Oral Health and Quality of Life in adults living in Northeastern Brazil

Paulo Sérgio de Mello Guimarães Jr.[1], Débora Rosana Alves Braga[2], Maria Vieira de Lima Saintrain[3]

[1]DDS. School of Dentistry, University of Fortaleza – Unifor, Av. Washington Soares, 1321, Edson Queiroz, CEP 60.811-905 Fortaleza, Ceará, Brazil

[2]Public Health Graduation Program, University of Fortaleza – Unifor, Av. Washington Soares, 1321, Edson Queiroz, CEP 60.811-905 Fortaleza, Ceará, Brazil

[3]PhD. Professor of the Public Health Graduation Program, University of Fortaleza – Unifor. Av. Washington Soares, 1321 Edson Queiroz, CEP 60.811-905 Fortaleza, Ceará, Brazil

Abstract— Objective: To assess the oral health-related quality of life of adult people regarding social, physical and psychological aspects.

Methods: Analytical cross-sectional research conducted with adults living in Northeastern Brazil. Patients were assessed through three questionnaires: Sociodemographic (age, gender, skin color, marital status, education and income); OHIP-14 - instrument that assesses the impact of oral health on quality of life; COHI - Community Oral Health Indicator, which assesses: 1- Masticatory capacity; 2- Oral health injuries; 3- Use of dental prosthesis; 4) Dental visits.

Results: The research was conducted from January to April 2015 in two randomly-selected Primary Health Care centers Participants were 264 people whose age ranged 18-59 years (mean 37.06 years and SD±10.994). Statistically significant differences were found between mean OHIP scores and socioeconomic data: skin color (p= 0.036) and education (p=0.022), oral health status: no visible cavities (p<0.001), sore gums (p=0.005), three or more visible cavities (p<0.001), and soft tissue injuries (p= 0.005).

Conclusion: Quality of life was shown to be influenced by oral health status, although many interviewees reported having a good quality of life.

Keywords— Epidemiology. Oral Health. Quality of Life. Adults.

I. INTRODUCTION

Given the increasing development of public health policies on health promotion and disease prevention, studies on quality of life have been carried out to incorporate positive and negative perceptions of oral health and health outcomes [1, 2]. In this context, the 2nd National Conference on Oral Health [3] considers that "Oral health is an integral and inseparable part of an individual's general health".

In order for people to reach old age with a good oral health, it is necessary that they take care of it throughout their entire life. In adulthood, oral health problems are exacerbated due to the cumulative nature of the sequelae of oral diseases [4].

In a debate held in Rio de Janeiro [5], quality of life was defined as a sense of human satisfaction that is closely related to the degree of satisfaction found in family, love, social and environmental life and to existential aesthetics itself – which could be considered a cultural synthesis of all the elements that a certain society considers as its standard of comfort and well-being. Authors [6] have emphasized that self-reported symptoms and perceived oral health status and need for treatment are important measurable dimensions of oral health and quality of life. Therefore, good oral health is imperative to general health, well-being and quality of life and brings significant benefits to self-esteem, dignity, social integration, and nutrition in general.

Given that, the importance of oral health for adults is observed when toothache alone interferes with social life and prevents individuals from carrying out their work activities, significantly affecting their quality of life. Therefore, subjective or socio-dental indicators are crucial

for raising awareness on the effects of these problems on people [7, 8].

Despite advances and improvement in health care in Brazil after the implementation of its Unified Health System (*Sistema Único de Saúde – SUS*) in the 1990s, the oral health status of the Brazilian population is still worrisome, especially with regard to older people and adults. Epidemiological surveys conducted in Brazil to assess the number of decayed, missing and filled teeth (DMFT) in the Brazilian population show that in a 24-year period the oral health of adults and older people did not reflect much of the improvement in oral health policies. In these surveys, the mean DMFT in adults (aged 35-44 years) was 22.5 in 1986 (14.96 representing the extracted component), 20.1 in 2003 (13.2 extracted component) and 16.75 in 2010 (7.48 extracted component) [3, 4, 9, 10]. The findings present an alarming situation in which most of the components of the DMFT index in this age group refer to missing or extracted teeth.

Another factor that is particularly present in this age group is the need for dental prosthesis. Findings of the last epidemiological survey revealed that only 26.6% of adults in this age group do not need any type of dental prosthesis [10]. This means that the attack of dental caries is a concern that manifestly affects the good oral health status of this portion of the Brazilian population.

In addition to this problem, tooth loss and poor dental care are common and generate physical, psychic, and/or social problems, as research [11] has demonstrated that chewing disability produces a significant and negative impact on oral health-related quality of life (QoL), and both poor QoL and chewing disability are related with the decrease of the number of natural teeth.

An example of such relationship can be seen in a study that demonstrates that decreased appetite in patients with depression is associated with poor diet and decreased self-esteem [12]. Additionally, another study found that depressive symptoms were associated with the oral discomfort in older people [13].

