

# Pattern of Demand for Removable Acrylic Partial Denture (RPD) in the city of Port Harcourt, Nigeria

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## ABSTRACT

**Background:** Pattern of demand for RPDs and distribution of stock teeth carried by these prostheses is rarely reported. The current study is designed to determine the pattern of demand for RPDs and to compare the patterns of distribution of stock teeth carried by these prostheses between the right and left sides of each jaw and between the upper and lower jaws respectively.

**Materials and Methods:** This retrospective study reviewed the authorization forms of 1,000 adult patients who requested for RPD from two dental hospitals in the metropolitan city of Port Harcourt, Nigeria. The gender, type (upper, lower or both) of RPD and the teeth requested were analyzed

**Results:** There were 906 properly filled forms belonging to 464 (51.2%) females and 442 (48.8) males. More males (38.5%) compared to 32.5% females requested for upper RPD and more females (15.8%) as against 7.3% males demanded for lower RPD. More males (3.5%) compared to females (3.0%) requested for combination of upper and lower RPD. A decline in the number of teeth demanded was noted as we move away from the central incisor to the 2<sup>nd</sup> premolars. No marked difference was noted between the distribution of teeth provided for the right and left sides of each jaw. More prosthetic teeth were demanded for the upper jaw.

**Conclusion:** More females requested for removable acrylic partial denture. No marked difference was noted between the distribution of teeth provided for the right and left sides of each jaw. More prosthetic teeth were demanded for the upper jaw

**Key words:** Acrylic partial denture, removable, stock teeth

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## INTRODUCTION

People are living longer and retaining more of their teeth into old age.<sup>1</sup> It is said that this trend is likely to continue as the current middle-aged population which is tomorrow's elderly is showing a dramatic improvement in oral health compared with a similar group 20 years ago.<sup>1</sup> In our environment, it may not be true that people are living longer but a decrease in the mean number of missing teeth among the elderly<sup>2</sup> and decline in complete denture patients<sup>3</sup> had also been observed and reported. Many observers of this phenomenon among the elderly conclude

that if edentulism and tooth loss continue to decline in the coming decades, the need for prosthodontic services will also decline.<sup>4</sup> However, the result of the investigation into the unmet prosthodontic need in the US prompted the authors to predict a large and increasing amount of unmet prosthodontic need in the future.<sup>4</sup> Furthermore, an overall increase in public awareness and education about the importance of oral health has been said to lead to an increase in perceived need and effective demand for dental care including prosthetic services in the US.<sup>4</sup>

As socio-economic depression continues to cut across the world particularly Africa, effective demand for fixed partial denture might continue to be the exclusive right of privileged few. When choosing between fixed and removable partial dentures, cost effectiveness and oral hygiene factors were found to influence dentist decision the most.<sup>5</sup> Removable partial prosthodontics is a versatile cost-effective and reversible treatment method for partially edentulous patients at any age.<sup>6,7</sup> Acrylic partial denture as against the metallic counterpart is easy to fabricate and repair. It could be designed and fabricated by non-specialist dental surgeons and technicians respectively and besides, expensive equipment is not required. This type of dental prosthesis will continue to serve as a useful alternative to fixed partial denture which is more desirable but less affordable.

A clear understanding of the pattern of denture demand and distribution of stock teeth is very important because, this information will enable administrators to understand oral rehabilitation needs of prosthetic patients and to make intelligent purchases of materials. In addition, it will also enable restorative dentists to recognize natural teeth that are vulnerable to early loss but which are of utmost relevance to the patients. Provision of removable denture is often initiated by patient demand.<sup>5</sup> It is not clear at the moment why patients with normative need do not care and why patients in whom use of partial denture is deemed unnecessary requested for them. A study of the distribution pattern of stock teeth demanded over time may help us to have a better understanding of why most patients request for denture. There is a limited study on the distribution pattern of stock teeth carried by RPD at the moment. Also, the relationship between gender, number and type of partial denture (maxillary/mandibular) being worn by patients is not clear and it is also not clear whether there is a marked disproportion between the distribution of stock teeth being provided for one side of each arch and the corresponding teeth on the other side as well as between those provided for the upper arch and the corresponding teeth on the opposing arch.

