

# The use of removable dentures among the elderly attending a Geriatric Centre in a Nigerian Teaching Hospital

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## Abstract

**Background:** Loss of multiple teeth is common among the elderly and it affects their oral functions. The oral functions can be improved by removable dentures, however, many of the elderly are not using these removable prostheses.

**Objective:** To assess the prevalence of tooth loss, wearing and non-wearing of removable dentures as well as the reasons for non-wearing of denture among the elderly attending a Geriatric Centre in a Nigerian Teaching Hospital.

**Subjects and method:** This was a cross-sectional study that employed interviewer-administered questionnaires to collect information on gender, age, dental status, use of denture, types of denture, and non-usage of denture from consented elders. Data was analyzed using IBM SPSS Version 20. Fisher's exact test was performed for discrete variables. Data obtained were significant at  $p < 0.05$ .

**Result:** There were 165 (32.3%) males and 346 (67.7%) female participants. Majority (30.5%) were in the 66 -70 years' age group. Only 48.1% had no missing tooth, 183 (35.8%) had missing teeth that were never replaced, 62 (12.1%) had dentures in place while 20 (3.9%) had stopped using dentures. The major reason for non-wearing of denture was the perception that it was not necessary in old age. Poor retention was the major reason for discontinuing denture wearing. There was a statistically significant relationship between age and use of denture ( $p = 0.034$ ), and between types of denture and non-usage of denture ( $p = 0.00$ ).

**Conclusion:** There is high prevalence of tooth loss but low prevalence of denture wearing among the participants.

**Key word:** *Elderly, tooth loss, denture, geriatrics.*

## Résumé

**Contexte :** La perte de plusieurs dents est courante chez les personnes âgées et affecte leurs fonctions buccales. Les fonctions buccales peuvent être améliorées par des prothèses amovibles, cependant, de nombreuses personnes âgées n'utilisent pas ces prothèses amovibles.

**Objectif :** Évaluer la prévalence de la perte de dents, du port et du non-port de prothèses amovibles ainsi que les raisons du non-port de prothèse chez les personnes âgées fréquentant un centre gériatrique dans un hôpital universitaire nigérian.

**Sujets et méthode :** Il s'agissait d'une étude transversale qui a utilisé des questionnaires administrés par des enquêteurs pour collecter des informations sur le sexe, l'âge, l'état dentaire, l'utilisation de prothèses dentaires, les types de prothèses dentaires et la non-utilisation de prothèses dentaires auprès d'ânés consentants. Les données ont été analysées à l'aide d'IBM SPSS version 20. Le test exact de Fisher a été effectué pour les variables discrètes. Les données obtenues étaient significatives à  $p < 0,05$ .

**Résultat :** Il y avait 165 (32,3%) hommes et 346 (67,7%) femmes participantes. La majorité (30,5%) était dans le groupe d'âge de 66 à 70 ans. Seulement 48,1 % n'avaient pas de dent manquante, 183 (35,8 %) avaient des dents manquantes qui n'ont jamais été remplacées, 62 (12,1 %) avaient des prothèses en place tandis que 20 (3,9 %) avaient cessé d'utiliser des prothèses. La principale raison du non-port de prothèse dentaire était la perception qu'elle n'était pas nécessaire à un âge avancé. Une mauvaise rétention était la principale raison de l'arrêt du port de la prothèse. Il y avait une relation statistiquement significative entre l'âge et l'utilisation de prothèse ( $p = 0,034$ ), et entre les types de prothèse et la non-utilisation de prothèse ( $p = 0,00$ ). **Conclusion :** Il y a une forte prévalence de perte de dents mais une faible prévalence de port de prothèse parmi les participants.

**Mot clé :** *Personnes âgées, perte de dents, prothèse dentaire, gériatrie.*

## Introduction

Tooth loss is an irreversible oral condition and has been described as a final marker of disease burden for oral health [1]. It is closely associated with socio-

economic factors and more prevalent among the poor populations and elderly [2]. Although studies [3,4] have shown a decline in tooth loss in developed nations, there has been reported increase in the prevalence of tooth loss in developing nations [3]. The growing population of the elderly as a result of improved health condition in the developed nations, however, results in high number of edentulous individuals [3].