Thus, it should be said that the comprehensive nature of dental care requires integration with other professionals in order to consider life in all its aspects (e.g., physical, social and psychological). However, the assessment of these conditions requires indicators/indices such as the OHIP (The Oral Health Impact Profile), developed by Slade and Spencer [14], and its shorter version – OHIP [15], which is suitable for assessing oral health-related quality of life.

Therefore, Oral health-related quality of life (OHIP) will be compared using the Community Oral

Health Indicator (COHI). This indicator, developed by Saintrain [16] and validated by Saintrain, Vieira [17], was shown to be very effective in assessing the oral health of research participants included all ages.

In this context, it is important to assess people's satisfaction with their oral health so that dental care can be delivered in a comprehensive and humanized way taking into consideration the capacities and needs of this and other population groups.

Thus, the present study aimed at assessing the oral health-related quality of life of adults with regard to social, physical and psychological aspects, comparing with the actual oral health condition.

II.   METHODS

This is a quantitative, descriptive, and analytical cross-sectional research conducted with adults living in the city of Fortaleza, Ceará, Northeastern Brazil. Adults were individuals aged 35 to 59 years according to Brazil's National Policy on Older People's Health, which establishes age 60 as the beginning of old age [18].

The city of Fortaleza is divided into six administrative regions (*Secretarias Executivas Regionais – SER*) and has a total of 93 Primary Health Care (PHC) Centers. The research was carried out in two randomly selected PHC centers in each region.

Sample size was determined based on data from DATASUS (Brazil's Unified Health System Database) on the total number of adult inhabitants in the city of Fortaleza in 2012, which showed that the Metropolitan Region of Fortaleza had 1,464,700 adults [19].

A minimum sample size was determined to estimate a population proportion with a maximum expected proportion of 20%, a significance level of 5% (95% confidence interval) and a maximum permissible error of 5%. Thus, the sample size was determined to be 264 adults. Therefore, data were collected from 22 adults from each PHC center – a total of 44 adults from each SER.

The interviewers were previously trained in order to standardize the data collection process. After the training, the patients were assessed through three questionnaires: a) identification form – a semi-structured questionnaire to obtain sociodemographic data (address, age, gender, skin color, marital status, education, and income); b) Oral health-related quality of life - OHIP-14 – a specific instrument containing 14 essential items to assess the impact of oral health on quality of life. Each question is assessed based on the following scale: 0 =

'never', 1 = 'hardly ever', 2 = 'occasionally', 3 = 'fairly often', and 4 = 'very often' [14, 15]; c) COHI – Community Oral Health Indicator [16, 17], which assesses: 1 - Masticatory capacity (number of teeth in the mouth); 2 – Degree of severity (no visible cavities, presence of tartar, one or two visible cavities, three or more visible cavities, soft tissue injuries); 3 - Use of prosthesis; and 4) Dental visits in the previous year.

After collection, data were entered and analyzed using the Statistical Package for the Social Sciences – S PSS version 15 (SPSS Co, Chicago, USA).

Data were analyzed using descriptive and analytical statistics. Significant differences between variables were checked using the Mann-Whitney* U test when comparison involved two categories and the Kruskal-Wallis test** when more than two categories were compared. In order to facilitate understanding of analyses, it should be noted that the higher the mean value for the sum of scores, the lower the quality of life of interviewees.

Inferential analyses with "p" value less than or equal to 0.05 (p<0.05) were considered statistically significant.

The research protocol complied with the ethical precepts of research involving human beings and is in accordance with Resolution 466/12 of the National Health Council. Study participants were guaranteed dignity, respect and protection, and the study followed the four basic reference principles of bioethics: autonomy, beneficence, nonmaleficence and justice. The study was approved by the Research Ethics Committee under Opinion No. P068232/2013.

III. RESULTS

The study was conducted with 264 people whose age ranged 18-59 years, with a mean of 37.06 years and Standard Deviation ± 10.994.

There was a predominance of single individuals (107; 40.5%), women (193; 73.1%), ages 28 to 37 years (90; 34.09%), white skin color (133, 50.37%), income of up to one minimum wage (147, 55.68%, and complete secondary education (103, 39.01%).

Statistically significant differences were found between the mean OHIP scores and socioeconomic data: skin color (p= 0.036) and education (p=0.022). (Table 1).

Regarding oral health status, 213 people (80.68%) had 20 or more teeth in their mouths. Of these, 119 (45.07%) had no visible cavities. Additionally, 209 (79.16%) participants did not use dental prosthesis.

Statistically significant differences were found between the mean OHIP scores and oral health status: no visible cavities (p<0.001), sore gums (p=0.005), three or more visible cavities (p<0.001), and soft tissue injuries (p= 0.005). (Table 2).

Table 1 shows the results of the comparative analysis between the sociodemographic data of the adults and the median value of the OHIP-14 index.

