

Attitude of dental professionals toward cast partial denture: A questionnaire survey in India

Nithin Kumar Sonnahalli, Sunil Kumar Mishra¹, Ramesh Chowdhary

Department of Prosthodontics, Rajarajeswari Dental College and Hospital, Bengaluru, Karnataka, ¹Department of Prosthodontics, People's College of Dental Sciences and Research Centre, Bhopal, Madhya Pradesh, India

Abstract

Aims: The use of cast partial dentures (CPDs) has been decreased and its importance has been declined in the teaching curriculum. The purpose of this survey was to evaluate the attitudes of dental professionals toward conditions using CPDs in private practice in India.

Settings and Design: Descriptive survey

Materials and Methods: This survey consists of eight close-ended questions concerning the use of CPD by dental professionals practicing in India. The URLs of the questionnaire were shared via E-mail to dentists practicing throughout India, to obtain a response of 384 which is a predetermined sample size.

Statistical Analysis Used: Statistical analysis was done using counts and percentages and the results were further analyzed statistically by the Chi-square test.

Results: Nearly 42.79% of general dental practitioners (GDPs), 47.26% of prosthodontists, and 9.95% of other specialist dentists responded to the questionnaire. GDPs mostly preferred removable partial dentures (RPDs) (71.87%) and fixed partial dentures (57.22%), whereas prosthodontists preferred mostly implant (60.91%). GDPs mostly preferred flexible dentures (62.42%), whereas prosthodontists preferred CPDs 62.84%. Almost 52.50% of the GDPs mostly raised a cost issue and 63.11% of the prosthodontists had difficulty in adjustment with CPDs. Nearly 63.46% of the dentists told that implant-supported restorations are better options compared to CPDs; still, majority of the dentists (53.23%) were in favor that more importance for teaching CPDs in graduation curriculum should be given.

Conclusions: This survey shows that in India a significant proportion of GDPs (71.87%) preferred RPDs, mostly flexible dentures (62.42%) due to their low cost compared to CPDs. Prosthodontists mostly preferred implants (60.91%) because they are more confident and better trained in these. It is recommended that more importance be given in teaching implants along with CPDs in graduation curriculum so that practitioners can better educate their patients about implants and their advantages over flexible dentures and their utilization in cases where patients are not willing for CPDs.

Keywords: Attitude, cast partial denture, dental implants, dentist, flexible denture

Address for correspondence: Dr. Ramesh Chowdhary, Department of Prosthodontics, Rajarajeswari Dental College and Hospital, Bengaluru - 560 074, Karnataka, India.

E-mail: drramc@yahoo.com

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INTRODUCTION

As the population ages, there is an increased proportion of partially edentulous individuals.^[1] A traditional way of rehabilitation of these partially edentulous conditions was using cast partial dentures (CPDs).^[2] However, the patient acceptance of CPDs is very poor; many studies have shown that 35%–50% of patients received removable partial dentures (RPDs) never or only occasionally wore the dentures.^[3,4] RPDs have low functional, esthetic, and psychological value because of the metal clasps and the design of the denture.^[5]

The current trends in teaching RPDs in dental schools are declining; a national average of only ten RPDs were made in 3 years of graduate prosthodontic course in US dental schools.^[6] In most of the British dental schools, the number of RPDs required to graduate is only one.^[7] Rashedi and Petropoulos stated that in 14% of the US dental schools, RPDs were not a separate course in preclinical curriculum and in 18% of the schools, RPDs was not a requirement for graduation.^[8]

This decline in the use of RPD is attributed to the availability of better treatment modalities such as implant-supported prosthesis.^[9] The use of thermoplastic RPDs (flexible RPD) emerged as an alternative to conventional RPDs because of their unbreakable nature, esthetics, and comfort.^[10] In a survey by Polyzois *et al.*, it was reported that 75% of the patients who received flexible RPDs were satisfied.^[5]

With the decrease in the use of conventional RPDs and its limited importance in the teaching curriculum, we aimed to find the status of RPDs in private practice in India through this survey.

