

## Original Article

# Cross-Sectional Evaluation of Dentists Knowledge and Awareness towards Rubber Dam Usage in Pediatric Dental Procedures: An Original Study

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### ABSTRACT:

**Background and Aim:** Rubber dam has been considered one of the ideal isolation tools especially during root canal treatment and other pediatric restorative procedures. It has also been frequently used as the standard of care. The aim of this study was to evaluate the current knowledge and awareness about Rubber dam among general dental practitioner in Ghaziabad District, India. **Materials & Methods:** This study was entirely based on a cross sectional methodology. Authors have employed a self prepared logical questionnaire having related questions. A total of 200 private dental practitioners of Ghaziabad were approached to fill the questionnaire. We employed a questionnaire which was used close ended. It had questions about the current knowledge and awareness about usage of rubber dam for pedodontic procedures. The authors had processed the responses of clinicians who accurately answered this questionnaire. Data was obtained and inferences were evaluated statistically to finally estimate knowledge and awareness level regarding rubber dam. **Results:** Statistical analysis was completed using statistical software Statistical Package for the Social Sciences (SPSS). The obtained data was subjected to suitable statistical tests to obtain p values, mean, standard deviation, standard error.  $P \leq 0.05$  was considered as statistically significant. 39 practitioners use to have rubber dam during amalgam & composite restorations in pediatric patients. 182 practitioners think that rubber dam is not handy as it has many cumbersome components. 109 practitioners think that they have been given adequate and satisfactory education regarding rubber dam. 110 practitioners think that rubber dam improves the accuracy and outcomes of restoration. **Conclusion:** Within the limitations of the study authors concluded that clinician's knowledge and awareness about rubber dam usage in pedodontic procedures was at moderate levels. Because rubber dam is an efficient tool for isolation in most of the pedodontic procedures, general awareness campaigns, educational demonstrations and technique illustrations should be performed on regular basis.

**Key words:** Rubber Dam, Pedodontics; Awareness, Isolation.

Received: 14 December 2018

Revised: 27 December 2018

Accepted: 28 December 2018

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**This article may be cited as:** Dokania R, Varshney S, Verma P, Sahoo SK. Cross-Sectional Evaluation of Dentists Knowledge and Awareness towards Rubber Dam Usage in Pediatric Dental Procedures: An Original Study. J Adv Med Dent Scie Res 2019;7(1):121-124.

### INTRODUCTION

Rubber dam was invented by Dr. Sanford Christe Barnum in Monticello, New York, USA, in 1864. Rubber dam is a thin sheet of rubber used for isolation of area of operation during dental procedures. The principle of rubber dam is that crowns of one or more teeth project through a sheet of rubber so that the dentist may work on them in isolation from the rest of the mouth. Rubber dam usage has many

advantages however most of the practicing dentists do not use it judiciously.<sup>1</sup> Some dental practitioners have inadequate knowledge on rubber dam and do not use it in their clinical practice for pediatric procedures. It is therefore expected that the knowledge that the general practicing dentists possess about rubber dam, is inadequate. Three commonly held misconceptions preventing widespread usage of rubber dam by dentists are; that the

technique is both difficult, time consuming and that the patient may find the procedure uncomfortable.<sup>2</sup> Rubber dam comes in various colors, flavors and sizes. Material used may be latex or latex free rubber and may be dark or light colored. The dark colored rubber gives a better contrast while the light colored one provides illumination to the area of operation. Clamps used in the placement of rubber dam may be winged, wingless of different sizes. Saliva plays an important role in the oral microflora.<sup>3</sup> It contains microorganisms and antigens from the food ingested. Rubber dam provides an aseptic operating field, isolating the tooth from oral and salivary contamination. It cannot be stressed enough that contamination of the root canal with saliva introduces new microorganisms to the root canal which may prolong treatment and reduce prognosis. Rubber dam is a low-cost and high-efficiency appliance.<sup>4-6</sup> It improves treatment results by retracting soft tissues to provide better access to the operating field, provides a dry field for improved visibility, reduces fogging of mirror and enhances visual contrast, protects patients from aspiration and ingestion of small instruments used during procedures and irrigating solutions, minimizes patient conversations, and encourages them to keep their mouth open during treatment. The ultimate aim of this study was to evaluate the current knowledge and awareness about Rubber dam usage among general dental practitioner in Ghaziabad, India.

**MATERIALS & METHODS**

This study was performed to estimate the current knowledge and awareness about rubber dam among general dental practitioner in Ghaziabad, India. The study was done on a cross sectional and questionnaire ideology wherein it included 200 private dental practitioners of Ghaziabad, India. Authors had accessed the general dental practitioners by their contact details those obtained from the office of Ghaziabad society of general dental practitioners. We had noticed that a total of 296 dentists were there, out of which, 46 were involved in academic/research works. Moreover we also noticed that 50 of them not participated to our study. Consequently we had final sample size of total 200 the general dental practitioners. We have attempted our best to genuinely analyze the questionnaire response so as to draw a concrete outline. We had framed the questions of rubber dam knowledge and awareness in the form of a close ended questionnaire containing 10 queries. The copy of the questionnaire was given to the clinicians at their workplace.

