INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

INFLUENCE OF RUBBER DAM ISOLATION ON THE LONGEVITY OF THE DENTAL RESTORATIONS: DENTIST`S PERCEPTION WITH RESPECT TO GENDER

Original Research

Sameen Zohra[1], Huma Azhar[2], Emaan Ahmad[2], Nimra Nadeem Bhatti[3], Abdul Moiz Bin Hamid[4], Aleena Shahid5, Hira Butt[1]*

[1]General Dental Practitioner, Lahore, Pakistan.
[2]House Officer College of Dentistry, Sharif Medical and Dental College, Lahore, Pakistan.
[3]General Dental Practitioner, Bilal Hospital, Rawalpindi, Pakistan.
[4]Student, Doctor of Dental Surgery Program, Touro College of Dental Medicine, USA.
[5]Final year BDS student, College of Dentistry, Sharif Medical and Dental College, Lahore, Pakistan.
Corresponding Author: Hira Butt, General Dental Practitioner, Lahore, Pakistan, hira.ah.butt@gmail.com
Acknowledgement: The authors acknowledge the support of Sharif Medical and Dental College, Lahore, for facilitating this research.

Conflict of Interest: None
Grant Support & Financial Support: None

ABSTRACT

Background: Effective isolation during restorative dental procedures plays a vital role in the longevity of dental restorations. The rubber dam is widely accepted as the most reliable method for achieving a dry and contaminant-free operative field, enhancing the success of restorations by preventing saliva, blood, and moisture contamination. Despite its proven clinical benefits, the routine use of rubber dam varies, potentially influenced by practitioner-related factors such as gender, clinical training, and perceptions of efficacy.

Objective: To determine the association between the gender of dental practitioners and the frequency of rubber dam usage, and to assess its perceived impact on the longevity of dental restorations.

Methods: This descriptive cross-sectional study was conducted at the College of Dentistry, Sharif Medical and Dental College, Lahore, from May 2024 to May 2025. A total of 150 dental practitioners were recruited using non-probability convenient sampling. Ethical approval was obtained from the institutional review board (Ref No. SMDC/SMRC/201-21), and informed consent was secured. Data were collected using a validated structured questionnaire that captured demographics, frequency of rubber dam use, and perception of its effect on restoration longevity. Statistical analysis was performed using SPSS version 23. Chi-square test was applied to assess associations, and a p-value ≤ 0.05 was considered statistically significant.

Results: Among the participants, 44 (29.3%) were males and 106 (70.7%) were females, with a mean age of 23.29 ± 1.245 years. Frequent rubber dam usage was reported by 63.6% of males and 59.0% of females. The association between gender and frequency of use was statistically non-significant ($p = 0.817$). Additionally, 88.6% of male and 83.6% of female dentists believed that rubber dam contributes to restoration longevity, with this perception also showing a non-significant gender-based association ($p = 0.385$).

Conclusion: Both male and female dentists demonstrated commendable use of rubber dam and acknowledged its positive role in enhancing restoration longevity, regardless of gender differences.

Keywords: Dental fillings, Dentist, Gender identity, Isolation technique, Longevity, Rubber dam, Tooth restoration.

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

INTRODUCTION

Operative and restorative dentistry fundamentally revolves around the durability and longevity of dental restorations, which directly impacts patient satisfaction and oral health outcomes (1,2). One of the most critical factors contributing to the success of such restorations is the maintenance of effective isolation throughout the operative procedure (3). Particularly in adhesive dentistry, the use of a rubber dam has long been considered the gold standard for achieving a dry, uncontaminated working field. This technique not only provides unobstructed access to the tooth being restored but also significantly enhances the predictability and integrity of the restorative process (4,5). Proper isolation minimizes the risk of microleakage, marginal degradation, and postoperative sensitivity, all of which are common causes of early restoration failure (6–8). Despite these well-established advantages, the routine clinical use of rubber dam remains surprisingly limited. Previous studies have identified several barriers, including perceived time constraints, patient discomfort, and insufficient clinician training or confidence in rubber dam placement (9). Furthermore, emerging evidence suggests that the dentist's personal characteristics, including gender, may influence clinical decisions related to isolation techniques and restorative approaches (10). Gender-based practice patterns have been observed in various aspects of dentistry, such as material selection, communication styles, and treatment planning (11).

