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Impact of Mental Attitude and Class of Complete Edentulism on Oral Health-Related Quality of Life of Patients Treated With Conventional Complete Dentures

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Abstract

Aim: To assess the impact of mental attitude and class of edentulism on the oral-health related quality of life of patients treated with conventional complete dentures.

Materials and method: The mental attitude and class of edentulism was assessed for 20 completely edentulous patients who were also provided with complete dentures. Their oral-health related quality of life was also assessed before treatment, 1 month and 3 months post insertion of complete dentures.

Results: Majority 14 (70.0%) of the patients had a “philosophical” mental attitude while 6 patients (30%) had “exacting” attitude. Patients with Kennedy class III edentulous space had the highest mean score of 5.3 ± 0.6 ($P=0.035$) in the “physical function” domain while Class IV complete edentulism had the highest mean score of 7.5 ± 2.1 in the psychosocial function domain. Those with Philosophical mind had the higher base line score and post treatment scores. ($p<0.05$). Overall, a significant increase ($P=0.0001$) in the GOHAI-T mean score was observed after treatment with complete dentures irrespective of their class of edentulism or mental status.

Conclusion: Class of edentulism and mental status of patients had significant impact on the oral health related quality of life of complete edentulous patients after treatment with complete dentures.

Keywords: Complete dentures; Oral health-related quality of life; Mental attitude; Class of edentulism

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Introduction

Traditionally, conventional complete dentures have been used as a means of rehabilitation for patients with complete edentulism. They have been documented to be the most common form of prosthetic rehabilitation for complete edentulism, [1,2] especially in less developed countries with limited financial resources. Several researches have shown an improvement in the oral health related quality of life of patients treated with complete dentures [3-8]. However, successful treatment with conventional complete dentures depends to a great extent on the patient's ability to adapt to the new denture [9]. Stated that patient's adaptation to complete dentures is strongly related

to the prosthetic condition, which combines denture quality, muscular control and residual ridge characteristics [10]. Thus, the discrepancy between the dentist's evaluation of denture quality and the patient's subjective judgment may result from inappropriate assessment of the quality of the denture-bearing surfaces and patient's neuromuscular coordination. Presently, there is paucity of literature on the effect of classes of complete edentulism and Oral health related quality of life.

Aside this, there is the possibility that patient's opinion and mental attitude towards treatment may influence the outcome of treatment irrespective of the ridge complexities and underline medical conditions. Furthermore, understanding the mental

attitude of the patient may help the clinician to anticipate the patient's likely response after treatment.

Several studies have been conducted to relate patient's acceptance of dentures to their psychological status [11-20]. Some of the studies used validated tools in general psychology to assess the mental attitude and psychological status of their subjects, while others used direct clinical psychological assessment of patients for their study. The results of these studies are varied. While some found no influence of psychological status on patient acceptance of dentures, others reported significant influence. The confusion in the outcome may be due to psychological tools used for the studies. Some of the tools used some question items that relate more with general life satisfaction and their day to day activities rather than been specific on oral health related quality of life. Therefore, a specific tool/rating scale designed for edentulous patients would be more appropriate and their outcomes easy to interpret. House MM [21,22] devised a system of classification of mental attitude for the edentulous patients' psychological responses to becoming edentulous and adapting to dentures into the following four types: Philosophical mind, Exacting mind, Hysterical mind, and Indifferent mind. The purpose of such classification was to guide the clinician to anticipate the challenges that individual patient may pose during complete denture treatment.

Few studies have been published on the influence of mental status based on House classification of mental attitude on patient's acceptability and utilization of new dentures [23-25]. A study showed that females were found to be more exacting in attitude than males. This was attributed to females being conscious of their look and appearance compared to men [26]. The same study showed that men have more of indifferent attitude to complete denture treatment than the females. It is generally believed that women frequently voice their concern while men usually conceal their emotions or concerns. Furthermore, older individuals have been shown to be hysterical in nature. This has been attributed to decline physical and mental state which may result in them being resentful in nature.

In view of the paucity of literature on this subject, it is important that more studies are conducted particularly from Nigeria where complete edentulism is common due to high prevalence of periodontal diseases so as to be able to predict treatment outcomes and ways to manage potentially difficult patients. Hence, this study is aimed at assessing the impact of mental attitude and class of edentulism on the oral health-related quality of life of patients treated with conventional complete dentures. It will therefore bring to fore a better understanding of the psychosomatic component already established in the field of prosthodontics.

