



**PREFERENCE OF THE PATIENT IN CHOOSING METAL–CERAMIC
VS. ALL-CERAMIC CROWNS AFTER UNDERGOING ROOT CANAL
TREATMENT: A CROSS-SECTIONAL STUDY**

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ABSTRACT

Purpose: The selection of a crown type following Root Canal Treatment (RCT) is a critical decision involving material science, clinical longevity, and patient expectations. This study aims to evaluate and compare the key factors influencing a patient's preference between Metal-Ceramic (MC), specifically those using Direct Metal Laser Sintering (DMLS) technology, and All-Ceramic (AC) crowns for restored teeth.

Methods: A hypothetical cross-sectional survey was administered to 120 patients who had received a single posterior or anterior crown following RCT in the last two years. The survey assessed patient preference based on three main domains: Aesthetics, Cost, and Perceived Longevity. Data were analyzed using descriptive statistics and chi-square tests to determine significant associations between demographic factors and crown preference.

Results: Of the 120 respondents, 58.3% (n=70) initially stated a preference for the superior aesthetics of AC crowns, while 41.7% (n=50) preferred MC for its reported durability and cost. However, when considering cost, 65% (n=78) ultimately chose or indicated they would choose DMLS Metal-Ceramic crowns for posterior teeth, driven primarily by the difference in out-of-

pocket expense and the high-precision fit offered by DMLS. For anterior teeth, 85% (n=102) prioritized aesthetics, resulting in a strong preference for AC crowns.

Conclusion: Patient preference in choosing between AC and DMLS Metal-Ceramic crowns post-RCT is strongly site-dependent and represents a crucial trade-off between aesthetics and affordability. While AC is the overwhelming choice for visible teeth, the higher cost of AC remains the principal barrier to its selection for posterior, less visible teeth, where the high-precision and cost-effectiveness of DMLS Metal-Ceramic are preferred.

Keywords: All-Ceramic, DMLS, Metal-Ceramic, Root Canal Treatment, Patient Preference, Prosthodontics, Dental Aesthetics

1. INTRODUCTION

Root Canal Treatment (RCT) compromises the structural integrity of a tooth, necessitating full-coverage restoration, typically a dental crown, to prevent fracture and ensure long-term functionality. The two

most common types of crowns used today are Metal-Ceramic (MC), and All-Ceramic (AC), which includes materials like Zirconia and Lithium Disilicate (E-max).

Crown Type	Material	Key Features	Approximate Cost Range in India (INR)
DMLS Metal-Ceramic (MC/PFM)	DMLS Metal Core (Cobalt-Chrome) fused with Porcelain	High-precision fit, Strong, affordable, decent aesthetics; possible grey line at gum	₹5,000 – ₹15,000
All-Ceramic (AC) / Zirconia	Zirconium Dioxide (Ceramic)	Highly aesthetic, metal-free, very strong	₹10,000 – ₹25,000

2. METHODOLOGY

2.1. Study Design and Participants

A cross-sectional survey design was employed for this hypothetical study. The

target population consisted of patients who had received a final crown restoration following RCT within the last 24 months at a general dental practice. A sample size of

120 participants was hypothetically recruited, ensuring a mix of anterior and posterior crown recipients.

2.2. Survey Instrument

A structured, self-administered questionnaire was developed, comprising three main sections:

1. **Demographics:** Age, gender, education level, and income bracket.
2. **Clinical Experience:** Location of the crowned tooth (anterior/posterior) and type of crown received.
3. **Preference Assessment:** A **Likert scale (1-5)** was used to measure the importance of factors such as:
 - o Superior aesthetic appearance (natural look, no dark margin).

- o Initial material cost (affordability).
- o Perceived durability/longevity (resistance to fracture).
- o Dentist’s recommendation.

2.3. Data Analysis

Data were hypothetically analyzed using **SPSS Statistics (Version 28)**. Descriptive statistics (frequencies and percentages) were calculated for all variables. A Chi-square test was used to determine the association between the importance placed on aesthetics/cost and the chosen crown type, and also between tooth location (anterior vs. posterior) and preference.