Research has shown that female dental students tend to prioritize patient comfort and esthetics, which may lead to less frequent rubber dam usage (12). Conversely, male students often emphasize procedural longevity and technical performance, guiding their preference for more traditional and durable techniques like rubber dam application (12). These behavioral patterns are influenced by differences in training exposure, clinical confidence, time management strategies, and overall attitudes toward patient care (13). Given the significant role rubber dam isolation plays in determining the outcome of restorative procedures, understanding the factors that influence its use is critical for improving clinical standards and educational practices. Although the impact of operator gender on isolation preferences and restoration success has been hinted at in the literature, it remains an underexplored area of research (14,15). Identifying these differences is essential not only for optimizing restorative outcomes but also for informing the development of targeted training interventions in dental education. Therefore, the objective of this study was to investigate the association between dentist gender and the frequency of rubber dam use, and to evaluate its influence on the longevity of dental restorations.

METHODS

This descriptive cross-sectional study was conducted over a one-year period from May 2024 to May 2025 at the College of Dentistry, Sharif Medical and Dental College, Lahore. The study aimed to assess the association between the gender of dental practitioners and their frequency of rubber dam usage during restorative procedures, as well as their perception of its influence on the longevity of dental restorations. The sample size of 150 dentists was calculated based on a 5% margin of error, a 95% confidence level, and an estimated rubber dam usage prevalence of 11% among dentists (16). Ethical approval was obtained from the institutional review board under reference number SMDC/SMRC/201-21. Written informed consent was taken from all participants prior to data collection. Dentists were eligible to participate irrespective of their gender, age, specialty, or clinical practice area. However, those with less than six months of clinical experience and those who had never used a rubber dam were excluded from the study to ensure meaningful responses regarding practice behaviors and perceptions. A pre-validated, structured questionnaire was used as the primary data collection tool. It comprised both demographic items (age, gender, and years of clinical experience) and questions regarding the use of rubber dam, including its frequency during restorative procedures and the respondents' views on its contribution to restoration longevity. Data were analyzed using SPSS version 23. Descriptive statistics were applied to summarize the demographic characteristics of the sample. The Chi-square test was used to determine associations between the gender of dentists and the frequency of rubber dam use, as well as their perceptions of its impact on the durability of restorations. A p-value ≤ 0.05 was considered statistically significant.

RESULTS

A total of 150 dental practitioners participated in the study, with a mean age of 23.29 ± 1.245 years. Among them, 44 (29.3%) were males and 106 (70.7%) were females. Analysis of the frequency of rubber dam usage during dental restorations showed that 63.6% of

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

male dentists and 59.0% of female dentists reported using it frequently. A smaller proportion reported using it rarely, including 29.5% of males and 31.4% of females. Only 6.8% of male participants and 9.5% of female participants reported never using a rubber dam during restorative procedures. The association between dentist gender and frequency of rubber dam usage was not statistically significant ($p = 0.817$), although both groups showed a high frequency of use overall. In terms of perception regarding the role of rubber dam in enhancing the longevity of dental restorations, 88.6% of male practitioners and 83.0% of female practitioners believed that rubber dam isolation contributes positively to restoration success. Only 11.4% of males and 17.0% of females disagreed with this perspective. This association between gender and perception of restoration longevity was also statistically non-significant ($p = 0.385$), though the majority of respondents across both groups endorsed the clinical benefit of rubber dam usage in improving long-term outcomes.