Material and Methods

This study comprised a total of 20 consenting completely edentulous elderly patients who requested for complete dentures. Ethical approval was sought before the commencement of the study.

Mental attitude assessment of the patients was carried out at presentation using the criteria proposed by Dr. MM House which classified patients into philosophical, exacting, hysterical and indifferent. Clinical examination included a classification of the edentulous state based on the classification criteria provided by the American college of Prosthodontist comprising four (4) levels of difficulty or ridge complexity: [27] Class I (Ideal or minimally compromised), II (Moderately compromised), III (Substantially compromised) and IV (Severely compromised). Following history taking and clinical examination of the patients, an assessment of their baseline OHRQoL was carried out using an 11-item modified Geriatric Oral Health Assessment Index questionnaire [28]. It became necessary to make some adjustments to the original GOHAI questionnaire in order to aid effective communication and understanding between the patients and the researcher. The original 12-item GOHAI questionnaire was modified into an 11-item scale by eliminating the 12th item which deals with sensitivity of teeth to hot, cold or sweet foods based on a previous study from India [29]. The modified 11-item GOHAI questionnaire was then administered to the patients before commencement of treatment. The questionnaire consisted of positive items (3, 5 and 7) and negative items (1, 2, 4, 6, 8, 9 10 and 11) with a 3-point Likert scale scoring as (always-1, sometimes-2, never-3). The 11-item GOHAI questions were further organized into three (3) domains namely:

1. **Physical function:** (Which is related to problems of eating, speech and swallowing and comprises items 1, 2, 3 and 4).
2. **Psychosocial function:** (Related to problems of worry, self-consciousness about oral health and avoidance of social contacts; items 6, 7, 9, 10 and 11).
3. **Pain or discomfort:** (Comprising items 5 and 8). The items under each domain were added together to give the total score of each domain. The total GOHAI score for each patient is the summation of all scores obtained from the 11 questions (comprising the three domains) with the scoring for the positive items (3, 5, and 7) reversed. A higher GOHAI score following treatment indicated a higher quality of life and vice versa. Conventional complete dentures were then fabricated by the same technologist for the patients and inserted. Following insertion and acceptance of the dentures by the patients, follow up visits were then scheduled for one (1) month and three (3) months to assess their OHRQoL using the modified 11-item GOHAI questionnaire. The total scores were also obtained at these follow up visits and comparison were made between the pre-treatment and post-treatment scores based on their class of edentulism and mental attitude.

The data collected was imputed and saved in the computer using Statistical Package for Social Sciences (SPSS) version 23.0 for Windows. Analysis was done and presented in frequencies and percentages. Association between discrete variables was tested using Chi-Square. Measures of central tendency such as means

and standard deviation were determined for the total GOHAI score of the patients. The means and standard deviation of the different domains of GOHAI was also determined. Differences between means were tested using student t test, one-way ANOVA and post Hoc test (Bonferroni test). Statistically significance was taken at $p < 0.05$.

Results

The study comprised a total of 20 completely edentulous patients with an age range of 60-88 years and a mean age of 73.2 ± 8.6 years. There were more males than females with a male:female ratio of 1: 0.8. The majority of the respondents were in the age group 60-69 years with 60% belonging to the unskilled occupational category. Most of the respondents, 11 (55.0%) had primary education only (Table 1). The majority 14 (70.0%) of the patients had a “philosophical” mental attitude while 6 patients (30%) had an “exacting” attitude. None of the patients had a hysterical or an indifferent mental attitude (Table 2). The commonest classification of complete edentulism seen among the patients was Class II (55%) followed by Class I (20.0%). The least common class of complete edentulism among the patients was Class IV accounting for 2 (10%) (Figure 1). There was no statistically significant variation in OHRQoL according to gender, occupation and mental attitude. However, the patients with a philosophical mental attitude had a slightly higher total GOHAI mean score (14.4 ± 2.0) than those with an exacting attitude (13.5 ± 1.0). Furthermore, a significant variation in OHRQoL according to the educational level in the pain and discomfort domain only was observed. A patient who had been educated up to the tertiary level had the highest mean score of 5.0. The lowest mean score of 3.0 ± 0.6 was seen among those educated up to primary level (Table 3). A significant variation was also observed in the OHRQoL scores according to the class of edentulism in the physical function domain only with Class III patients having the highest mean score of 5.3 ± 0.6 ($P=0.035$) (Table 3). Further post hoc analysis revealed a significant relationship between Class III only and other classes of complete edentulism. Although not a statistically significant finding, it was observed that patients with Class IV complete edentulism had the highest mean score of 7.5 ± 2.1 in the psychosocial function domain and this was followed by those in Class III with a mean score of 6.0 ± 1.0 . The lowest scores in the psychosocial domain were observed in those with Class I with a mean score of 5.6 ± 1.0 (Table 3).

