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Online Questionnaire-Based Study to Evaluate the Attitudes and Use of Rubber Dental Dams by Saudi Dental Practitioners

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Background: A dental dam is a protective sheet with an aperture and is used to prevent the spread of infection during dental procedures. This study aimed to use a 2-part online questionnaire to evaluate the attitudes and use of rubber dental dams by 300 Saudi dental interns, general dental practitioners, residents, specialists, and consultants in prosthodontics, endodontics, and restorative dentistry.


Material/Methods: The 17-item validated questionnaire consisted of 5 questions on demographics, 2 on knowledge, 6 on attitudes, and 4 on perceptions. It was distributed through Google Forms. The chi-square test was used to determine the associations between the study variables and perception questions.

Results: A total of 41.67% participants were specialists/consultants, among which 59.2% were in the prosthodontics specialty, 12.8% in endodontics, and 28% in restorative dentistry. Most participants (84.67%) stated the necessity of using rubber dams during post and core procedures. A total of 53.67% had received enough training for using rubber dams during their undergraduate/residency education. The majority of participants (41%) also preferred using rubber dams during the prefabricated post and core procedures, and 28.33% stated that the remaining tooth structure was one of the major reasons for not using rubber dams during the post and core procedures.

Conclusions: Workshops and hands-on training should be conducted among dental graduates to instill a positive attitude regarding the use of rubber dams.

Keywords: **Attitude • Patient Isolation • Post and Core Technique • Rubber Dams**

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Background

To carry out proper surgical techniques in dentistry, one requires accessibility and isolation, which provides adequate visibility over the working area. Any dental surgical technique requires sufficient control over the operating space [1]. The primary objective in endodontics is the elimination of microorganisms infecting the root canal system. This requires rigorous aseptic protocols and isolation of saliva, blood, and other gingival fluids [2].

Isolation can be achieved directly using rubber dams, cotton rolls, saliva ejectors, liquid dams, and gingival retraction cords or it can be achieved indirectly using local anesthesia and anti-anxiety drugs and muscle relaxants [1]. The most universal and ideal method for isolation is rubber dams, which were invented by Dr. Sanford C. Barnum in 1864 [3,4]. Rubber dams are tiny latex or nonlatex sheets that are used for isolating 1 or more teeth and thereby preventing contamination of the surgical area by microorganisms [1]. The patient's oropharynx is shielded by a rubber dam from potential aspiration or swallowing of files, irrigating fluids, and debris. Additionally, it provides protection to the gingiva, tongue, lips, and cheeks from rotary instruments [3].

The American Association of Endodontists stated isolation is the standard of care that is vital during any endodontic procedures. A study performed by Ingle et al in the United States showed that insufficient cleaning and shaping of root canals is a significant factor in root canal failure [5].

Post and core procedures are performed after root canal treatment and are mainly indicated when there is a significant loss of tooth structure, thereby providing improved crown retention. However, the insertion of a post without using a rubber dam can cause subsequent microbial contamination of the root canal-treated teeth due to coronal microleakage. This indicates the use of rubber dams as an ideal method for the post and core procedures [6,7].

Although rubber dams provide numerous benefits, they are still not widely used in dental practice. Their lack of use has been attributed to several reasons, such as patient acceptability issues, application time requirements, high cost, and a lack of adequate training [3]. In a prior survey, 75% of participants answered that rubber dams are a mandatory requirement at the time of root canal treatment [8]. Additionally, Lynch and McConnell concluded that 57% of dentists had difficulty in placing rubber dams and found it was a tedious task [1]. Thus, it is noted that, despite rubber dams being considered the criterion standard, the studies show a considerable difference in attitudes, beliefs, and practices of dental practitioners [9].

