

An Assessment of Rubber Dam usage amongst Dentists in India: A Cross Sectional Survey

Abstract

Background: Rubber dam is considered as an ideal device for tooth isolation. Nevertheless, its usage is reported to be low. The aim of this study was to gather and evaluate information regarding the use of rubber dam by dentists in India **Method:** A questionnaire-based survey was conducted among 500 dentists across India. Study population included undergraduates, interns, postgraduates and private practitioners. Information was sought about age, gender, educational qualification and the use of rubber-dam. **Results:** In the present, 169 (40.7%) of study participants reported to use rubber dam. The usage of rubber dam was highest among the post graduates. Age, gender and educational qualification showed statistically significant influence on the usage of rubber dam. **Conclusion:** The findings of this study show that there is an under usage of rubber dam by dentists in India. Dentists need to be made aware about the importance of rubber dam in dental practice.

Key Words

Rubber dam; questionnaire; utilization

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INTRODUCTION

Ever since its introduction in 1864 by Dr. SC Barnum, the rubber dam has long been advocated as a useful adjunct while performing operative and root canal treatment procedures.^[1] The use of rubber dam proves to be an excellent means of providing infection control during dental treatment by reducing bacterial contamination of the prepared cavities or root canal systems, and thus reducing the transmission of infective agents between the dentist and the patients.^[2,3] Rubber dam also facilitates retraction of soft tissues such as the tongue, lips and cheeks during dental treatments. In addition they also prevent aspiration of fine instruments, provide a dry operating field and allow treatment of patients with sensitive gag reflexes.^[4] Previous studies have shown that rubber dam is not routinely used even for root canal treatments, where small instruments and potentially harmful agents are being used.^[5-8] Good practice guidelines, such as the European Society of Endodontology,^[6] recommends that

rubber dam should always be used to isolate the tooth undergoing root canal treatment. From medico-legal standpoint, dental defence agencies recommend, the use of rubber dam while performing root canal treatments or treatment involving the use of potentially harmful agents such as phosphoric acid.^[7] These agencies regard situations where inhalation of an endodontic file occurs, and rubber dam has not been used as indefensible. The use of rubber dam is also advised by textbooks in endodontology.^[8,9] It seems paradoxical that a technique that is advocated as promoting and supporting good clinical practice is often ignored in routine dentistry. It is widely believed that the application of rubber dam is difficult and time consuming and that patients non-compliance is also a problem.^[10] Patients discomfort, insufficient time and training, and cost are frequently cited as a reasons for the limited use of rubber dam.^[11,12] Going and Sawinski^[13] reported that rubber dam use was low in the United kingdom

Table 1- distribution of study population according to age, gender and qualification

	Frequency	Percentage
Age		
Less than 25years	377	90.8
More than 25 years	38	9.2
Total	415	100
Gender		
Male	138	33.3
Female	277	66.7
Total	415	100
Qualification		
Interns	87	21
Undergraduates	268	64.6
PG students	54	13
Private practitioner	6	1.4
Total	415	100

Table 2: Gender distribution according to age groups and mean age of participants

	Males	Females	total	Mean age (mean±sd)
Less than 25years	115 (30.5%)	262 (69.4%)	377 (100%)	24.23±2.2
More than 25 years	23 (60.5%)	15 (39.5%)	38 (100%)	23.36±1.2
Total	138 (33.3%)	277 (66.7%)	415 (100%)	23.65±1.4

Table 3: Use of rubber dam according to age and gender

	Yes	No	Total
Rubber dam use	169 (40.7%)	246 (59.3%)	415 (100%)
According age			
Below 25 years	138 (36.6%)	239 (63.4%)	377 (100%)
Above 25 years	31 (83.8%)	7 (16.2%)	38 (100%)
Gender			
Males	80 (57.9%)	58 (42.1%)	138 (100%)
Female	89 (32.1%)	188 (67.9%)	277 (100%)

and North America while Jenkins *et al.*,^[5] observed that rubber dam was not routinely used even for root canal treatment. In Great Britain, about 5% of dentists in the National Health Service were reported to use rubber dam more than their colleagues in private practice.^[14] Marshall and Page^[11] reported that rubber dam was used in 1.4% operative procedures in the UK as compared to 10.9% of endodontic procedures.^[15] Despite the increasing awareness of the need for effective and evidence based practice, clinical techniques such as the use of rubber dam has not been assessed in India. The aim of this study was to gather and evaluate information regarding the use of rubber dam by dentists in India.