A previous study<sup>8</sup> in our environment on this subject only showed the distribution pattern of stock teeth provided for each quadrant, no comparative analysis was done. Furthermore, the relationship between gender, number and type of removable partial denture provided for the patients was also not part of the study. The current study is designed to determine the pattern of demand for RPDs and to compare the patterns of distribution of stock teeth carried by these prostheses between the right and left sides of each jaw and between the upper and lower jaws respectively.

## Methodology

### Survey Instrument

Our data was generated from one thousand consecutive work authorization forms of patients who were 17 years old and above who demanded for removable acrylic partial dentures. The sample size was selected by convenience. The following data were extracted from the authorization form: gender, age, type of denture (maxillary/mandibular or both) and the number as well as the specific teeth being requested.

In addition, the results reported by Olusile and Esan (2002)<sup>8</sup> from a similar study conducted at the Dental Center of Obafemi Awolowo University Teaching Hospital Complex (OAUHC) located in the rural and ancient city of Ile-Ife, Osun State, Nigeria was obtained and subjected to descriptive analysis for easy comparison with our results.

### Study Design

The study was a retrospective review of dental laboratory records.

### Exclusion Criteria

The work authorization forms of patients who were less than 17 years, of those whose authorization forms contain insufficient information and those who demanded for complete dentures, denture repairs, over denture, transitional and fixed partial dentures were excluded from the study.

### Study Setting

The dental laboratory records of patients attending University of Port Harcourt Teaching Hospital, Port Harcourt and Rivers State Government Dental and Maxillofacial Hospital, Port Harcourt, Nigeria were employed for the study. Most of the dentures were provided by general dental practitioners working in the two hospitals. The Dental and Maxillofacial Hospital of the Rivers State Government was the only dental referral centre in the metropolitan city of Port Harcourt for a long time until the University of Port Harcourt Teaching Hospital established a specialist dental centre about 5 years ago. The two dental centers serve the people of Rivers State and those from adjoining Niger Delta States in the federal Republic of Nigeria.

### Ethical Issues

The anonymity and confidentiality of the patients whose laboratory records were employed for the study were preserved.

### Data Management

SPSS for Windows version 11.0, (SPSS Inc Chicago Illinois, USA) was used to generate descriptive analysis (frequency

and percentage, mean, SD).

## RESULTS

Nine hundred and six properly filled authorization forms belonging to 464 female patients and 442 male patients out of the 1,000 authorization forms that were reviewed were employed for this study. More females (51.21%) compare to females (48.79%) requested for removable partial denture but there was no marked difference between the two groups. More males requested for upper removable partial denture as against the lower jaw where females made more request (Table 1). The number of cases where both upper and lower removable partial dentures were requested was almost the same for the two groups (Table 1). In the result presented by Olusile and Esan (2000)<sup>8</sup> there were 216 patients comprising 116 males (53.70%) and 100 females (46.30%). More males demanded for removable partial denture in this previous study. Age of the patients was excluded from our data analysis because more than half of the records only indicated whether the patient was an adult or child.

Our results showed that upper central and lateral incisors were the most demanded removable stock teeth respectively followed by the corresponding lower teeth (Table 2). A similar pattern was recorded by Olusile and Esan (2002)<sup>8</sup>. A decline in the number of teeth demanded was noted as we move away from the central incisor to the 2<sup>nd</sup> premolars particularly in the lower arch. The result of Olusile and Esan (2002)<sup>8</sup> was not different from the above. Our results and those of Olusile and Esan (2002)<sup>8</sup> showed that first molars were the most demanded posterior teeth. No marked difference was noted between the distribution of teeth provided for the right and left sides of each jaw in our result, but the results of the previous study<sup>8</sup> showed notable differences in the distribution of the right and left upper canine (upper right 63.2%, upper left 36.8) and lower 2<sup>nd</sup> molars (lower right 61.8%, lower left 31.8%)(Table 2).