Additionally, studies have been performed extensively in various countries, such as the United States and United Kingdom, and have reported varying trends of rubber dam use over time, providing an insight into attitudes and beliefs of practitioners about the use of rubber dams at various points in time [8,10]. To the best of our knowledge, the most studies have assessed knowledge, attitudes, and practices toward the use of rubber dams in dental practice [10-13]. Many studies have also been performed in Saudi Arabia [6,14-17]. Jouhar et al in 2022 recommended the usage of rubber dams during all endodontic procedures for better clarity and reducing the risk of aspiration of instruments [2]. Also, Abuzeneda et al reported that 86.4% of students believed that restorations performed with a rubber dam have a longer lifespan than those placed without one [17]. However, no studies have reported dental practitioner and dental students' perspectives of using rubber dams while performing post and core procedures. Hence, we concluded that a questionnaire study would provide a deeper understanding of dental practitioner's usage of rubber dams. Therefore, this study aimed to use a 2-part online questionnaire to evaluate the attitudes and use of rubber dental dams by 300 Saudi dental interns, general dental practitioners, residents, specialists, and consultants in prosthodontics, endodontics, and restorative dentistry.

Material and Methods

The study was performed in accordance with the principles of the Helsinki Declaration. On receiving approval from the Institutional Review Board of King Khalid University, College of Dentistry (ethical clearance no. IRB/KKUCOD/ETH/2021-22/034), participants were briefed about the study's goals and the questionnaire's format. Online written consent was also obtained at the beginning of the study. To preserve the accuracy and confidentiality of the data, the questionnaire was made anonymous.

Sample Size and Study Population

The sample size for the descriptive sampling technique was calculated using an expected response rate of between 40% and 60% and a 90% power calculation with a 95% confidence interval. Therefore, 300 participants were chosen at random. A self-administered, validated online questionnaire study was conducted among 300 participants and was directed to Saudi Arabia-based dental interns, general dental practitioners, residents, specialists, and consultants in fields such as prosthodontics, endodontics, and restorative dentistry who fulfilled our inclusion criteria and were included. Dental practitioners residing outside Saudi Arabia and who were not willing to participate were excluded from the study.

Sampling Technique and Data Collection

Data were gathered using a well-designed, validated, and thoroughly verified pretested questionnaire. The questionnaire for the current study had multiple-choice questions and responses. The study employed a convenience and snowball sampling strategy. The survey was distributed online (through WhatsApp and email) and through a Google Form. Participants had to select 1 check box from a set of options for each question. It was made sure that each person could only respond to the questionnaire once and that all the questions had to be answered. The study did not include any questionnaire items with missing answers.

Questionnaire Development

The 17-item questionnaire consisted of 5 questions on demographics, 2 on knowledge, 6 on attitudes, and 4 on perceptions and was framed to gather information on dental professionals' attitudes and beliefs regarding the isolation of rubber dams during post and core procedures for endodontically treated teeth (Tables 1, 2).

Table 1. Part 1 of the online questionnaire: Demographic data of the study participants.

Sex	Male
	Female
Place of work	Government
	Private
Occupation	Dental Intern
	General dental practitioner
	Dental resident
	Specialist/consultant
Specialty	Endodontics
	Prosthodontics
	Restorative
	Other
Years of practice	1-5
	6-10
	More than 10

Table 2. Part 2 of the online questionnaire: Attitudes and use of rubber dental dams by the study participants.

Is rubber dams necessary during post and core procedures?	Yes
	No
	I don't know
Do you think that the use of rubber dams during post and core procedures has an impact on the success of endodontically treated teeth?	Yes
	No
	I don't know
Do you think you can achieve adequate isolation without a conventional rubber dam?	Yes
	No
Did you use rubber dam during prefabricated post and core procedure?	Always
	Sometimes (cotton roll, liquid dam, suction only)
	Rarely (cotton roll, liquid dam, suction only)
	Never (cotton roll, liquid dam, suction only)
Did you use rubber dam during casted post and core procedure?	Always
	Sometimes (cotton roll, liquid dam, suction only)
	Rarely (cotton roll, liquid dam, suction only)
	Never (cotton roll, liquid dam, suction only)
What kind of isolation method/s you use?	Cotton roll
	Liquid dam
	Saliva ejector
	I always use rubber dam
	Other

Table 2 continued. Part 2 of the online questionnaire: Attitudes and use of rubber dental dams by the study participants.

