

## ORIGINAL ARTICLE

# An Assessment of Frequency and Barriers of Rubber Dam Use by Dental Practitioners in Raipur District, Chhattisgarh

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## ABSTRACT

**Introduction:** Impending threats of cross-infection between dental professional and patient can be reduced using recommended isolation techniques. One such well-established method is the use of a rubber dam during the clinical dental procedure. In spite of its benefits, dentists still abstain from using it. Hence, the objective of this study was to assess rubber dam usage among dental practitioners with respect to frequency and attitude of users and also to find out barriers to the routine use among dental practitioners in Raipur district, Chhattisgarh.

**Materials and Methods:** A 20 item structured, close-ended questionnaire was administered to dental practitioners of Raipur, Chhattisgarh. The questionnaire included questions about demographic details, methods of isolation during clinical practice, use of rubber dam, barriers against its uses, training, and attitude toward its usage. The sample size comprised 137 dental practitioners. Data were collected and analyzed using the statistical package for the social sciences software for Windows version 16.0 of various responses were calculated.

**Results:** Dentists using the rubber dam in their routine dental practice were only 25.5%, of which, only 5.1% of dentists always used it. When the question regarding barrier for not using the rubber dam was asked, 34.3% dentists said they do not use rubber dam because its time consuming, 22.5% do not use it due to patient discomfort, 18.6% responded that it is costly, and 15.7% cited insufficient training as a reason.

**Conclusion:** The rubber dam use by dental practitioners was quite low (25.5%). The best way to reduce the time and

improve patient acceptance for rubber dam is, the operator must use it regularly and repeatedly so that they achieve proficiency. Continuing education courses can play a crucial role in increasing its usage by regular training and emphasizing its benefits.

**Keywords:** Barriers, Frequency, Raipur, Rubber dam.

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## INTRODUCTION

Infection control is a very important issue in the dental practice. It is reported that 1 ml of saliva sample from the mouth of an average healthy person contains about 750 million microorganisms; therefore, it is one of the most relevant topics in dentistry and has become an integral part of the practice.<sup>[1]</sup> Exposure to patient's saliva and/or blood makes the dentist vulnerable to occupational biohazards.<sup>[2]</sup> Disease transfer to the dentist and dental staff during dental care is considered an "occupational exposure" to a pathogenic agent, while disease transfer from one patient to another in the dental clinics is considered "cross-infection." Therefore, the dental health caregiver must be knowledgeable about the diseases commonly encountered during dental care and must conscientiously provide care to patients without getting infected, or without infecting patients.<sup>[3,4]</sup>

These impending threats of cross-infection between dental professional and patient can be reduced using recommended isolation techniques.<sup>[4,5]</sup> One such well-established method is the use of a rubber dam during the clinical dental procedure. It was first introduced in 1860s by S.C. Barnum and has since been used in dental practices.<sup>[6]</sup>

Some harmful effects of rubber dam usage have been documented. Allergy to latex present in rubber dam sheets has been reported, although now latex-free rubber dams are also available.<sup>[4,7]</sup> Some patients may experience a claustrophobic feeling with the rubber dam in place, and it also makes conversation with dentist difficult.<sup>[4,8,9]</sup> The use of rubber dam is most of the times

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proven advantageous. It provides the clinician with a clean and dry operative field, improves visibility, minimizes patient conversation, and ultimately increasing the overall efficacy of the treatment.<sup>[4,10]</sup> It also offers significant patient protection by preventing aspiration of instruments, medications, debris, as well as retracts and protects the oral mucosal soft tissues against possible trauma caused by rotary and hand instruments and endodontic medicaments.<sup>[11,12]</sup> Research studies have proven that rubber dam significantly reduces the microbial content of air turbine aerosols produced during endodontic methods, thereby reducing the risk of cross-infection.<sup>[4,11]</sup>

Provided the fact that rubber dam placement is one of the best isolation methods, it is not routinely practiced by dental practitioners. Many studies have been conducted in different countries, reported significantly lower use of rubber dam for the procedures of operative dentistry.<sup>[4,13-15]</sup> The reasons for not using rubber dam by dental practitioners may include time taking a procedure, lack of expertise, more technique sensitive, and increase patient load to a complete lack of interest in employing this technique.<sup>[4]</sup>

Keeping in mind the above-mentioned facts there is a need to educate the general and specialist dental practitioners regarding the importance of rubber dam usage and the benefits it offers. The aim of this study was to assess rubber dam usage among dental practitioners with respect to frequency and attitude of users and to find out barriers to the routine use of rubber dam.

