

## Impact of tooth loss on the quality of life of patients seen in a Nigerian teaching hospital

### Wpływ bezzębia na jakość życia pacjentów hospitalizowanych w szpitalu klinicznym w Nigerii

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#### Abstract

**Introduction.** Tooth loss (edentulism) is an irreversible oral condition that has been described as a final marker of disease burden for oral health. It can impact the quality of life of an individual as it may affect speech and ability to chew properly. **Aim of the study.** To assess the effect of tooth loss on the quality of life of the Nigerian population using the Oral Health Impact (OHIP) questionnaire, and to determine factors that influence the severity of tooth loss impact. **Material and method.** A cross-sectional study was performed among partially edentulous patients at a Nigerian teaching Hospital. The Oral Health Impact (OHIP) questionnaire was used to obtain information from the participants. Data collected through the questionnaire were analysed using SPSS version 17 software. Chi square test was used to assess the correlation between the quantity and location of tooth loss and impact of tooth loss on the quality of life. The level of significance was set at  $P \leq 0.05$ . **Result.** One hundred and sixty five partially edentulous patients participated in the study. There were 80 (48.5%) males and 85 (51.5%) females. The highest mean impact score was 2.27 and was recorded for the question "Have you found it uncomfortable to eat any food because of your missing teeth"? Of the seven domains of OHIP, the highest mean score (4.2) was recorded for the physical pain domain. There was a statistically significant relationship between the location of missing teeth and the severity of impact on the quality of life of the

#### Streszczenie

**Wprowadzenie.** Bezzębie (utrata zębów) jest stanem nieodwracalnym, który został opisany jako ostateczny wskaźnik zdrowia jamy ustnej. Może mieć ono wpływ na jakość życia, ponieważ oddziałuje na indywidualną wymowę i zdolność do prawidłowego żucia. **Cel pracy.** Celem niniejszej pracy było ustalenie wpływu bezzębia na jakość życia wśród ludności Nigerii. Zastosowano kwestionariusz wpływu bezzębia na zdrowie OHIP, w celu ustalenia czynników, które mają wpływ na stopień dotkliwości bezzębia. **Materiał i metody.** Wykonano badanie przekrojowe wśród pacjentów częściowo bezzębnych w nigeryjskim szpitalu klinicznym. Informacje od uczestników zbierano stosując kwestionariusz „Profil wpływu zdrowia jamy ustnej” (OHIP). Dane zebrane za pośrednictwem kwestionariusza były analizowane za pomocą SPSS wersja 17. Test  $\chi^2$  został użyty do oceny związku między ilością i lokalizacją utraconych zębów a jakością życia. Poziom ważności ustalono na poziomie  $p \leq 0,05$ . **Wynik.** W badaniu uczestniczyło stu sześćdziesięciu pięciu częściowo bezzębnych pacjentów. Przebadano 80 (48,5%), mężczyzn i 85 (51,5%) kobiet. Najwyższy uśredniony wynik to 2,27 i dotyczył odpowiedzi na pytanie: „Czy masz trudności z jedzeniem niektórych pokarmów ze względu na problemy związane z utratą zębów?” Spośród siedmiu działów OHIP, najwyższy średni wynik (4,2) uzyskała kategoria związana z bólem fizycznym. Wykazano istotny statystycznie związek pomiędzy lokalizacją

#### KEYWORDS:

edentulism, impact, oral health, quality of life

#### HASŁA INDEKSOWE:

bezzębie, wpływ, zdrowie jamy ustnej, jakość życia

participants. **Conclusion.** Missing anterior teeth had significant impact on the quality of life of the patients.

brakujących zębów a powagą wpływu na jakość życia pacjentów. **Wniosek.** Brak przednich zębów miał znaczący wpływ na jakość życia pacjentów.

## Introduction

In Nigeria,<sup>1,2</sup> as in other parts of the world, dental caries and periodontal diseases are the two most common oral diseases. These two conditions cause major health problems as they may lead to pain and tooth loss. Tooth loss is an irreversible condition and has been described as a final marker of disease burden for oral health.<sup>3</sup> It is closely associated with socio-economic factors and is more prevalent among the poor populations, women and the elderly.<sup>4</sup> The high incidence of edentulism (total loss of teeth) among the elderly population is the cumulative effect of poor oral hygiene and inattention to dental problems. Poor access to dental care is another important factor that contributes to tooth loss.<sup>5</sup>