Either you use/not use rubber dam, what in your opinion may be the reason/s for others/you, for not using the rubber dam during post and core procedure?	Cost
	Time consumption
	Remaining tooth structure
	I don't have enough training for using rubber dam
	Other
Is the location of tooth affect your decision for using rubber dam during post and core procedure?	Yes
	No
12/a. If the question 12 answer is YES, then select which location of teeth you can achieve adequate isolation without using rubber dam (you can select more than one)	Upper posterior teeth
	Upper anterior teeth
	Lower posterior teeth
	Lower anterior teeth
During your undergrad/residency do you feel you have enough training for using rubber dams?	Yes
	To some extent
	No
Do you want to know more about rubber dams and their application?	Yes
	No
	Maybe
What do you think the best way to enhance the knowledge about rubber dams?	Continuous dental education program –lectures
	Adding extra theory and clinical hours in bachelor of dental surgery training
	Workshops and hands-on training

Questionnaire development and data collection were carried out by 2 researchers (S.M.A and S.C.). The dental public health faculty was consulted for an expert opinion for determining the questionnaire's validity. The experts expressed their reservations regarding the questionnaire's simplicity, applicability, and significance. The reliability was also established by test-retest analysis. The kappa value was 0.8, which indicated high reliability. Following this, a pilot study was conducted with a few practicing dentists, who were asked to complete the questionnaire and offer feedback on its content, clarity, and brevity.

The first part of the questionnaire consisted of questions pertaining to dental professional's demographic variables, such as sex, place of work, occupation, specialty, and years of practice. The second part of the questionnaire consisted of questions related to the attitudes and practices of dentists toward rubber dam isolation of endodontically treated teeth during post and core procedures. This included attitudes toward the use of rubber dams in post and core procedures, impact on success of endodontically treated teeth, adequate isolation

using conventional rubber dams, usage during prefabricated and all steps of casted (indirect) post and core procedure, decision for its usage based on tooth location, training for using rubber dams during undergraduate/residency education, knowledge about rubber dams and their application, the best way to enhance the knowledge about rubber dams, and the recommendation of the use of rubber dams during post and core procedures. The 2 open-ended questions were regarding the isolation methods used and the reasons for not using the rubber dam during the post and core procedures.

Statistical Analysis

The data were analyzed using R software version 4.2.0 and Microsoft Excel version 2021. A 95% confidence level of $P < 0.05$ was considered statistically significant. Descriptive statistics were performed, followed by a chi-square test for determining the association between categorical variables.

Table 3. Responses of the study participants to the questions.

Variables	Subcategory	No. of participants (%)
Sex	Female	103 (34.33%)
	Male	197 (65.67%)
Place of work	Government	219 (73.0%)
	Private	81 (27.0%)
Occupation	Dental intern	51 (17.0%)
	Dental resident	32 (10.67%)
	General practitioner	92 (30.67%)
	Specialist/consultant	125 (41.67%)
Speciality/consultant	Endodontics	16 (12.8%)
	Prosthodontics	74 (59.2%)
	Restorative dentistry	35 (28.0%)
Years of practice	1-5	188 (62.67%)
	6-10	47 (15.67%)
	More than 10	65 (21.67%)
Is rubber dam necessary during post and core procedure?	I do not know	8 (2.67%)
	No	38 (12.67%)
	Yes	254 (84.67%)
Do you think using of rubber dam during post and core procedure has an impact on the success of endodontically treated tooth?	I do not know	17 (5.67%)
	No	23 (7.67%)
	Yes	260 (86.67%)
Do you think you can achieve adequate isolation without conventional rubber dam?	No	173 (57.67%)
	Yes	127 (42.33%)
Did you use rubber dam during prefabricated post and core procedure?	Always	123 (41.0%)
	Never	43 (14.33%)
	Rarely	35 (11.67%)
	Sometimes	99 (33.0%)
Did you use rubber dam during all steps of casted (indirect) post and core procedure?	Always	77 (25.67%)
	Never	85 (28.33%)
	Rarely	38 (12.67%)
	Sometimes	100 (33.33%)
What kind of isolation method/s you use?	Cotton roll	76 (25.33%)
	Liquid dam	22 (7.33%)
	Saliva ejector	60 (20.0%)
	I always use rubber dam	68 (22.66%)
	Cheek retractor	18 (6.0%)
	I use all the methods	56 (18.66%)

Table 3 continued. Responses of the study participants to the questions.