MATERIALS AND METHODS

An English-language questionnaire was created online (www.surveymonkey.com) concerning the use of CPD by dental professionals practicing in India. The participants included in the survey were dental practitioners irrespective of whether they are general dental practitioners (GDPs) or specialists. The URLs of the questionnaire were created and shared via E-mail to 1000 dentists practicing throughout India, to obtain a response of 384 which is a predetermined sample size. The sample size calculation was based on a 5% margin of error and 95% confidence level with an estimated response rate of 40%, which would provide a power of at least 80 using statistical software (G*Power v. 3.1.5, Faul,

Erdfelder, Buchner and Lang, Heinrich Heine University, Düsseldorf, Germany).

The created online descriptive survey had eight close-ended questions [Table 1] with the beginning message of the aim of the survey. All questions were made mandatory with only one response from one device. The first three questions (Q01–Q03) were related to the preference of RPDs, types of RPDs, and how frequent patients prefer it. The next two questions (Q04 and Q05) were related to the number of CPDs given to patients and type of problems faced. The next three questions (Q06 and Q08) were on justification of other RPDs as alternative to CPDs, reason for not recommending CPDs, and finally whether CPDs should be recommended ahead of implant for dental graduates. The survey was carried out in June–July 2019 for over a period of 45 days. Three reminder E-mails were sent to collect the required number of responses.

Statistical analysis was done using counts and percentages and the results were further analyzed statistically by the Chi-square test. The data were analyzed using the Statistical Package for the Social Sciences statistical software (IBM SPSS Statistics for Windows, Version 20.0. IBM Corp., Armonk, NY, USA). As the present study is a computer-aided survey, sometimes also erroneously referred to as a doubleblind trial, the software will not cause any type of bias between the researcher and the participant.

RESULTS

A total of 402 dentists responded, out of which 42.79% (172/402) were doing general practice, 47.26% (190/402) were prosthodontists, and 9.95% (40/402) were other specialist dentists in private practice. The respondents were having an experience of clinical practice ranging from 3 years to 36 years. The responses to the questionnaire are presented in Table 2.

Out of the 402 dentists, 7.96% of dentists (32/402) preferred RPDs, 43.03% of dentists (173/402) preferred fixed partial dentures (FPDs), and 49.01% of dentists (197/402) preferred implants to rehabilitate partially edentulous patients. GDPs mostly preferred RPDs (71.87% [23/32]) and FPDs (57.22% [99/173]) and prosthodontists mostly preferred implants (60.91% [120/197]). The difference was statistically significant for the choice of RPDs ($P = 0.0021$), FPDs ($P = 0.0039$), and implants ($P = 0.00007$) among GDPs, prosthodontists, and other specialists.

When the question of if you have to choose RPDs, what type of RPDs you would prefer? was asked,

Table 1: Questionnaire concerning the use of cast partial denture by Indian dentists

Question numbers (Q)	Question	Choice of responses
Q1	Preference for rehabilitation of partially edentulous patients in your clinical practice	1. RPDs 2. FPDs 3. Implants
Q2	If you have to choose RPDs, the type of RPDs you prefer?	1. CPDs 2. Acrylic treatment partial denture 3. Flexible partial dentures
Q3	If CPDs is the choice, how often does the patient agrees?	1. Very rarely 2. Rarely 3. Quite often 4. Very regularly
Q4	Number of CPDs delivered per year in your clinic practice?	1. 0 2. 1-5 3. 5-10 4. >10
Q5	Major problems faced while suggesting CPDs to the patients?	1. Fabrication 2. Cost 3. Fracture 4. Adjustment
Q6	Do you feel is it justifiable to give acrylic or flexible RPDs as an alternative to CPDs?	1. Yes 2. No
Q7	If CPDs are not the option to Q6, then what is the reason for not recommending CPDs?	1. Too complicated procedure to be carried out 2. Availability of better treatment options such as implant-supported restorations 3. Acrylic or flexible RPDs are better options to CPDs
Q8	Do you recommend giving more importance for teaching CPDs in graduation curriculum when compared to implant-supported treatment modalities?	1. Yes 2. No

RPDs: Removable partial dentures, FPDs: Fixed partial dentures, CPDs: Cast partial dentures

45.53% (183/402) of the dentists choose CPDs, 17.41% (70/402) opted for acrylic treatment partial dentures, and 37.06% (149/402) of dentists opted for a flexible denture. Prosthodontists generally preferred CPDs (62.84% [115/183]) and acrylic treatment partial dentures (44.29% [31/70]), whereas flexible dentures were mostly preferred by GDPs (62.42% [93/149]). The difference was statistically significant for the choice of CPDs ($P = 0.0002$) and flexible dentures ($P = 0.00047$), whereas it was insignificant for acrylic treatment partial dentures ($P = 0.906$) among the GDPs, prosthodontists, and other specialists.