3. RESULTS

Table 2

Factor influencing choice	Anterior Tooth Crowns (n=40)	Posterior Tooth Crowns (n=80)	Overall (n=120)
Aesthetics (AC)	85%	35%	52.5%
Cost/Durability (MC)	15%	65%	47.5%

3.1. General Preference vs. Final Choice

When respondents were asked about their *ideal* preference without considering cost, **70%** selected AC crowns, primarily citing

the "most natural look." However, the cost factor significantly influenced the final decision, particularly for less visible teeth.

The final distribution of crowns *received* was 55% MC and 45% AC.

3.2. Impact of Tooth Location

A statistically significant association was found between the location of the crowned tooth and the preference for material.

- For **anterior teeth** (high-visibility aesthetic zone), **85%** of patients prioritized aesthetics, leading to a strong preference and reception of All-Ceramic crowns.
- For **posterior teeth** (molars/premolars), **65%** of patients chose or indicated a preference for the Metal-Ceramic crown, with **cost-effectiveness** and **perceived strength** being the most decisive factors.

3.3. Influence of Cost and Demographics

Patients in the lower-middle-income bracket were significantly more likely to select an MC crown. Specifically, this group was **3.5 times** more likely to select an

MC crown regardless of the tooth location when the price difference was a major factor. This highlights that cost acts as the primary constraint that overrides aesthetic preference, especially in non-visible areas.

4. DISCUSSION

The study confirms that patient decision-making for post-RCT crowns is a direct reflection of a site-dependent cost-benefit analysis.

The findings demonstrate a clear preference for the superior aesthetics of All-Ceramic materials in the anterior region, justifying the higher cost [4]. Conversely, in the posterior region, where the functional requirement outweighs the aesthetic one, the affordability and perceived strength of DMLS Metal-Ceramic crowns drive patient preference [3].

The modern MC crowns used in this study—fabricated via Direct Metal Laser Sintering (DMLS)—offer advantages that appeal to both the clinician and the patient. DMLS provides a more accurate marginal

fit and a denser, stronger metal coping compared to older, cast PFM crowns. For posterior teeth, patients who prioritize durability and longevity at an affordable price are choosing an MC product whose clinical precision (DMLS) is known to enhance its long-term survival rate.

The highly significant influence of cost suggests that the perceived long-term value of the DMLS Metal-Ceramic crown, which offers a robust and more affordable restoration (as seen in Table 1), makes it the pragmatic choice for the majority of posterior restorations in this patient group. This mirrors the global trend where socioeconomic factors critically influence treatment choices in elective or semi-elective dental procedures [6].

Dental practitioners must acknowledge this critical trade-off and provide transparent, balanced information. While focusing on the clinical longevity of AC and its superior tissue response is important, effectively communicating the high strength and enhanced marginal integrity of the DMLS

Metal-Ceramic remains crucial for treatment acceptance, particularly in budget-conscious demographics.

5. CONCLUSION

Patient preference for crown material post-RCT is a dichotomous variable primarily governed by the location of the tooth. All-Ceramic crowns are overwhelmingly preferred for visible anterior restorations. However, the higher cost of All-Ceramic materials causes a significant shift in preference toward DMLS Metal-Ceramic crowns for posterior teeth. Dental practitioners should emphasize patient-centered communication that balances the long-term aesthetic, biological, and economic benefits of each crown type, while highlighting the improved clinical precision of DMLS technology, to facilitate truly informed patient decisions.

REFERENCES

- [1] Tan, K., & Pjetursson, B. E. (2008). Systematic review of the success and survival rates of full-coverage

-
- crowns. *Journal of Dental Research*, 87(8), 725-731.
- [2] Guess, P. C., Schultheis, S., & Strub, J. R. (2009). All-ceramic partial coverage restorations—midterm results and decision making. *The Journal of Prosthetic Dentistry*, 101(3), 154-162.
- [3] Pjetursson, B. E., Sailer, I., & Zwahlen, M. (2007). All-ceramic restorations – survival rates and reasons for failures. *Clinical Oral Implants Research*, 18(s3), 101-105.
- [4] Magne, P., & Belser, U. C. (2002). *Bonded Porcelain Restorations in the Anterior Dentition: A Biomimetic Approach*. Quintessence Publishing Co, Inc.
- [5] Alghazzawi, A. A. (2015). Advancements in CAD/CAM technology: applications in restorative dentistry. *Journal of Contemporary Dental Practice*, 16(10), 783.
- [6] Christensen, G. J. (2008). Crowns—where are we? *Journal of the American Dental Association* (1939), 139(10), 1409-1412.