

Assessment of Awareness and Use of Rubber Dam among Dental Practitioners in Navi Mumbai, India

Sayali Dhamne¹, Sabita M Ram², Vaibhav P Thakkar³, Sanjana S Dharadhar⁴, Ratan G Upadhyay⁵, Tanvi A Patel⁶

ABSTRACT

Aim: This study was planned to assess the awareness and use of rubber dam in routine practice among the dental practitioners of Navi Mumbai, India.

Materials and methods: A Google document with a self-administered validated questionnaire consisting of 14 items was digitally sent to 300 dental practitioners via WhatsApp/e-mail and their responses were collected.

Results: The surveyed responses revealed that 261 (88.2%) dental practitioners do not use rubber dam in their routine practice, whereas only 35 (11.8%) use it. However, about 166 (58.7%) dentists showed willingness to inculcate the use of rubber dam in their routine practice after appropriate training and knowledge, while 99 (35%) dentists were not sure of using it and 18 (6.4%) were not keen on using it at all. Moreover, 204 (72.1%) dental practitioners expressed interest in enhancing their knowledge regarding rubber dam.

Conclusion: The results of this questionnaire-based research study revealed that the prevalence of use and awareness of rubber dam was very limited among the dental practitioners in Navi Mumbai, India.

Clinical significance: More emphasis should be given to the importance of rubber dam. Various continued dental education (CDE) programs and hands-on workshop can be conducted for dental practitioners.

Keywords: Awareness, Dentistry, Isolation, Rubber dam.

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INTRODUCTION

Any dental operative procedure necessitates the need for adequate control over the operating field. It is imperative to have proper moisture control, good accessibility, and visibility as well as adequate room for instruments around the working area. Success of most restorative procedures is dependent on the isolation techniques followed. Such environment is necessary for easy manipulation and insertion of restorative materials. Isolating the working area includes isolation from moisture such as saliva, blood, and gingival sulcular fluid and isolation from the soft tissues such as lips, cheeks, gingiva, and tongue. The goals therefore for isolation in dentistry are moisture control, retraction and access, and harm prevention. These are achieved by either direct or indirect methods. Direct methods include techniques such as rubber dams, cotton rolls and absorbent wafers, evacuator system and saliva ejectors, gingival retraction cord, and mouth props; whereas indirect methods include local anesthesia and drugs such as antianxiety, muscle relaxants, etc.¹

Rubber dam is a small latex or nonlatex sheet used to isolate a single tooth or multiple teeth from the oral environment for preventing the migration of fluids or foreign objects into or out of the operative field. It is a universally acknowledged mandatory method of isolation particularly during the operative and endodontic procedures. It has several advantages such as it provides adequate access and visibility in the operating field, maximum isolation, creates an aseptic working area, prevents ingestion or aspiration of burs or other instruments, prevents ingestion of irrigants, helps in protection and retraction of soft tissues, and improves infection control.²

^{1,3-5}Department of Public Health Dentistry, MGM Dental College and Hospital, Navi Mumbai, Maharashtra, India

²Department of Prosthodontics, MGM Dental College and Hospital, Navi Mumbai, Maharashtra, India

⁶Department of Oral and Maxillofacial Pathology, MGM Dental College and Hospital, Navi Mumbai, Maharashtra, India

Corresponding Author: Sayali Dhamne, Department of Public Health Dentistry, MGM Dental College and Hospital, Navi Mumbai, Maharashtra, India 

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Despite all these advantages in favor of rubber dam, many dental practitioners fail to use it in their routine practice.³ They claim that it is time-consuming, expensive, and uncomfortable for patients. A study by Udoye and Jafarzadeh reported though 77% of dentists were aware of rubber dam, only 18% of dentists in a subpopulation of Nigeria use rubber dam.⁴ Also, in a study conducted by Lynch and McConnell on Irish general dental practitioners, it was seen that 57% of dentists found rubber dam difficult to place and a cumbersome procedure.⁵

The main aim of this study is to assess the awareness regarding rubber dam among the dental practitioners in Navi Mumbai, India, and their willingness to adopt it in their routine practice.

MATERIALS AND METHODS

After the ethical approval from Institutional Ethical Review Committee (IERC) to conduct this study, a self-administered validated questionnaire consisting of 14 multiple-choice questions was digitally circulated to dental practitioners in Navi Mumbai via WhatsApp messenger (a texting application). Their responses were collected using a custom Google form. The participating dentists were asked to anonymously answer the questions relevant to them. Informed consent was obtained from the participants before administering the questionnaire. The consent was included as a part of the questionnaire that was circulated. Only dental practitioners registered under the State Dental Register and with minimum of 3 years of dental practice were included in the study. The reason behind this inclusion criteria was to include practitioners who had substantial experience and could respond accurately. All undergraduate dental students and interns were excluded.