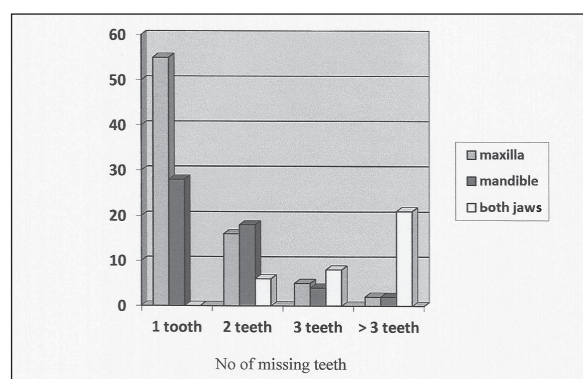
The prevalence of tooth loss varies in different parts of the world and in different age groups. A Canadian health survey<sup>6</sup> reported an overall prevalence of edentulism at 6.4% and a prevalence of 21.7% among adults above 60 years of age. *Oginni et al.*<sup>7</sup> reported a prevalence of tooth loss at 22.3% among rural dwellers in south-west Nigeria while *Oremosu and Uti*<sup>8</sup> in a study among Hausa dwelling in the same region reported a prevalence of partial edentulism at 33.6% (38.7% for males and 28.4% for females).

Tooth loss can affect the quality of life of an individual as it may affect the ability to chew properly, to communicate effectively and to socialize.<sup>9</sup> The quality of life is a subjective and difficult to define concept since it is based on an individual system of values and perceived life experience that can be influenced by factors such as a socioeconomic status, culture and belief of an individual.<sup>10</sup> The World Health Organization (WHO), however, defines the quality of life as “individual perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns.”<sup>11</sup>

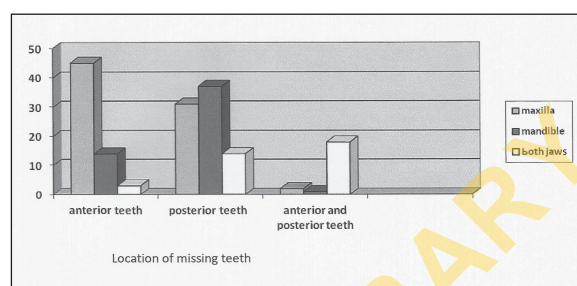
Studies have shown a correlation between tooth loss and the quality of life among the Nigerians.<sup>12,13</sup> *Okoje et al.*,<sup>12</sup> in a study on the emotional effect of tooth loss reported decreases in self-confidence in 2% of the cases studied. Other emotional effects of tooth loss reported in the study include feelings of sadness, depression and loss of a body part. Another study by *Dosumu and Ogunrinde*<sup>13</sup> reported the negative effect of tooth loss on social life of an ectodermal dysplasia patient. These studies, however, reported the effect of tooth loss on one or two domains of quality of life. The purpose of this study was to assess the impact of tooth loss on the quality of life among the Nigerian population using the Oral Health Impact (OHIP) questionnaire and to determine factors that influence the severity of tooth loss impact.

## Patients and method

The research was a cross-sectional study which recruited partially edentulous patients presenting at the conservative and prosthetic clinics of a Nigerian teaching hospital during a study period of 12 months. Inclusion criteria included patients in good physical and mental condition who were willing to participate. A self-administered two-part questionnaire was used to elicit information from participants after obtaining an informed verbal consent. The first part asked about the patient's age, gender, occupation, the number and location of missing teeth. The second part consisted of fourteen questions assessing the impact of missing teeth on oral health (OHIP-14 questionnaire).<sup>14</sup> The OHIP questionnaire focuses on seven domains of oral health i.e. functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. Each of the seven domains has two questions graded on a five-point (0, 1, 2, 3, and 4) Likert scale. The first two questions focused on the functional limitation, the next two questions on



**Fig. 1.** Distribution of patients according to the number of missing teeth.



**Fig. 2.** Distribution of patients according to the location of edentulous space.

**Table 1.** Demographic characteristics of the participants

Socio-demographic variables	Frequency	Percentage
<b>Gender</b>		
Male	80	48.5
Female	85	51.5
<b>Age range</b>		
1 – 20 years	9	5.5
21 – 40 years	57	34.5
41 – 64 years	68	41.2
65 years and above	31	18.8

physical pain, then psychological discomfort – in that sequence. The OHIP questionnaire has been validated and found reliable in our environment.<sup>15</sup> Data collected through the questionnaire were analysed using SPSS version 17 software. Analysis consisted of mean, range and percentage. Chi-square was used to assess correlation between tooth loss and the quality of life. Level of significance was set at  $p \leq 0.05$ .

## Result

One hundred and sixty-five partially edentulous patients participated in the study. There were 80 (48.5%) males and 85 (51.5%) females. The age

range of the participants was 17 to 89 years with a mean of 46.1 years ( $SD \pm 1.67$  years) (Table 1).