Rehabilitation of patients with tooth loss may be achieved using a variety of treatment options. The options are removable partial denture (RPD), removable complete denture, fixed partial dentures (FPD) and dental implants [5]. The factors that may affect the choice of prosthesis used are the cost, periodontal status of abutment teeth, aesthetic requirements, and patient's choice [6]. RPD is more commonly employed than FPD because of its accessibility to lower socio-economic groups in whom the highest rates of tooth loss occur [7]. RPDs may be fabricated in cast metal, acrylic resin and flexible resin [5]. The acrylic RPD is more frequently used especially in developing countries because it is more affordable and easier to fabricate [3]. Acrylic dentures however, are mucosa borne, hence cannot withstand heavy occlusal load [5]. This limits its effectiveness in restoration of masticatory function in partially edentulous patient. It can also cause inflammatory reaction in the gingivae [8]. In addition, it can cause residual ridge resorption which may result in loose denture [5].

A removable partial denture is indicated for individuals with long or multiple saddles, unhealthy or insufficient number of abutments for fixed partial denture [5]. It is also indicated in those who cannot afford FPD and when there is need for a temporary rehabilitation [8]. Therefore, RPD remains a viable treatment modality among the elderly worldwide [3,6] and especially in developing nations.

According to the American Dental Association, approximately 57% of the elderly in America wear dentures [9] while National Oral Health Survey of Adults (NOHSA) in Malaysia [10] reported that 50.8% elderly aged 60 years and older had some form of oral prostheses. In Nigeria, Ibiyemi and Lawal [11] reported a prevalence of 7.1% denture wearing among elderly people with missing teeth in a suburban population in South west Nigeria. It was observed however, by Worstmann *et al.*, [12] that many of the older people did not wear their dentures or removed it during eating.

Several reasons have been identified as causes of non-wearing of dental prosthesis. One of

such factors was the reduction of taste and texture sensation due to wide coverage of the palate especially with acrylic removable denture [13]. Discomfort from a poorly fabricated denture has also been mentioned as a cause of cessation of use of denture [14]. In addition, loss of retention and stability sequel to ridge resorption could discourage the use of denture. In a study by Savoca *et al.*, [15] approximately 33% of denture wearers reported their dentures as poor fitting and the authors stated that those individuals were more likely to stop using their dentures or remove it while eating.

Dentures have been known to improve the quality of life of patients with tooth loss through restoration of mastication, speech, aesthetics, comfort, general health, social and psychological wellbeing [7]. Failure of replacement of missing teeth can therefore be an index of poor health. Although studies had been carried out on the prevalence of tooth loss and denture wearing [11,16,17] among older people in our nation, the cause of non-usage of dentures has not been explored. The aim of this study was to assess the prevalence of tooth loss, denture usage and non-usage as well as the reasons for non-usage of denture among the elderly attending a Geriatric Centre in a Nigerian Teaching Hospital.

#### **Patients and method.**

This was a cross-sectional study conducted among elderly patients attending a Geriatric Centre in a Nigerian Teaching Hospital. Consecutive patients that presented at the clinic during a data collection period of six weeks were recruited. Two trained dental house officers were involved in data collection. They were calibrated by one of the investigators (a consultant prosthodontics). After obtaining consent, the patients were assessed and examined clinically and those that satisfied the inclusion criteria were recruited into the study. The inclusion criteria were: willingness to participate and having orientation of time, place and person. A twenty-item semi structured interviewer-administered questionnaire developed by the principal investigator was employed for data collection. The questionnaire items included demographic data, number of missing teeth, duration of tooth loss, use and non-use of removable dentures. Reasons for non-usage of denture or non-replacement of missing teeth were also obtained. Patients were classified into four socio-economic classes according to classification by Croxford [18]. Data was analyzed using IBM SPSS version 20. Descriptive statistics were generated, and Fisher's exact test was performed for discrete variables. The level of significance was set at  $p < 0.05$ .

## Result

Five hundred and eleven patients participated in the study. There were 165 (32.3%) males and 346 (67.7%) females. One hundred and ten (21.5%) of the participants were in the 60-65 years age group while the majority (30.6%) were in the age group 66-70 years. Majority (51.1%) were in class 3 occupational group (Table 1).

