

Current Clinical Practice and Attitudes Toward Cast Partial Dentures Among Dental Professionals in North Malabar Region of Kerala: A Questionnaire Survey

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Abstract

Cast partial dentures (CPDs) remain an important treatment option for the rehabilitation of partially edentulous patients. However, contemporary treatment preferences, increasing availability of alternative prosthetic modalities, patient-related factors, and clinician-related barriers may influence their utilization. The present study evaluated awareness, attitudes, treatment preferences, clinical utilization, and perceived barriers related to CPDs among dental professionals practicing in North Malabar region of Kerala. A descriptive cross-sectional questionnaire-based survey was conducted among 200 dental professionals. A structured 14-item questionnaire assessed professional

characteristics, commonly encountered patterns of partial edentulism, preferred rehabilitation modality, preferred type of removable partial denture, perceived patient acceptance, annual CPD utilization, reasons for patient refusal, clinician-related difficulties, factors influencing hesitation to recommend CPDs, and perceptions regarding undergraduate education. Data were analyzed using descriptive statistics and expressed as frequencies and percentages. Questions permitting more than one response were analyzed as multiple-response items. Sixty-four percent of respondents practiced in rural areas and 53.5% were general dental practitioners, while 18.5% were prosthodontists. Kennedy Class I was the most frequently reported pattern of partial edentulism

(51.0%). Removable partial dentures were the most commonly preferred rehabilitation modality (58.5%), while acrylic partial dentures were the most preferred RPD type (74.5%); CPDs were preferred by 11.0%. Nearly 70% of respondents reported delivering no CPDs during the preceding year. Procedural complexity was the most frequently reported reason for not recommending CPDs (73.5%), while cost was the most frequently perceived reason for patient refusal (56.5%). Lack of treatment planning was the most frequently reported clinician-related difficulty (60.0%). Overall, 96.5% of respondents reported hesitation in recommending CPDs, and 96.0% supported greater emphasis on CPD education during undergraduate training. The findings indicate low clinical utilization of CPDs in North Malabar, with procedural complexity, cost, treatment-planning difficulties, and laboratory-related concerns emerging as important perceived barriers. Strengthening undergraduate and continuing professional education in CPD diagnosis, treatment planning, framework design, and clinician-laboratory communication may facilitate appropriate utilization of CPDs.

Keywords: Cast Partial Denture, Dental Professionals, Partial Edentulism, Prosthodontic Education, Removable Partial Denture, Treatment Preference.

Introduction

Partial edentulism remains an important clinical condition encountered in routine dental practice. Replacement of missing teeth aims to restore function and aesthetics while maintaining the health and integrity of the remaining dentition and supporting tissues. Removable partial dentures (RPDs) remain an important treatment option for partially edentulous patients, particularly when fixed or implant-supported rehabilitation is unsuitable, financially inaccessible, contraindicated, or declined by the patient. Cast partial

dentures (CPDs) incorporate rigid frameworks with strategically positioned rests, direct retainers, connectors, and other components designed to provide support, stability, and retention. Appropriate treatment planning and framework design are therefore fundamental to fabricate a successful CPD.

The provision of RPDs is influenced by several factors extending beyond the clinical condition itself. Patient preferences, cost, treatment time, clinician experience, laboratory support, and confidence in treatment planning may influence the final treatment decision. A survey of dentists in the United Kingdom reported that the provision of partial dentures was influenced by patient-related and practice-related factors, including time and cost, with a reported divergence between knowledge and clinical practice.²

Changes in contemporary prosthodontic practice have increased the availability of implant-supported restorations, fixed prostheses, acrylic RPDs, and thermoplastic RPDs. These alternatives may influence clinicians' treatment preferences and patient expectations. An Indian questionnaire survey involving dental professionals reported substantial variation in treatment preferences and demonstrated differences between general dental practitioners and prosthodontists in their preferences for flexible dentures, CPDs, and implants.¹

Educational exposure may also influence clinical confidence. A survey of British dental schools demonstrated limited clinical experience with cobalt-chromium framework RPDs, with fewer such cases being treated compared with acrylic RPDs.³ This raises the possibility that reduced exposure during undergraduate education may subsequently influence clinicians' confidence in providing cast frameworks.

Although previous studies have investigated attitudes toward CPDs, regional data from Kerala remain limited. North Malabar includes dental practitioners working in both rural and urban settings and provides an appropriate setting for evaluating contemporary treatment preferences and barriers associated with CPD utilization. Therefore, the present study was undertaken to evaluate the awareness, attitudes, treatment preferences, clinical utilization, and perceived barriers related to cast removable partial dentures among dental professionals practicing in the North Malabar region of Kerala.

