# Oral Health Related Quality of Life among Elderly People in a General Practice Setting in Lagos

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Abstract

Background: Oral health-related quality of life is a multidimensional construct. Oral health has an impact on an individual's daily functioning, well-being and the overall quality of life. The elderly are prone to several dental problems such as dental caries and periodontal disease which constitute the major oral health burden all over the world. These two diseases have a high prevalence rate, wide geographical spread, graded severity and are important public health challenges. It is therefore important to examine the role of oral diseases with age and its impact on the quality of life of the elderly.

Aim: To assess the pattern of oral health and quality of life amongst elderly patients.

Materials and Methods: It is a descriptive cross sectional study, conducted among 294 elderly patients attending Orile Agege General Hospital, Lagos. Data was collected using a semi-structured, interviewer administered questionnaire for individual's oral health using the WHO Oral Health Questionnaires for the adult and oral health related quality of life using Oral Health Impact Profile. Data obtained was subjected to descriptive, bivariate and multivariate analysis using IBM SPSS 20.

Results: The mean age of the elderly was 68.65 ± 6.58 years. Nine point five percent of the respondents had less than 20 natural teeth, 46.6% were experiencing discomfort in mouth, 30.6% were using partial removable dentures and 4.8% were utilizing full lower or full upper removable dentures. Only 6.1% reported poor tooth condition and 8.2% stated poor gum condition. However, 42.9% of the respondents cleaned their teeth two times or more daily, 15.0% and 85.7% of subjects used tooth-brush/dental floss and fluoridated toothpaste respectively.

On the oral health quality of life (OHQoL), 35.4% had some impact of oral health on QoL with the dominant domains being physical pain (50.3%), psychological discomfort (44.6%) and functional limitation (43.2%). OHQoL was influenced by the number of natural teeth (OR = 5.417, p<0.001), discomfort in mouth (OR = 2.128, p = 0.002), removable dentures (OR = 2.732, p = 0.001) and frequent tooth-brushing (OR = 1.770, p = 0.021).

Conclusion: The number of natural teeth, discomfort in the mouth, presence of removable dentures and frequent mouth-washing influenced the quality of life of the elderly.

Keywords: Oral Health, Quality of Life, Elderly People, General Practice.

## Introduction

In Nigeria, the present population of elderly is over 5 million which is perhaps the largest concentration of the elderly in West Africa. The population of the elderly is projected to be 16 million by 2030 and 47 million by year 2060[1,2]. There is a high prevalence of periodontal diseases among the elderly which is about 90.8% for gingivitis and 75.4% for periodontitis[3]. The mouth, like every other part of the body reflects the elderly's health and well-being as oral diseases have an impact on many aspects of general health[3].

As high as 50.0% of mortality from the ten leading causes of death among the elderly in Nigeria and other Sub-Sahara African countries can be linked to attributes of life-style such as physical inactivity and poor oral hygiene[4]. It is therefore important to examine the interplay of oral diseases with age, and the impact of the diseases on the quality of life for the elderly[5].

Oral health-related quality of life is a multidimensional construct. Oral health has an impact on individual's daily functioning, well-being and the overall quality of life[6]. Dental caries and periodontal diseases are the major oral health burdens amongst the elderly all over the world[7,8]. They have high prevalence rate, wide geographical spread and graded severity[9].

The aim of the study is to determine the pattern of oral health and the impacts oral health has on the quality of life of the elderly patients attending Orile Agege General Hospital, Lagos.

## Methodology

The study was a descriptive cross-sectional study which employed a quantitative study method. Verbal consent was taken for inclusion in the study. Patients that were above 60 years who could understand English and those who did not understand English were communicated to through an interpreter. The study population consisted of 269 elderly patients attending Orile Agege General Hospital, Lagos, Nigeria. Systematic sampling technique was also used to recruit respondents from each unit that participated in the study. Oral examination was done and data was collected using a semi-structured, interviewer administered questionnaire which addressed the socio-demographic information, self-reporting of an individual's oral health using the WHO Oral Health Questionnaires for the Adult,[10] and the impact of oral health conditions on the quality of life of the elderly patients using Oral Health Impact Profile-14 (OHIP-14). During the intra-oral examination, the number of missing teeth was counted.