The relationship between patients' gender, age, number of missing teeth and use of denture is shown table 3. The proportion of participants with no missing teeth decreased with increase in age though the proportion that wear denture increased with increase in age of the patients and the relationship between age and use of denture was statistically significant ( $p=0.034$ ). There was no

**Table 1:** Socio-demographic characteristics of the participants.

Age group (years)	Frequency	Percentage
60 - 65	110	21.5
66 - 70	156	30.5
71 - 75	134	26.2
>75	111	21.8
<i>Gender</i>		
Male	165	32.3
Female	346	67.7
<i>Occupational group</i>		
Class 1	77	15.1
Class 2	173	33.8
Class 3	261	51.1
Total	511	100.0

Table 2 shows the characteristic of the patients according to dental status and denture use. Two hundred and sixty-five (51.9%) had one or more missing teeth while 246 (48.1%) of the participants had no missing tooth. One hundred and eighty-three (35.8%) had missing teeth that were never replaced, 62 (12.1%) had dentures in place while 20 (3.9%) were no longer using their dentures. Eighty-two, (16.0%) of those with missing teeth had lost their teeth for more than 15 years. The major reasons for non-replacement of missing teeth were the perception that denture wearing was not necessary at old age, 77 (15.1%) and the perception that eating 30 (5.9%) was not affected by tooth loss. The prevalence of denture use in this study were: upper removable partial denture (URPD) 49 (9.6%), lower removable partial denture (LRPD) 24 (4.7%) and upper complete denture (UCD) 3 (0.6%). Thirty-four (6.7%) participants had used their dentures for more than 15 years while 4.7% of the study population had used it only for one to five years. Twenty (3.9%) of the participants had stopped using their dentures and majority 9 (1.8%) did so because the dentures were loose or unstable while 3 (0.6%) patients stopped because they perceived they can still eat without the denture. Thirty-four (6.6%) of the respondents removed their dentures before eating and the major reason for their action was because of discomfort/pain 11 (3.3%).

statistically significant relationship between gender and use of denture ( $P=0.171$ ), as the percentage of male participants with no replacement of missing teeth (29.5%) is lower than those using removable dentures (43.5%) and the percentage of female participants with no replacement of missing teeth (70.5%) is higher than those using removable dentures for the missing teeth (56.5%). The percentage of participants not replacing missing 1-2 teeth (83.1%) is higher than those that replaced 1-2 missing teeth with RPDs (51.6%). The percentage of participants with non-replaced 3-4 missing teeth (13.1%) and 5-6 missing teeth (2.7%) were less than those that replaced 3-4 (22.6%) and 5-6 (11.3%) missing teeth respectively. And the relationship between number of missing teeth and use of denture was statistically significant ( $P=0.00$ ).

Table 4 shows the relationship between types of denture and denture usage. The percentage of participants that had URPD only and were using dentures (64.5%) is greater than those that stopped using their removable dentures (45.0%) while the percentage of participants that had LRPD only and were using their dentures (27.4%) is less than those that stopped using their removable dentures (35.0%). The relationship between types of denture and the use of denture was statistically significant ( $p=0.00$ ).

**Table 2:** Characteristic of patients according to missing teeth and denture use.

What is your edentulous status?	n	%
No missing teeth	246	48.1
Missing teeth not replaced	183	35.8
Missing teeth replaced and denture in place	62	12.1
Missing teeth replaced but stopped using denture	20	4.0
<i>If you have missing teeth, how many are they?</i>		
1 - 2	198	38.8
3 - 4	43	8.4
5 - 6	14	2.7
>6	10	2.0
Not applicable	246	48.1
<i>If you have missing teeth, how long?</i>		
1-5 years	79	15.5
6-10 years	72	14.1
11-15 years	32	6.3
>15years	82	16.0
Not applicable	246	48.1
<i>If you have missing teeth and had never used denture why?</i>		
Not affect eating	30	5.9
Not affect appearance (look)	16	3.1
Not need it at this age	77	15.1
Others (Financial 13, More problematic 9, Not aware 14, no speech 3)	60	11.7
Not applicable	328	64.2
<i>If you are using denture, what type of denture?</i>		
URPD	49	9.6
LRPD	24	4.7
UCD	3	0.6
U&LRPD	6	1.1
Not applicable	429	84.0
<i>If you are using denture, how long?</i>		
1 - 5 years	24	4.7
6 - 10 years	13	2.5
11-15 years	11	2.2
>15 years	34	6.6
Not applicable	429	84.0
<i>Do you remove your denture when you want to eat?</i>		
Yes	34	6.6
No	48	9.4
Not applicable	429	84.0
<i>Why do you remove your denture when you want to eat?</i>		
Because it was loose	8	1.5
It is uncomfortable/painful to eat with	11	2.2
For it not to break	6	1.2
Others ( Not to be dirty, to follow instruction)	9	1.8
Not applicable	477	93.3
<i>If you are using denture and stopped, why did you stopped?</i>		
Loose or unstable	9	1.8
Can still eat without it	3	0.6
Not need it at this age	4	0.8
Others (It breaks, pain, financial: 2, 1, 1)	4	0.8
Not applicable	491	96.0