When dentists were asked that if CPDs are the option, how often does the patient agree for it? 383 dentists responded to this question, and it was found that 26.63% (102/383) of patients agreed very rarely for CPDs, 52.74% (202/383) agreed rarely, 18.28% (70/383) agreed quite often, and only 2.35% (9/383) agreed very regularly for CPDs. GDPs mostly found that patients very rarely agreed for CPDs (57.84% [59/102]), and this difference was statistically significant ($P = 0.0039$). Prosthodontists found that patients regularly agreed for CPDs (66.66% [6/9]), but the difference was statistically insignificant ($P = 0.409$).

When asked about the number of CPDs delivered per year in clinical practice, 34.08% (137/402) of the dentists

reported that they did not give CPDs in their practice, 46.27% (186/402) of the dentists had given 1–5 CPDs, 9.45% (38/402) of dentists had given 5–10 CPDs, and 10.20% (41/402) of dentists had given more than 10 CPDs per year. Mostly GDPs (55.47 [76/137]) had never given CPDs in their clinical practice, and this difference was statistically significant ($P = 0.0134$). Mostly prosthodontists (75.61% [31/41]) had given more than 10 CPDs per year, and it was statistically significant ($P = 0.0006$).

When asked about the different problems related to CPDs, 389 dentists responded to this question, and it was found that 21.60% (84/389) of the dentists had a problem with fabrication, 41.13% (160/389) of the dentists reported a problem with the cost, 5.91% (23/389) of the dentists had a problem of denture fracture, and 31.36% (122/389) of the dentists found difficulty in adjusting the dentures. Surprisingly, mostly prosthodontists found difficulty in fabrication (40.48% [34/84; $P = 0.852$]) and fracture (47.82 [11/23; $P = 0.712$]) of CPDs, but this difference was statistically insignificant. Mostly GDPs raised a cost issue (52.50 [84/160; $P = 0.049$]) and prosthodontists (63.11% [77/122; $P = 0.043$]) had difficulty in adjustment with CPDs, and this difference was statistically significant.

