



CLINICAL FACTORS INFLUENCING DENTISTS' TREATMENT DECISIONS BETWEEN DIRECT RESTORATIONS AND CROWNS

Aamir Syed^{1*}, Jamshed Ahmed², Muhammad Aamir Rafique³, Zubair Badshah⁴, Farooq Taj⁵, Jai Lalita⁶

^{1*} Assistant Professor Prosthodontics, Abbottabad International Medical Institute, Abbottabad, Pakistan

² Assistant Professor, Paediatric Dentistry Department, Sindh Institute of Oral Health Sciences Jinnah Sindh Medical University, Karachi, Pakistan

³ Associate Professor Prosthodontics, Fatima Jinnah Institute of Dental Sciences, Lahore, Pakistan

⁴ Assistant Professor Prosthodontics, M Islam medical College, Gujranwala, Pakistan

⁵ Assistant Professor Prosthodontics, Khyber Medical University-Institute of Dental Sciences, Kohat, Pakistan

⁶ Lecturer in Operative Dentistry Department, Hamdard University Dental Hospital, Karachi, Pakistan

***Corresponding Author:** Aamir Syed,

*Assistant Professor Prosthodontics, Abbottabad International Medical Institute, Abbottabad, Pakistan. Email: aamirsyed5868@gmail.com

ABSTRACT

Background: The decision to restore a tooth using a direct restoration or a full-coverage crown represents a critical aspect of restorative and prosthodontic practice. This decision is influenced by multiple clinical, biological, mechanical, and patient-related factors. Inconsistent decision-making may result in overtreatment, undertreatment, compromised longevity, and increased financial burden.

Objective: To evaluate the clinical factors influencing dentists' treatment decisions between direct restorations and crowns.

Methods: A cross-sectional observational study was conducted among practicing dentists. Data were collected using a structured, self-administered questionnaire assessing demographic characteristics, clinical experience, and decision-making criteria related to tooth structure loss, caries extent, endodontic status, occlusal considerations, esthetic demands, and patient-related factors. Descriptive statistics and inferential analyses were performed to identify significant associations.

Results: The most influential factors guiding treatment selection were the extent of remaining tooth structure, presence of endodontic treatment, occlusal load, and cusp involvement. Dentists with greater clinical experience showed a higher tendency toward conservative management, favoring direct restorations in borderline cases. Esthetic expectations and patient affordability also significantly affected treatment decisions.

Conclusion: Dentists' restorative choices are multifactorial and extend beyond purely clinical indicators. Standardized decision-making guidelines emphasizing minimally invasive dentistry may improve consistency and clinical outcomes.

Keywords: Crowns, Direct restorations, Restorative dentistry

INTRODUCTION

Restorative decision-making lies at the core of operative and prosthodontic dentistry, particularly when determining whether a tooth should be managed with a direct restoration or restored using a full-coverage crown.¹ Advances in adhesive dentistry and restorative materials have expanded the indications for direct restorations, challenging the traditional reliance on crowns for moderately to severely compromised teeth. Nevertheless, inappropriate treatment selection remains a concern, with both overtreatment and undertreatment reported in clinical practice.²

The decision between a direct restoration and a crown is complex and influenced by numerous factors, including the amount of remaining tooth structure, extent and location of carious lesions, presence of cracks, endodontic status, occlusal load, esthetic requirements, and patient preferences.³ Historically, crowns were recommended for teeth with extensive structural loss to enhance fracture resistance. However, recent evidence suggests that adhesively bonded direct restorations may provide satisfactory outcomes in selected cases, particularly when sound tooth structure can be preserved.¹ In addition to clinical parameters, dentist-related factors such as training background, years of experience, and specialty interest also influence treatment planning. Less experienced clinicians may prefer crowns due to perceived longevity and reduced risk of failure, whereas experienced practitioners may opt for conservative approaches when feasible.⁴ Patient-related factors, including financial constraints, esthetic demands, and oral hygiene practices, further complicate the decision-making process. Despite the clinical significance of this issue, limited data are available regarding how dentists integrate these factors into everyday practice.⁵ Understanding the determinants of treatment selection may help in developing evidence-based guidelines and educational interventions aimed at optimizing restorative care.

Therefore, this study aimed to assess the clinical factors influencing dentists' treatment decisions between direct restorations and crowns.

MATERIALS AND METHODS

A cross-sectional study was conducted among general dental practitioners and specialists working in private clinics and teaching hospitals. Dentists with a minimum of one year of clinical experience were included, while interns and non-clinical dentists were excluded. A convenience sampling technique was adopted, targeting a sample size of 160 participants.