## Discussion

Majority of the participants in this study were females and this is in agreement with previous hospital-based

studies [2, 19] where predominance of female participants were reported. The reason for this

**Table 3:** Relationship between age, gender, occupational group, number of missing teeth and denture wearing of elderly.

Age in group (years)	dental status				Total	Chi-square
	No missing teeth n(%)	Missing teeth not replaced	Missing teeth replaced and wear denture	Missing teeth replaced, but not wear denture		
60-65	69 (28.1)	32 (17.5)	6 (9.7)	3 (15.0)	110	0.034
66-70	76 (30.9)	57 (31.1)	16 (25.8)	7 (35.0)	156	
71-75	53 (21.5)	52 (28.4)	23 (37.1)	6 (30.0)	134	
>75	48 (19.5)	42 (23.0)	17 (27.4)	4 (20.0)	111	
<i>Sex</i>						
Male	76 (30.9)	54 (29.5)	27 (43.5)	8 (40.0)	165	0.171
Female	170 (69.1)	129 (70.5)	35 (56.5)	12 (60.0)	346	
<i>No of missing teeth</i>						
1-2		152 (83.1)	32 (51.6)	13 (65.0)	197	0.00
3-4		24 (13.1)	14 (22.6)	5 (25.0)	43	
5-6		5 (2.7)	7 (11.3)	1 (5.0)	13	
>6		2 (1.1)	6 (9.7)	1 (5.0)	9	
All teeth in Upper arch		0	3 (4.8)	0	3	
No missing teeth	246	0	0	0	246	
Total	246	183	62	20	511	

**Table 4:** Relationship between type of denture and denture wearing by the patients

Types of denture.	Denture use by patients.			Total	P value
	Denture in use.	Stopped using denture.			
URPD	40 (64.5)	9 (45.0)		49	0.00
LRPD	17 (27.4)	7 (35.0)		24	
U § LRPD	2 (3.3)	4 (20.0)		6	
UCD	3 (4.8)	0 (0.0)		3	
Total	62	20		82	

finding could be that women are more concerned about their health and quality of life, so they visit the hospitals more regularly. The age distribution of the patients in this study was similar to that of Arigbede and Chukwuma's study [16].

In this study, the prevalence of tooth loss was 51.1% while the prevalence of denture use was 16.0%. This prevalence (51.1%) was comparable to the 52.0% reported by Taiwo and Omokhodion [17] and close to 47.7% observed in the study by Ibiyemi and Lawal [11] but lower than 78.0% reported in a clinic-based study in Ireland [20] and higher than a prevalence of 31.5% seen in a study carried out in Greece among patients aged 65-74 years [21]. The prevalence of tooth loss varies from one location to another based on factors such as socio-economic status and dental awareness of the community [3].

The prevalence of denture wearing among the participants was 16.0% which is comparable to the prevalence of 13.5% reported by Arigbede and Chkwuma [16] and 16.5% reported in a study among elderly in India [19]. This prevalence was higher than 7.1% reported by Ibiyemi and Lawal [11], but far lower than 46.3% reported by Zainab [19]. The most common reason for non-use of denture in this study was the perception that denture wearing was not necessary in old age and that it did not affect eating unlike in the previous studies [11,16] where financial constraints was reported as the major reason for non-use of denture. Other causes of non-use of dentures among elders included influence by negative experience of others and perception that wearing of dentures might cause discomfort [19]. Apart from missing 3<sup>rd</sup> molars which are usually not replaced,

any other edentulous space that does not compromise aesthetics, speech, chewing and mental health of the patient should not necessarily require prescription of denture particularly where the tendency for supra-eruption is low and the patient is not enthusiastic about replacing the tooth. This is in accord with principle of shortened dental arch concept [22]. This does not however, diminish the need for dentures in the society. The non-inclusion of prosthetic dental treatment in the health insurance scheme of Nigeria had been attributed to low prevalence of denture use in the nation [16]. A study in Croatia [23] reported an upward trend in demand and use of denture following health insurance coverage of the cost of denture.