A comparison of the OHRQoL of the patients at baseline and 1 month after treatment revealed a significant increase in the mean GOHAI scores across all domains ($P=0.0001$). The highest mean score was observed in the psychosocial function domain from 6.0 ± 1.1 at baseline to 13.0 ± 1.1 | Nigeria after treatment ($P=0.0001$). The lowest mean score was observed in the pain and discomfort domain from 3.7 ± 1.0 at baseline to 5.1 ± 0.4 | month after treatment ($P=0.0001$). A significant increase ($P=0.0001$) in the GOHAI-T mean score was observed from 14.1 ± 1.8 at baseline to 26.5 ± 1.4 1 month after treatment with complete dentures (Table 4). A comparison of the OHRQoL of patients 1 month and 3 months after treatment with complete dentures

Table 1 Socio-demographic of respondents.

Characteristics	Frequency (n)	Percent (%)
Gender		
Male	11	55
Female	9	45
Age group		
60-69	8	40
70-79	6	30
≥ 80	6	30
Occupation		
Skilled	4	20
Semi-Skilled	2	10
Unskilled	12	60
Dependent	2	10
Educational Level		
No formal education	6	30
Primary	11	55
Secondary	2	10
Tertiary	1	5
Total	20	100

Table 2 Mental attitude assessment of the patients

Mental attitude	Frequency(n)	Percentage (%)
Philosophical	14	70
Exacting	6	30
Hysterical	0	0
Indifferent	0	0
Total	20	100

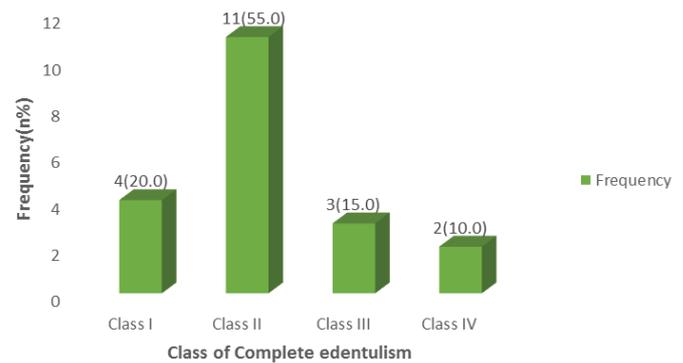


Figure 1 Classification of complete edentulism of the patients.

revealed a significant increase in the mean GOHAI scores across all domains ($P=0.0001$). The highest mean score was observed in the psychosocial function domain from 13.0 ± 1.1 recorded 1 month after treatment to 14.7 ± 0.7 recorded 3 months after treatment with complete dentures ($P=0.0001$). The lowest mean score was observed in the pain and discomfort domain from 5.1 ± 0.4 recorded 1 month after treatment to 6.0 ± 0.2 recorded 3 months after treatment ($P=0.0001$). A significant increase in the GOHAI-T mean score ($P=0.0001$) was observed from 26.5 ± 1.4 recorded 1 month after treatment to 32.1 ± 1.1 recorded 3 months after treatment with complete dentures (Tables 5 and 6).

Table 3 Oral health-related quality of life of patients (N = 20) at baseline.