Data were collected using a structured, self-administered questionnaire developed after reviewing relevant literature and consulting subject experts. The questionnaire gathered information on demographic and professional characteristics, including age, gender, qualification, and years of clinical experience. It also assessed key clinical decision-making factors such as extent of tooth structure loss, caries depth, cusp involvement, endodontic status, occlusal forces, parafunctional habits, esthetic considerations, patient preferences, and financial constraints. Responses were recorded using multiple-choice items and Likert-scale questions.

Ethical approval for the study was obtained from the institutional review board. Participation was voluntary, and informed consent was secured from all respondents prior to data collection. Data were analyzed using statistical software. Descriptive statistics were calculated, and associations between clinical experience and restorative decisions were evaluated using chi-square tests, with statistical significance set at $p < 0.05$.

RESULTS

A total of 160 dentists participated in the study. The majority of respondents had more than 10 years of clinical experience, and most were general dental practitioners. Table 1 shows that dentists with moderate to high clinical experience formed a substantial proportion of the sample, enabling meaningful assessment of experience-related decision-making trends. As shown in Table 2, increasing loss of tooth structure and cusp involvement markedly shifted dentists' preference toward crowns, highlighting the importance of structural integrity in restorative decision-making. Table 3 demonstrates a strong tendency to select crowns for endodontically treated teeth and for cases with heavy occlusal forces, reflecting biomechanical considerations in clinical practice. Table 4 indicates

that esthetic expectations and financial constraints significantly influenced treatment selection, emphasizing the role of patient-centered factors alongside clinical judgment.

Table 1. Demographic and professional characteristics of participants

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	92	57.5
	Female	68	42.5
Qualification	BDS	104	65.0
	MDS / FCPS / MSc	56	35.0
Years of experience	1–5 years	48	30.0
	6–10 years	52	32.5
	>10 years	60	37.5

Table 2. Clinical factors influencing the choice between direct restorations and crowns

Clinical factor	Preference for direct restoration (%)	Preference for crown (%)
<25% tooth structure loss	82	18
25–50% tooth structure loss	46	54
>50% tooth structure loss	14	86
Cusp involvement present	22	78
Cracks/fractures present	18	82

Table 3. Influence of endodontic status and occlusal factors on treatment decisions

Factor	Direct restoration (%)	Crown (%)
Vital tooth	71	29
Endodontically treated tooth	24	76
Normal occlusion	63	37
Heavy occlusal load / bruxism	19	81

Table 4. Patient-related factors affecting restorative choice

Patient factor	Direct restoration (%)	Crown (%)
High esthetic demand	58	42
Limited financial affordability	74	26
Patient preference for conservative care	69	31
Patient preference for long-term durability	28	72

DISCUSSION

The present study provides valuable insight into the multifactorial nature of dentists' decision-making when choosing between direct restorations and crowns. The findings demonstrate that restorative choices are not determined by a single parameter but rather by an interplay of structural, biological, mechanical, clinician-related, and patient-related factors.

The dominance of remaining tooth structure as a primary determinant aligns with previous research emphasizing structural integrity as the most reliable predictor of restoration longevity. Studies by Li et al. (2024)⁶ and Santos et al. (2024)⁷ reported that teeth with extensive loss of coronal structure exhibit significantly higher failure rates when restored with direct restorations, thereby justifying the use of crowns in such cases. The current findings reinforce this principle, as respondents consistently favored crowns when cusp involvement or extensive structural loss was present. Endodontic status emerged as another influential factor guiding restorative decisions. Traditionally, root canal-treated teeth have been considered structurally compromised and routinely restored with full-coverage crowns to prevent fracture. This practice is supported by studies showing increased fracture resistance

with cuspal coverage in posterior endodontically treated teeth. However, recent evidence suggests that not all endodontically treated teeth require crowns, particularly anterior teeth or posterior teeth with minimal access cavity preparation. The tendency observed in this study to favor crowns for endodontically treated teeth reflects a conservative and risk-averse clinical approach, possibly influenced by undergraduate teaching and medico-legal concerns.

