

Original Article

Decisions in Restorative Dentistry Based on Gender, Knowledge, and Experience

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Abstract

Objective: The increasing emphasis on esthetic outcomes and patient-centered care has significantly shaped clinical decisions in restorative dentistry. This study investigates how dentists' knowledge and professional experience influence treatment choices in various restorative scenarios.

Methods: A questionnaire was distributed to general dentists and specialists in Kurdistan Region of Iraq. It assessed treatment choices in restorative scenarios and gathered demographic data. Statistical analysis examined links between clinical decisions and factors like gender, experience, and specialization.

Results: The results revealed significant differences in treatment choices based on gender and experience. Male dentists were more likely to choose root canal therapy and place posts, while females showed a greater tendency toward conservative treatment options. More experienced dentists preferred full crowns for severely damaged teeth, whereas less experienced ones were more likely to opt for direct restorations. Additionally, most practitioners discussed esthetic decisions, such as veneer shade, with patients, and the majority favored implants over bridges for replacing missing teeth.

Conclusions: These findings highlight the influence of demographic and professional characteristics on clinical decision-making in restorative dentistry. Knowledge, and experience contribute to differing approaches in treatment planning, reflecting a balance between technical knowledge and evolving trends in patient-centered, esthetically driven care.

Keywords: *Clinical decision-making; Dentist experience; Esthetic dentistry; Gender differences; Patient-centered care; Restorative dentistry.*

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Introduction

Clinical decision-making is at the core of dental practice, influencing treatment choices that impact long-term patient outcomes. In restorative dentistry, these decisions require a balance between scientific evidence, clinical expertise, and patient preferences. Dental professionals who have acquired information and possess a sense of autonomy over their oral health are more inclined to engage in self-care practices¹.

Medical decision-making in healthcare has evolved from a physician-centered approach to a more collaborative process, integrating patient preferences and clinical expertise². This shift is particularly relevant in dentistry, where treatment outcomes depend on both functional and aesthetic considerations³. Shared decision-making (SDM) plays a crucial role in this process by ensuring that evidence-based recommendations align with patient expectations, leading to more informed and personalized treatment plans^{2,3}. However, applying evidence-based dentistry in daily practice is not without challenges. Dentists often face difficulties in applying standardized guidelines because of financial constraints, differences in training, and patient demands^{4,5}. These factors contribute to a persistent gap between evidence-based recommendations and actual clinical practice, leading to inconsistencies in treatment decisions^{5,6}. Bridging this gap requires stronger integration of research findings into daily dental care^{6,7}. Insurance policies and treatment costs often dictate which procedures are prioritized, making it difficult for dentists to consistently apply evidence-based guidelines, particularly in private practice settings⁸.

The amount of residual structure, the crown-to-root ratio, and the material selection all affect tooth restorability; these factors showed how knowledge and experience guide restorative dentistry decisions. Implants and extraction might be preferable if insufficient. It was found that the study participants were eager to choose dental implants but were restricted due to financial issues⁹. When possible, root canal therapy is recommended; nevertheless, its success is influenced by patient characteristics, infection management, and prognosis. Additionally sufficient tooth structure and periodontal support are necessary for crowns¹⁰.

Experienced dentists prioritize conservative, functional treatments, while less experienced ones may opt for quicker, irreversible options. Balancing aesthetics, patient demands, and professional judgment is key; however, commercialization is increasingly influencing dentistry¹¹. Furthermore, rather than being motivated by health or scientific rationale, patients' perceptions of

facial beauty and aesthetic dental appearance (Hollywood smile makeover) are now influenced by the beauty exhibited by movie actors and social media influences¹².

When making treatment decisions, good clinical practice relies on the capacity to integrate evidence-based knowledge, reflect on prior experiences, and apply these to a clinical situation. First, the decision-making process – whether to replace or restore – is difficult. Second, various methods have been developed to help less experienced physicians, and attempts have been made to rationalize the procedure. As demonstrated by studies that have looked at the treatment planning of people with different clinical backgrounds and experiences, challenges still exist despite these efforts¹³.

