

A SURVEY ON CHALLENGES ENCOUNTERED DURING RUBBER DAM ISOLATION AMONG INDIAN DENTAL PRACTITIONERS

Dentistry

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ABSTRACT

AIM - To assess the challenges encountered during rubber-dam isolation among Indian dental practitioners. **MATERIALS AND METHODS** - A self-administered web-based questionnaire was designed and used for data collection. The participants comprised of total 214 Dental Health Care Professionals including General Dental practitioners, Post Graduates and Endodontists. Information sought included problems they encounter using rubber dam isolation and description of challenges they face during the same. The data was analysed using Statistical package for social sciences (SPSS v 26.0, IBM). **RESULTS** -70.1% of respondents encountered problems in selection and adaptation of clamp. 82.7% find rubber dam application time consuming whereas 65.4% lack experience/knowledge in placement of rubber dam. 82.2% encountered rubber dam sheet tearing as the main problem while using rubber dam sheet. 69.6% faced impingement of gingival tissue whereas as main problem with rubber dam clamps. 82.7% encountered difficulty in taking radiographs due to rubber dam frame. 79.4% are aware of modifications in rubber dam frames of which 78.7% are aware about Nygaard Ostby frame. 71.5% are aware about Optra-dam as an alternative to conventional rubber dam. **CONCLUSIONS** - This survey revealed that there is an urgent need to introduce Rubber Dam Isolation at early stages in dental education and make it as mandatory practices. Also research needs to be directed for better, convenient and eco-friendly alternatives to Rubber Dam Isolation.

KEYWORDS

Rubber dam challenges; survey; rubber dam modifications; dental education; dental health care professionals

INTRODUCTION

Isolation of the oral cavity is one of the most important aspects for infection control in various operative and endodontic procedures. Rubber dam is the most widely used isolation tool for endodontic and operative treatments and is considered to be the Gold standard. (1) Its usage provides a variety of advantages such as isolation of the operative area, prevention of infection transfer, prevention of ingestion of endodontic instruments and foreign objects, provision of aseptic field, and retraction of soft tissues during operative procedure. (2,3) Studies have shown that the use of rubber dam greatly reduces the load of aerosols produced during dental procedures. (4) Hence rubber dam usage reduces the risk of contamination and cross infection among patients and dental practitioners. The European Society of Endodontology advises the use of the rubber dam in its quality guidelines. (5) The Covid-19 pandemic has further stressed the importance of Rubber dam and it has been listed in the 'Centers for Disease Control and Prevention Transmission of coronavirus disease 2019 (COVID-19)' guidelines as a tool for disease and infection control in dental clinics. (10)

However, literature suggests that many of the dental practitioners have apprehensions of using rubber dam isolation for endodontic treatments. (2,3,7) In their opinion, Rubber Dam isolation is difficult and time consuming. Some have also cited patient non-compliance and cost factor as reasons for limited use of Rubber Dam in clinical practice. (3,9)

There is a lack of literature regarding the use of Rubber dam and its equipments by Indian Dental practitioners. To our knowledge, there has been no previous study highlighting the challenges and problems encountered by Indian dental practitioners while using Rubber dam and related equipments. Hence, the aim of present study is to assess the challenges encountered during Rubber Dam isolation by Indian Dental practitioners.

MATERIALS AND METHODS

A cross sectional web-based questionnaire was designed and approved

by Institutional Ethics Committee. A total of 11 questions were used for data collection. The participants who responded comprised of total 214 Dental Health Care Professionals including General Dental practitioners, Post Graduates, Endodontists and Dental students. Information sought included, prevalence of use of Rubber Dam among Dental practitioners, Endodontists, other Post Graduates and dental students. It also included questions on practitioners' knowledge about advancements and modifications in rubber dam and its equipment, and challenges encountered while using rubber dam isolation.

STATISTICAL ANALYSIS

All data were entered into a computer by giving coding system, proofed for entry errors. Data obtained was compiled on a MS Office Excel Sheet (v 2019, Microsoft Redmond Campus, Redmond, Washington, United States). Data was subjected to statistical analysis using Statistical package for social sciences (SPSS v 26.0, IBM). Descriptive statistics like frequencies and percentage for categorical data has been depicted.