A higher patronage of the hospital and denture wearing among females was observed, though the proportion of male denture wearers is higher than female. The higher number of female denture wearers agrees with the finding of Zainab [19] and the report of National Oral Health Survey of Adults carried out in Malaysia [10] where majority of denture wearers were females. This is probably because the females were more concerned about their quality of life as denture wearing has been reported to increase the quality of life of denture wearers [10]. The most common type of denture being used by the participants was upper removable partial denture. This may be because tooth loss is more common in the upper jaw than in the lower jaw [17].

About twenty-four percent of those that had denture stopped using them, this is similar to the report of Lamensly and Murvey [20] where 21% of the patients that were fitted with dentures no longer wore them. The most common reason in this study why the elders stopped wearing their dentures was because it was loose or unstable. A similar finding was reported by Martins *et al* [26]. Loose denture can create a great problem for elders as it can easily traumatize the atrophic oral mucosa. In addition, loose denture is a strong predisposing factor to dislodgment of denture from the dental arch and its impaction into the oesophagus [27]. Savoca *et al.*, [15] reported that about 33% of denture wearers were using poor fitting denture and were more likely to stop using their dentures. The fact that most of the participants in this study wore old and un-serviced dentures for many years explained why many were no longer wearing their prostheses.

Thirty-four (6.6%) of the respondents removed their dentures when they wanted to eat and the major reason for this was that it was not comfortable. This agrees with findings of previous studies [20,28,29] that observed that some patients

removed their dentures while eating because of discomfort. For a denture to perform optimally, it should be retentive, stable, and well supported. These qualities are lost when dentures are used for a long time without appropriate maintenance. It is therefore important to emphasize the significance of recall visits to denture wearers.

The proportion of participants with no missing teeth decreases as the age increases while the proportion that wear dentures increases with increase in age of the patients. This is because the cumulative effects of common chronic dental diseases like caries, periodontal diseases, tooth wear lesions and their treatments often result in unavoidable tooth loss as age increases [30]. Also, the decrease in quantity and quality of saliva often seen in the elderly on account of systemic diseases, side effect of drugs and possibly ageing, contributes to reduced immunity and repairs process which enhances degenerative process of oral tissue and eventual tooth loss [23] in the elderly. This translates into an increase in wearing of denture.

There was a significant relationship between number of missing teeth and use of denture. About 10% of those that were using dentures had more than six missing teeth while 1.1% of those with missing teeth that were not replaced had one or two missing teeth. The major reasons for replacement of missing teeth are to improve appearance and mastication. The more number of teeth missing the more compromise of masticatory functions and aesthetics. As the number of missing teeth increases, it is expected that the desire for teeth replacement to enhance mastication or appearance should increase. Number of missing teeth and position of saddle area are equally important when oral function is being considered. Ten uninterrupted pairs of occluding maxillary and mandibular natural teeth has been reported as the minimum number required for oral functions without recourse to denture [22]. Also, there was a statistically significant relationship between types of denture and use or non-use of the denture. The percentage of the participants that stopped wearing their dentures was high among the patients that had lower removable partial dentures and combination of upper and lower removable partial dentures. The reason for this could be as a result of the reduced denture bearing area in the lower jaw which reduced the mucosa support, retention, and stability of removable dentures. In the elderly, the lower residual ridge is often compromised, and this ultimately affects the prognosis for removable partial denture.

## Conclusion

This study shows a high prevalence of tooth loss but low prevalence of denture wearing among the participants. The major reason for non-wearing of dentures was the perception that it was not necessary in old age while the major reason for discontinuing denture wearing was poor retention and stability. We recommend adequate education on the use and maintenance of removable dentures for the elderly with tooth loss.

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