Table 1: Role of gender of dental practitioner in using rubber dam for dental fillings

		Frequency of usage during dental fillings			Total	P value
		Rarely	Frequently	Never		
Gender	Male	13 (29.5%)	28 (63.6%)	3 (6.8%)	44 (100%)	0.817
	Female	33 (31.4%)	62 (59%)	10 (9.5%)	105 (100%)	

Table 2: Dental practitioner`s perspective on longevity of dental restoration placed using rubber dam

		Success in terms of longevity		Total	P value
		Yes	No		
Gender	Male	39 (88.6%)	5 (11.4%)	44 (100%)	0.385
	Female	88 (83%)	18 (17%)	106 (100%)	

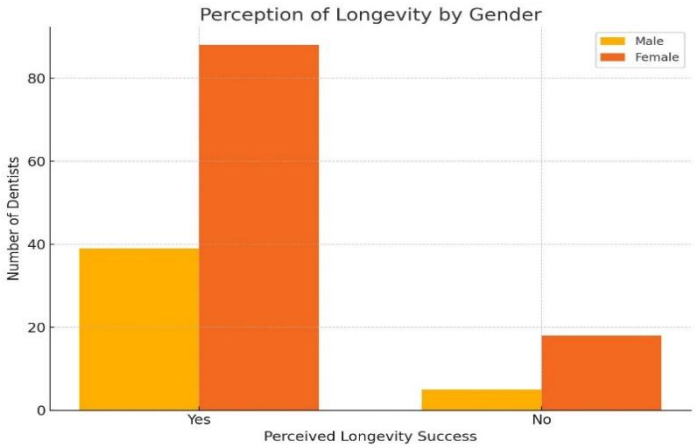

Figure 1 Perception of Longevity by Gender

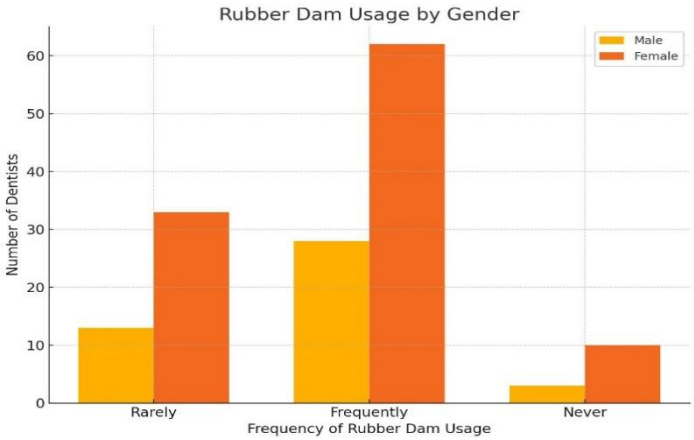

Figure 2 Rubber Dam Usage by Gender

DISCUSSION

The findings of the present study demonstrated a statistically non-significant association between the gender of dental practitioners and their use of rubber dam for direct restorations ($p = 0.817$). Despite this, a substantial proportion of both male (63.6%) and female (59.0%) dentists reported using rubber dam frequently during restorative procedures. This suggests a positive inclination toward rubber dam usage, likely influenced by robust undergraduate training that emphasizes its role in adhesive restorative dentistry. The results are consistent with earlier studies reporting that approximately 63% of dentists incorporate rubber dam in clinical practice during placement of direct restorations (17,18). However, some contrasting evidence exists in international literature. For instance, a study conducted in the United Kingdom revealed that only 30% of dentists regularly used rubber dam, attributing limited adoption to the perceived inconvenience and time constraints associated with its use (19). While male dentists in this study demonstrated a slightly higher usage of rubber dam compared to their female counterparts, this difference may reflect varying degrees of clinical confidence, experience in

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

technique-sensitive procedures, or perceived competence in applying rubber dam. Previous literature has indicated that male practitioners are more inclined to adopt precise isolation techniques due to heightened clinical judgment and skill proficiency (20,21). Female dentists, on the other hand, have been observed to prioritize patient comfort and esthetics, which may lead to lower usage of procedures perceived to cause patient discomfort, including rubber dam application (22).