To calculate the sample size for the present study, the following formula was used.

$$\text{Sample size } n = [\text{DEFF} \times Np(1-p)] \left[\left(\frac{d^2}{Z_{1-\alpha/2}^2} \right) \times (N-1) \right] + p \times (1-p)$$

Population size (for finite population correction factor or fpc) (N): 1,000

Hypothesized percentage frequency of outcome factor in the population (p): 50 ± 5%

Confidence limits as percentage of 100 (absolute ± %) (d): 5%

Design effect [for cluster surveys—degrees of freedom (DEFF)]: 1

Based on the above formula, a sample size of 278 was derived. However, an additional 10% were included in the study [N = 305.8 (rounded down to 300)] to compensate for potential refusals. The sample size of this study for a subpopulation of Navi Mumbai, India, was thus estimated to be 300 at 95% confidence interval.

Questionnaire (Table 1).

RESULTS

A total of 300 responses were received. Of which 295 (98.3%) dentists were willing to participate in the study and 5 (1.6%) refused to participate. Of the 295 dentists who participated in the study, 212 (71.9%) were general practitioners and 83 (28.1%) were specialists (Fig. 1).

When asked whether they were taught about rubber dam in their dental graduate study, 205 (69.3%) denied while 91 (30.7%) agreed. The survey also showed that 261 (88.2%) dental practitioners did not use rubber dam in their routine practice, whereas 35 (11.8%) did use (Fig. 2). Among the users of rubber dam, 34 (13.8%) use it for endodontic procedures, 13 (5.3%) use it for operative procedures, 6 (2.4%) use it for pediatric procedures, and 7 (2.8%) use it for tooth preparation procedures in prosthodontics. A alarming 206 (83.7%) dentists said they do not use rubber dam for any procedures (Fig. 3).

When surveyed about the most difficult aspect of using rubber dam, 166 (61%) responded saying selection and adaptation of correct clamp, 51 (18.8%) said placement of rubber dam, 48 (17.6%) said placement of the frame, 5 (1.9%) said they have never used it therefore have no idea, and 1 (0.4%) said insertion through tight contact (Fig. 4). Dentists were then questioned about their opinion on what they feel is the greatest advantage and disadvantage of rubber dam. In case of advantages, 202 (69.2%) were of the

Table 1: Questionnaire consisting of 14 multiple-choice questions

Questionnaire
1. The purpose of this study is to assess the awareness and use of rubber dam among the dental practitioners in Navi Mumbai. The information thus obtained will be used only for the research purpose. Participation in the study is entirely on the will of the dentist. Participating dentist's identity will not be revealed and full confidentiality will be assured. No charges will be applicable for the participation in the study. Do you agree to participate in the study?
Yes
No
2. Are you a general practitioner or a specialist?
General practitioner
Specialist
3. If specialist, please specify your field of specialization
4. Registration number
5. Were you taught placement of rubber dam in your college?
Yes
No
6. Do you use rubber dam in your routine practice?
Yes
No
7. If yes, for which procedures do you use rubber dam?
Endodontic procedures
Operative procedures
Pediatric patients
Tooth preparation procedures for prosthesis
I do not use rubber dam for any procedures
Others
If others, please specify
8. According to you, which is the most difficult aspect about rubber dam procedure?
Placement of the frame
Placement of rubber dam
Selection and adaptation of correct clamp
Other
If others, please specify
9. What in your opinion is the greatest advantage of rubber dam?
Provides maximum isolation and aseptic working space
Prevents swallowing or aspiration of instruments/prosthesis
Prevents ingestion of irrigants/other harmful materials used in dentistry
Other
If others, please specify
10. What in your opinion is the greatest disadvantage of rubber dam?
Difficulty in placement
Consumption of time
Expensive
Patient compliance
Other
If others, please specify
11. If not rubber dam which is the other method of isolation that you use in your routine practice?
Cotton rolls

Contd...

Contd...

Questionnaire

Saliva ejectors
Cellulose wafers
Retraction cords
Gauze and throat shields
Other

If others, please specify

12. Do you think there should be more emphasis and proper training in rubber dam usage in dental colleges?

Yes

No

Maybe

13. If provided with proper knowledge and training to effectively use rubber dam, would you choose to use it in your routine practice?