Variables	Subcategory	No. of participants (%)
Either you use/not use rubber dam, what in your opinion may be the reason/s for others/you, for not using the rubber dam during post and core procedure?	Cost	56 (18.66%)
	Time consuming	61 (20.33%)
	Remaining tooth structure	85 (28.33%)
	I don't have enough training for using rubber dam	34 (11.33%)
	Lack of knowledge	36 (12.0%)
	Rubber dam not available in clinic	28 (9.33%)
Is the location of tooth affect your decision for using rubber dam during post and core procedure?	No	123 (41.0%)
	Yes	177 (59.0%)
Which location of teeth you can achieve adequate isolation without using rubber dam (n=177)	Lower posterior teeth	2 (1.13%)
	Lower posterior teeth, lower anterior teeth	4 (2.26%)
	Upper anterior teeth	54 (30.51%)
	Upper anterior teeth, lower anterior teeth	17 (9.6%)
	Upper anterior teeth, lower posterior teeth, lower anterior teeth	2 (1.13%)
	Upper posterior teeth	26 (14.69%)
	Upper posterior teeth, lower posterior teeth	4 (2.26%)
	Upper posterior teeth, upper anterior teeth	52 (29.38%)
	Upper posterior teeth, upper anterior teeth, lower anterior teeth	12 (6.78%)
	Upper posterior teeth, upper anterior teeth, lower posterior teeth	2 (1.13%)
During your undergrad/residency do you feel you have enough training for using rubber dam?	No	26 (8.67%)
	To some extent	113 (37.67%)
	Yes	161 (53.67%)
Do you want to know more about rubber dam and its application?	Maybe	79 (26.33%)
	No	81 (27.0%)
	Yes	140 (46.67%)
What do you think the best way to enhance the knowledge about rubber dam?	Adding extra theory and clinical hours in bachelor of dental surgery training	72 (24.0%)
	Continuous dental education program lectures	72 (24.0%)
	Workshops and hands-on training	156 (52.0%)
Do you recommend the use of rubber dam during post and core procedure?	Maybe	51 (17.0%)
	No	13 (4.33%)
	Yes	236 (78.67%)

Results

The present study was conducted using an online survey including 300 dentists to analyze the attitudes and practices regarding the use of rubber dams during operative and endodontic practice. Out of 300 participants, 65.67% were men and 34.33% were women. A total of 73% of participants worked in a government organization, whereas 27% worked in a private organization. A total of 41.67% were specialists or consultants, among which 59.2% belonged to the prosthodontics specialty. A total of 30.67% were general practitioners. A total of 21.67% had more than 10 years of experience, while 62.67% had 1 to 5 years of experience. A large proportion of participants (84.67%) stated the necessity of using rubber dams during post and core procedures, and a majority of 86.67% of participants also felt the direct impact of using rubber dams on the success of endodontically treated teeth during the post and core procedures.

Most (57.67%) also felt that they could not achieve adequate isolation without conventional rubber dams, 41% of participants always preferred using rubber dams, and 11.67% rarely preferred using rubber dams during prefabricated post and core procedures. We also asked questions pertaining to other isolation methods used and 25.33% used cotton rolls, followed by rubber dams (22.66%) and saliva ejectors (20%).

A total of 28.33% stated that the remaining tooth structure was one of the major factors for the lack of use of rubber dams, and 59% of participants stated that the location of the tooth affects the decision to use the rubber dams during post and core procedures.

A total of 53.67% of participants reported they received enough training for using rubber dams during their undergraduate residency, and 46.67% of participants were willing to learn more about rubber dam applications. Workshops and hands-on training will be the best way to enhance the knowledge about rubber dams, as stated by most participants (52%) (Table 3).

The majority of the participants (86.67%) also felt the direct impact of using rubber dams on the success of endodontically treated teeth during post and core procedures, among which 81.73% were men ($P < 0.001$). The chi-square test results showed a significant association between participant sex and the following: opinion about rubber dam use during post and core procedure having an impact on the success of endodontically treated tooth, rubber dam use during all steps of casted (indirect) post and core procedure, kind of isolation methods used, opinion about the reason why others are not using the rubber dam during post and core procedures, and feeling that during undergraduate/residency education they have had enough training for using rubber dam (Figure 1).

