

Removable partial dentures: Patterns and reasons for demand among patients in a teaching hospital in southwestern Nigeria

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ABSTRACT

Background: Removable partial denture (RPD) is a versatile, cost-effective, and reversible treatment method for replacing missing teeth in partially edentulous patients. It serves the purpose of improving patients' appearance, speech, mastication, confidence, and psychological well-being. **Aims:** Determining the patterns and reasons for demand of RPDs, including their relation to the socio-economic status among patients attending a teaching hospital dental center. **Settings and Design:** A retrospective study. **Materials and Methods:** Records of partial denture patients who attended the prosthetic dental clinic of the University College Hospital, Ibadan between January 2006 and December 2010 were retrieved. Information obtained included demographic data, occupation, and type of partial edentulous arch based on Kennedy classification. **Statistical Analysis Used:** Data were analyzed using SPSS version 20. Level of significance was set at $P \leq 0.05$. Frequency and means were used for continuous variables, while Chi-square was used for categorical variables. **Results:** Nine hundred and sixty-three patients in the age range of 7-99 years and a mean of 45.1 ± 18.9 years were given RPDs during the period; 37% of the patients were young adults (21-40 years), 51.7% were male, and 31.9% were civil servants. Aesthetics was the main reason (60.2%) for seeking RPD and was statistically significant in relation to age group ($P = 0.00$). Majority [525 (54.5%)] demanded for maxillary RPD. There was increase in demand for both upper and lower dentures among the older age groups ($P = 0.00$). Majority (56.9%) of the dentures demanded were for Kennedy class III edentulous arches. **Conclusions:** Kennedy class III dentures were the highest in demand than any other class both in the maxilla and mandible, and the main reason for RPDs was aesthetics.

KEYWORDS: Denture demand, Kennedy classification, removable partial denture

Introduction

Removable partial denture (RPD) is a versatile, cost-effective, and reversible treatment method for replacing missing teeth in partially edentulous patients. Other options include conventional fixed partial dentures, resin-bonded fixed partial dentures, and implant-retained prosthesis.^[1] In low socio-economic areas, provision of acrylic resin-based RPDs is preferred to cobalt-chromium-based RPDs because they are more affordable for patients.^[2]

Also, the likelihood of further tooth loss often prompted the provision of an acrylic resin-based RPD because the prosthesis could be altered easily should further tooth loss occur.^[3] The simple technology involved in fabrication of acrylic dentures makes it a popular option in developing countries.

The most important reason why patients seek prosthetic replacement of missing teeth is to improve their appearance.^[3,4] Other reasons include the restoration of speech, mastication, confidence, and psychological well-being.

For easy communication among dental colleagues, students, technicians, and dental technologies, partially edentulous arches have been divided into classes.^[5,6] The most widely used classification was postulated by Kennedy in 1923,^[5-7]

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in which partially edentulous mouth was classified into four classes:

- Class I: Bilateral edentulous area located posterior to the remaining natural teeth
- Class II: Unilateral edentulous area located posterior to the remaining natural teeth
- Class III: Unilateral edentulous area with natural teeth anterior and posterior to it
- Class IV: Single anterior edentulous area, which crosses the midline of the arch, with remaining teeth located only posterior to it.

Previous studies^[7-9] have shown varying patterns of demand for RPDs. Osborne and Lammie^[7] reported Kennedy class I, Sadiq and Idowu^[8] reported Kennedy class III, and Bassey^[9] reported Kennedy class IV as the commonest edentulous arches for which patients demand teeth replacement.

Although the effect of age and sex on the demand for RPDs has been investigated,^[10] the influence of social status on the pattern of demand and the major reason for demanding for dentures are yet to be investigated in our environment.

This study was, therefore, designed to determine the patterns and reasons for demand for RPDs, including their relation with socio-economic status among patients attending a university teaching hospital dental center. This will enable the establishment of a database of RPD treatment and provide clinically useful information for dental training and continuing education.

