Impact of Conventional Removable Complete Dentures on the Oral Health-Related Quality of Life of Completely Edentulous Patients in a Tertiary Health Institution in Nigeria

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ABSTRACT

Objective: To assess the impact of conventional removable complete dentures on the oral-health related quality of life of completely edentulous patients.

Methods: Conventional removable complete dentures were fabricated for 20 completely edentulous elderly patients at the University of Benin Prosthetic Dental clinic. Their oral-health related quality of life was assessed using the 11-item modified Geriatric Oral Health Assessment Index (GOHAI) Questionnaire, before treatment, 1 month and 3 months post insertion of complete dentures.

Results: There was a significant increase (P=0.0001) in the mean GOHAI scores across all domains following treatment with complete dentures. The highest mean score was observed in the psychosocial function domain from 6.0±1.1 prior to treatment with complete dentures to 13.0±1.1, 1 month after treatment and eventually 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 3.7±1.0 at baseline to 5.1±0.4, 1 month after treatment to 6.0±0.2 recorded 3 months after treatment (P=0.0001). A significant increase (P=0.0001) in the GOHAI-T mean score was also observed from 14.1±1.8 at baseline to 26.5±1.4, 1 month after treatment to 32.1±1.1 recorded 3 months after treatment with complete dentures.

Conclusion: Conventional removable complete dentures impacts positively on the Oral health-related quality of life of edentulous patients

Keywords: Conventional removable complete dentures, Oral health-related quality of life, complete edentulism, Geriatric Oral Health Assessment Index.

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INTRODUCTION

Conventional removable complete dentures are dental prostheses that replace the entire dentition and associated structures of the maxilla and the mandible.[1] They have been documented to be the most common form of prosthetic rehabilitation for complete edentulism, [2, 3]especially in less developed countries with limited financial resources. Despite the vast improvements and long-term clinical success with implant retained prosthesis for replacing missing dentition, conventional removable dentures continue to represent the first therapeutic option offered to edentate patient globally because of its affordability and ease of fabrication.[4] It's efficiency in recovering masticatory function, promoting satisfaction, physical, social and psychological health, increasing self-esteem and significantly enhancing patients quality of life has been documented.[5] The term "quality of life" is often used as an umbrella term that covers various concepts dealing with health status, function and life conditions. Oral health-related quality of life (OHQoL) is the perception of how oral conditions affect daily function and well-being.[6] It has been widely used in clinical studies as an outcome to assess the quality, effectiveness and efficacy of oral health care.[7, 8] The development of patient-based outcome measures has enhanced the ability to assess oral health-related quality of life of patients generally and particularly in the elderly population who are complete denture wearers. One of such patient-based reliable and valid outcome measures used in assessing the OHRQoL in elderly patients, is the Geriatric Oral Health Assessment Index tool (GOHAI). Most of the existing studies carried out using the GOHAI tool have been done in other countries.[9-12] Currently, there is no documentation of its use in assessing the OHRQoL of completely edentulous elderly patients in Nigeria especially as regards quality of life pre and post rehabilitation with complete dentures. Hence its use in this study will greatly impact on the body of knowledge. Furthermore, several researches conducted in other climes have shown an improvement in the oral health related quality of life of patients treated with complete dentures.[13-18] However, there are paucity of such studies in our environment. Hence there is the need to assess the impact of complete dentures on the oral health-related quality of life of edentulous patients so that inferences can also be drawn from our local environment for comparative evaluation in scientific literatures.

MATERIALS AND METHODS

This study comprised a total of 20 consenting completely edentulous elderly patients who requested for complete dentures at the University of Benin Teaching Hospital Prosthetic Dental clinic from January to June 2017. Ethical approval was sought from the Ethics Committee of the University of Benin Teaching Hospital, Benin City, Nigeria before the commencement of the study. Oral and written informed consent was also obtained from each patient before participating in the study. 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. 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. [19] A Pilot test was then conducted on three (3) edentulous patients who were not part of the study using the modified 11-item questionnaire after which the questionnaire was then administered to the study participants 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 which includes, Physical function domain (which is related to problems of eating, speech and swallowing and comprises items 1, 2, 3 and 4); Psychosocial function domain (related to problems of worry, self-consciousness about oral health and avoidance of social contacts; items 6, 7, 9, 10 and 11), and Pain or discomfort domain (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 was the summation of all scores obtained from the 11 questions (comprising the three domains). The scores for the positive items (3, 5, and 7) was reversed. A higher GOHAI score following treatment indicated a higher quality of life and a lower GOHAI score indicated lower quality of life. Conventional complete dentures were then fabricated by the same technologist for the patients and inserted. They were seen 24 hours and 1 week

post insertion of the dentures to assess their acceptance of the prosthesis and to make necessary adjustments when necessary. Following final 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. In total, 3 recordings were taken. At Baseline (before treatment), 1 month after treatment and at 3 months. At the end of study, baseline measures were compared with 1 month scores and 1 month scores were compared with 3 months scores. The data collected was imputed and saved in the computer using Statistical Package for Social Sciences (SPSS) version 26.0 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 $p<0.05$.

Modified 11-item 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?			
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

RESULTS

The study comprised a total of 20 completely edentulous patients with an age range of 60-88years and a mean age of 73.2 ± 8.6 years. The majority of the respondents were in the age group 60-69 years. There were more males than females with a male: female ratio of 1: 0.8 (Table 1). Most of the respondents, 11(55.0%) had primary formal education, with 60% in the unskilled occupational category (Table 1). There was no significant variation in OHRQoL according to gender and occupation among the patients prior to treatment with complete dentures. However, there was significant variation in OHRQoL according to the educational level in the

pain and discomfort domain only, with a patient who had been educated up to the tertiary level having the highest mean score of 5.0. The lowest mean score of 3.0 ± 0.6 was observed among those with formal primary education (Table 2).