Characteristics	Physical function	Psychosocial function	Pain and discomfort	GOHAI-T scores
	(Maximum score= 6)	(Maximum score = 9)	(Maximum score = 5)	(Maximum score = 18)
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Gender				
Male	4.5 ± 0.5	5.9 ± 1.2	3.7 ± 0.9	14.1 ± 1.5
Female	4.6 ± 0.7	6.0 ± 1.1	3.6 ± 1.1	14.1 ± 2.2
P value	0.722	0.865	0.71	0.981
Occupation				
Skilled	4.5 ± 0.6	6.5 ± 1.9	3.8 ± 0.5	14.8 ± 2.1
Semiskilled	5.5 ± 0.7	6.0 ± 1.4	5.0 ± 0.0	16.5 ± 2.1
Unskilled	4.4 ± 0.0	7.0 ± 1.4	3.5 ± 1.0	13.5 ± 1.3
Dependent	4.0 ± 0.0	6.0 ± 1.1	3.0 ± 1.4	14.0 ± 2.8
P value	0.055	0.294	0.177	0.138
Educational Level				
Primary	4.7 ± 0.5	5.7 ± 1.2	4.3 ± 0.8	14.7 ± 1.4
Secondary	4.3 ± 0.5	6.2 ± 1.2	3.0 ± 0.6	13.5 ± 1.7
Tertiary	5.0 ± 1.4	6.0 ± 1.4	4.5 ± 0.7	15.5 ± 3.5
	5	5	5	15
P value	0.269	0.714	0.003	0.347
Mental attitude				
Philosophical	4.6 ± 0.6	5.9 ± 1.4	3.9 ± 1.0	14.4 ± 2.0
Exactng	4.3 ± 0.5	6.2 ± 0.4	3.0 ± 0.6	13.5 ± 1.0
P value	0.426	0.594	0.051	0.344
Class of Complete edentulism				
Class I	4.3 ± 0.5	5.6 ± 1.0	3.3 ± 1.0	13.3 ± 1.9
Class II	4.5 ± 0.5	5.7 ± 1.0	3.7 ± 1.1	13.9 ± 1.4
Class III	5.3 ± 0.6	6.0 ± 1.0	4.0 ± 1.0	15.3 ± 2.8
Class IV	4.0 ± 0.0	7.5 ± 2.1	3.5 ± 0.7	15.0 ± 2.8
P value	0.035	0.249	0.795	0.433

The P value was calculated by two sample t-tests for gender and mental attitude and by one-way analysis of variance for the other factors

Table 4 Comparison of oral health-related quality of life of Patients at baseline and 1 month after treatment with complete dentures.

OHRQoL Domains	Baseline Mean ± SD	1month after treatment Mean ± SD	P-value
Physical function	4.5 ± 0.6	8.5 ± 0.9	0.0001
Psychosocial function	6.0 ± 1.1	13.0 ± 1.1	0.0001
Pain and discomfort	3.7 ± 1.0	5.1 ± 0.4	0.0001
GOHAI-T scores	14.1 ± 1.8	26.5 ± 1.4	0.0001

Table 5 Comparison of oral health-related quality of life of patients 1 month and 3 months after treatment with complete dentures

OHRQoL Domains	1monthafter treatment Mean ± SD	3monthsafter treatment Mean ± SD	P-value
Physical function	8.5 ± 0.9	11.5 ± 0.6	0.0001
Psychosocial function	13.0 ± 1.1	14.7 ± 0.7	0.0001
Pain and discomfort	5.1 ± 0.4	6.0 ± 0.2	0.0001
GOHAI-T scores	26.5 ± 1.4	32.1 ± 1.1	0.0001

Table 6 Modified 11-Items Geriatric Oral Health Assessment Index (GOHAI) Questionnaire.

In the past (1 or 3) Months.....	Always	Sometimes	Never
1. How often did you limit the kinds of food eaten because of problems with your teeth, gums or dentures?	--	--	--
2. How often did you have trouble biting or chewing any kind of food, such as firm meat or apples?	--	--	--
3. How often were you able to swallow comfortably?	--	--	--
4. How often have your teeth, gums or denture prevented you from speaking the way you wanted?	--	--	--
5. How often were you able to eat anything without feeling discomfort?	--	--	--
6. How often did you limit contact with people because of the condition of your teeth, mouth or dentures?	--	--	--
7. How often were you pleased or happy with the looks of your teeth, gums or dentures?	--	--	--

In the past (1 or 3) Months.....	Always	Sometimes	Never
8. How often did you use medication to relieve pain or discomfort from around your mouth?	--	--	--
9. How often were you worried or concerned about problems with your teeth, gums or dentures?	--	--	--
10. How often did you feel nervous or self-conscious because of problems with your teeth, gums or dentures?	--	--	--
11. How often did you feel uncomfortable eating in front of others because of problems with your teeth, mouth or dentures?	--	--	--
Always=1, Sometimes=2, Never=3			

Discussion

Successful treatment with conventional complete dentures depends to a large extent on the patient's ability to use the denture. This, in turn, is closely linked to the patient's attitude towards treatment as well as the class of edentulism based on the degree of ridge complexity. There is a dearth of knowledge in the literature on this relationship and its impact on the oral health-related quality of life of patients following treatment with complete dentures. Hence, there is need for this study.