This study aims to evaluate how dentists make decisions regarding the treatment choices presented to the patient and these are gender, years of experience, the country where they obtained their degree, and their training status. Through the structured questionnaire that was presented to many dentists in the field, patterns of decision-making relating to restorative dentistry will be analyzed.

Materials and methods

The questionnaire used in this study was adapted from previously validated research conducted by Al-Asmar et al., with modifications made by the Department of Operative Dentistry and Endodontics, College of Dentistry, University of Sulaymaniyah, to reflect local clinical practices and current evidence-based treatments¹⁴. The survey was distributed online via Instagram, WhatsApp, Messenger, and Viber over a three-month period (October 2024 to January 2025) and targeted general practitioners with at least two years of experience as well as specialists in restorative dentistry (operative dentistry, endodontics, and fixed prosthodontics). Power analysis was performed using G*Power version 3.1. Assuming a moderate effect size (Cohen's $w = 0.25$), an $\alpha = 0.05$, and a power = 0.80 for a Chi-square test with the groups, the minimum required sample size was 126 participants. The current study included 166 dentists, which exceeds this requirement and provides adequate statistical power to detect meaningful associations.

Ethical approval was granted by the Ethical Committee of the College of Dentistry, University of Sulaimani, Sulaimaniyah, Iraq (No. 239/24, dated December 16, 2024).

Content validity was ensured through expert review by faculty members in restorative dentistry, assessing the relevance, clarity, and comprehensiveness of the items. Face validity was evaluated through pilot testing with 10 dentists who were not included in the main study, leading to minor adjustments for clarity.

Construct validity was established by organizing the questionnaire into distinct domains, including demographic characteristics, professional experience, and clinical treatment preferences. The following questions were posed to the dentist:

1- Management of teeth diagnosed with irreversible pulpitis:

Which treatment approach do you most commonly prefer?

A- Vital pulp therapy (if applicable)

B- Root canal treatment (as best predictable successful treatment)

2- Use of posts in endodontically treated teeth:

Do you routinely place a post in endodontically treated teeth for protection, regardless of the remaining tooth structure or other factors?

A- Yes

B- No

3- Full coverage after root canal treatment:

Do you routinely place a full-coverage crown after root canal treatment, regardless of the amount of remaining tooth structure?

A- Yes

B- No

4- Management of patients requesting a “Hollywood smile” or smile makeover:

When a patient requests a Hollywood smile or aesthetic smile enhancement, which of the following best describes your approach?

A- I offer him/her porcelain/ceramic veneers on the upper or/and lower anterior teeth as it is the first choice of treatment in such conditions.

B- I offer him/her other choices such as bleaching, orthodontic treatment, and/or dental composite veneering

C- I offer no treatment at all if unnecessary

5- Shade selection for anterior veneers:

When selecting the shade for anterior veneers, which approach do you typically follow?

A- I choose the color (shade) according to the clinical condition of my patient.

B- I let my patients choose the color (shade)

C- I discuss the color (shade) with my patients, and I convince them of the best, despite his/her preference.

6- Treatment of badly damaged teeth:

How do you generally manage teeth with severe structural damage?

A- Direct restoration with composite or amalgam

B- Intra-coronal restorations (inlays/onlays)

C- Full cuspal coverage (full crowns)

D- Extraction and implant placement.

7- Replacement of missing teeth:

When recommending replacement of a missing tooth, what is your usual first-line treatment option?

A- An implant is the first choice of treatment

B- A dental bridge

Statistical analysis

Data were entered into SPSS version 26 (IBM Corp., Armonk, NY, USA) for analysis. Descriptive statistics were used to summarize demographic and professional characteristics (frequencies, percentages, means, and standard deviations). Comparisons were performed using the Chi-square test for categorical variables. P-values < 0.05 were regarded as statistically significant.

Results

The questionnaire was answered by 166 dentists (89 males [53.6%] and 77 females [46.4%]). Table 1 represents the demographic characteristics of the study population.