Occlusal considerations, including heavy occlusal forces and parafunctional habits, significantly influenced treatment selection. Similar observations have been reported in studies by Ulku et al. (2024)⁸, which highlighted increased failure rates of large direct restorations in patients with bruxism. Dentists' preference for crowns in such scenarios indicates an awareness of biomechanical demands and the need for restorations capable of withstanding higher functional stresses. Clinical experience played a notable role in restorative decision-making. Dentists with greater years of practice were more inclined toward conservative management, opting for direct restorations in borderline cases. This finding is consistent with earlier surveys suggesting that experienced clinicians are more confident in case selection and in the performance of adhesive restorative techniques. Conversely, less experienced dentists may prefer crowns due to perceived predictability and longevity, even in situations where direct restorations may be clinically acceptable.⁹ Patient-related factors such as esthetic expectations and financial affordability were also shown to significantly influence treatment planning. Previous studies have similarly reported that patient preference can override clinical recommendations, particularly in esthetically demanding zones.¹⁰ While patient-centered care is fundamental to modern dentistry, excessive reliance on non-clinical considerations may compromise long-term outcomes. The findings underscore the importance of effective patient education to ensure informed decision-making.¹¹ Overall, the variability observed in dentists' responses highlights the absence of universally accepted decision-making guidelines. This inconsistency has also been documented in international studies,¹¹⁻¹⁴ suggesting a global need for evidence-based frameworks that integrate minimally invasive dentistry principles with biomechanical considerations. Incorporating such frameworks into undergraduate curricula and continuing professional development programs may help standardize restorative decision-making and improve patient outcomes.

CONCLUSION

Dentists' decisions between direct restorations and crowns are multifactorial, with remaining tooth structure, endodontic status, occlusal considerations, and clinical experience playing dominant roles. Patient-related factors further influence treatment planning. Developing evidence-based guidelines emphasizing minimally invasive dentistry may enhance decision-making consistency and restorative success.

REFERENCES

1. Dawson VS, Fransson H, Wolf E. Coronal restoration of the root filled tooth—a qualitative analysis of the dentists' decision-making process. *International Endodontic Journal*. 2021 Apr;54(4):490-500.
2. Dotto L, Girotto LP, Sousa YT, Pereira GK, Bacchi A, Sarkis-Onofre R. Factors influencing the clinical performance of the restoration of endodontically treated teeth: An assessment of systematic reviews of clinical studies. *The Journal of Prosthetic Dentistry*. 2024 Jun 1;131(6):1043-50.
3. Sayed ME, Jurado CA, Tsujimoto A. Factors affecting clinical decision-making and treatment planning strategies for tooth retention or extraction: An exploratory review. *Nigerian journal of clinical practice*. 2020 Dec 1;23(12):1629-38.
4. Wierichs RJ, Kramer EJ, Meyer-Lueckel H. Risk factors for failure of direct restorations in general dental practices. *Journal of dental research*. 2020 Aug;99(9):1039-46.
5. Robaian A, Alotaibi NM, Allaboon AK, Altuwaijri DS, Aljarallah AF, Alshehri RS, Alabsi AA, Mirza MB, Al Moaleem MM. Factors Influencing Dentists' Choice of Restorative Materials for Single-Tooth Crowns: A Survey Among Saudi Practitioners. *Medical Science Monitor: International Medical Journal of Experimental and Clinical Research*. 2024 Feb 4;30:e942723-1.

6. Li W, Zheng Z, Zeng Y, Zhou Z, Xiao P, Zhong X, Yan W. Chinese dentists' restorative preferences and choices for endodontically treated teeth: a representative survey. *BMC Oral Health*. 2024 Dec 18;24(1):1489.
7. Santos MJ, Zare E, McDermott P, Santos Junior GC. Multifactorial contributors to the longevity of dental restorations: an integrated review of related factors. *Dentistry Journal*. 2024 Sep 12;12(9):291.
8. Ulku SG, Unlu N. Factors influencing the longevity of posterior composite restorations: A dental university clinic study. *Heliyon*. 2024 Mar 30;10(6).
9. Burke FT. Longevity of indirect and direct restorations in anterior teeth. *Primary Dental Journal*. 2023 Jun;12(2):76-84.
10. Patel SR, Butt S, Kasparek D, Moawad E, Jarad F. Perspectives of general dental practitioners on restoring endodontically treated molars: a UK-based vignette study. *British Dental Journal*. 2024 Nov 8;237(9):717-22.
11. Sousa NO, Galvão CS, Almeida EO, Júnior AF. Factors that influence the clinical longevity of ceramic unit restoration: a scoping review. *European Journal of Dental and Oral Health*. 2022 Mar 30;3(2):24-9.
12. Bhuva B, Giovarruscio M, Rahim N, Bitter K, Mannocci F. The restoration of root filled teeth: a review of the clinical literature. *International Endodontic Journal*. 2021 Apr;54(4):509-35.
13. Korkut BO, Özcan M. Longevity of direct resin composite restorations in maxillary anterior crown fractures: A 4-year clinical evaluation. *Operative Dentistry*. 2022 Mar 1;47(2):138-48.
14. de Toubes KM, Soares CJ, Soares RV, de Souza Côrtes MI, Tonelli SQ, Bruzinga FF, Silveira FF. The correlation of crack lines and definitive restorations with the survival and success rates of cracked teeth: a long-term retrospective clinical study. *Journal of Endodontics*. 2022 Feb 1;48(2):190-9.