## Data Analysis

The data was entered and analysed using SPSS-Version 20. Three levels of analyses were employed. The univariate analysis was used to calculate the mean and standard deviation for continuous data while proportions were determined for all the categorical data. The bivariate analysis was utilized to determine associations between variables. Chi square Statistics was used to determine the relationship between oral health, oral hygiene practices and quality of life of the elderly. Multivariate analysis was employed for regression and the level of significance was defined at 95% confidence interval ($p < 0.05$).

The questionnaire used to obtain information about an individual's oral health and the oral hygiene practices was adapted from WHO Oral Health Questionnaires for the Adult[10]. The individual scores were summed up to evaluate the oral health self-assessment and the oral hygiene practices. The reliability and validity scores for this study were determined. The Oral Health Impact Profile (OHIP – 14) Questionnaires response was classified using the Likert scale with six options ranging from; Never- 0, Hardly ever- 1, Occasionally- 2, Fairly often- 3, Very often- 4, Don't know- 5. There were 7 main domains in which two questions each were derived from. These included functional limitation, physical pain, psycho discomfort, physical disability, psycho disability, social disability and handicap. The score for each response is summed up for the fourteen questions and the mean score is calculated for all respondents, dichotomizing responses into "no impact" versus "some impact" where "no impact" is the score lower than mean sum and "some impact" indicates mean score and above[11]. The scores assigned to the responses to the 14 questions are added to obtain values between 0 and 14[12].

## Ethical Considerations

Ethical approval was obtained from the Health Research and Ethics Committee of the Lagos University Teaching Hospital, Lagos with an assigned identification number of ADM/DCST/HREC/APP/197.

## Results

Table 1 shows overall responses of the elderly to the statements assessing their oral health quality of life. The questions were asked to know if they had certain difficulties because of problems associated with

teeth, mouth or dentures. Although 3 (1.0%) of the respondents did not indicate if they had trouble pronouncing words, 3 of every 5 of the respondents stated they never had trouble pronouncing words.

On whether sense or taste had worsened, 143 (48.6%) of the respondents never experienced such difficulty.  Concerning having pain or ache in the mouth, approximately one-tenth of the respondents indicated that they either had pain very often (31, 10.5%) or fairly often (30, 10.2%) due to problems with teeth, mouth or dentures while (115, 39.1%) experienced it occasionally.

On whether the respondents had been self-conscious of their mouth because of problems with teeth, mouth or dentures, 121 (41.2%) stated "never". One hundred and fifty-nine (54.1%) respondents indicated they never had unsatisfactory diet because of problems with mouth, teeth or dentures.

Majority of the respondents (197, 67.0%) said they had never been irritable with other people when they had problems with their mouth, teeth and dentures. The other responses of the respondents to the statements assessing their oral health quality of life are as shown in Table 1.

Table 1: Distribution of Oral Health Impact Profile of the elderly patients  (n=294)