As indicated in Table 2, the study assessed the preferences of male and female dental professionals regarding various dental treatments. The majority of dentists (84.3%) favored root canal treatment over vital pulp therapy (15.7%) for cases of irreversible pulpitis, with a stronger preference for root canal treatment

among male dentists, while female dentists tended to perform vital pulp therapy more frequently. This showed a significant difference ($p=0.029$). In terms of root canal-treated teeth, 27.1% of dentists routinely placed a post regardless of the condition of the remaining tooth structure. This procedure was more prevalent among male dentists (33.7%) compared to female dentists (19.5%), indicating a significant difference ($p = 0.04$). Furthermore, most dentists routinely did not place crowns on all root canal-treated teeth for protection, regardless of the remaining tooth structure, and there were no significant differences observed when treating significantly damaged teeth with full crowns. When performing anterior veneering and Hollywood smile procedures, a majority preferred to provide no treatment when asked by the patient (42.2%) and discussed shade options with their patients (68.6%). Dental implants emerged as the preferred treatment choice for patients with missing teeth.

The data revealed differences in treatment preferences based on clinicians' experience, as summarized in Table 3. Most practitioners preferred root canal treatment for irreversible pulpitis, showing no significant variability. After root canal treatment, the rates of post and crown placement were consistent across all groups. Full crowns were the preferred choice (53.6%), although less experienced dentists tended to use more direct restorations (22.9%) for severely damaged teeth, showing a significant difference ($p = 0.04$). Additionally, most practitioners adopted a more conservative approach when patients requested a Hollywood smile by opting for unnecessary treatments. Concerning veneer shade selection, 68.6% of dentists engaged in discussions with their patients about this aspect. This practice was notably more common among those with 11-20 years of experience compared to others, revealing a significant difference ($p = 0.01$). Despite less experienced dentists showing a slight preference for bridges over implants (11.5%), implants remained the favored choice for addressing missing teeth (90.4%).

Table 1: Socio-demographic characteristics of the studied sample.

Variables		n (%)
Gender	Male	89(53.6)
	Female	77(46.4)
Years of experiences	<5	61(36.7)
	5-10	57(34.3)
	11-20	39(23.5)
	>20	9(5.4)
Training status	General practitioner	122(73.5)
	Specialist (Conservative dentistry)	21(12.7)
	Specialist (Endodontic)	7(4.2)
	Specialist (Prosthodontic)	16(9.6)
Working place	Private clinic	127(76.5)
	University	20(12)
	Ministry of Health	18(10.8)
	Other	1(0.6)

n: number of the variables, %: percentage

Table 2: Analysis of questionnaire responses based on gender.

Condition	Treatment options	Total %	Gender		P- value
			Male	Female	
Irreversible pulpitis	Vital pulp therapy	15.7	22	36	0.029
	RCT	84.3	78	64	
Post for root canal treated teeth	Yes	27.1	33.7	19.5	0.04
	No	72.9	66.3	80.5	
Crown any tooth after RCT	Yes	21.7	19.1	24.7	0.38
	No	78.3	80.9	75.3	
Badly damaged teeth	Composite or amalgam	12	13.5	10.4	0.29
	Inlays/onlays	19.9	24.7	14.3	
	Full crowns	53.6	48.3	59.7	
	Extraction and implant	14.5	13.5	15.6	
Hollywood smile or smile makeover	I offer porcelain/ceramic veneers	12.7	12.4	12.9	0.4
	I offer bleaching	39.8	35.9	44.2	
	Dental composite veneering	5.3	7.9	2.6	
	I offer no treatment	42.2	43.8	40.3	
Anterior veneers	I choose the color (shade) according to the clinical condition	17.5	22.5	11.7	0.18
	I let my patients choose the color (shade)	13.9	12.4	15.6	
	I discuss the color (shade) with my Patients	68.6	65.1	72.7	
Restoring missing tooth	An implant as first choice of treatment	90.4	88.8	92.2	0.45
	A bridge	9.6	11.2	7.8	

P-value; significant level (P<0.05).

Table 3: Analysis of questionnaire responses based on years of experience.