Table 1: Sociodemographic characteristics of the patients

Characteristics	Frequency(n)	Percent (%)
Age (years)		
60 – 69	8	40.0
70 – 79	6	30.0
≥80	6	30.0
Gender		
Male	11	55.0
Female	9	45.0
Educational Level		
No Formal Education	6	30.0
Primary	11	55.0
Secondary	2	10.0
Tertiary	1	5.0
Occupation		
Skilled	4	20.0
Semi-skilled	2	10.0
Unskilled	12	60.0
Dependent	2	10.0
Total	20	100.0

Table 2: Oral health-related quality of life of patients (*N* = 20) before treatment with complete dentures in relation to gender, educational level and occupation.

Characteristics	Physical function (Maximum score= 6) Mean ± SD	Psychosocial function (Maximum score = 9) Mean ± SD	Pain and discomfort (Maximum score = 5) Mean ± SD	GOHAI-T scores (Maximum score = 18) 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	0.710	0.981
Educational Level				
No Formal	4.7 ± 0.5	5.7 ± 1.2	4.3 ± 0.8	14.7 ± 1.4
Primary	4.3 ± 0.5	6.2 ± 1.2	3.0 ± 0.6	13.5 ± 1.7
Secondary	5.0 ± 1.4	6.0 ± 1.4	4.5 ± 0.7	15.5 ± 3.5
Tertiary	5.0	5.0	5.0	15.0
***P* value**	0.269	0.714	**0.003**	0.347
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

A comparison of the OHRQoL of the patients at baseline and 1month 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 prior to treatment with complete dentures to 13.0±1.1, 1 month 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, 1 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 3). Furthermore, a comparison of the OHRQoL of patients 1 month and 3 months after treatment with complete dentures 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). Consequently, 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 (Table 4).

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

OHRQoL Domains	Before treatment Mean ±SD	1 month 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 4: Comparison of oral health-related quality of life of patients1 month and 3 months after treatment with complete dentures

OHRQoL Domains	1month after treatment Mean ±SD	3months after 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

DISCUSSION

Rehabilitation of complete edentulism with the use of complete dentures has been reported in previous studies to improve oral health-related quality of life (OHRQoL) of patients.[20, 21] Their affordability, ease of fabrication and repair if need be has also made them useful appliances in the management of complete edentulism especially among low income earners and those residing in a developing country like Nigeria. Furthermore, they have been reported to improve oral appearance and social interactions of individuals, which might enhance self-esteem and thus contribute to psychological well-being.[22]

The mean age of 73.2 ± 8.6 years in this study was in accordance with a previous study [23] but higher than those of other studies conducted on completely edentulous elderly patients.[24, 25] A male preponderance was observed in this study. This corroborates with some studies [26-28] and at variance with other studies.[25,29] 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.[30,31] The females are more conscious about their oral health and have a more positive attitude towards their dental health,[32,33] resulting in retention of teeth till old age. A notable finding from this study is that the majority of the patients had only been educated up to the primary level. The inadequate formal education may have resulted in reduced awareness of preventive dental care thereby acting as a contributory factor to complete edentulism. This finding had been documented by several other studies.[34- 40] Thompson and Kreisel in 1998 stated that subjects with little or no formal education and those who belong to a low socioeconomic status with reduced income are most likely to be edentulous.[41] Most of the participants belonged to the unskilled occupational group comprising farmers,

messengers, and cleaners in agreement with previous studies.[34,35] 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 perceived high cost of dental treatment leading to increased incidence of edentulous cases.[41, 42]

Also observed from this study was pre- and post-operative higher psychosocial domain mean score of GOHAI tool compared to the pain and discomfort domain that was the lowest of all the domains. The higher score in the psychosocial domain may be attributed to the fact that the study group comprised of elderly persons who may not pay particular attention to the psychosocial aspects of tooth loss such as aesthetics and avoidance of social contacts; as they attribute tooth loss to a normal aging process and are less psychologically affected.[25] On the other hand low scores observed in pain and discomfort domain as well as the physical function domain could be attributed to the functional impact of tooth loss on oral health related quality of life especially as regards mastication, speech and swallowing irrespective of age. Furthermore, this study revealed a significant improvement in the OHRQoL across all domains as well as the total GOHAI mean scores among the patients before treatment, 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.[13, 14,25,43,44] It was also observed that the quality of life of the patients was higher at 3 months than 1month post-treatment. This difference in mean scores could be explained by the fact that at 1 month post insertion of complete dentures, the patients were still adapting to their new prostheses compared to at 3 months after insertion. Following insertion of a new prosthesis, the adaptation period may vary according to the patient's acceptance of the new prosthesis and the ability to use it comfortably. This period usually varies from patient to patient and adjustments may need to be carried out in the initial days and weeks following denture delivery. It is expected that at 1 month following delivery of the prosthesis, the adaptation process would have begun and an assessment of any improvement in the OHRQoL can be ascertained at that point. A previous study that assessed the OHRQoL of completely edentulous patients at 1 month after insertion of the dentures also corroborates this finding.[13]

This study therefore agrees with the view that conventional removable complete dentures impacts positively on the OHRQoL of patients. Hence, its use should be strongly encouraged as a treatment option for complete edentulism especially among elderly patients who are financially handicapped and who may not be able to afford more complex forms of rehabilitation.

CONCLUSION

Conventional removable complete dentures impact positively on the Oral health-related quality of life of edentulous patients.

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Conflict of interest
None declared

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