| S. No | Item | Very often n (%) | Fairly often n (%) | Occasionally n (%) | Hardly ever n (%) | Never n (%) | Don't Know n (%) |
|---|---|---|---|---|---|---|---|
| 1. | Have had trouble pronouncing any word because of problems with teeth, mouth or dentures. | 14 (4.8) | 14 (4.8) | 50 (17.0) | 35 (11.9) | 178 (60.5) | 3 (1.0) |
| 2. | Felt that sense or taste has worsened because of problems with teeth, mouth or dentures. | 14 (4.8) | 25 (8.5) | 37 (12.6) | 56 (19.0) | 143 (48.6) | 19 (6.5) |
| 3. | Have had pain and ache in the mouth | 31 (10.5) | 30 (10.2) | 115 (39.1) | 38 (12.9) | 76 (25.9) | 4 (1.4) |
| 4. | Have found it uncomfortable to eat any foods because of problems     with teeth, mouth or dentures. | 14 (4.8) | 26 (8.8) | 76 (25.9) | 49 (16.7) | 120 (40.8) | 9 (3.1) |
| 5. | Have been self-conscious because of teeth, mouth or dentures. | 27 (9.2) | 13 (4.4) | 65 (22.1) | 37 (12.6) | 121 (41.2) | 31 (10.5) |
| 6. | Have felt tense because of problems    with teeth, mouth or dentures. | 9 (3.1) | 8 (2.7) | 27 (9.2) | 45 (15.3) | 154 (52.4) | 51 (17.3) |
| 7. | Diet has been unsatisfactory because of problems with teeth, mouth or dentures. | 12 (4.1) | 15 (5.1) | 36 (12.2) | 34 (11.6) | 159 (54.1) | 38 (12.9) |
| 8. | Had to interrupt meal because of problems     with teeth, mouth or dentures. | 20 (6.8) | 15 (5.1) | 64 (21.8) | 29 (9.9) | 135 (45.9) | 31 (10.5) |
| 9. | Have had difficulty relaxing because of problems with teeth, mouth or dentures. | 17 (5.8) | 19 (6.5) | 27 (9.2) | 36 (12.2) | 167 (56.8) | 28 (9.5) |
| 10. | Have been a bit embarrassed because of problems with teeth, mouth or dentures. | 7 (2.4) | 5 (1.7) | 33 (11.2) | 41 (13.9) | 190 (64.6) | 18 (6.1) |
| 11. | Have been a bit irritable with other people because of problems with teeth, mouth or dentures. | 6 (2.0) | 8 (2.7) | 16 (5.4) | 37 (12.6) | 197 (67.0) | 30 (10.2) |
| 12. | Have had difficulty doing usual jobs because of problems with teeth, mouth or dentures. | 15 (5.1) | 9 (3.1) | 18 (6.1) | 23 (7.8) | 211 (71.8) | 18 (6.1) |
| 13. | Had  felt that life in general was less satisfying because of problems with teeth, mouth or dentures. | 12 (4.1) | 7 (2.4) | 12 (4.1) | 25 (8.5) | 214 (72.8) | 24 (8.2) |
| 14. | Have been totally unable to function because of problems with teeth, mouth or dentures. | 10 (3.4) | 9 (3.1) | 18 (6.1) | 23 (7.8) | 208 (70.7) | 26 (8.8) |

Table 2 summarized the impact of oral health on domains of quality of life (OHQoL) as measured by the oral health impact profile (OHIP) of the respondents attending Orile-Agege general hospital, Lagos. The most dominant domain was "Physical pain" (148, 50.3%) followed by "Psychological discomfort" (131, 44.6%) and "Functional limitation" (127, 43.2%). The least frequent domain was "Handicap" (71, 24.1%). Table 3 shows the association between oral health quality of life (OHQoL) and pattern of oral health among the elderly attending Orile-Agege General Hospital, Lagos. A statistically significant association was observed among elderly patients with less than 20

teeth and impact on oral health quality of life and also between elderly patients having discomfort with their teeth and impact on oral health quality of life. The proportion of respondents with full lower/upper removable dentures (71.4%) assessed to have some impact on OHQoL was significantly higher than those with either partial removable dentures (47.8%) or no removable denture (26.8%) (F. exact= 19.539, P<0.001). Also, a significantly higher proportion of respondents who brushes twice daily (42.9%) was assessed to have some impact on OHQoL when compared with those that do not brush their teeth 2 times/day (29.8%) ($x^2$ = 5.401, P = 0.026).

Table 2: Distribution of the domains of oral health impact profile (n = 294)

|  | Domain | Mean ± SD | Impact n (%) | No Impact n (%) |
|---|---|---|---|---|
| 1 | Functional Limitation | 1.00 (1.0-3.0) | 127 (43.2) | 167 (56.8) |
| 2 | Physical Pain | 3.00 (1.0-4.0) | 148 (50.3) | 146 (49.7) |
| 3 | Psychological discomfort | 2.00 (0.0-4.0) | 131 (44.6) | 163 (55.4) |
| 4 | Physical disability | 2.00 (0.0-4.0) | 120 (40.8) | 174 (59.2) |
| 5 | Psychological disability | 1.00 (0.0-3.0) | 94 (32.0) | 200 (68.0) |
| 6 | Social disability | 0.0 (0.0-2.0) | 91 (31.0) | 203 (69.0) |
| 7 | Handicap | 0 (0.0-2.0) | 71 (24.1) | 223 (75.9) |
| 8 | General OHIP | 11.00 (5.0-19.0) | 104 (35.4) | 190 (64.6) |