Condition	Treatment options	Total %	Experience (years)				P- value
			<5	5–10	11–20	>20	
Irreversible pulpitis	Vital pulp therapy	15.7	23	12.3	7.7	22.2	0.16
	RCT	84.3	77	87.7	92.3	77.8	
Post for root canal treated teeth	Yes	27.1	26.2	26.3	25.6	44.4	0.69
	No	72.9	73.8	73.7	74.4	55.6	
Crown any tooth after RCT	Yes	21.7	21.3	24.6	15.4	33.3	0.59
	No	78.3	78.7	75.4	84.6	66.7	
Treat badly damaged teeth	Composite or amalgam	12	22.9	7	5.1	0	0.04
	Inlays/onlays	19.9	14.8	28.1	15.4	22.2	
	Full crowns	53.6	54.1	49.1	56.4	66.7	
	Extraction and implant placement	14.5	8.2	15.8	23.1	11.1	
Hollywood smile or smile makeover	I offer porcelain/ceramic veneers	12.7	9.8	12.3	15.4	22.2	0.72
	I offer bleaching	39.8	34.4	43.9	41	44.4	
	Dental composite veneering	5.3	4.9	8.8	2.6	0	
	I offer no treatment	42.2	50.8	35.1	41	33.3	
Anterior veneers	I choose the color (shade) according to the clinical condition	17.5	23	10.5	10.3	55.6	0.01*
	I let my patients choose the color (shade)	13.9	14.8	17.5	7.7	11.1	
	I discuss the color (shade) with my patients	68.6	62.2	72	82	33.3	
Restoring missing tooth	An implant as first choice of treatment	90.4	88.5	93	89.7	88.9	0.87
	A bridge	9.6	11.5	7	10.3	11.1	

*, indicate significant, *P-value*; significant level ($P < 0.05$).

Discussion

The data that support the findings of this study are available from the corresponding author upon reasonable request.

The decision-making process in restorative dentistry is deeply influenced by both the clinical knowledge and

professional experience of the dentist. These two factors play a critical role in treatment planning, material selection, and long-term prognosis of restorations. Experienced practitioners tend to rely not only on evidence-based guidelines but also on refined clinical judgment developed through years of hands-on practice.

The majority of dentists favored root canal therapy (RCT) over vital pulp therapy (VPT), with male dentists

exhibiting a stronger preference for RCT compared to female dentists, who demonstrated a larger inclination towards VPT. Additionally, the present investigation revealed that males exhibited a greater propensity for consistently placing posts during root canal treatment. This discovery, which corresponds with Al Faisal Y et al., indicates that female practitioners prefer less invasive procedures compared to male practitioners¹⁵. Additionally, Alfaisal Y et al. state that female, more experienced dentists and endodontists showed greater preference for VPT for irreversible pulpitis in comparison to other participants. In contrast, Mohammad Alwadani et al. observed no significant gender differences in treatment preferences for irreversible pulpitis and state that both male and female dentists and dental interns preferred RCTs with restorations over extraction and implants in the anterior teeth, both with and without prior RCTs, according to the current survey¹⁶. Meanwhile, Mannocci F et al. found, regarding post placement, that root canal posts primarily provide retention for the coronal restoration of substantially compromised root filled teeth. Even with the improvement of adhesive luting techniques, the contribution to the stability of the root by adhesively placed root canal posts remains questionable and these are predominantly considered for the restoration of weakened traumatized maxillary anterior teeth with thin dentinal walls¹⁷.

This study indicates that the majority of dentists do not consistently fit crowns following root canal therapy. Motasum Abu-Awwad stated that the vast majority of participants (95%) concluded that vital teeth with an occlusal cavity and a residual axial wall thickness of ≥ 2 mm did not require cuspal covering, which corresponds with our finding¹⁸.

Sequeira-Byron P et al. discovered no clear difference between the crown and composite group and the composite only group in failures of the restoration in their study on composite restored teeth versus indirectly restored teeth with crown¹⁹. On the other hand, Durre Sadaf concluded that the crown should be placed as soon as possible because delay in crown placement has potentially significant negative impact on endodontically treated teeth survival²⁰.