Materials and Methods

The records of partial denture patients who attended the prosthetic dental clinic of the University College Hospital, Ibadan between January 2006 and December 2010 were reviewed. Information on the demographic data including the occupation, type of partial edentulous arch based on Kennedy classification, numbers of teeth replaced, and reasons for demanding for RPDs were obtained from their records. Patients were classified according to their profession into executive manager, civil servant, semi-skilled workers, unskilled, students and unemployed, and retiree/pensioners using the modified classification of socio-economic strata devised by Famuyiwa *et al.*^[11] Patients with palatal or mandibular defect and those who demanded for fixed and complete dentures were excluded. Data were analyzed using SPSS version 20. Frequency, percentages, and means were used for continuous variables, while Chi-square was adopted for categorical variables. Statistical significance was set at $P \leq 0.05$. The data are presented in frequency tables and figures.

Results

Nine hundred and sixty-three patients were given RPDs during the period. The age range of the patients was between 7 and 99 years, with a median age of 44 years and a mean of

45.1 ± 18.9 years. Majority (37.2%) of the patients were young adults (21-40 years), while the lowest percentage (8.1%) was of children and adolescents (≤ 20 years). Majority (51.7%) of the patients were male [Table 1].

Majority [307 (31.9%)] of the patients were civil servants, while the lowest percentage [39 (4%)] was of executive officers [Table 2]. Aesthetics was the main reason (60.2%) for seeking RPD [Figure 1] and was statistically significant in relation to age group with the highest number of patients having aesthetics as the major reason found in the younger age group (21-40 years) [Figure 1] ($P = 0.00$).

Majority of the patients [525 (54.5%)] needed maxillary RPD only, while 166 (17.2%) needed mandibular RPD only and 272 (28.2%) opted for both maxillary and mandibular RPD. Patients of all age groups demanded for maxillary dentures more than mandibular dentures. Proportion of upper to lower dentures reduced with increase in age [Figure 2]. There was a statistically significant increase in demand for both upper and lower dentures among the older age groups ($P = 0.00$).

Table 3 shows that the demand for Kennedy class III was the commonest in both maxilla [485 (60.9%) accounting

Table 1: Age and gender distribution of the patients

Age range, years	Gender				Total	
	Male		Female		n	%
	n	%	n	%		
≤20	51	5.30	27	2.80	78	8.10
21-40	208	21.60	151	15.68	359	37.28
40-64	149	15.47	196	20.35	345	35.82
≥65	90	9.34	91	9.45	181	18.80
Total	498	51.71	465	48.29	963	100

Table 2: Frequency distribution of patients according to their profession

	n	%
Executive	39	4
Civil servant	307	31.9
Semi-skilled workers	68	7.1
Unskilled	175	18.2
Students and unemployed	187	19.4
Pensioners	159	16.5
Not stated	28	2.9
Total	963	100

Table 3: Distribution of dentures demanded for according to Kennedy classification

Kennedy classification	Maxillary				Mandibular				Total	
	No mod	Mod	Subtotal		No mod	Mod	Subtotal		n	%
			n	%			n	%		
Class II	22	30	52	4.2	23	20	43	3.5	95	7.7
Class III	340	145	485	39.3	124	94	218	17.7	703	57.0
Class IV	207	-	207	16.7	106	-	106	8.6	313	25.3
Total	585	212	797	64.5	288	150	438	35.5	1235	100

Mod = Modification

for 39.3% of all the prostheses] and mandible [218 (49.8%) accounting for 17.7% of all the prostheses] among the patients, while the demand for Kennedy class I dentures was the least in both maxilla [52 (6.5%;4.2% of total)] and mandible [43 (9.8%;3.5% of total)].

The central incisors were the most commonly replaced teeth in the maxilla [899 (23%)] and mandible [460 (11.8%)], followed by lateral incisors [441 (11.3%)] and [310 (7.9%)] in the maxilla and mandible, respectively. The canines were the least replaced teeth in both jaws (4.6% and 3.5% in the maxilla and mandible, respectively) [Table 4]. The incisors (central and lateral) accounted for more than 50% of the teeth replaced in both upper and lower arches.

Discussion

The gender distribution of the patients in this study is in agreement with previous studies in our environment, with males demanding for removable denture more than females.^[4,9,10] However, this is contrary to the report of Arigbade and Taiwo^[12] who found higher female distribution. This could be because males are more prone to tooth loss than females due to poor attitude toward oral health and the fact that they participate more in sport and other activities that could lead to loss of teeth. The predominance of young adults (21-40 years) in this study also is in agreement with previous studies.^[4,9,10] Young adults are more likely to request for replacement

of missing teeth than the elderly because they are more socially conscious.