RESULTS

214 participants had responded to the study. Out of these 214 participants, 109 (50.9%) were Post Graduate students, 59(27.6%) were general dental practitioners, 30(14%) were specialist Endodontists and 16 (7.5%) were dental students/interns. (Table 1)

Table 1 – Categories and frequencies of participants

Category	Frequency	Percent
Endodontists	30	14.0
General Practitioner	59	27.6
Others	16	7.5
Postgraduate student	109	50.9
Total	214	100.0

USE OF RUBBER DAM IN CLINICAL PRACTICE

In the study, 91.1 % of the participants feel that it is mandatory to use Rubber dam while performing endodontic procedures. 51.4% of the participants use Rubber dam in 10-30% of the cases (occasionally), whereas on the other hand, about 52.3% of the participants require average 4-6 minutes for Rubber Dam placement.

CHALLENGES ENCOUNTERED DURING RUBBER DAM ISOLATION

70.1% of the participants encountered 'Selection of clamps and its adaptation' as the most common problem during rubber dam isolation. (Figure 1)

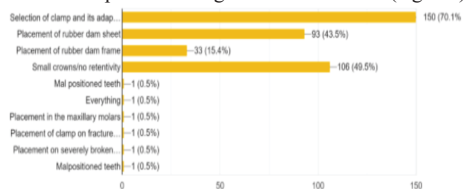


Figure 1 - Common Problems while using Rubber Dam isolation

On the other hand, 82.7% of the participants have stated Rubber dam isolation of being a 'Time-consuming procedure'. This has been stated as the most common reason for disuse of rubber dam in clinical practice. (Figure 2)

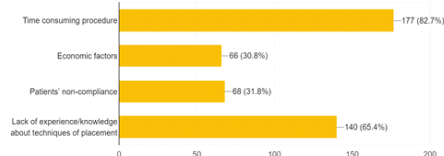


Figure 2 - Reasons for disuse of rubber dam in routine dental practices

When enquired about difficulties in using a rubber dam sheet, 82.2% of the participants encountered 'Tearing of Rubber dam sheet' as the main challenge. (Figure 3)

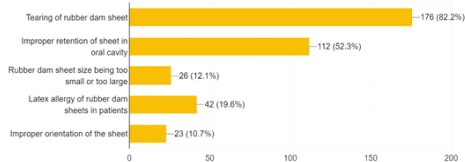


Figure 3 - Challenges related to Rubber dam sheet

69.6% of the participants faced 'impingement of gingival tissue' as the main challenge while using a rubber dam clamp, while 65.9% of the participants have selected 'accidental dislodgement of rubber dam clamp' as a difficulty while using the same. (Figure 4)

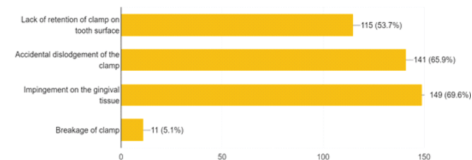


Figure 4 - Challenges related to Rubber dam clamp

Among the participants, 82.7% encountered 'difficulty in taking radiographs' while using rubber dam frame. (Figure 5)

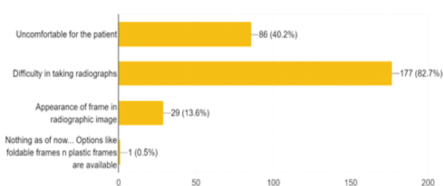


Figure 5 - Challenges related to Rubber dam frame

MODIFICATIONS/ADVANCES IN RUBBER DAM

MATERIALS

Among the participants, 79.4% of them are aware of modifications in rubber dam frames. (Figure 6)



Figure 6 – Awareness about rubber dam frame modifications

Out of these participants, 78.7% have chose 'Nygaard-Ostby' frame as they are more aware about it compared to the other modifications in rubber dam frames. (Figure 7)

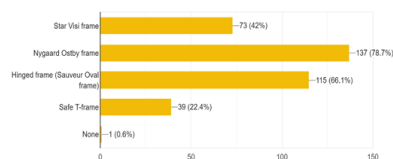


Figure 7 – Preferred rubber dam frame modifications

As mentioned before, maximum participants find rubber dam application time consuming and hence, other alternatives to conventional rubber dams are also available in the market. Among these modifications, 71.5% of participants are more aware about 'Optra-dam', when compared to the other alternatives. (Figure 8)

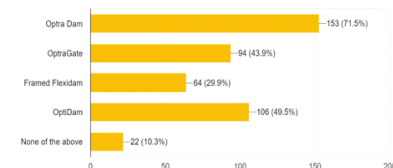


Figure 8 – Alternatives to conventional rubber dam

DISCUSSION

The prevalence of Rubber dam usage among dental practitioners have been studied previously via questionnaires and surveys. There has been a lack of studies highlighting the reasons for disuse of rubber dam in clinical practice. Various challenges and problems encountered by practitioners have been scarcely highlighted in previous studies. Hence, a questionnaire survey regarding the same was designed for the study.