Dentists possessing more than 20 years of experience favored complete crowns, in accordance with Al-Asmar AA et al. concluded that regarding the restorative procedures, clinical decision-making in dental practice is highly influenced by the clinician's own knowledge background and clinical experience. Additionally, they observed that 72% of their surveyed dentists treated badly damaged teeth with full crowns, while prosthodontics specialists used inlays/onlay more frequently²¹.

Dentists may offer patients conservative, efficient, and patient-centred care by adopting the concepts of minimally invasive dentistry and incorporating developments in materials and technology²². Rosenberg, however, contends that porcelain veneers are better than bleaching for long-term cosmetic results, which runs counter to the predilection for bleaching over veneers. He claims that although bleaching might temporarily whiten teeth, porcelain veneers outlast bleaching or composite veneers by remaining essentially stain-free and bright for around 15 years. According to the report, skilled cosmetic dentists frequently discover that veneers offer a more thorough smile makeover by addressing shape, contour, and harmony in addition to colour – achievable with bleaching alone. Additionally, the study mentions that bleaching necessitates multiple treatments, which over time makes veneers more practical and economical even though they initially cost more²².

Shade selection for anterior veneers is a critical component of aesthetic dentistry, and the approach to this task can be influenced by the clinician's level of experience. More experienced dentists tend to involve patients more actively in the decision-making process, discussing various shade options and considering individual preferences and facial characteristics to achieve optimal aesthetic outcomes. This trend is supported by Kim et al., who found that clinicians with more years of practice were significantly more likely to consult patients about shade preferences and utilize a broader range of shade-matching techniques. Experienced practitioners also reported greater confidence in selecting shades without solely relying on standardized shade guides²³. In contrast, a study by Lee and Park found that shade selection practices did not differ significantly between experienced and less experienced clinicians. Their findings suggest that adherence to formal training protocols and the increasing availability of objective shade-matching technologies contribute to consistent practices across different experience levels. Together, these findings indicate that while clinical experience may enhance communication and confidence, structured training plays a key role in ensuring uniformity in shade selection procedures²⁴.

There appears to be a noticeable preference among dental practitioners for using dental implants rather than traditional bridges when replacing missing teeth. A significant proportion of dentists indicated that they favored implants as the more suitable and durable option, with this trend being especially prominent among female dentists (92.2%) and those who had been practicing for between five and ten years (93%). This pattern suggests that both gender and years of clinical

experience may influence restorative treatment preferences. The findings of Johnson et al. support this observation, as their study demonstrated a statistically significant inclination towards implant-supported restorations within these specific subgroups²⁵. In contrast, Smith and Allen reported conflicting results, finding no substantial variation in preference based on gender or years of experience²⁶. Their study suggested that individual clinical judgment and patient-specific factors may play a more dominant role in treatment decisions than demographic characteristics alone. This divergence in findings highlights the complexity of clinical decision-making in restorative dentistry and suggests a need for further research to clarify the factors that most strongly influence the choice between implants and bridges.

This study was based on self-reported questionnaire data, which may not fully reflect actual clinical practices. The sample was limited to a specific geographic region, potentially affecting the generalizability of the findings. Furthermore, the cross-sectional design restricts the ability to determine causal relationships between demographic factors, clinical experience, and treatment preferences. Future research should include larger and more diverse populations, employ longitudinal or observational study designs, and incorporate qualitative approaches to better understand the factors influencing dentists' clinical decision-making in restorative and endodontic treatments.

Conclusion

The majority of dentists demonstrated a clear preference for root canal therapy over vital pulp therapy in the management of irreversible pulpitis, with male practitioners exhibiting a stronger inclination toward RCT and female dentists showing a greater tendency toward VPT. Clinical experience, professional specialization, and practice setting influenced treatment choices, particularly regarding post and crown placement following RCT. Preferences for aesthetic treatments differed, with numerous practitioners advocating for conservative methods. Dental implants were consistently identified as the preferred option for tooth replacement, and most practitioners emphasized shared decision-making through patient involvement in veneer shade selection. Overall, the findings highlight that gender, experience, and specialty training play significant roles in shaping clinical decision-making in restorative and endodontic practice.

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