber dam in place. However, its removal during the procedure for radiographs is not recommended.[11]

Almost half of the participants (51.1%) prefer to use rubber dam in pediatric patients. The same results were reported in a study done in Chennai.[13] the reason suggested by Kapitan M for limited use of rubber dam in pediatric patients was uncooperative behaviour.[14] Similarly a study done in Odisha stated low percentage of use of rubber dam in pediatric patients.[15] In general, question about latex allergy before rubber dam application was not asked by the patients.[13] In the present study, majority of the respondents (65.9%) did not asked the patients about the latex allergy before rubber dam use showing less knowledge of students regarding this.

When asked about the continuation of use of rubber dam in future restorative and endodontic procedures 92% students gave positive response and 72% of the respondents were also willing to gain knowledge about rubber dam through Continuing dental education programs and workshop**s**. Another study also showed the positive attitude of house surgeons regarding continued dental education regarding rubber dam use.[10]

The present study showed that majority of the students knows the importance of using rubber dam and want to learn and update them regarding this. The knowledge and attitude of the students improved yearly and definitely will become more with the experience of doing cases of rubber dam application and updating themselves by taking workshops and seminars.

## CONCLUSION

This study reaffirms the need for educational methods to be formulated to improve the attitude of dental students towards the used of rubber dam during undergraduate training and after graduation. For quality assurance workshops and continuing dental education programs should be developed to enforce and enhance the use of rubber dam

## RECOMMENDATIONS

By increasing the exposure of students during their undergraduate pre-clinical restorative exercises in using rubber dam will help them to reduce the time taken to place

rubber dam. Similarly more pre-clinical exercise on clinical partners applying rubber dam in different quadrants would also assist students. Continuing practice and providing knowledge regarding the importance of rubber dam in continuing education programs should be developed to make it an obligatory practice in teaching institutes and private clinics.

**Conflicts of Interest:** There are no conflicts of interest.

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