Aim

To evaluate the awareness, attitudes, and clinical utilization of cast partial dentures among dental professionals practicing in the North Malabar region of Kerala.

Objectives

1. To assess treatment preferences for rehabilitation of partially edentulous patients.
2. To determine the frequency of CPD utilization in clinical practice.
3. To identify clinician-related and laboratory-related difficulties associated with CPD delivery.
4. To assess dental professional's perceptions regarding the adequacy of undergraduate education in CPDs.

Materials and Methods

Study Design

A descriptive cross-sectional questionnaire-based survey was conducted among dental professionals practicing in the North Malabar region of Kerala, India.

Study Population

The study included dental professionals practicing in the North Malabar region, including general dental practitioners and specialists from various dental disciplines.

The respondents included professionals from general dental practice/BDS, Conservative Dentistry and Endodontics, Oral Medicine and Radiology, Oral and Maxillofacial Surgery, Oral Pathology, Orthodontics, Pediatric Dentistry, Periodontology, Prosthodontics, and Public Health Dentistry.

Sample Size and Sampling

A total of 200 dental professionals participated in the survey.

Sample size for the study was estimated using the proportion and the equation is given by $n = \frac{pq}{d^2}$ where, p is the proportion, q= 1-p, d is the precision and is the standard normal table value for the given confidence interval.

Considering a proportion of dental professionals who prefer CPD as 45.53% (Nithin Kumar et al) with an absolute precision of 7% and 95% confidence level, the minimum sample size required is

$n = 194$, which can be approximated to 200.

Questionnaire Development

A structured 14-item close-ended questionnaire was developed for the study.

The questionnaire assessed:

1. Years of professional experience
2. Area of practice
3. Professional specialization
4. Frequently encountered Kennedy classification
5. Preferred rehabilitation modality
6. Preferred type of RPD
7. Perception regarding acrylic/flexible RPDs as alternatives to CPDs
8. Reasons for not recommending CPDs
9. Perceived frequency of patient acceptance
10. Reasons for patient refusal
11. Number of CPDs delivered annually

12. Problems encountered during CPD delivery
13. Factors influencing hesitation to recommend CPDs
14. Perception regarding the importance of CPD education in the undergraduate curriculum

Questions addressing reasons, problems, or factors permitted multiple responses where applicable. Such questions were therefore analyzed as multiple-response items.

Data Collection

The questionnaire was distributed through google forms to dental professionals practicing in the North Malabar region. Participation was voluntary, and electronic informed consent was obtained before questionnaire completion.

Statistical Analysis

The statistical analysis will be performed by IBM SPSS. Categorical variables will be expressed as frequencies and percentages whereas continuous variables as mean standard deviation. Chi Square test will be used to find the significant association between the variables. A p value ≤ 0.05 will be considered as statistically significant.

Ethical Considerations

Ethical approval was obtained from the institution. Electronic informed consent was obtained from all participants before participation in the survey.

Results and Discussion

Demographic and Professional Characteristics

A total of 200 dental professionals participated in the survey. Sixty-four percent practiced in rural areas and 36.0% in urban areas. General dental practitioners constituted 53.5% of respondents, followed by prosthodontists (18.5%), Conservative Dentistry and Endodontics (9.5%), and Pediatric Dentistry (9.0%). The

largest proportion of respondents had 1–5 years of professional experience (44.5%).

Table 1: Demographic and Professional Characteristics

Variable	n	%
Area of practice		
Rural	128	64.0
Urban	72	36.0
Professional category		
General dental practitioner/BDS	107	53.5
Conservative Dentistry & Endodontics	19	9.5
Oral & Maxillofacial Surgery	12	6.0
Oral Pathology	1	0.5
Orthodontics	2	1.0
Pediatric Dentistry	18	9.0
Periodontology	4	2.0
Prosthodontics	37	18.5
Professional experience		
1–5 years	89	44.5
5–10 years	72	36.0
10–15 years	26	13.0
≥ 15 years	13	6.5

The predominance of general dental practitioners in the present survey is relevant when interpreting the findings because CPD treatment planning and framework design may vary according to professional training and clinical exposure.

Frequently Encountered Pattern of Partial Edentulism

Kennedy Class I was the most frequently reported pattern of partial edentulism (51.0%), followed by Class II (37.5%), Class III (15.0%), and Class IV (3.5%).

Table 2: Frequently encountered Kennedy classifications

Kennedy classification	n	%
Class I	102	51.0
Class II	75	37.5
Class III	30	15.0
Class IV	7	3.5

Preferred Rehabilitation Modality and Type of RPD

RPDs were the most frequently preferred rehabilitation modality for partially edentulous patients (58.5%), followed by fixed partial dentures (34.5%) and implants (7.0%).