MATERIALS AND METHOD

A cross sectional questionnaire based study was conducted from November 2013 to January 2014 among the dentists across India. A pre-piloted questionnaire was used for the study and the questionnaire was self-administered. Before the start of the study ethical clearance was obtained from Institutional review board and informed consent was obtained from all the respondents. The

study was conducted in various dental colleges across India. The total 500 questionnaire were distributed, out of which 415 were returned. Information sought included age, gender, educational qualification and the use of rubber-dam. Distribution and collection of the questionnaire was done by the same investigator. Data from the completed questionnaires were entered into an electronic database (Microsoft Excel 2007). Data was analysed by using SPSS version 17 (SPSS Inc., Chicago, IL, USA). Frequencies were calculated and cross tabulations were performed. The chi-square test was used for the analysis and p value of < 0.05 was considered statistically significant.

RESULTS

Table 1 shows the distribution of study participants according to age, gender and educational qualification. In the present study a total of 415 dentists out of 500 completed the questionnaire giving us a response rate of 83%. The age ranged from 20- 37 years. Among the 415 respondents, 64.6% were undergraduate students, 21% interns, 13% postgraduate students and the remaining 1.4 % were private practitioners. Table 2 shows the mean

age of study population was 23.65 ± 1.4 years (Males- 24.33 ± 2.2 , females- 23.36 ± 1.2). One thirty eight (33.3%) respondents were males and 277 (66.7%) respondents were females. A total of 377 (90.8%) respondents were aged less than 25 years: 115 males and 262 females. Thirty eight (9.2%) were aged above 25 years: 23 males and 15 females ($p < 0.05$). In table 3, out of 415 study participants, only 169 (40.7%) used rubber-dam while 246 (59.3%) did not reported to use it. It also represents the usage of rubber dam according to age and gender. Participants aged above 25 years (83.8) reported higher rubber dam usage compared to younger age group (36.6%). Statistically significant difference ($p < 0.05$) was observed between males and females in relation to rubber-dam usage. Higher number of males (57.9%) reported to use rubber dam compared to females (32.1%) ($p < 0.001$). Fig. 1 shows rubber dam use according to educational qualification. Fifty two out of fifty four (96.2%) of the postgraduate students used rubber-dam. While only 17.5% of the undergraduates reported to use rubber dam. Statistically significant difference was obtained in relation to rubber-dam usage and educational qualification. ($p < 0.001$)

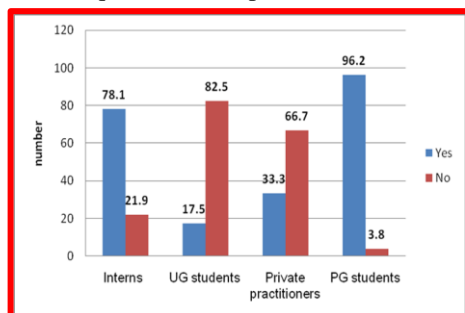


Fig. 1: Use of rubber dam according to the educational qualification

DISCUSSION

The questionnaire survey is regarded as a common instrument to collect data in the healthcare field as large amount of data can be collected in a relatively short period of time. However, a major disadvantage of collecting data by this means is its low response rate. The response rate of 83% in the present study is reasonable, but it should be remembered that there may be a form of selection bias; those practitioners who are enthusiastic about the use of rubber dam may have been more likely to respond than those who are not. The predominance of females among the respondents in the present study is consonant with the finding of Abdulwahab *et al.*,^[16] in their study of Saudi Arabian dentists but not with those of Soldani and Foley^[17] who studied