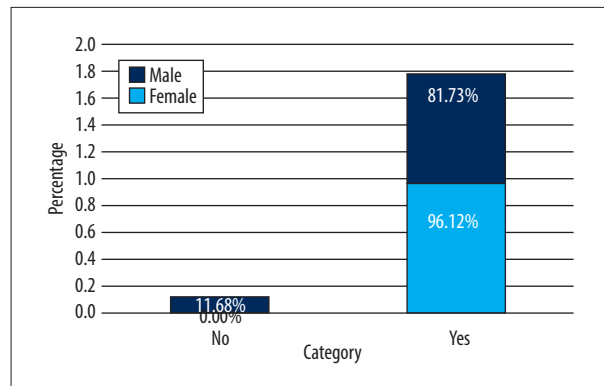


Figure 1. The use of rubber dental dams during endodontic procedures and the evaluation of the direct impact on the success of the procedure, according to the sex of the practitioner.

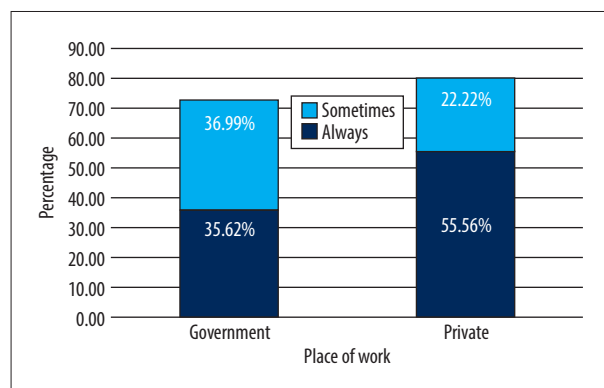


Figure 2. The use of rubber dental dams by Saudi dental practitioners at the place of work.

A total of 36.99% of participants working in a government institution sometimes used rubber dams during prefabricated post and core procedures ($P = 0.0166$). The chi-square test results showed a significant association between place of work and the following: using a rubber dam during prefabricated post and core procedures, kind of isolation methods used, and opinion about the reason why others are not using the rubber dam during post and core procedures (Figure 2).

The majority of participants (80.8%) who were specialists or consultants stated rubber dam use was necessary during the post and core procedures ($P = 0.0175$). They also recommended workshops and hands-on training as the best way to enhance the knowledge about rubber dams, as suggested by 46.4% ($P = 0.0363$). The chi-square test results showed a significant association between occupation and the following: opinion that rubber dam is necessary during post and core procedures, rubber dam use during all steps of casted (indirect) post and core procedure, kind of isolation methods used, opinion about the reason why others are not using the rubber dam during post and core procedure, feeling that during undergraduate/