Yes

No

Maybe

14. If given an opportunity, are you willing to attend a CDE program or hands-on workshop on rubber dam?

Yes

No

Maybe

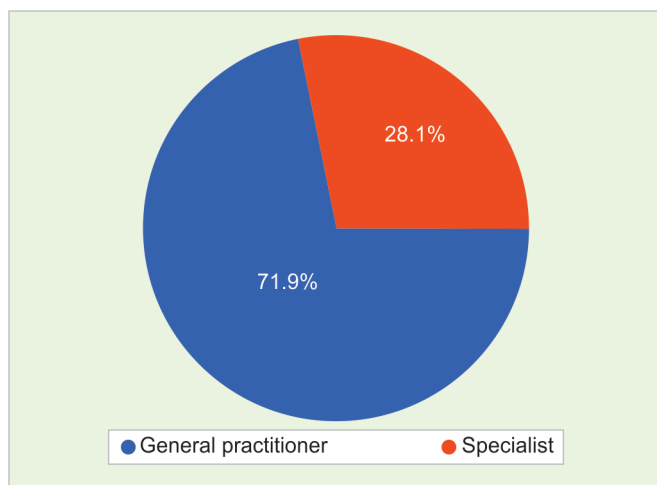


Fig. 1: Distribution of dental practitioners

opinion that it provides maximum isolation and aseptic working area, 67 (22.9%) agreed that it prevents swallowing or aspiration of instruments/prosthesis, and 22 (7.5%) believed that it prevents ingestion of irrigants and other harmful materials used in dentistry. In case of disadvantages, 116 (39.9%) believed that it is time-consuming, 86 (29.6%) were of the opinion that it is difficult to place, 54 (18.6%) were of the opinion that it is uncomfortable for the patient, and 32 (11%) were of the opinion that it was expensive.

We also learned of alternatives that were being used in place of rubber dam, such as 267 (90.5%) preferred saliva ejectors, 247 (83.7%) dentists used cotton rolls, 35 (11.9%) liked retraction chords, 24 (8.1%) used gauze and throat shields, and 12 (4.4%) use cellulose wafers as the preferred method of isolation in their practice.

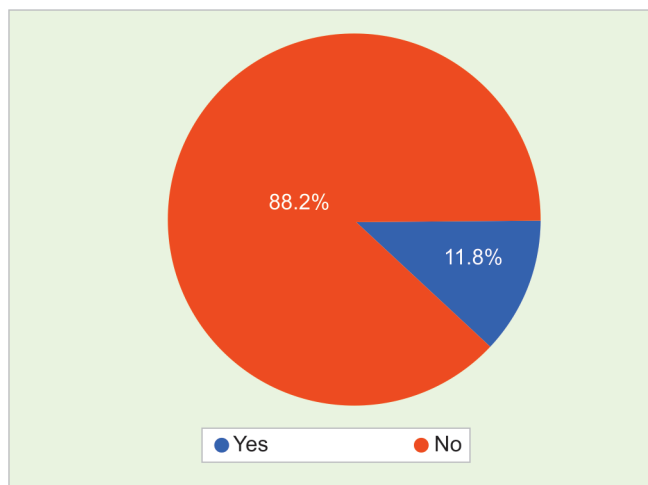


Fig. 2: Graph depicting number of dental practitioners using rubber dam in routine practice

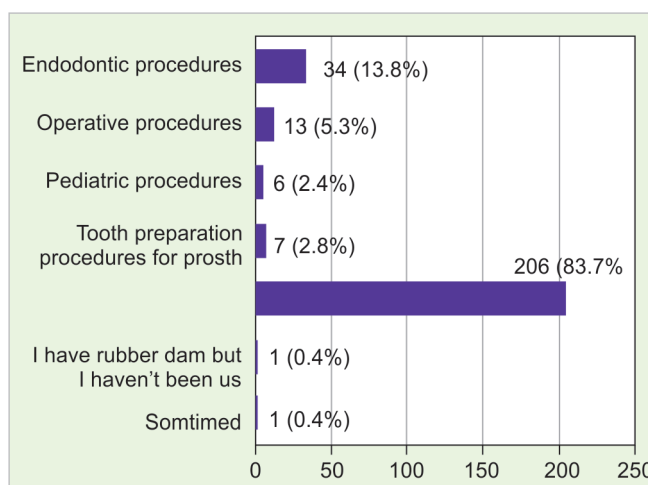


Fig. 3: Various procedures for which dental practitioners use rubber dam

We also found that only a few (9) dentists used modified and advanced forms of rubber dam such as minidams and easy dam.