the paediatric specialists in the United Kingdom. In India, the expansion of the number of women in dentistry in India has been one of the major dental workforce trends during the last quarter of the past century and will continue during the initial decades of this century. This is reflected by the greater number of female than male applicants to dental schools. Since 1999 there has been an increase in the female students, more so in 2000 and this trend is continuing today.^[18] In the present study majority of the respondents were of the younger age group. This was similar to the studies done by Lynch and McConnell^[4] and Udoye *et al.*^[15] Whereas in the study done by Soldani and Foley,^[17] more than 50% of respondents were aged 40-50 years. This difference could be due to difference in the study design. Study population in this study includes under graduates, interns, postgraduates and private practitioners. The rubber-dam usage was highest among the postgraduate students (96.2%). Studies have shown that professionals with some kind of post-graduation training use rubber dam more frequently.^[3] Lynch and McConnell^[4] suggested that specialists are more likely to be exposed to rubber dam placement during their course of specialization. Moreover, specialists tend to do complex procedures, which require a more qualified and sensitive technique.^[19] This explains the higher usage of rubber-dam among the postgraduates in this study. The results of this study showed that around forty percent of the study participants used rubber dam while around sixty per cent have never used rubber dam. This level of rubber dam usage is better than it is in Belgium,^[20] Cameroun,^[21] Denmark^[22] and Saudi Arabia,^[16] similar to the usage in Jordan,^[23] Nigeria^[15] and Lithuania,^[24] but worse than it is in the United Kingdom,^[5] New Zealand,^[25] the USA^[26] and Sweden.^[27] These studies were mainly done among general dental practitioners. The limited use of rubber dam noted in the present study agrees with most of the findings of the previous studies. This widespread disregard for the use of rubber dam, despite their acknowledged advantages, was recognised by Silversin *et al.*,^[14] when he observed that probably no other technique, treatment or instruments used in dentistry is so universally accepted and advocated by the recognised authorities and so universally ignored by practicing dentists. It would seem that despite the advantages of rubber dam, including superior infection control, not to mention medico-legal and safety concerns, majority of the dentists

do not use it routinely. Previous studies have cited various reasons for lack of use of rubber dam amongst the dental professionals.^[11] These include: patient discomfort, insufficient time, difficulty in use, insufficient training, cost and low fees for treatment. Various studies performed over the last few years have demonstrated that patients are generally not adverse to the use of rubber dam during dental treatment, but many actually prefer to have it being placed.^[12,28] The argument of insufficient time being a consideration is not entirely valid, as studies in the literature have demonstrated that, when proficient in its use, rubber dam application can be performed in approximately two minutes.^[1,7,28] Furthermore, there is evidence that treatments can be performed more quickly once the rubber dam has been applied.^[1] Majority in the present study reported that they did not use rubber dam, which may be related to a lack of proficiency in the technique. Attitude of dentists might be another factor which can be associated with the under usage of rubber dam. Previous investigations by the author in other areas of contemporary practice, such as fixed and removable prostheses have found a similar sense of carelessness and lack of attention to legal and 'good practice' guidelines.^[4] This area need to be evaluated by further studies. We suppose that the real frequency of rubber dam usage by all dentists in India might be lower than what we found in this study. This hypothesis is supported by several factors. First, a significant amount of questionnaires was obtained from younger dentists who use rubber dam more frequently than older colleagues.^[29] Secondly, majority of the participants were dental students (undergraduates, postgraduates and interns) and very few were private practitioners. Studies have shown that overall usage of rubber dam decreases when they start their own clinical practice.^[29]

CONCLUSION

The findings of this study shows severe under usage of rubber dam by dentists in India. This 'lack of use' presents certain medico-legal, safety and treatment quality concerns for the profession. It may be addressed through increasing the awareness of dentists about the importance of rubber dam and by giving more emphasis at undergraduate course as well as continuing dental education programmes.

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