Generally, in our results more stock teeth were demanded for the upper jaw compared to the lower jaw with the exception of 1<sup>st</sup> and 2<sup>nd</sup> upper molars where less demand was made compared to the lower counterparts (Table 3). Apart from the upper central and lateral incisors as well as upper left 2<sup>nd</sup> molars equal or more number of stock teeth were demanded in the lower jaw compared to the corresponding upper teeth in the result presented by Olusile and Esan (2002)<sup>8</sup>

**Table 1: Distribution of partial denture in relation to gender**

Type of denture	Male	Female
Upper partial denture	(38.0%)344	294(32.5%)
Lower partial denture	66(7.3%)	143(15.8%)
Upper and lower partial denture	32(3.5%)	27(3.0%)

## DISCUSSION

In the current study, more females requested for removable partial dentures. In a British study<sup>9</sup> more females like in our study demanded for removable partial denture in the ratio 3:2. Similarly, Ferreira et al. (2008)<sup>10</sup> reported that subjects that wear dentures are likely to be females. This pattern was, however, at variance with the previous reports<sup>8,11</sup> from our environment. More males were found to have demanded for upper partial dentures in our study unlike in the lower jaw

**Table 2 Distribution of stock teeth provided for each side of the jaw**

Type of Teeth	Right side		Left Side	
	Right side (Current Study) Freq. (%)	Left Side (Current Study) Freq. (%)	Right side (Olusile & Esan 2002) <sup>8</sup> Freq. (%)	Left Side (Olusile & Esan 2002) <sup>8</sup> Freq. (%)
Upper central incisor	419(51.2)	399(48.8)	106(52.7)	95(47.3)
Upper lateral incisor	137(48.2)	147(51.8)	42(51.9)	39(48.1)
Upper canine	43(55.1)	35(44.9)	12(63.2)	7(36.8)
Upper 1 <sup>st</sup> premolar	27(42.9)	36(57.1)	9(42.9)	12(57.1)
Upper 2 <sup>nd</sup> premolar	17(47.2)	19(52.8)	9(64.3)	5(35.7)
Upper 1 <sup>st</sup> molar	26(53.1)	23(46.9)	18(58.1)	13(41.9)
Upper 2 <sup>nd</sup> molar	14(56.0)	11(44.0)	13(54.2)	11(45.8)
Lower central incisor	172(48.9)	180(51.1)	45(51.1)	43(48.9)
Lower lateral incisor	94(49.7)	95(50.3)	35(51.5)	33(48.5)
Lower canine	24(51.1)	23(48.9)	17(56.7)	13(43.3)
Lower 1 <sup>st</sup> premolar	20(51.3)	19(48.7)	14(53.8)	12(46.2)
Lower 2 <sup>nd</sup> premolar	17(48.6)	18(51.4)	11(50.0)	11(50.0)
Lower 1 <sup>st</sup> molar	33(42.3)	45(57.7)	21(53.8)	18(46.2)
Lower 2 <sup>nd</sup> molar	24(52.2)	22(47.8)	13(61.9)	8(38.1)

**Table 3 Distribution of stock teeth provided for upper and lower jaws**

Type of teeth	Upper		Lower	
	Upper (Current Study) Frequency (%)	Lower (Current Study) Frequency (%)	Upper (Olusile & Esan 2002) <sup>8</sup> Frequency (%)	Lower (Olusile & Esan 2002) <sup>8</sup> Frequency (%)
Right central incisor	419(70.9)	172(29.1)	106(70.2)	45(29.8)
Left central incisor	399(68.9)	180(31.1)	95(68.8)	43(31.2)
Right lateral incisor	137(59.3)	94(40.7)	42(55.5)	35(45.5)
Left lateral incisor	147(60.7)	95(39.3)	39(54.2)	33(45.8)
Right canine	43(64.2)	24(35.8)	12(41.4)	17(58.6)
Left canine	35(60.3)	23(39.7)	7(35.0)	13(65.0)
Right 1 <sup>st</sup> premolar	27(57.4)	20(42.6)	9(39.1)	14(60.9)
Left 1 <sup>st</sup> premolar	36(65.5)	19(34.5)	12(50.0)	12(50.0)
Right 2 <sup>nd</sup> premolar	17(50.0)	17(50.0)	9(45.0)	11(55.0)
Left 2 <sup>nd</sup> premolar	19(51.4)	18(48.6)	5(31.3)	11(68.8)
Right 1 <sup>st</sup> molar	26(44.1)	33(55.9)	18(46.2)	21(53.8)
Left 1 <sup>st</sup> molar	23(33.8)	45(66.2)	13(41.9)	18(58.1)
Right 2 <sup>nd</sup> molar	14(36.8)	24(63.2)	13(50.0)	13(50.0)
Left 2 <sup>nd</sup> molar	11(33.3)	22(66.7)	11(57.9)	8(42.1)