Among RPD options, acrylic partial dentures were preferred by 74.5% of respondents, followed by flexible partial dentures (14.5%) and CPDs (11.0%).

Table 3: Treatment preferences

Treatment options	n	%
Preferred rehabilitation modality		
RPDs	117	58.5
FPDs	69	34.5
Implants	14	7.0
Preferred RPD type		
Acrylic partial denture	149	74.5
Flexible partial denture	29	14.5
Cast removable partial denture	22	11.0

The finding that RPDs remained the most frequently selected rehabilitation modality, while CPDs represented only a small proportion of RPD preferences, suggests that reduced CPD utilization does not necessarily indicate reduced utilization of removable prosthodontics overall. Instead, clinicians may be favoring simpler or less technique-intensive removable options.

These findings are broadly consistent with the Indian questionnaire survey by Sonnahalli et al., which demonstrated differences in treatment preferences among dental professionals and reported greater preference for flexible dentures among general dental practitioners compared with prosthodontists.¹

Perception of Acrylic and Flexible RPDs as Alternatives to CPDs

Seventy-seven percent of respondents considered acrylic or flexible RPDs acceptable alternatives to CPDs, whereas 23.0% did not. Among the reported reasons for not recommending CPDs, procedural complexity was the most frequent response (73.5%), followed by availability of alternative treatment options (20.5%) and the perception that acrylic or flexible RPDs were preferable (6.0%).

Table 4: Reasons for not recommending CPDs

Reason	n	%
Complexity of procedure	147	73.5
Availability of alternative treatment options	41	20.5
Acrylic/flexible RPDs considered preferable	12	6.0

Procedural complexity emerged as the dominant perceived barrier. CPD treatment requires systematic diagnosis, surveying, determination of the path of insertion, mouth preparation, framework design, laboratory communication, framework evaluation, and subsequent clinical adjustment. Reduced familiarity with this sequence may contribute to clinician hesitation.

Perceived Patient Acceptance

Patient acceptance of CPDs was perceived to be low. Fifty-five percent of respondents reported that patients accepted CPDs “very rarely,” while 42.5% reported “rarely.” Only 2.0% reported acceptance “quite often,” and 0.5% reported “very regularly.”

Table 5: Perceived patient acceptance of CPDs

Response	n	%
Very rarely	110	55.0
Rarely	85	42.5

Response	n	%
Quite often	4	2.0
Very regularly	1	0.5

These findings should be interpreted as clinicians' perceptions rather than direct measurements of patient attitudes. A separate patient-based study would be required to determine whether cost, aesthetics, comfort, treatment duration, awareness, or other factors directly influence patient acceptance

Annual CPD Utilization

Of the 200 respondents, 69.5% reported delivering no CPDs during the preceding year. Twenty-four percent reported delivering 1–5 CRPDs, 3.5% reported delivering 5–10, and 3.0% reported delivering more than 10 CPDs annually.

Table 6: Number of CPDs delivered annually

CRPDs/year	n	%
0	139	69.5
1–5	48	24.0
5–10	7	3.5
>10	6	3.0

The low annual utilization observed in the present study is noteworthy, particularly because distal-extension patterns were frequently reported. The findings suggest that CPDs may be underutilized within the surveyed professional population.

However, the cross-sectional design does not permit the conclusion that CPD utilization is declining over time. The present study therefore describes low reported utilization rather than a longitudinal decline.

Perceived Reasons for Patient Refusal

Cost was the most frequently reported reason for perceived patient refusal (56.5%), followed by procedural complexity (38.5%), aesthetic preferences (8.5%), and discomfort (5.0%).

Table 7. Perceived reasons for patient refusal of CPDs

Reason	n	%
Cost	113	56.5
Complexity of procedure	77	38.5
Aesthetic preferences	17	8.5
Discomfort	10	5.0

Note: Multiple responses were permitted; therefore, percentages do not total 100%.

Cost emerged as the most frequently perceived reason for patient refusal. Previous research has similarly identified cost, treatment time, and patient-related considerations as factors influencing the provision of removable partial dentures.²

Nevertheless, because the present study assessed patient refusal from the clinician perspective, these findings should not be interpreted as direct evidence of patient attitudes.

Problems Encountered During CPD Delivery

Lack of treatment planning was the most frequently reported clinician-related difficulty (60.0%), followed by communication with the dental laboratory (34.0%), visible metal components (12.0%), and limited interarch space (6.5%).

Table 8. Problems encountered during CPD delivery

Problem	n	%
Lack of treatment planning	120	60.0
Communication with laboratory	68	34.0

Problem	n	%
Visible metal components	24	12.0
Limited interarch space	13	6.5

Note: Multiple responses were permitted; therefore, percentages do not total 100%.