## MATERIALS AND METHODS

This cross-sectional study was carried out among the dental practitioners of Raipur district, Chhattisgarh state (India). Ethical clearance for the study was obtained from the Institutional Review Board of Maitri College of Dentistry and Research Centre, Anjora (Durg), Chhattisgarh state. The data were collected during the period of May 2017 to October 2017.

Initially, a pilot study was carried out among 20 dental practitioners to check the feasibility of the study and 4 out of 24 questions of the initial questionnaire were removed. The sampling frame comprised the dental practitioners of the Chhattisgarh state registered with the state dental council. The sampling unit consisted of the registered dental practitioners practicing in Raipur district. It comprised 155 dental practitioners; of which 137 responded to the questionnaire.

The questionnaire was personally administered, and the professionals were explained regarding the motive of the study and how to complete the questionnaire. It was emphasized that the confidentiality of the responses

made by them would be strictly maintained. The questionnaire including questions about demographic details, methods of isolation during clinical practice, use of rubber dam, barriers against its uses, training, and attitude toward its usage.

Data were entered into Microsoft Excel sheet (Windows 8), and analysis of data was done using SPSS statistical software package for Windows (Version 16). Only descriptive statistics such as percentage and frequencies were calculated.  $P \leq 0.05$  was considered statistically significant.

## RESULTS

Out of the 155 Dental practitioners, 137 responded. A total of 137 questionnaire completely filled and returned resulting in a response rate of 88.4%. Of these respondents, 38(27.7%) were females and 99(72.3%) were males [Figure 1].

A total of 98.5% of the dental practitioners claimed that they knew what the use of rubber dam is. While 97.8% of the respondents told that rubber dam use is beneficial in routine dental practice, 88.3% confirmed of being aware of rubber dam placement technique. Only 25.5% of dental practitioners were using rubber dam in their routine dental practice. Majority of study participants (87.6%) agreed that rubber dam application should be made compulsory before endodontic/operative/prosthetic procedures. According to 98.5% study participants, continuing dental education programs are important to gain knowledge with respect to rubber dam application [Table 1].

Five percent of respondent stated that they always use rubber dam whereas 7.3% used it quite often and 74.5% never used rubber dam during routine dental procedures [Table 2].

Rubber dam usage was significantly higher (41.9%) among specialist when compared to general dental practitioners (20.8%). Statistically, significant difference was found regarding the use of rubber dam between specialists and general dentists ( $P < 0.05$ ) [Table 3].

When asked about barriers to the use of rubber dam, 35 (34.3%) dentists said they did not use rubber dam because it is time-consuming, 23 (22.5%) did not use it due to patient discomfort, 19 (18.6%) responded that cost is very high, and 16(15.7%) cited insufficient training as a reason [Figure 2].

## DISCUSSION

Infection control is a very vital issue in the dental practice and has become an integral part of the practice.<sup>[1]</sup> Exposure to patient's saliva and/or blood makes the dentist vulnerable to health hazards.<sup>[2]</sup> Therefore, the

dental health caregiver must be knowledgeable about the diseases commonly encountered during dental care and must provide care to patients without getting infected, or without infecting patients.<sup>[3,4]</sup> Harmful effects of cross-infection between dental professional and patient can be reduced using recommended isolation techniques.<sup>[4,5]</sup> One such well-established method is rubber dam application used as a gold standard during the clinical dental procedure.<sup>[16,17]</sup>

In the current study, the majority of the respondents were male dental practitioners. This is in accordance