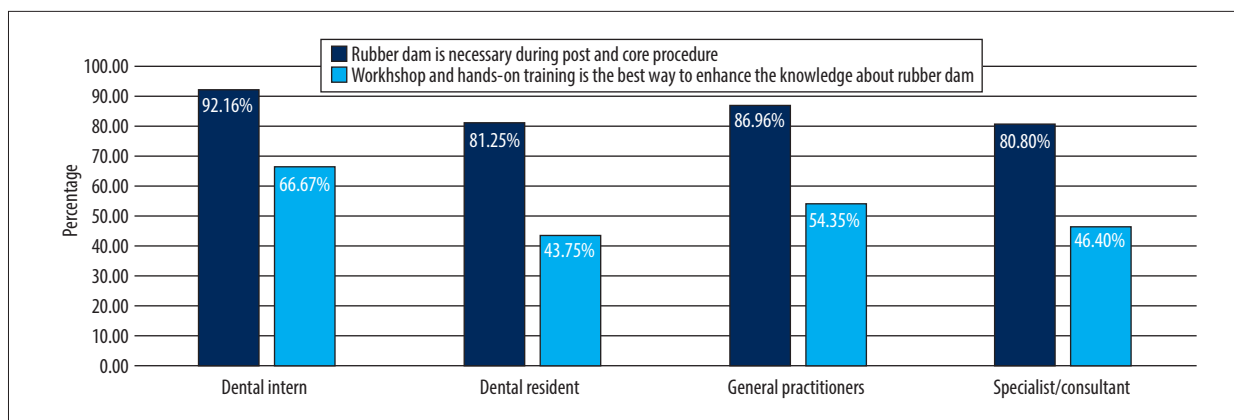


Figure 3. The use of rubber dental dams and opinion about the best way of enhancing knowledge of rubber dental dams with occupation of Saudi dental practitioners.

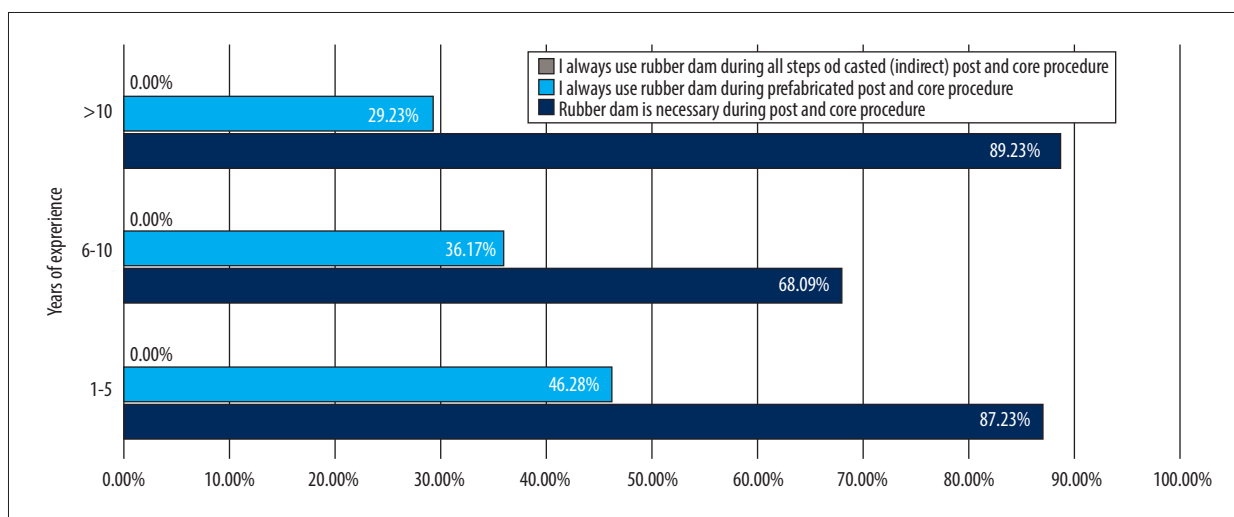


Figure 4. The use of rubber dental dams with years of experience of Saudi dental practitioners.

residency education they have had enough training for using rubber dams, opinion about the best way to enhance the knowledge about rubber dams, and recommendation regarding the use of rubber dams during post and core procedure (Figure 3).

A total of 87.23% of participants with 1 to 5 years of experience and 89.23% of dentists practicing for more than 10 years stated the need for rubber dams during the post and core procedures. The chi-square test results showed a significant association between years of experience and the following: opinion about the rubber dam being necessary during post and core procedure, rubber dam use during prefabricated post and core procedures, rubber dam use during all steps of casted (indirect) post and core procedures, kind of isolation methods used, opinion about the reason why others are not using the rubber dam during post and core procedures, wanting to know more about the rubber dam and its application, and opinion about the best way to enhance the knowledge about rubber dams (Figure 4).

Discussion

The main objective of performing any endodontic procedure is to keep natural teeth healthy and functioning. Improper isolation techniques and microbial contamination can cause endodontic treatment failure. Proper isolation can be achieved with the use of rubber dam isolation [9,18].