Remarkably, 277 (93.3%) dentists believed in placing more emphasis and appropriate training in the usage of rubber dam during the graduation, whereas 20 (6.7%) were not sure of this. About 166 (58.7%) dentists were ready to inculcate utilizing rubber dam in their routine practice with appropriate training and knowledge, 99 (35%) were not sure and little reluctant in using it, and 18 (6.4%) were simply not interested (Fig. 5). Two hundred and four (72.1%) dental practitioners wanted to enhance their knowledge regarding rubber dam and expressed willingness to attend a related continued dental education (CDE) program or hands-on workshop, 60 (21.2%) were little reluctant and not sure, and merely 20 (7.1%) did not show any interest (Fig. 6).

DISCUSSION

Rubber dam has been universally acknowledged and accepted as the ultimate method of isolation, considering several advantages favoring its use. It has numerous advantages such as it provides adequate access and visibility in the operating field, maximum isolation, creates an aseptic working area, prevents ingestion or aspiration of burs or other instruments, prevents ingestion of

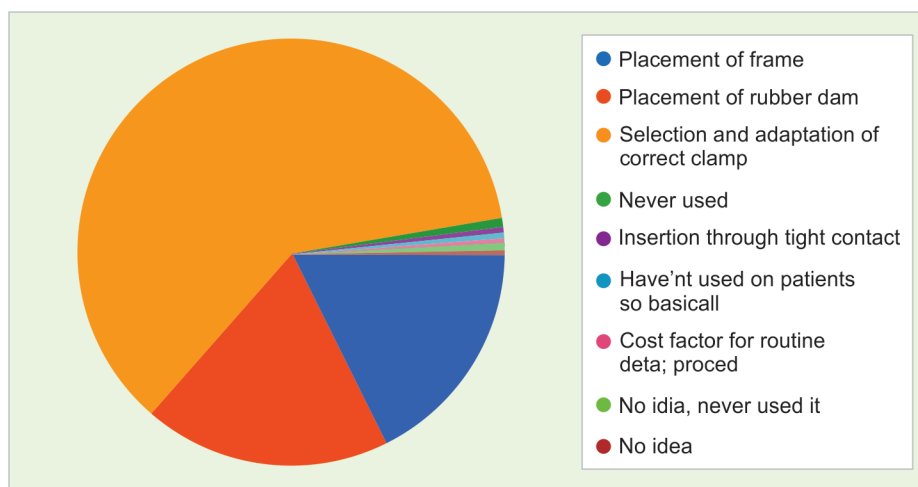


Fig. 4: Graph depicting the difficulties faced by dental practitioners while using rubber dam

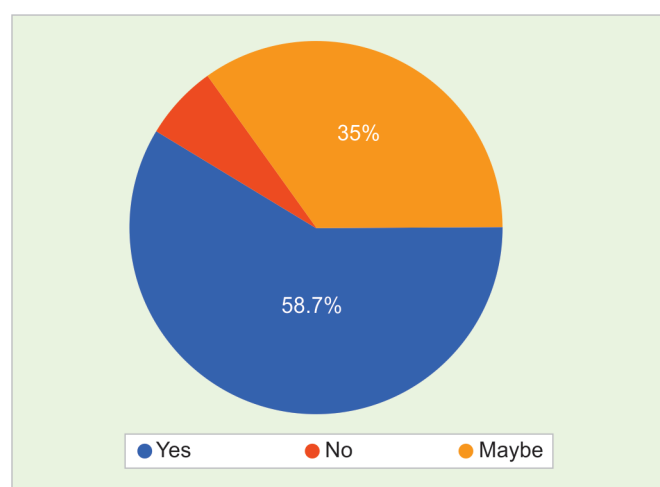


Fig. 5: Number of dentists who are willing to use rubber dam after proper training and knowledge