Majority of the patients seen in the study were civil servants, while executive officers were the least in number. The possible reason could be that the executives are able to keep their teeth healthy through maintenance of good oral hygiene or were able to afford conservative treatment such as tooth filling or root canal therapy instead of extraction of diseased teeth. It could also be due to the fact that they were able to afford other options of replacement such as implant or bridge.

The demand for more maxillary dentures is in agreement with a previous study^[7] and could be due to the maxillary anterior teeth being more prone to trauma than the mandibular teeth. However, as patients advance in age, the effects of periodontal diseases become more prominent and this affects both upper and lower teeth, hence the significant demand for both upper and lower RPDs in the elderly found in this study.

Kennedy class III was the most common edentulous space in this study followed by Kennedy class IV. This is in agreement with previous studies,^[8,13] but contrary to the report by Osborne and Lammine^[7] and Kefy^[14] who stated that Kennedy class I and II were the most edentulous spaces. The predominant demand for Kennedy class III and IV dentures could be attributed to the need to restore

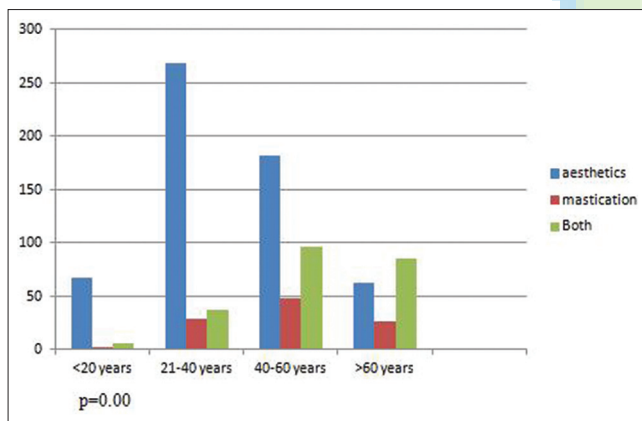


Figure 1: Reasons for replacement in relationship to the age groups

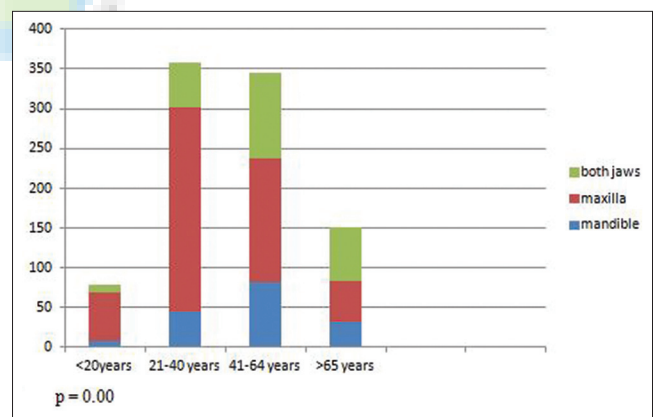


Figure 2: Distribution of the types of RPDs demanded

Table 4: Distribution of types of teeth replaced

Teeth replaced	Maxillary			Mandibular			Total	
	Right (n)	Left (n)	Subtotal n (%)	Right (n)	Left (n)	Subtotal n (%)	n	%
Central incisor	438	461	899 (23.03)	226	234	460 (11.78)	1359	34.81
Lateral incisor	219	222	441 (11.30)	147	163	310 (7.94)	751	19.24
Canine	81	82	163 (4.17)	63	60	123 (3.15)	286	7.32
1 st Premolar	88	93	181 (4.64)	64	63	127 (3.25)	308	7.89
2 nd Premolar	90	80	170 (4.36)	83	64	147 (3.76)	317	8.12
1 st Molar	120	115	235 (6.02)	132	137	269 (6.89)	504	12.91
2 nd Molar	90	92	182 (4.67)	96	101	197 (5.04)	379	9.71
Total	1126	1145	2271 (58.19)	811	822	1633 (41.81)	3904	100

aesthetics which is the most important reason for demanding dentures by patients in the present study. Although studies have shown that posterior teeth are the most commonly lost teeth due to periodontal diseases^[15] and caries,^[16] many patients do not care to replace posterior teeth.