Rubber dams are thought to decrease microbiological contamination and thus are regarded as the best tool for isolating teeth during endodontic procedures like posts and cores [4,13]. By significantly lowering the microbiological content of the air turbine aerosols created during endodontic procedures, rubber dams serve as an infection control barrier during dental procedures and thus are considered as the criterion standard of care by various dental organizations [3,19]. Coronal leakage and persistent microorganisms infect the root canal chambers and cause failure of endodontic procedures. According to Bakirtzoglou et al, in their a 6-to-10-year follow-up study, the

post and core system raised the survival potential of obturated maxillary anteriors from 82% to 96% [20]. Thus, it becomes imperative to use a rubber dam during endodontic procedures, especially during post and core procedures.

We conducted a questionnaire-based study to evaluate the attitudes and use of rubber dental dams of 300 participants, including Saudi dental interns, general dental practitioners, and consultants. In the present study, 81.73% of men and 96.12% of women stated that using rubber dams during post and core procedures had a direct impact on the success of the endodontically treated tooth ($P < 0.001$). This finding was contrary to the study done by Zou et al in China, in which no significant difference in rubber dam usage was found between male and female practitioners ($P > 0.05$) [21].

Additionally, 55.56% of participants belonging to private organizations used rubber dams during post and core procedures ($P = 0.0166$; **Figure 2**). This is due to more patient flow into a government organization and lack of time for application of a rubber dam during post and core procedures. Our findings were consistent with those of the study done by Anabtawi et al, in which most (85%) of the dentists working in HealthPartners Dental Group or Permanente Dental Associates used rubber dams at a higher rate. This is due to extensive peer review, which upholds the quality of care, and may be one factor contributing to higher use among these groups [22].

The main objective in knowing practitioner speciality was to derive a link between the usage of rubber dams in other dental specializations, like endodontics, restorative, and prosthetic dentistry, with the attitudes of the participants during various steps of prefabricated and casted post and core procedures. Since the specialized practitioners had received rigorous training during their postgraduate work, we hypothesized that they would be more aware of the use of rubber dams than would general dental practitioners.

A total of 80.8% of specialists and consultants in our study agreed that the use of rubber dams is necessary in post and core procedures ($P = 0.0175$). This result was similar to that of the study done by Awooda et al in 2016, in which 52.6% of specialists used rubber dams [12]. In the present study, 86.67% of participants also believed there is a direct impact of using rubber dams on the success of endodontically treated teeth during post and core procedures. This finding agreed with that of the study done by Tanalp et al, in which 49% of students declared that rubber dams should only be used during endodontic procedures [23]. This result may be explained by the larger focus in the dentistry curriculum placed on rubber dams in endodontic procedures, as opposed to restorative procedures, which can lead to the belief that root canal procedures are the main procedures for using rubber dams. To

avoid cross-infection, rubber dams should always be utilized during endodontic operations [24].

In our study, a majority of participants used other methods of isolation. A total of 25.33% of participants used cotton rolls, 20% used saliva ejectors, and 18.66% used all methods, including rubber dams, liquid dams, and cheek retractors. This result agreed with that of Zahra et al in Rawalpindi, in which a total of 73.3% used other methods of isolation, such as cotton rolls, saliva ejectors, and high-volume suction [25].

A clinical survey conducted by Ahmed et al showed that only 44% of general dental practitioners use rubber dams during endodontic procedures [9]. Additionally, a study conducted by Nezar in 2021 showed a reasonably good usage rate (71%) of rubber dams among the study participants [13]. Jouhar et al found most participants used rubber dams (74.0%) [2]. This contrasted our study findings, which showed a very low usage (22.66%) of rubber dams by dental practitioners.

The lack of usage and difficulty in using rubber dams during post and core procedures is a result of deficient training during undergraduate education. A study conducted in Mumbai, India, in 2020 also confirmed a similar finding, namely that 69.3% of dentists did not receive enough training in using rubber dams [1]. This finding was contrary to that of our study, in which most of the participants (53.67%) agreed that they had received proper training during their undergraduate/residency training.