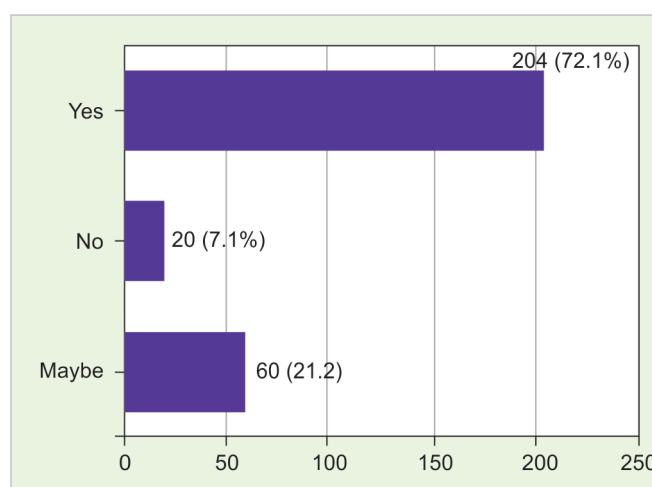


Fig. 6: Number of dental practitioners willing to attend CDE programs and hands-on workshops on rubber dam

irrigants, helps in protection and retraction of soft tissues, and improves infection control.^{1,2} However, its prevalence of use and awareness is low among the dental practitioners. Hence, this study was conducted to learn about this issue among a subpopulation of practicing dentists in Navi Mumbai, India. Of the 307 dentists who responded, 71.9% were general practitioners and 28.1% were specialists. The motive behind asking the field of specialization was to derive a correlation between its major use in specialties such as conservative dentistry and endodontics, pedodontics, and prosthodontics and the awareness of the respective respondents. Having been trained extensively in their specialized field for additional 3 years, we assumed their awareness would be relatively more as compared to the general dental practitioners.

When questioned on if they use rubber dam in their routine practice, about 88.2% dentists denied and only 35% were affirmative. On questioning the reasons of difficulty in using rubber dam, 61% said they find selection and adaptation of correct clamp difficult, 17.6% said placement of frame being the difficult part, and 18.8% said the whole placement of rubber dam is difficult. The main reason behind this scenario and the difficulties faced by the practitioners is the lack of proper training and knowledge during their dental degree curriculum. This was confirmed when 69.3%

dentists complained that they were not taught the use of rubber dam in their dental degree training. A study by Hill and Rubel in USA stated that there is a discrepancy between what is taught at the undergraduate level and general practice of dentistry.³ If a proper practical training, rather than just theoretical mention, is included at the level of undergraduation, the situation might change; 93.3% dentists agreed with this finding. The limited use of rubber dam in our study is similar to what was observed in a study conducted by Udoe and Jafarzadeh in which though 77% of dentists were aware of rubber dam, only 18% of dentists in a subpopulation of Nigeria use rubber dam.⁴ Also, in a study conducted by Lynch and McConnell on Irish general dental practitioners, they observed that 57% of dentists found rubber dam difficult to place and a cumbersome procedure.⁵ A number of other studies were conducted which support a similar claim.⁶

About 39.9% dentists believe that placement of rubber dam consumes a lot of time and 11% of them think that it is expensive. Thus, dentists opt for other methods of isolation such as saliva ejectors (90.5%), cotton rolls (83.7%), retraction chords (11.9%), gauze and throat shields (8.1%), and cellulose wafers (4.4%) which are readily available, easy to use, and cost-effective. A surprising result was that a few dentists (merely 1%) use modified and

advanced forms of rubber dams such as minidams and easy dams; 18.6% of dentists state that the placement of rubber dam provides discomfort to the patient. A study conducted by Stewardson and McHugh wherein they recorded the patients experience on the use of rubber dam in Birmingham dental school and general dental practitioners showed that patients were generally not against the use of rubber dam and operator experience helped with patient compliance.^{7,8}

Although dental practitioners agree with the several advantages and benefits of rubber dam, there is a lack of proper training and knowledge. Therefore, 72.1% dentists are willing to attend CDE programs and hands-on workshop to enhance their knowledge following which 58.7% dentists are willing to start utilizing dams in their routine practice. However, 21.2% is little skeptical and reluctant in attending such programs and 35% in using it, barring 7–8% who does not want to train and use it at all.

CONCLUSION

The prevalence of use and awareness of rubber dam is very limited among the dental practitioners in Navi Mumbai, India. Although dentists are aware of its numerous advantages and consider it as one of the most effective method of isolation, the rubber dam is underused in this region. It can be inferred from this study that the major reason behind this is lack of proper training and knowledge. However, dentists in this region are willing to train themselves and inculcate the use of rubber dam in their routine practice.

CLINICAL SIGNIFICANCE

The clinical significance of this study is that there is an urgent need to place more emphasis on rubber dam usage. Awareness can be raised via several CDE programs and also hands-on workshops that can provide appropriate training for dental practitioners and students.

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