Although the central and lateral incisors were the predominant teeth replaced, Kennedy class III was the predominant class of edentulous arch in this study. The possible explanation could be the fact that Kennedy class IV arches are considered as a modification when present in combination with other classes (Applegate modification of Kennedy classification)^[6] and the fact that edentulous space resulting from a missing central incisor is considered as the edentulous arch not crossing the midline (Kennedy class III).^[7] Also noted in this study was the greater number of teeth on the left side replaced compared with the right side, as reported by Olusile and Esan.^[4] Majority of the people in our environment are right-handed, and it is expected that cleaning and maintaining good oral hygiene on the left side of the arches should be easier. Could this be due to trauma affecting the left side more than the right side of the face or overzealous toothbrushing leading to gingival recession? This observation calls for investigation to ascertain why the left side of the face suffers more tooth loss than the right side. The long root of the canine makes it more durable in the mouth and this makes it the least replaced tooth in the study.

Conclusion

This study reveals that the demand for Kennedy class III dentures is higher than others both in the maxilla and mandible, while the demand for both maxillary and mandibular dentures is more common among the elderly. Majority of the patients who needed RPDs were civil servants and the main reason for the demand was for aesthetic concern.

References

- Al-Quaran FA, Al-Ghalayini RF, Al-Zu'bi BN. Single tooth replacement: Factors affecting different prosthetic treatment modalities. *BMC Oral Health* 2011;11:34.
- Graqham R, Mihaylov S, Jepson N, Allen PF, Bond S. Determining need for a Removable Partial Denture: A quantitative study of factors that influence dentist provision and patient use. *Br Dent J* 2006;200:155-8.
- MacGregor AR, Fenn, Liddelow and Gimson clinical dental prosthetics. 3rd ed. London: Butterworths; 1989. p. 107-17.
- Olusile AO, Esan TA. Pattern of demand of removable partial dentures in Ile-Ife. *Niger J Health Sci* 2002;2:6-8.
- Veeraiyan DN, Karthikeyan R, Vinaya B. Textbook of Prosthodontics. 4th ed. New Delhi, India: Jaypee Brothers Medical Publishers Ltd; 2003. p. 270-2.
- Carr AB, McGivney GP, Brown DT. McCracken's removable partial prosthodontics. 11th ed. New Delhi India: Elsevier; 2005. p. 3-20.
- Osborne J, Lammie GA. Partial denture. 4th ed. Oxford London, Edinburgh, Melbourne: Blackwell Scientific Publishers; 1974. p. 3-5.
- Sadig WM, Idowu AT. Removable partial denture design: A study of a selected population in Saudi Arabia. *J Contemp Dent Pract* 2002;3:40-53.
- Bassey IE. The prosthetic requirements of partially edentulous patients as seen in Lagos University Teaching Hospital. *Nig Q J Hosp Med* 1985;3:49-51.
- Akeredolu PA, Omitola OG, Savage KO. Age, Gender and pattern of tooth replacement at Lagos University Teaching Hospital. *Nig Q J Hosp Med* 2004;14:45-8.
- Famuyiwa OO, Olorunshola OA. Some family factors in sickle cell anaemia in Lagos Nigeria. *Niger Med Pract* 1998;35:70-8.
- Arigbede AO, Taiwo JO. Pattern of demand for acrylic removable partial dentures in the city of Port-Harcourt, Nigeria. *Niger Health J* 2011;11:47-50.
- Ehikhamenor EE, Oboro HO, Onuora OI, Umanah AU, Chukwumah NM, Aivboraye IA. Types of removable prostheses requested by patients who were presented to the University of Benin Teaching Hospital Dental Clinic. *J Dent Oral Hyg* 2010;2:15-8.
- Keyf F. Frequency of the various classes of Removable partial denture and selection of major connector and direct/indirect Retainers. *Turk J Med Sci* 2001;31:445-9.
- Mathew DC, Smith CG, Hanscorm SL. Tooth loss in periodontal patients. *J Can Dent Assoc* 2001;67:207-10.
- Sanya BO, Ng'ang'a PM, Ng'ang'a RN. Causes and pattern of missing permanent teeth among Kenyans. *East Afr Med J* 2004;81:322-5.

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