Table 2: Responses by the dental professionals participated in the survey

Question number	Questionnaire	All			GDPs, n (%)	Prosthodontists, n (%)	Other specialists, n (%)	P (<0.05)
		n (%)	95% CI					
			Lower	Upper				
1	Preference for the rehabilitation of partially edentulous patients in your clinical practice	402			172 (42.79)	190 (47.26)	40 (9.95)	
a	RPDs	32 (7.96)	5.4	10.03	23 (71.87)	7 (21.88)	2 (6.25)	0.0021*
b	FPDs	173 (43.03)	38.27	47.87	99 (57.22)	63 (36.42)	11 (6.36)	0.0039*
c	Implants	197 (49.01)	44.11	53.71	50 (25.38)	120 (60.91)	27 (13.71)	0.00007*
2	If you have to choose RPDs, the type of RPDs you would prefer?	402			172 (42.79)	190 (47.26)	40 (9.95)	
a	CPDs	183 (45.53)	40.4	50.12	50 (27.33)	115 (62.84)	18 (9.83)	0.0002*
b	Acrylic treatment partial dentures	70 (17.41)	13.85	21.18	29 (41.42)	31 (44.29)	10 (14.29)	0.906
c	Flexible partial dentures	149 (37.06)	32.53	41.93	93 (62.42)	44 (29.53)	12 (8.05)	0.00047*
3	If CPDs are the option, how often does the patient agree for CPDs	383			162 (42.30)	181 (47.26)	40 (10.44)	
a	Very rarely	102 (26.63)	22.42	31.02	59 (57.84)	33 (32.35)	10 (9.80)	0.0039*
b	Rarely	202 (52.74)	57.67	47.67	88 (43.56)	98 (48.51)	16 (7.92)	0.985
c	Quite often	70 (18.28)	14.52	22.12	12 (17.41)	44 (62.86)	14 (20)	0.0003*
d	Very regularly	9 (2.35)	0.89	3.69	3 (33.33)	6 (66.66)	0	0.409
4	Number of CPDs delivered per year in your clinic practice?	402			172 (42.79)	190 (47.26)	40 (9.95)	
a	0	137 (34.08)	28.98	38.18	76 (55.47)	47 (34.31)	14 (10.22)	0.0134*
b	1-5	186 (46.27)	41.92	51.52	70 (37.63)	99 (53.23)	17 (9.14)	0.189
c	5-10	38 (9.45)	6.69	12.29	19 (50)	13 (34.21)	6 (15.79)	0.198
d	>10	41 (10.20)	7.32	13.12	7 (17.07)	31 (75.61)	3 (7.32)	0.0006*
5	Major problems faced while suggesting CPDs to the patients?	389			163 (41.90)	188 (48.33)	38 (9.77)	
a	Fabrication	84 (21.60)	17.6	25.68	28 (33.33)	34 (40.48)	22 (26.19)	0.852
b	Cost	160 (41.13)	36.24	45.84	84 (52.50)	66 (41.25)	10 (6.25)	0.049*
c	Fracture	23 (5.91)	3.67	8.27	8 (34.79)	11 (47.82)	4 (17.39)	0.712
d	Adjustment	122 (31.36)	26.84	35.84	43 (35.25)	77 (63.11)	2 (1.64)	0.043*
6	Do you feel it is justifiable to give acrylic or flexible RPDs as an alternative to CPDs?	402			172 (42.79)	190 (47.26)	40 (9.95)	
a	Yes	224 (55.72)	50.9	60.52	106 (47.32)	93 (41.52)	25 (11.16)	0.192
b	No	178 (44.28)	39.73	48.81	66 (37.08)	97 (54.49)	15 (8.43)	0.134
7	If CPDs are not the option to Q6, then what is the reason for not recommending CPDs?	364			151 (41.48)	175 (48.08)	38 (10.44)	
a	Too complicated procedure to be carried out	37 (10.17)	23.36	29.36	15 (40.54)	16 (43.24)	6 (16.22)	0.825
b	Availability of better treatment options such as implant-supported restorations	231 (63.46)	48.04	57.84	99 (42.86)	122 (52.81)	10 (4.33)	0.725
c	Acrylic or flexible RPDs are better options to CPDs	96 (26.37)	42.56	51.56	37 (38.54)	37 (38.54)	22 (22.92)	0.566
8	Do you recommend giving more importance for teaching CPDs in graduation curriculum when compared to implant-supported treatment modalities?	402			172 (42.79)	190 (47.26)	40 (9.95)	
a	Yes	214 (53.23)	48.14	57.74	96 (44.86)	105 (49.07)	13 (6.07)	0.955
b	No	188 (46.77)	42.26	52.49	76 (40.43)	85 (45.21)	27 (14.36)	0.947

*Statistically significant ($P < 0.05$). RPDs: Removable partial dentures, FPDs: Fixed partial dentures, CPDs: Cast partial dentures, CI: Confidence interval of proportion, GDPs: General dental practitioners

When asked whether acrylic or flexible partial dentures is an alternative to CPDs, 55.72% (224/402) of the dentists justified acrylic or flexible partial dentures as an alternative to CPDs. A total of 178 (44.28%) dentists did not agree with giving acrylic or flexible RPDs. Mostly GDPs (47.32% [106/224; $P = 0.192$]) agreed for giving acrylic or flexible partial dentures as an alternative, but most of the prosthodontists (54.49% [97/178; $P = 0.134$]) disagree with it. The differences found were statistically insignificant.

When asked for the reason for not recommending CPDs, 364 dentists responded to the question; 63.46% (231/364)

of the dentists told that implant-supported restorations are better options compared to CPDs, but still, majority of the dentists (53.23% [214/402]) were in favor that more importance for teaching CPDs in postgraduation curriculum should be given.