91.1% of the respondents in the present study believe that rubber dam isolation is mandatory for Endodontic treatment which indicates that the participants are well aware of the benefits of using rubber dam isolation. However, it has been observed that there is a drastic difference between the understanding of awareness and applications of Rubber dam in clinical practice since it is used in only 10-30% (Occasionally) of the cases by General Dental Practitioners. Similar results have been obtained in studies by Lynch et al. (7) and Lin et al. (8)

The most notable reasons for such limited use of Rubber Dam in clinical practice, as mentioned in the previous studies, are as follows -

- Insufficient time
- economic factors
- difficulty in placing Rubber dam clamps/adaptation of rubber dam isolation in oral cavity
- lack of practice and training

According to the existing literature, one of the main reasons for disuse of Rubber dam in clinical practice is 'Time consuming' nature of Rubber dam application (1)(12)(13)(14)(15). According to the present study, 82.7% of the participants face the same challenge. Similar results have been obtained in studies conducted by Lin et al (8), Lynch et al (7) and Udoye et al (9). Reasons such as 'inadequate training' and 'lack of practice/use in rubber dam placement' in Undergraduate dental training are cited by the participants in the present study. Similar results have been obtained in studies by Marshall and Page (12), Brookman (13), Whitworth (11) and Stewardson (14). Proper Rubber

dam isolation training and frequent usage in undergraduate schools can counter this challenge. Also, instillation of the view, that rubber dam isolation is an important part of the dental treatment rather than an auxiliary should be established from early practice itself.

The average time taken for rubber dam placement in the present study is 4-6 minutes. This is in accordance with studies conducted by Stewardson and Mchugh (4.65 minutes) , Bander et al (5 minutes), Ryan et al. (5 minutes). This challenge faced by the General Dental Practitioners might not be entirely valid since it has been proven in the previous studies, that Rubber Dam isolation requires approximately 2 minutes when proficiently used. (14) 70.1% of the participants face challenge in 'Selection and adaptation of rubber dam clamp'. This has been the most common challenge faced by the participants in rubber dam isolation in the present study. Similar results were obtained by Tanalp et al (3) in his study. 82.2% of the participants face 'tearing of rubber dam sheet' as the main problem while using a rubber dam sheet. Alternate Rubber dam materials should be researched and promoted in the market for countering this problem. 82.7% of the participants face problems while 'taking radiographs' when using a rubber dam frame. To counter this challenge, foldable and plastic frames are available in the market. Various alternate modifications for rubber dam frames like star-visi frame, Hinged frames, Safe T frame, Nygaard-Ostby frame are also easily available and can be employed. 79.4% of the participants are aware about these modifications in rubber dam frames. Of these participants, 78.7% are more aware about Nygaard-Ostby frame modification. These modifications have made rubber dam much more user-friendly.

As mentioned in the above discussion, majority of the participants find difficulties in placing rubber dam assembly. Also, difficulties in handling of various rubber dam equipment has been one of the reasons for disuse of rubber dam by dental practitioners. Alternatives like Optra-dam, Optra-gate, Opti-dam, Framed flexi-dam can be employed in daily practice. 71.5% of the participants have used or are aware about Optra-dam as an alternative to conventional rubber dam. Such modifications are now being used widely by practitioners due to the comparative hassle-free application in routine clinical practice.

According to the present study, lack of proper guidance and lack of practice regarding the usage of Rubber dam in clinical practice seems to be the main cause for limited use of Rubber dam. Also, due to a high competition among dental practitioners to offer a quick and cost-effective dental treatment for maximum patients, some might compromise by eliminating Rubber dam isolation in day to day practice. Some of the dental practitioners themselves are not convinced of any additional benefit of using rubber dam isolation. Hence a positive outlook towards rubber dam should be instilled in dental education from early stages itself.

CONCLUSION

Rubber dam isolation is considered as gold standard for isolation in dental practices and more so in endodontic practices. The covid pandemic has further stressed its importance and may act as an additional shield to protect the clinician from aerosol generating procedures. It is challenging for most practitioners as it needs skilled expertise for quick and efficient placement. This survey revealed that there is an urgent need to introduce Rubber Dam Isolation at early stages in Dental Education and make it as mandatory practices. Also, research needs to be directed for better, convenient and eco-friendly alternatives to Rubber Dam Isolation.

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