Regarding the perceived impact of rubber dam isolation on the longevity of restorations, the majority of both male (88.6%) and female (83.6%) dentists acknowledged its role in enhancing restoration durability. Although the gender-wise difference was statistically non-significant ($p = 0.385$), the overall perception aligns with previous findings suggesting that isolation through rubber dam contributes significantly to the longevity and clinical success of restorations (23). A similar trend was noted in other regional studies, where both male and female practitioners attributed improved outcomes to the use of rubber dam, reinforcing its clinical importance regardless of practitioner demographics (23,24). This study offers valuable insights into the current clinical trends surrounding rubber dam use and highlights the broader acceptance of its role in ensuring the success of adhesive restorations. One of the key strengths of the study lies in its focus on gender-based differences, an area not frequently explored in restorative dentistry literature. The use of a validated questionnaire and well-defined inclusion criteria enhanced the reliability of the data collected. Furthermore, the study addressed not only clinical practices but also practitioner perceptions, adding depth to the findings.

However, the study was not without limitations. Being a single-center study, it lacked the heterogeneity that a multicenter approach could have provided, thereby limiting the generalizability of the results. Additionally, the sample size, although adequate for preliminary analysis, may not have been large enough to detect subtle but clinically significant differences between groups. The cross-sectional nature of the study also restricted any causal inferences. Moreover, the exclusion of dentists with no experience of rubber dam usage may have introduced a bias, as it excluded potentially valuable perspectives on barriers to adoption. Despite these limitations, the findings underscore the commendable integration of rubber dam in clinical practice among both genders and reaffirm its perceived contribution to restorative success. Moving forward, future studies should aim to include larger, more diverse populations and explore additional variables such as specialty, years of experience, and institutional training background. Educational strategies should continue to emphasize the clinical value of isolation techniques while also addressing perceived barriers to usage, ultimately supporting more evidence-based and consistent practices in operative dentistry.

CONCLUSION

The findings of this study highlight that both male and female dental practitioners recognize the importance of rubber dam usage during restorative procedures, not only in routine clinical practice but also in contributing to the long-term success of dental restorations. Despite no statistically significant gender-based differences, the shared positive perception underscores the value of rubber dam as a reliable method of isolation. Its ability to maintain a sterile operative field reinforces its clinical relevance in adhesive dentistry. These results emphasize the need for reinforcing rubber dam training during undergraduate and postgraduate education, as early skill development and habit formation are key to encouraging its consistent use in professional practice, ultimately enhancing the quality and durability of restorative treatments.

AUTHOR CONTRIBUTION

Author	Contribution
Sameen Zohra	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Huma Azhar	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Emaan Ahmad	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Nimra Nadeem Bhatti	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Author	Contribution
Abdul Moiz Bin Hamid	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Aleena Shahid	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published
Hira Butt*	Contributed to study concept and Data collection Has given Final Approval of the version to be published