Table 3: Association between oral health related quality of life and pattern of oral health

| Pattern of oral health | OHQoL | | | $x^2$/Fishers Exact | P-value |
|---|---|---|---|---|---|
|  | No impact | Some Impact | Total |  |  |
| Number of natural teeth |  |  |  |  |  |
| < 20 | 8 (28.6) | 20 (71.4) | 28 |  |  |
| ≥ 20 | 182 (68.4) | 84 (31.6) | 266 | 17.597 | <0.001* |
| Discomfort in mouth |  |  |  |  |  |
| Yes | 76 (55.5) | 61 (44.5) | 137 |  |  |
| No | 114 (72.6) | 43 (27.4) | 157 | 9.398 | 0.002* |
| Removable dentures |  |  |  |  |  |
| None | 129 (73.2) | 51 (26.8) | 190 |  |  |
| Partial | 47 (52.2) | 43 (47.8) | 90 | 19.539 | <0.001** |
| Lower/ upper | 4 (28.6) | 10 (71.4) | 14 |  |  |
| Condition of teeth |  |  |  |  |  |
| Good | 85 (65.4) | 45 (34.6) | 130 |  |  |
| Average | 96 (66.2) | 49 (33.8) | 145 | 2.667 | 0.276 |
| Poor | 9 (47.4) | 10 (52.6) | 19 |  |  |
| Condition of gum |  |  |  |  |  |
| Good | 80 (65.0) | 43 (35.0) | 123 |  |  |
| Average | 94 (63.9) | 53 (36.1) | 147 | 0.083 | 0.965 |
| Poor | 16 (66.7) | 8 (33.3) | 24 |  |  |
| Frequent tooth brushing |  |  |  |  |  |
| ≥ 2 times/day | 72 (57.1) | 54 (42.9) | 126 |  |  |
| < 2times/day | 118 (70.2) | 50 (29.8) | 168 | 5.401 | 0.026* |
| Use of toothbrush and dental floss |  |  |  |  |  |
| Yes | 24 (54.5) | 20 (45.5) | 44 |  |  |
| No | 166 (66.4) | 84 (33.6) | 250 | 2.300 | 0.171 |
| Use toothpaste that contain fluoride |  |  |  |  |  |
| Yes | 162 (64.3) | 90 (35.7) | 252 |  |  |
| No | 28 (66.7) | 14 (33.3) | 42 | 0.089 | 0.862 |

Significant; *($x^2$), **(Fishers exact)

Table 4 showed that after controlling for other variables, elderly with <20 natural teeth were 5 times more likely to have some impact on their oral health quality of life when compared to those with 20 or more natural teeth (OR = 5.417, p<0.001). Elderly with discomfort in the mouth were 2 times more likely to have some impact on oral health quality of life when compared to those without discomfort in their mouth (OR = 2.128, p = 0.002). Elderly with

removable upper/lower removable dentures were 3 times more likely (OR = 2.732, p = 0.001) and those with removable partial removable dentures 2 times more likely (OR = 2.494, p = 0.001) to have some impact of oral health quality of life.

Also, elderly who washed mouth 2 times or more daily had about 2 times likelihood of having some impact of oral health quality of life (OR = 1.770, p = 0.021).

Table 4: Logistic regression analysis relating pattern of oral health to Oral health related quality of life.

| | Odds Ratio | Confidence Interval | | P-value |
| | | Lower limit | Upper limit | |
| --- | --- | --- | --- | --- |
| Number of natural teeth | | | | |
| < 20 | 5.417 | 2.293 | 12.797 | <0.001 |
| 20 (RC) | 1.000 | -- | -- | -- |
| | | | | |
| Discomfort in mouth | | | | |
| Yes (RC) | 2.128 | 1.308 | 3.461 | 0.002 |
| No | 1.000 | -- | -- | -- |
| | | | | |
| Removable dentures | | | | |
| None (RC) | 1.000 | -- | -- | -- |
| Partial | 2.494 | 1.477 | 4.209 | 0.001 |
| Lower/ upper | 2.732 | 0.798 | 9.346 | 0.001 |
| | | | | |
| Frequent tooth brushing | | | | |
| ≥ 2 times/day | 1.770 | 1.091 | 2.871 | 0.021 |
| < 2times/day (RC) | 1.000 | -- | -- | -- |

*RC = Reference category, some impact

## Discussion

The study assessed the pattern of oral health and oral hygiene practices among the elderly. It also determined the oral health quality of life and the association between oral health and the quality of life of the elderly. It was observed in this study that 42.9% of the respondents brushed their teeth twice or more a day and 15.0% of the respondents used dental floss. This is lower than the findings in the study done by Armitage and Robertson[13] which reported that about 60.0% of the respondents brushing their teeth twice daily. Oral hygiene practices of the respondents in this present study seemed ineffective in meeting oral health needs and preventing oral diseases. Epidemiological studies have shown that poor oral hygiene and high level of oral health needs are associated with high prevalence rate and severity of periodontal diseases[14,15,16].