In the present study, the majority of participants (28.33%) stated that the remaining tooth structure was the major barrier for not using the rubber dam during the post and core procedure, followed by more time consumption (20.33%) and high cost (18.66%). Fifty-nine percent of participants also stated that the location of teeth affects their selection. This was in contrast to the study done by Kumar et al in India, in which patient discomfort was the most common reason given by respondents (22.5%). Madarati et al and Ali et al in 2016 reported unavailability of rubber dams at the workplace and high patient flow as the major barriers in using rubber dams, respectively [8,10]. Similar studies by Abraham et al and Sanghvi et al cited patient discomfort as a major reason for not using rubber dams [15,26].

Root canal-treated teeth can be contaminated by microorganisms from exposure to saliva when dental professionals insert posts without using rubber dam isolation. In the present study, 41% of participants always employed rubber dams for prefabricated steps, while 33.3% sometimes used rubber dams during casted post and core techniques. Additionally, it is recommended that using a rubber dam will greatly increase the success rate of the underlying endodontic therapy during prefabricated post installation [5]. This finding was similar to

that of a study by Disco et al, in which 16% of the participants used rubber dams 90% to 100% of the time [27].

Additionally, the years of work experience had a direct impact on the use of rubber dams during post and core procedures. A total of 89.23% of participants in our study practicing for more than 10 years in Saudi Arabia stated that rubber dams were inevitable during post and core procedures, and 46.28% and 28.72% participants practicing for more than 5 years and more than 10 years, respectively, always used rubber dams during prefabricated/casted post and core procedures. Thus, it can be concluded that years of practice had a direct influence on the use of rubber dams in post and core procedures. This finding was similar to that of the study done by Anabtawi et al in 2015: although 47% of network dentists reported using a rubber dam all of the time, 16% reported using it from 90% to 99% of the time [22].

In our study, 78.67% of participants recommended using rubber dams during post and core procedures. This finding was similar to that of various other studies published. More than half of the students were eager to use the rubber dam in their future practice, according to a finding from a study by Milanović et al [28]. Al-Abdulwahhab et al also stated similar findings to our study, wherein most interns might employ rubber dams [16]. Additionally, Abuzenada found that, following graduation, 85.5% of the students intended to employ rubber dams for all procedures [17].

If appropriate practical training is offered at the undergraduate level in addition to academic education, such as through continuing dental education program lectures, more theory and clinical hours to the Bachelor of Dental Surgery program, or holding workshops, the situation might change. The use of rubber dams throughout post and core procedures was recommended by 78.67% of participants, who also agreed with this conclusion and claimed that workshops and hands-on training are the best approaches to expand one's understanding of rubber dams. This was also consistent with a study conducted by Dhamne et al, which showed that 72.1% were willing to attend continuing dental education programs and hands-on workshops [1]. Olatosi et al had similar findings, stating that 98% of participants reported they would like to have more training on the use of rubber dams [29].

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It is already clear that a rubber dam during root canal therapy can lower the frequency of posttreatment illness. Rubber dam usage is regarded as the minimal safety level of care during root canal treatments [30]. The present study used a questionnaire that motivated and increased the participants' use of rubber dams in the post and core procedures. However, this study has some limitations. Due to the web-based survey conduction, the reliability of the opinions by the participants cannot be ensured. The convenience sampling used in our study may lack external validity. Additionally, the study participants were only from Saudi Arabia, which can prevent generalizing the results to other countries.

Future research is needed to examine various interactive education programs or teaching modules with undergraduate dental students that will instill a positive attitude toward using rubber dams. This would make it easier to pinpoint the precise causes of unfavorable views, which could then be addressed by making the necessary changes to the educational curriculum.

Conclusions

Rubber dams are regarded as the criterion standard of care in various endodontic procedures. The success of root canal-treated teeth is greatly increased when a rubber dam is used during prefabricated post installation. The most popular technique for isolation was found to be the combination of cotton rolls and all other techniques, such as the liquid dam, spit ejector, cheek retractor, and rubber dam. The use of rubber dams is frequently discouraged by general dental practitioners in Saudi Arabia for a variety of reasons, including application time, expense, tooth structure that is still present, lack of appropriate training and knowledge, and unavailability. Workshops and hands-on training should be conducted among dental graduates to instill a positive attitude regarding the use of rubber dams.

Declaration of Figures' Authenticity

All figures submitted have been created by the authors, who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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