DISCUSSION

The functional and esthetic rehabilitation of partially edentulous patients with missing single teeth to multiple teeth includes a range of treatment options such as provisional removable partial dentures, a definitive CPDs,

a resin-bonded prosthesis, FPDs, or implant-supported prosthesis.^[11]

The conventional RPDs were the most commonly used treatment mode for rehabilitating partially edentulous patients.^[12] However, the patient acceptance rate is very poor, and many studies reported an increased incidence of caries and periodontal breakdown when RPDs were worn.^[3,4,13,14] This apparent poor compliance with wearing RPDs, together with their potential to generate an additional long-term treatment need, represents a considerable potential waste of resource.^[12]

In the present study, we investigated the use of CPDs by Indian dental professionals. With the availability of various treatment options for rehabilitation of partially edentulous patients, in this study, majority of the dentists preferred FPDs (43.03%) or implant-supported prosthesis (49.01%) and only 7.96% of dentists preferred RPDs. Dissatisfaction with RPDs therapy was related to the position of tooth replaced (anterior esthetic requirements), patient age, and prior RPDs experience.^[15,16] Similar results were obtained in a study by Dikbas *et al.* where in 18% of US dental schools, RPDs were not a clinical requirement for graduation, which could be attributed to the increased interest toward implants with high success rates.^[6]

In the present survey, GDPs mostly preferred RPDs (71.87% [23/32]) and FPDs (57.22% [(99/173)]) and prosthodontists mostly preferred implants (60.91% [120/197]). Similar result was obtained in a study by Nagpal *et al.* where it was found that dentists' knowledge and attitude toward dental implants was maximum in postgraduate prosthodontists compared to GDPs.^[17] Similar results were obtained in a study conducted by Maalhigh-Fard *et al.* which showed that a stronger positive correlation with offering and restoring implants was seen in graduates who had completed the elective program in implant dentistry.^[18] A study conducted by Eckert *et al.* showed that most prosthodontists used implant-supported prosthesis in their practice.^[19]

Sometimes, RPDs serve to be the treatment of choice because of some anatomical, cost, and other patient factors.^[11] A removable partial denture can be of acrylic treatment partial denture, CPD, or flexible denture.^[5] In the present survey, 45.53% of dentists preferred CPDs maybe because of the theoretical belief that these are the better choices.

There is an increase in the use of flexible dentures (37.06%), and 55.72% of the dentists justified giving flexible

dentures over CPDs. These flexible dentures have better patient acceptance, are comfortable, and are also functionally and esthetically better than CPDs at a low cost.^[20-22] Prosthodontists generally preferred CPDs (62.84% [115/183]), whereas flexible dentures were mostly preferred by GDPs (62.42% [93/149]). GDPs found that patients very rarely agreed for CPDs (57.84%), whereas prosthodontists found that patients regularly agreed for CPDs (66.66%). This is also reported by Hill *et al.* as specialists had a negative opinion about flexible dentures and more GDPs compared to specialists prescribe flexible prostheses in their clinical practice, the reason of which may be that there is a lack of enough clinical evidence for the use of flexible dentures.^[23] Pun *et al.* also found that there was less preference for flexible RPDs (5.2% [46/892]) compared to CPDs (66.8% [596/892]) in Eastern Wisconsin.^[24]

GDPs mostly reported raised cost of CPDs as the major issue (52.50 [84/160]) for not preferring them in the present survey. Similar result was found by Allen *et al.* in their survey in England, where majority of the GDPs agreed that the gross national health service (NHS) fee for a RPDs is not feasible and in fact is a disincentive to providing cobalt chrome RPDs.^[12]

In the present survey, when asked for the reason of not recommending CPDs, 63.46% (231/364) of the dentists told that implant-supported restorations are better options compared to CPDs, but still, majority of the dentists (53.23% [214/402]) were in favor that more importance for teaching CPDs in postgraduation curriculum should be given.

Although GDPs did not follow much implants in their clinical practice, still they are in favor of it. The reason for this may be lack of training courses and that patients' economic status led to poor implant results and a negative attitude for the same among GDPs. Training in the field of implants is an added factor that may enhance the knowledge, provide a good attitude, and increase the practice of implants. Those who have received implant training obviously have an edge over those who did not with regard to the knowledge, attitude, and results.^[25]

CONCLUSIONS

Within the limitations of the present survey, the following conclusions were drawn:

1. In India, GDPs (71.87%) prefer RPDs, mostly flexible dentures (62.42%) due to their low cost compared to CPDs

2. Prosthodontists mostly prefer implants (60.91%) because they are more confident and better trained in these
3. It is recommended that more importance in teaching implants along with CPDs in graduation curriculum be given so that practitioners can better educate their patients about implants and their advantages over flexible dentures and their utilization in cases where patients are not willing for CPDs.

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Conflicts of interest

There are no conflicts of interest.

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