Literature has well evidenced that questionnaire studies are outstandingly imperative. They are especially useful in getting comprehensive information regarding personal and group perceptions. Questionnaire studies are also capable of saving time and money by studying the patients at their personal levels. The privacy guidelines and other rights of the study contestants were completely ensured. As a formal practice of study ethics, we also obtained informed consents from the contributing clinicians. The significance of this study was elucidated in detail to all participating practitioners. Results were tabulated and subjected to basic statistical analysis. P value less than 0.05 was considered significant (p< 0.05).

**STATISTICAL ANALYSIS AND RESULTS**

All remarkable findings were gathered and sent for statistical evaluation using statistical software Statistical Package for the Social Sciences version 21 (IBM Inc., New York, USA). The resultant details were subjected to appropriate statistical tests to obtain p values, mean, standard deviation, chi- square test, standard error. Table 1 and Graph 1 showed that out of 200 practitioners, males were 130 and females were 70. Total 60 practitioners were falling in the age group >65 years. Total 16 clinicians were in the age range of 35-44 years hence we can believe that most of the general dental practitioners were belonging to older age groups. P value was significant in group II of age range 45-54 years. Questionnaire analysis revealed significant results wherein p value was also found to be significant (Table 2 & 3). 166 practitioners think that rubber dam is perfect tool for isolation in pediatric patients. 39 practitioners use to have rubber dam during amalgam & composite restorations in pediatric patients. 182 practitioners think that rubber dam is not handy as it has many cumbersome components. 109 practitioners think that they have been given adequate and satisfactory education regarding rubber dam. 110 practitioners think that rubber dam improves the accuracy and outcomes of restoration. 142 practitioners actually think that most of the pediatric Patient do not like the rubber dam. 125 practitioners think that rubber dam makes radiograph taking procedure difficult. Basic statistical description with level of significance evaluation using Pearson Chi-Square Test revealed that p value was significant for question no 2, 3 and 4.

**Table 1: AGE & GENDER WISE ALLOCATION OF CLINICIANS**

Age Group (Yrs)	Male	Female	Total %	P value
35-44	10	6	16 [8 %]	0.07
45-54	23	7	30 [15 %]	0.01*
55-60	38	10	48 [24 %]	0.50
61-65	33	13	46 [23 %]	0.90
>65	38	22	60 [30 %]	0.80
Total	130	70	100%	*Significant

\*p<0.05 significant

**Table 2: QUESTIONNAIRE RESPONSES ASSESSMENT WITH RELATED STATISTICAL CORRELATIONS**

Questionnaire	Variables	Responses of Clinicians [Yes]	Responses of Clinicians [No]	p Value
1	Do you think that rubber dam is perfect tool for isolation in pediatric patients?	166	34	0.010*
2	Do you use rubber dam during amalgam & composite restorations in pediatric patients ?	39	161	
3	Do you think that rubber dam is not handy as it has many cumbersome components ?	182	18	
4	Do you think that you have been given adequate and satisfactory education regarding rubber dam ?	109	91	
5	Do you think that rubber dam makes radiograph taking procedure difficult ?	125	75	
6	Do you think that rubber dam application usually extends treatment timing unnecessarily ?	123	77	
7	Do you think that rubber dam improves the accuracy and outcomes of restoration ?	110	90	
8	Do you really think that most of the pediatric Patient do not like the rubber dam ?	142	58	