This study comprised of 20 completely edentulous elderly patients. The mean age of 73.2 ± 8.6 years in this study was in accordance with a previous study [30] but higher than those of other studies conducted on completely edentulous elderly patients. [31,32] A male preponderance was observed in this study. This corroborates previous studies [33,34] and was at variance with other studies [35]. The male preponderance observed in this study could be attributed to the fact that the male gender is more prone to trauma beginning from an early age resulting in tooth loss and eventually, complete edentulism [36,37]. The females are more conscious about their oral health and have a more positive attitude towards their dental health, [38,39] they, therefore, tend to retain their teeth till old age.

Most of the participants belonged to the unskilled occupational group comprising farmers, messengers, and cleaners. This was in agreement with previous studies [40,41]. A finding that could be attributed to the fact that these groups of persons in the society belong to the low-income earners and may not be able to afford professional preventive oral care earlier in life. Individuals of a low socioeconomic status rarely seek dental care regularly due to a perceived high cost of dental treatment leading to an increased incidence of edentulous cases [42,43].

A notable finding from this study is that the majority of the patients had only been educated up to the primary level. The deficiency in formal education could have resulted in reduced awareness of preventive dental care thereby acting as a contributory factor to complete edentulism. This finding had been documented by previous studies. Thompson and Kreisel in 1998 stated that subjects with the least education and lowest income are most likely to be edentulous.

An evaluation of the mental attitude of the patients studied revealed that the majority of the patients were philosophical in attitude with very few exhibiting an exacting attitude. No patient exhibited a hysterical or an indifferent attitude to treatment. Although this finding was not significant in relation to their OHRQoL, it could be a pointer to the fact that most patients who present for complete denture treatment are motivated towards

its use and are willing to cooperate with the dentist in ensuring a favourable outcome. Other studies have also validated this finding [44-46].

It was observed from this study that Class II was the commonest class of edentulism seen among the patients. This is at variance with a Canadian study where it was observed that the majority of the patients examined belonged to the Class III group of complete edentulism. This difference may be attributed to the fact that Africans have thicker cortical bones than Caucasians which may translate to a slower pace in residual ridge resorption [47]. Although more studies are needed to validate this assertion, previous studies conducted have demonstrated that blacks have thicker bones at all skeletal sites compared to their white counterparts [48-50] in their study using the Panoramic Mandibular Index (PMI) to relate cortical bone thickness found that African-Americans had thicker cortical bone than their white counterparts in both the maxilla and the mandible [51]. The difference in bone thickness from their study was attributed to an increased biting force and masticatory load applied by African-Americans and Africans during feeding; resulting in functional bone adaptation. In relating the Class of complete edentulism to the OHRQoL of the patients, a significant relationship was observed between the Class of complete edentulism and the OHRQoL in the physical function domain. Patients with Class III complete edentulism had the highest mean score. This finding may be explained by the fact that the Class III patients had probably adapted to their edentulous state compared to those in Class I who may have just recently been rendered completely edentulous considering the fact that bone loss is an ongoing process following tooth loss [52]. Although, not a statistically significant finding, it was observed that patients with Class IV complete edentulism had the highest mean scores in the psychosocial function domain and this was closely followed by those in Class III. Surprisingly, those in Class 1 had the lowest mean scores in the psychosocial domain. This may be a pointer to the fact that patients' psychosocial function component of OHRQoL may be least affected despite the degree of simplicity or complexity of the edentulous ridge. Hence, the mental attitude of the patient has a key role to play in treatment outcome irrespective of the state of the edentulous mouth [53].

Conclusion

This study revealed a significant improvement in the OHRQoL across all domains as well as the total GOHAI mean scores among the patients at baseline, 1 month and 3 months after treatment with complete dentures. This finding is in agreement with several other studies that assessed the OHRQoL of completely edentulous patients before and after treatment. It was also observed that

the quality of life of the patients was higher at 3 months than 1 month post-treatment. This difference in mean scores could be explained by the fact that the patients were still adapting to their new prostheses.

This study has therefore brought to the fore an understanding

of the impact of mental attitude and Class of edentulism on the OHRQoL of patients. In addition, the use of conventional complete dentures is still strongly advocated as a treatment option for complete edentulism as it has been proven once more to significantly improve the OHRQoL of patients.

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