Eighty-three (50.3%) patients had an edentulous gap involving one tooth, 40 (24.2%) involving two teeth and 17 (10.3%) involving three teeth. The majority (47.3%) of the missing teeth occurred in the maxilla (Fig. 1).

Almost half (49.7%) of the respondents had the edentulous gap located posteriorly while 62 (37.5%) anteriorly and 21 (12.7%) had a combination of anterior and posterior edentulous spaces (Fig. 2).

Table 2 shows patients' responses to the OHIP questionnaire. The mean OHIP score was low

**Table 2.** Patients' response to the OHIP questionnaire

OHIP questions	Oral Health Impact Score					Total [N/%] (Score)	Mean (Score)
	Never 0 [n/%] (Score)	Rarely 1 [n/%] (Score)	Occasionally 2 [n/%] (Score)	Often 3 [n/%] (Score)	Very often 4 [n/%] (Score)		
1) Have you had trouble pronouncing any words?	7/4.2 (0)	90/54 (90)	23/13.9 (46)	24/14.5 (72)	21/12.7 (84)	165/100 (292)	1.77
2) Has your sense of taste been affected?	9 5.5 (0)	115/69.7 (115)	18 /10.9 (36)	15/9.1 (45)	8/4.8 (32)	165/100 (228)	1.38
3) Have you had aching anywhere in your mouth?	7/4.2 (0)	66/40 (66)	15/9.1 (30)	63/38.7 (189)	14/8.5 (56)	165/100 (341)	2.07
4) Have you found it uncomfortable to eat any food?	3/1.8 (0)	64/38.8 (64)	16 /9.7 (32)	50/30.3 (150)	32/19.4 (128)	165/100 (374)	2.27
5) Have you been self-conscious?	5/3.0 (0)	70 /42.4 (70)	21 /12.7 (42)	36/21.8 (108)	33/20 (132)	165/100 (352)	2.13
6) Have you felt tense because of your missing teeth?	10/6.1 (0)	95/57.6 (95)	20/12 (40)	24/14.5 (72)	16/9.7 (48)	165 /100 (255)	1.54
7) Has your diet been unsatisfactory?	10/6.1 (0)	95/57.6 (95)	22/13.3 (44)	23/13.9 (69)	15/9.1 (60)	165/100 (268)	1.62
8) Have you had to interrupt meals?	6/3.6 (0)	95/57.6 (95)	21/12.7 (42)	33/20 (99)	10/6.1 (40)	165/100 (276)	1.67
9) Have you found it difficult to relax because of your missing teeth?	8/4.8 (0)	108/65.5 (108)	22 /13.3 (44)	22/13.3 (66)	5/3.0 (20)	165/100	1.44
10) Have you been embarrassed?	5/3.0 (0)	114/69.1 (114)	15/9/1 (30)	24/14.5 (72)	7/4.2 (28)	165/100 (244)	1.48
11) Have you been irritable with other people?	9/5.5 (0)	110/66.7 (110)	22/13.3 (44)	17/10.3 (51)	7/4.2 (28)	165/100 (233)	1.41
12) Have you avoided laughing in public?	4/2.4 (0)	99/60 (99)	24/14.5 (48)	18/10.9 (54)	20/12.2 (80)	165/100 (281)	1.70
13) Have you had difficulty doing your usual jobs?	6/3.6 (0)	128/77.6 (128)	16/ 9.7 (32)	8/4.8 (24)	7/4.2 (28)	165/100 (212)	1.28
14) Have you found life less satisfying?	9/5.5 (0)	115/69.7 (115)	14/8.5 (28)	18/10.9 (54)	9/5.5 (27)	165/100 (224)	1.36

(<2) for the majority of questions. The highest mean impact score was 2.27 with 32 (19.5%) and 50 (30.3%) patients indicating the "very often" and "often" response respectively to the question "Have you found it uncomfortable to eat any food because of your missing teeth?" This was followed

by the mean score of 2.13 with 33 (20%) and 36 (21.8%) patients indicating the "very often" and "often" response respectively to the question "Have you been self-conscious because of your missing teeth?" The lowest mean OHIP score was 1.28 with 7(4.2%) and 8 (4.8%) patients indicating the "very

**Table 3.** Distribution of the OHIP scores according to quality of life domains

OHIP DOMAINS	Min	Max	Mean	Standard Deviation
Functional limitation	0	8	3.15	1.72
Physical pain	0	8	4.29	1.82
Psychological discomfort	0	8	3.76	1.89
Physical disability	0	8	3.30	1.72
Psychological disability	0	8	2.92	1.46
Social disability	0	8	2.69	1.41
Handicap	0	8	2.67	1.34

**Table 4.** Relationship between the number of missing teeth and the OHIP scores of patients

Number of missing teeth	OHIP Scores		Total
	<2	≥2	
1 tooth n (%)	57 (68.7)	26 (31.3)	83 (100)
2 teeth n (%)	23 (57.5)	17 (42.5)	40 (100)
3 teeth n (%)	12 (60.6)	5 (39.4)	17 (100)
>3 teeth n (%)	14 (56)	11 (44)	25 (100)
Total	106	59	165

Chi-square test; P= 0.468.