where females made more request. There was a marginal difference between the number of males and females who requested for both upper and lower partial dentures in favour of the males. We do not know why more females demanded for lower partial denture in our study but Idowu and AI-Shamrani (1995)<sup>12</sup> had earlier found a significant higher rate of mandibular molar tooth loss in females compared to males. In the current study, more mandibular molars were replaced compared to the maxillary molars. This may partly explain why more females demanded for lower partial denture. Upper central and lateral incisors were the most demanded removable prosthetic teeth respectively followed by the corresponding lower teeth. A similar pattern was presented by Olusile and Esan (2002)<sup>8</sup>. The canine because of its long and deep seated root as well as its position at the angle of the mouth- a position which is away from direct frontal impact is not often as missing as the other anterior teeth. It is not surprising therefore, that many requests for artificial teeth replacement did not involve the canine. Our study also show

that more upper teeth were requested for replacement compared to the corresponding teeth in the lower arch with the exception of upper 1<sup>st</sup> and 2<sup>nd</sup> molars where more lower teeth were requested. A higher rate of mandibular teeth retention was reported earlier among a group of Nigerian elderly<sup>2</sup>, this may partly explain the reason behind the reduced number of request made for lower anterior teeth. A previous study<sup>5</sup> also revealed that demand for denture will most likely be initiated if upper or anterior tooth is missing. Not only may a removable partial denture help to restore appearance, it may actually improve it.<sup>13</sup> Restoration of appearance remained a strong motivating factor for most removable partial prosthodontic patients.<sup>13</sup> Apart from aesthetics, particularly in educated individuals speech defect could play a contributory motivating factor in the demand for prosthetic teeth when anterior teeth are missing. The loss of maxillary anterior teeth may prevent clear reproduction of certain sounds, particularly F and V which are pronounced by the lower lip contacting the edges of the maxillary incisors.<sup>13</sup>

Only a few stock teeth were demanded for the posterior segment of the jaws. This result supports that which was presented by Olusile and Esan (2002)<sup>8</sup>. This pattern is not unexpected because it has been shown that even in countries with highly developed dental care systems open spaces in the premolar and molar systems are well accepted by people of all ages.<sup>14</sup> First, with the modern foods and methods of preparation, it is unlikely that a patient will suffer from malnutrition even though a large amount of teeth are missing.<sup>13</sup> Secondly, the shortened dental arch concept has shown that individuals with a significantly reduced number of teeth have satisfactory oral functions.<sup>15</sup> Also, in the light of the current understanding of removable partial denture equation (balance that must be struck between desirable and undesirable effects that may arise through the wearing of RPD)<sup>13</sup> dentists might have become more cautious in recommending RPD in cases where posterior teeth are missing.

. Our study is retrospective, examination of patients and review of their case history was not conducted; only the laboratory request forms were examined. Therefore, the results may not give an accurate account or reasons why the patients were demanding for artificial removable prosthesis. We suggest that further studies on this subject involving patient interview and examination be conducted so that we can compare the pattern of distribution of stock teeth being provided worldwide.

**CONCLUSION**

Male gender made more requests for upper acrylic partial denture and combination of upper and lower partial denture while females requested more for lower partial denture. On the whole, more females requested for removable acrylic partial denture. A decline in the number of teeth demanded was noted as we move away from the central incisor to the 2<sup>nd</sup> premolars particularly in the lower arch. The first molars were the most demanded posterior teeth. No marked difference was noted between the distribution of teeth provided for the right and left sides of each jaw. Generally, in our results more stock were demanded for the upper jaw

compared to the lower jaw with the exception of 1<sup>st</sup> and 2<sup>nd</sup> upper molars where fewer demand was made compared to the lower counterparts.

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