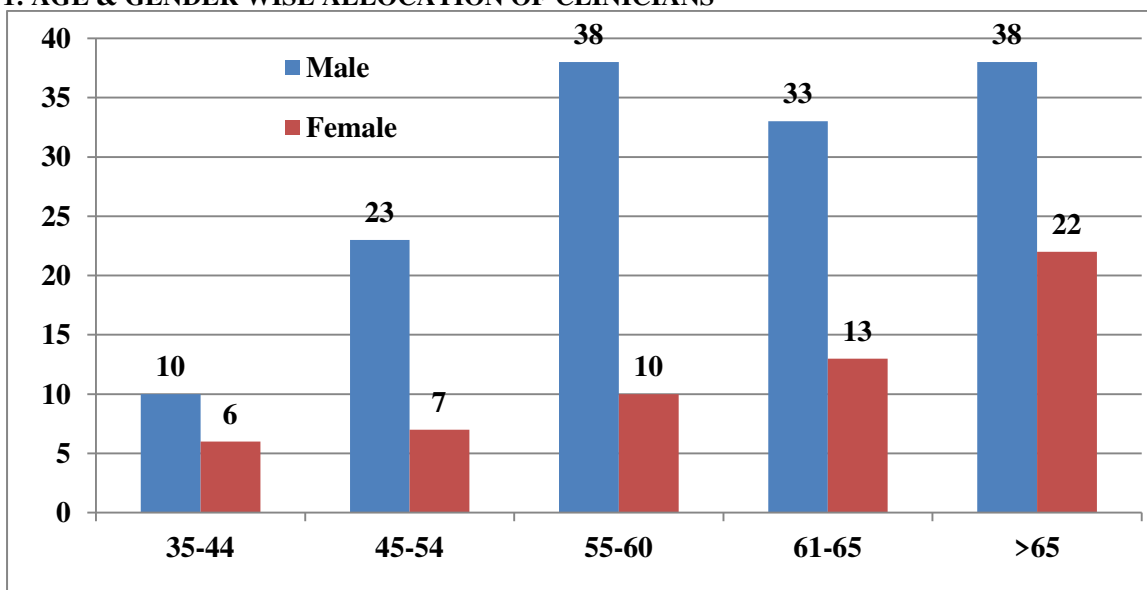
\*p<0.05 significant

**Table 3: BASIC STATISTICAL DESCRIPTION WITH LEVEL OF SIGNIFICANCE EVALUATION USING PEARSON CHI-SQUARE TEST**

Variable No.	Mean	Std. Deviation	Std. Error	95% CI	Pearson Chi-Square Value	df	Level of Significance (p value)
1	2.54	0.542	0.160	1.96	2.433	1.0	0.086
2	2.54	0.267	0.000	1.96	2.242	2.0	0.010*
3	2.58	1.276	0.078	1.96	2.298	1.0	0.010*
4	2.45	0.486	0.023	1.96	1.766	1.0	0.000*
5	2.23	0.276	0.025	1.96	2.544	3.0	0.080
6	2.54	0.352	0.021	1.96	2.463	1.0	0.485
7	1.23	0.145	0.034	1.96	1.231	1.0	0.321
8	2.65	0.323	0.078	2.33	1.256	1.0	0.543

\*p<0.05 significant

**Graph 1: AGE & GENDER WISE ALLOCATION OF CLINICIANS**



## DISCUSSION

Clinical usage and advantages of the rubber dam are being taught in undergraduate dental curriculum. As we all know that rubber dam usage symbolizes the gold standard of care in endodontic practice. Different studies have been done to check the frequency, efficacy and dilemmas related of rubber dam usage worldwide.<sup>7</sup> The use of rubber dam in the treatment of children is limited appreciably by the children's poor cooperation. A literature suggests that even an inexperienced operator can apply a rubber dam in a few minutes. In addition, the rubber dam offers better working conditions including maintaining a dry field, retracting the tissues, limiting tongue and lips movement by the patient, reducing the time of changing cotton rolls, and also preventing post treatment diseases which compensates for the extra time used while placing it.<sup>8</sup> Rubber dam comes in various colors, flavors and sizes. The sizes may be 5"by 5" or 6"by 6". Material used may be latex or latex free rubber and may be dark or light colored. The dark colored rubber gives a better contrast while the light colored one provides illumination to the area of operation.<sup>9</sup> The rubber dam is the most effective technique for moisture control and has revolutionized the control of moisture in restorative dentistry and it is rated as one of the most useful and essential tools we have in dentistry along with local anesthetics. Since it provides effective isolation and also improves access to the operating site, it is indicated where moisture control and airway protection is essential for example root canal treatment and the acid-etch technique.<sup>10-12</sup> It is also recommended where aseptic technique is important. Rubber dam is mainly used for composite restorations both anterior and posterior, endodontic treatment, fissure sealants, abrasion cavities and cervical lesions (glass ionomer cements, compomers) and it also plays a big role in pediatric dentistry with varied applications ranging from behavior management to restorative treatment including pulpotomies, pulpectomies, adhesive restorations and micro-abrasion.<sup>13</sup> Several studies have been carried out worldwide to find out the percentage of dentists using the rubber dam and also to find out the reasons why some of them do not use it routinely. In United Kingdom it has been seen that less than one fifth of dentists always or frequently used rubber dam, whilst 60% never used it. Three commonly held misconceptions preventing widespread usage of rubber dam by dentists are; that the technique is both difficult, time consuming and that the patient may find the procedure uncomfortable.<sup>14-15</sup>

## CONCLUSION

This study was attempted to evaluate the current knowledge and awareness about Rubber dam usage among studied general dental practitioner. Here authors have concluded that practitioner's knowledge and awareness about rubber

dam usage in pedodontic procedures was at moderate levels. Because rubber dam is an efficient tool for isolation in most of the pedodontic procedures, general awareness campaigns, educational demonstrations and technique illustrations should be performed on regular basis. Our study outcomes must be considered as evocative for predicting clinical outcomes pediatric patients. However, we look forward for some other large scale studies that could further establish certain concrete and standard guidelines in this perspective.

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Source of support: Nil

Conflict of interest: None declared

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