**Table 5.** Relationship between location of missing teeth and the OHIP scores

Location of missing teeth	OHIP Scores		Total
	<2	≥2	
Anterior n (%)	31 (50)	31 (50)	62 (100)
Posterior n (%)	60 (73.2)	22 (26.8)	82 (100)
Anterior and posterior n (%)	15 (71.4)	6 (28.6)	21 (100)
Total n (%)	106	59	165 (100)

Chi-square test; P=0.012.

often” and “often” response to the questions “Have you had difficulty doing your usual jobs because of your missing teeth?”

On the seven domains of OHIP, the highest

mean score was recorded for “physical pain”  $4.29 \pm 1.82$  followed by “psychological discomfort”  $3.76 \pm 1.89$  and the lowest was for “handicap”  $2.67 \pm 1.34$  (Table 3).

Table 4 shows the relationship between the number of missing teeth and the OHIP score of the patients. A majority 106 (64.2%) of the patients had the OHIP score  $<2$  indicating low impact of tooth loss on their quality of life. Twenty-six (31.3%), seventeen (42.5%) and five (29.4%) with one, two and three missing teeth respectively had the OHIP score  $\geq 2$ . However, there was no statistically significant relationship between the number of missing teeth and oral health-related quality of life ( $p=0.468$ ).

Thirty-one (50%) of patients with anterior missing teeth had the OHIP  $\geq 2$  indicating high impact of tooth loss on their quality of life while twenty-two (26.8%) with posterior missing teeth had the OHIP  $\geq 2$  and six (28.6%) patients with anterior and posterior missing teeth had the OHIP  $\geq 2$ . The relationship between the location of missing teeth and the impact on quality of life of the patient is statistically significant  $p=0.012$  (Table 5).

## Discussion

The most common missing teeth in this study were the posterior teeth. This agrees with report of a previous study<sup>7</sup> in which lower posterior teeth were the most common missing teeth followed by upper posterior teeth. The reason for this might be the fact that caries, which is a major cause of tooth loss, affects the posterior teeth more than the anterior ones.

In this study, the physical pain domain which comprises of feeling of pain or discomfort while eating is the aspect of the quality of life mostly affected by tooth loss. *Krismanper* et al.<sup>16</sup> stated that having the reduced number of teeth has a significant impact on physical discomfort and functional limitation domains of quality of life. The loss of posterior teeth by majority of the participants could be responsible for the feeling of discomfort on eating.

The impact on psychological discomfort which was next to physical pain corresponded with the finding of *Okoje* et al.<sup>12</sup> who reported psychological

effect such as feeling of sadness and depression because of missing teeth. Handicap was the least affected domain of the OHIP questionnaire. This agrees with the views that tooth loss is not associated with handicap.<sup>17</sup>

The study showed greater impact of anterior missing teeth on the OHIP with greater proportion of patients with anterior missing teeth having the OHIP score  $\geq 2$ . This tallies with the previous study<sup>18</sup> that stated that location of missing teeth affects the severity of impairment of quality of life of an individual. *Ogunrinde* and *Gbadebo* reported aesthetics as the main reason why patients request replacement of missing teeth, thereby highlighting the importance of missing anterior teeth on the quality of life of the patients.<sup>19</sup>

Also, the number of missing teeth influenced the impact of missing teeth on oral health with greater proportion of patients with more than three missing teeth having their OHIP score  $\geq 2$ . This tallies with previous studies which stated that the number of retained teeth is a key determinant of oral function and oral health status.<sup>20,21</sup> According to *Akpata* et al.,<sup>22</sup> the number of remaining teeth was significantly associated with the selection of foodstuffs. In a systematic review evaluating the relationship between oral function and dentition, the number of teeth below twenty was associated with impaired masticatory efficiency and individual perception of the patient's ability to chew.<sup>20</sup>

## Conclusion

This study shows a low mean OHIP score among partially edentulous patients, however, the physical pain and psychological discomfort domains of the oral health quality of life were mostly affected by loss of teeth. Missing teeth in the anterior region had a significant impact on oral health-related quality of life of the patients. The National Health Insurance Scheme (NHIS) should include replacement of missing teeth in their programme to improve the quality of life of partially edentulous patients.

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