REFERENCES

1. Niaz R, Waheed AB, Urooj SM, Anas M, Farrukh MJIJoBR. Attitudes of Young Dentists Toward Rubber Dam Use in Clinical Practice. 2024;2(02):1299-306.
2. Dazin E. Rubber dam in Dental Care and Other Related Subjects of its use in Dentistry: A Scoping Review: Universidade Fernando Pessoa (Portugal); 2023.
3. Bokhari AM, Vinothkumar TS, Albar N, Basheer SN, Felsypremila G, Khayat WF, et al. Barriers in rubber dam isolation behaviour of dental students during adhesive restorative treatments: A cross-sectional study. 2024;16(4).
4. Olegário IC, Moro BL, Tedesco TK, Freitas RD, Pássaro AL, Garbim JR, et al. Use of rubber dam versus cotton roll isolation on composite resin restorations' survival in primary molars: 2-year results from a non-inferiority clinical trial. 2022;22(1):440.
5. Wong MC, Zou J, Zhou X, Li C, Wang YJCDoSR. Rubber dam isolation for restorative treatment in dental patients. 2021(5).
6. Khosravanifard B, Rakhshan V, Parhiz H. Effect of rubber dam isolation on the longevity of restorations: A systematic review and meta-analysis. Restorative Dentistry & Endodontics. 2021;46(1):e8.
7. Hanbashi A, Otayf H, Alshawkani H, Mashyakhy M, Chourasia HJWJoD. Dentist's attitudes, practice, and barriers toward the use of rubber dam during operative and endodontic treatments: An online questionnaire survey. 2021;12(4):306-10.
8. Shafqat F, Mirza W, Liaqat M, Bajwa UM, Jamil F, Babary DF, et al. Techniques Used by Dental Specialists for Extensive Posterior Composite Restorations. 2023;17(02):472-.
9. Butt H, Amer L, Khan H, Hassan SA, Khan AN, Khan NR, et al. Trends and concerns regarding using composites as posterior restorations and techniques employed to minimize their failure. 2021;1(2):2-7.
10. Falacho RI, Melo EA, Marques JA, Ramos JC, Guerra F, Blatz MB. Clinical in-situ evaluation of the effect of rubber dam isolation on bond strength to enamel. J Esthet Restor Dent. 2023;35(1):48-55.
11. Dev AK, Gupta A, Dalai S. A Comparative Investigation of Aerosol Generation and Exposure Risk During Access Cavity Preparation With or Without Rubber Dam Application. Cureus. 2024;16(6):e61758.
12. Current JL, Unkel JH, Berry EJ, Reinhartz J, Reinhartz D. Comparing Behavior Outcomes with Rubber Dam or IsoVac Isolation in Patients Undergoing Moderate Sedation. J Dent Child (Chic). 2022;89(2):83-7.
13. Taylor A, Burns L. Deep margin elevation in restorative dentistry: A scoping review. J Dent. 2024;146:105066.
14. Eggmann F, Ayub JM, Conejo J, Blatz MB. Deep margin elevation-Present status and future directions. J Esthet Restor Dent. 2023;35(1):26-47.
15. Gomez-Sosa JF, Granone-Ricella M, Rosciano-Alvarez M, Barrios-Rodriguez VD, Goncalves-Pereira J, Caviedes-Bucheli J. Determining Factors in the Success of Direct Pulp Capping: A Systematic Review. J Contemp Dent Pract. 2024;25(4):392-401.
16. Notarantonio AE, McClintock D. The Effect of Isolation and Dehydration on Shade Matching. Compend Contin Educ Dent. 2022;43(5):E9-eE12.
17. Tiwari RVC, Managutti A, Lakshmi DP, Mohindru K, Damarasingu R, Dubey A. Isolation Systems and its Effectiveness in Oral and Maxillofacial Surgery: A Systematic Review. J Pharm Bioallied Sci. 2023;15(Suppl 1):S79-s85.
18. Wang Q, Meng Q, Meng J. Minimally invasive esthetic management of dental fluorosis: a case report. J Int Med Res. 2020;48(10):300060520967538.
19. Mistry N, Mupparapu M, Panchal N. A Patient with an Unknown Latex Allergy Presenting for Sealant Placement. Dent Clin North Am. 2023;67(3):519-21.
20. Vodoriz YY, Tkachenko IM, Nazarenko ZY, Pisarenko OA, Gurzhiy OV. THE PREVALENCE OF RUBBER DAM AMONG DENTISTS IN DIFFERENT COUNTRIES. Wiad Lek. 2022;75(9 pt 2):2252-5.

21. Scott D, Hogan T, John J. Rubber dam evidence. Br Dent J. 2020;229(3):150.
22. Miao C, Yang X, Wong MC, Zou J, Zhou X, Li C, et al. Rubber dam isolation for restorative treatment in dental patients. Cochrane Database Syst Rev. 2021;5(5):Cd009858.
23. Mergoni G, Ganim M, Lodi G, Figini L, Gagliani M, Manfredi M. Single versus multiple visits for endodontic treatment of permanent teeth. Cochrane Database Syst Rev. 2022;12(12):Cd005296.
24. Olegário IC, Moro BLP, Tedesco TK, Freitas RD, Pássaro AL, Garbim JR, et al. Use of rubber dam versus cotton roll isolation on composite resin restorations' survival in primary molars: 2-year results from a non-inferiority clinical trial. BMC Oral Health. 2022;22(1):440.