The prominence of treatment-planning difficulties highlights the importance of practical training in surveying, path of insertion, mouth preparation, rest-seat preparation, direct-retainer selection, major and minor connector design, and laboratory prescription.

Communication with the laboratory was the second most commonly reported problem. Successful CPD treatment requires close clinician–laboratory coordination, particularly during framework design and fabrication.

Factors Influencing Hesitation to Recommend CPDs

Overall, 96.5% of respondents reported hesitation in recommending CPDs. Cost consideration (45.6%) and procedural complexity (44.0%) were the most frequently identified factors, followed by laboratory errors (18.1%) and adjustment problems (14.5%).

Table 9: Factors influencing hesitation to recommend CPDs

Factor	n	%
Cost consideration	88	45.6
Complexity of procedure	85	44.0
Laboratory errors	35	18.1
Adjustment problems	28	14.5

Note: Multiple responses were permitted; therefore, percentages do not total 100%.

The findings indicate that hesitation toward CPD recommendation is multifactorial. Cost and procedural

complexity were the leading concerns, while laboratory and post-insertion adjustment issues were also reported.

Perception Regarding Undergraduate Education

Ninety-six percent of respondents indicated that greater emphasis should be given to CPDs during undergraduate dental education.

This finding is consistent with previous observations that undergraduate exposure to cobalt-chromium framework RPDs may be limited. Clark et al. reported reduced clinical experience with cobalt-chromium framework RPDs in British dental schools compared with acrylic RPDs.³ The high proportion of respondents supporting greater educational emphasis suggests a perceived need for strengthening both theoretical and practical CPD training.

Overall Discussion

The present study demonstrates low reported clinical utilization of CPDs among dental professionals in North Malabar despite the continued use of removable prosthodontic rehabilitation.

RPDs remained the most commonly preferred rehabilitation modality; however, acrylic partial dentures were substantially more commonly selected than CPDs. Only 11.0% of respondents preferred CPDs. This may reflect the influence of treatment complexity, cost, patient expectations, laboratory support, and clinician confidence.

The findings are broadly comparable with previous surveys demonstrating variation in RPD treatment preferences among dental professionals. Sonnahalli et al. reported differences between general dental practitioners and prosthodontists in their preferences for flexible dentures, CPDs, and implants.¹

Nearly 70% of the present respondents reported delivering no CPDs during the preceding year. This finding suggests low utilization within the surveyed

population. However, because the study is cross-sectional and does not contain historical utilization data, it cannot establish a temporal decline in CPD use.

Procedural complexity was the most frequently reported reason for not recommending CPDs. This may be related to the multiple clinical and laboratory stages required for successful CPD treatment. Treatment planning was also the most frequently reported clinician-related difficulty, indicating that the barriers may involve both knowledge and practical workflow.

Patient-related factors were also prominent. Cost was the most frequently perceived reason for patient refusal, while aesthetic concerns and discomfort were reported less frequently. Previous research has similarly identified cost, time, and patient preferences as factors influencing partial denture provision.²

The present findings should not be interpreted as evidence that acrylic or flexible RPDs are inherently inferior or that CPDs should replace other treatment options. Each prosthetic modality has specific indications, advantages, limitations, and clinical considerations. Treatment selection should therefore remain individualized and based on biological, biomechanical, functional, aesthetic, financial, and patient-related factors.

The study highlights the potential value of strengthening clinical education in diagnosis, surveying, treatment planning, framework design, mouth preparation, impression procedures, laboratory communication, and framework evaluation. Improved training and continuing professional education may help clinicians make more informed and case-appropriate decisions regarding CPD as a treatment modality.

Conclusion

The present survey demonstrates low clinical utilization of cast removable partial dentures among dental

professionals in the North Malabar region of Kerala, despite the continued relevance of removable prosthodontic rehabilitation.

Although RPDs were the most frequently preferred rehabilitation modality, acrylic partial dentures were substantially more commonly selected than CPDs. Nearly 70% of respondents reported delivering no CPDs during the preceding year. Procedural complexity, cost, inadequate treatment planning, and laboratory-related concerns were prominent perceived barriers to CPD recommendation and delivery.

The finding that 96% of respondents supported greater emphasis on CPD education during undergraduate training suggests that educational exposure and clinical confidence may be important considerations in contemporary CPD utilization.

Rather than indicating obsolescence of CPDs, these findings highlight the need for appropriate case selection, improved treatment-planning skills, greater clinical exposure, enhanced laboratory communication, and stronger undergraduate and continuing professional education. Addressing these factors may help ensure that CPDs remain appropriately integrated within the contemporary spectrum of treatment options for partially edentulous patients.

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