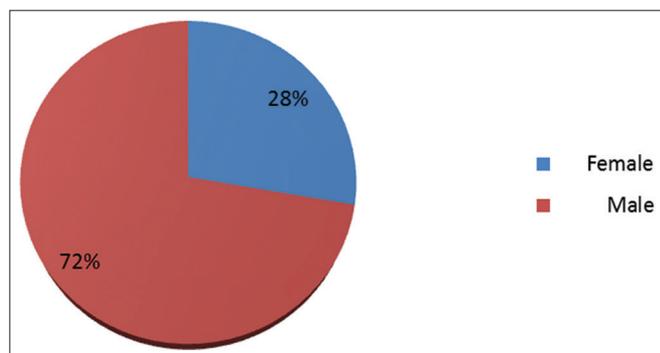


Figure 1: Distribution of study participants according to gender

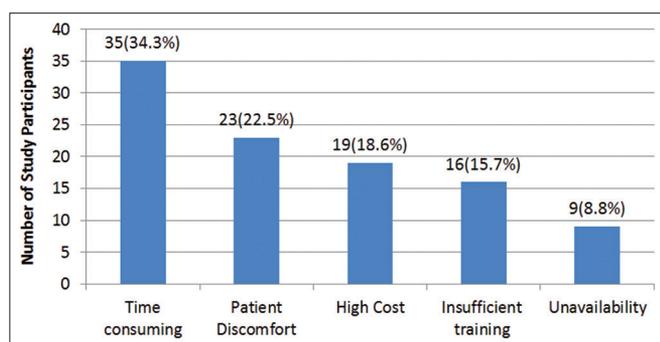


Figure 2: Barriers felt by study participants to the use of rubber dam

with the results of the studies done by Ali *et al.*<sup>[4]</sup> Udoye and Jafarzadeh,<sup>[18]</sup> as well as Ravanshad *et al.*<sup>[19]</sup>

In the present study, about 74.5% of the dentists never used a rubber dam in their routine practice. Similar findings were reported by a number of different studies including Ali *et al.*<sup>[4]</sup> (52.1%), Sanghvi *et al.*<sup>[16]</sup> Stewardson.<sup>[20]</sup> (63.2%), and Wilson *et al.*<sup>[21]</sup> (61%). In the current study, about 25.5% used it for routine procedures to a varying extent. This finding is similar with the results of Sanghvi *et al.*<sup>[16]</sup> and Gupta and Rai.<sup>[22]</sup> who reported 23.8% and 27% usage in India, respectively. However, studies done by Mala *et al.*<sup>[23]</sup> and Anabtawi *et al.*<sup>[24]</sup> have reported a significantly higher prevalence of rubber dam usage (98% and 85%, respectively), especially in the developed countries (In UK). The reason for high usage could be high knowledge and availability in developed countries.

When asked about the barriers to the routine use of rubber dam, 34.5% of the dentists mentioned that it is time-consuming procedure. About 22.5% considered patient discomfort as an obstacle for rubber dam use. Similar results were reported by Csinszka *et al.*<sup>[6]</sup> and Sanghvi *et al.*<sup>[16]</sup> whereas contradictory results obtained in a study done by Ali *et al.*<sup>[4]</sup> Mentioning, a higher patient load (49%) as the greatest hindrance. Higher patient load on local dentists indicates there may be less number of practicing dentists for the local population, resulting in over-burden of work on existing dentists and a compromised quality of dental care.<sup>[4]</sup>

The reason being time-consuming procedure given by 34.5% respondent is not actually completely valid. Studies in literature demonstrated that with proficiency, rubber dam placement can be done in <5 min.<sup>[25,26]</sup> A literature suggested that even an inexperienced clinician can apply a rubber dam in a few minutes.<sup>[27]</sup> Rubber

Table 1: Knowledge and attitude of dentists toward rubber dam usage

S.N.	Question	Yes (%)	No (%)
1.	Do you know why rubber dam is used?	135 (98.5)	02 (1.5)
2.	Do you think rubber dam is beneficial in routine dental practice?	134 (97.8)	03 (2.2)
3.	Do you use rubber dam?	35 (25.5)	102 (74.5)
4.	Do you know how rubber dam is placed (technique of placement)?	121 (88.3)	16 (11.7)
5.	Do you think rubber dam application should be made compulsory before endodontic/operative/prosthetic procedures?	120 (87.6)	17 (12.4)
6.	Do you think it is important to gain knowledge about rubber dam application through various dental educational programs?	135 (98.5)	02 (1.5)