Oral health impact profile (OHIP) assessed the impact of oral health on the quality of life of the elderly in this study. It was not surprising that the most dominant domain of oral health quality of life among the elderly in this study was physical pain. The experience of pain affects the ability to perform many different physical activities[17]. This result is in tandem with the finding in the report of an aging Canadian population study[11], in which the most commonly reported dominant domain was 'physical pain'. Physical pain was also reported to be the most dominant domain of oral health quality of life in the study that assessed the relationship between oral health and oral health related quality of life among elderly people in United Kingdom[7]. while psychological disorder was reported to be the most dominant in the study conducted in Spain[18].

The other dominant domains in this present study were psychological discomfort and functional

limitation. This is similar to the study done in the aging Canadian population in which psychological discomfort was also reported as a dominant domain of oral health quality of life[11]. However, in contrast to the finding in this present report, a Spanish study[18] reported functional limitation as the second most dominant and physical pain as the third most dominant domain. These differences could be due to the method of OHIP adopted and the lifestyle of respondents in each study location. In this study, 'additive mean score' method was used while the study in Spain adopted the "occasional threshold method"[12]. Social disability was the least dominant domain in Masood et al's study[7] while handicap was the least dominant in this study and in a study conducted in Spain[12].

In this study, number of natural teeth related to oral health quality of life. While the elderly with less than 20 natural teeth were assessed to have some impact of oral health on their quality of life, while those having 20 or more standing teeth have lesser impact of oral health on their quality of life. This finding is similar to the report in a study done in United Kingdom[7] which observed that the elderly population had poorer OHQoL when the number of missing teeth was between 6–17. It is perhaps unsurprising that the experience of discomfort in mouth has some impact on oral health quality of life among the elderly, a significant proportion of respondents with discomfort in mouth (44.5%) assessed to have some impact on OHQoL was higher when compared with those elderly without discomfort in mouth. This finding is similar to the study conducted in United Kingdom[7], which observed that pain originating from the mouth extends further and causes physical, psychological and social disability among older people. Re-orientating the elderly on oral health services could be key to helping them eliminate pain in the mouth[19].

Wearing of dentures was found to affect oral health quality of life among the respondents in this study. Those with full lower/upper removable dentures assessed to have some impact on OHQoL were significantly higher than those with either partial removable dentures or no removable dentures. This finding is similar to the study in which there was association between wearing dentures with higher OHIP-14 scores[7]. There are many possible reasons for the association of dentures with some impact of oral health related quality of life. These include features such as adaptation, fitness and retention of the dentures. Improperly fitted prosthesis or dentures are known to cause stomatitis and traumatic ulcer[20].

Frequent tooth brushing was found to affect oral health QoL. A higher proportion of respondents who brush their teeth more than 2 times/day was assessed to significantly have some impact on OHQoL in comparison to those who brush less than 2 times/day. Self-esteem and self-perception (54.1%) could explain why regular tooth brushing could be seen in an elderly. It could be in response to the way he perceives his oral health.

After controlling for other variables, those respondents with natural teeth of less than 20 in number were 5 times more likely to have some impact on their oral health quality of life when compared to those with 20 or more natural teeth (OR = 5.417, p<0.001). Respondents with discomfort in mouth were 2 times more likely to have some impact of oral health on their quality of life (OR = 2.128, p = 0.002). Elderly with full upper/lower removable dentures were 3 times more likely (OR = 2.732, p = 0.001) and those with partial removable dentures, 2 times more likely to have some impact of oral health on their QoL.

## Conclusion

Based on the finding of this study, a large number of the respondents were assessed to have some impact of oral health on quality of life with the most dominant domain of OHIP-14 being physical pain and least dominant domain was handicap. The pattern of oral health that was assessed to have some impact on quality of life was number of natural teeth, discomfort in mouth, removable dentures and frequency of tooth brushing.

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