Table 2: Frequency of rubber dam use

Question	Frequency	Percentage (%)
How often do you use a rubber dam for routine dental procedures?	1. Always	07 (5.1)
	2. Quite often	10 (7.3)
	3. Sometimes	13 (9.5)
	4. Hardly ever	05 (3.6)
	5. Never	102 (74.5)

**Table 3:** Comparison among general dentists and specialists with respect to rubber dam usage

Category	Use of rubber dam			Chi-square value	P
	Yes (%)	No (%)	Total (%)		
General dentist	22 (20.8)	84 (79.2)	106 (100)	5.65	P<0.05
Specialist	13 (41.9)	18 (58.1)	31 (100)		
Total (%)	35 (25.5)	102 (74.5)	137 (100)		

dam provides better working conditions including maintaining a clean, dry field, retracting the soft tissues, restricting tongue and lips movement by the patient, reducing the time of changing cotton rolls, and gauze pieces ultimately compensating the extra time used while placing it.<sup>[16,27]</sup>

The second most common reason given by respondents in the present study was patient discomfort. Studies conducted by Csinszka *et al.*<sup>[6]</sup> and Sanghvi *et al.*<sup>[16]</sup> stated that 28% and 37% of practitioners considered patient discomfort as a barrier, respectively. Patient discomfort is a perception that is related to the dentist's own attitude rather than the patients.<sup>[16]</sup> Several studies reported that most patients accepted it suitably and were not felt any kind of discomfort.<sup>[25,28,29]</sup> The best way to improve patient acceptance for rubber dam is, operator must use it regularly and repeatedly so that he or she will ultimately become expert and proficient in rubber dam placement technique.<sup>[16,25]</sup> Experience is the key to effectively and efficiently placing the rubber dam, which comes with frequent use. Therefore, the insufficient utilization may be due to the lack of expertise and proficiency.<sup>[16,30]</sup>

Rubber dam usage was significantly higher (41.9%) among specialist when compared to general dental practitioners (20.8%). Statistically, significant difference was found regarding the use of rubber dam between specialists and general dentists ( $P < 0.05$ ). The rubber-dam usage was high among the specialist. The finding is in accordance with the study done by Schorer-Jensma and Veerkamp.<sup>[31]</sup> Professionals with some kind of postgraduation training use rubber dam more regularly.<sup>[32]</sup> This is suggested that specialists are more likely to be exposed to rubber dam placement procedure during their course of specialization.<sup>[33]</sup> Furthermore, specialists tend to do more complex procedures, which require a skillful and sensitive technique.<sup>[34]</sup> This explains the higher usage of rubber dam among specialist in this study.

According to 98.5% study participants, continuing dental education programs are important to gain knowledge with respect to rubber dam placement, similar finding was reported by Ali *et al.*<sup>[4]</sup> That means dentists attitude is positive and they are interested toward gaining knowledge about rubber dam usage.

The use of rubber dam required to be increased in providing quality dental care to the patients. Greater

efforts must be placed on rubber dam usage during their clinical training, especially during undergraduate course. By continuing dental education programs and training, the time essential for its usage can be reduced. Patient acquiescence can be increased by educating them about its advantages. To prevent altered breathing pattern of patients, reduce the duration of application or create vents in the rubber dam in a place where leakage cannot occur.

## CONCLUSION

The findings of this study revealed under usage of rubber dam among dental practitioner in Raipur, Chhattisgarh. The rubber dam use by dental practitioners was quite low (25.5%). Rubber dam usage was significantly higher (41.9%) among specialist when compared to general dental practitioners (20.8%).

The best way to reduce the time and improve patient acceptance for rubber dam is, the operator must use it regularly and repeatedly so that he or she will ultimately become expert and proficient in rubber dam placement technique. Dental colleges should make it mandatory for students to use the rubber dam during routine dental practice. Continuing education courses can play a crucial role in increasing its usage by regular training and emphasizing its benefits.

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