Table 2 shows the results of the comparative analysis between the oral health status of the adults and the median value of the OHIP-14 index.

Table 1. Distribution and comparative analysis of sociodemographic data versus mean Oral health-related quality of life - OHIP scores. Fortaleza, Ceará - Brazil.

Variables	N	Oral health-related quality of life			
		Median	Standard Deviation	Mean	p value
Age					
18-27 years	60	6	9.5	8.6	0.509**
28-37 years	90	7	9.0	9.2	
38-47 years	53	8	7.8	9.2	
> 47 years	61	8	9.4	10.4	
Marital status					
Single	107	7	9.4	9.1	0.747**
Married	92	7.5	8.3	9.3	

	n	Median	Standard Deviation	Mean	p value
Diivorced	13	6	8.3	9.0	
Widowed	7	16	13.4	14.9	
Other	45	7	8.8	9.4	
Gender					
Men	71	7	8.5	8.9	0.806*
Women	193	7	9.2	9.5	
Skin color					
White	133	6	8.4	8.0	0.036**
Black	24	11	9.3	11.5	
Pardo	105	8	9.5	10.7	
Other	2	10	2.8	10.0	
Employed					
Yes	189	7	9.3	9.4	0.984*
No	75	6	8.2	9.2	
Income					
1 wage	147	8	9.1	10.0	0.267**
2-5 wages	62	7	9.2	8.5	
5 wages or more	3	4	2.3	2.7	
No income	52	6	8.5	9.1	
Education					
None	7	5	7.3	8.7	0.022**
Incomplete primary	69	9	11.2	10.9	
Complete primary	46	10	8.2	11.0	
Incomplete secondary	12	15.5	8.8	13.9	
Complete secondary	103	6	7.6	7.8	
Higher education	27	4	7.9	6.8	

Source: research data * Mann-Whitney U test; ** Kruskal-Wallis test

Table 2. Distribution and comparative analysis of Oral Health Status versus mean OHIP scores. Fortaleza, Ceará - Brazil.

Variables	Oral health-related quality of life - OHIP				
	n	Median	Standard Deviation	Mean	p value
Number of teeth in the mouth					
None	8	11.5	7.2	12.1	0.273**
1-10 teeth	21	8	9.8	10.3	
11-19 teeth	22	10	7.7	10.6	
20 or more teeth	213	7	9.1	9.0	
No visible cavities					

Yes	119	4	8.9	7.7	<0.001*
No	145	10	8.8	10.7	
Presence of tartar					
Yes	63	9	8.3	9.6	0.536*
No	201	7	9.2	9.3	
Sore gums					
Yes	71	11	9.2	11.7	0.005*
No	193	6	8.8	8.5	
One or two visible cavities					
Yes	90	9	7.8	9.9	0.121*
No	174	6	9.5	9.1	
Three or more visible cavities					
Yes	48	12.5	8.8	13.3	<0.001*
No	215	6	8.8	8.5	
Soft tissue injuries					
Yes	34	12	7.3	12.1	0.005*
No	230	6	9.1	9.0	
Use of prosthesis					
Yes	55	8	9.272	10.35	0.318*
No	209	7	8.908	9.11	
Dental visit in the previous year					
Yes	155	7	9.4	9.7	0.791*
No	109	7	8.3	8.9	
Source: research data. * Mann-Whitney U test; ** Kruskal-Wallis test					

IV.   DISCUSSION

Oral health is an important component of general health and quality of life. However, oral diseases still constitute an important public health problem in both high-income and low- and middle-income countries. Despite this, disease prevention and oral health promotion are largely neglected in the public health field [20].

Therefore, the present research, which seeks to measure the impact of oral health status on the quality of life of adults, assumes that oral health is an "integral and inseparable part of an individual's general health", that is, it is notably a significant component of people's general health and quality of life [3, 21].

The assessment of oral health-related quality of life (OHIP-14) found no significant differences between genders. A similar situation was observed in Greece [22] – where the mean OHIP value was 2.0 (standard deviation ±

2.7) for male gender and 2.5 (standard deviation ± 2.8) for female gender – and in Germany [23].

The research findings reveal statistically significant differences between the quality of life and education of the participants.

The application of the OHIP to the adult population in England, Wales and Northern Ireland has revealed weaker marginal effects for all outcomes for occupational social class compared to education or income, i.e., educational and income-related inequalities were larger among young people and non-significant among 65+ year-olds [24].

In addition, Previous research [25] using the OHIP-14 with 1788 adults has identified that individuals' self-perception of their oral health was related to sociodemographic, socioeconomic, psychosocial, and behavioral variables, thus confirming that emphasis should

be placed on social factors when addressing oral health problems.

Data from the 2010 SB Brasil reveal that adults from Northeastern Brazil had one of the highest rates of tooth loss in the country [10].

The present sample presented a relatively low socioeconomic status and a large number of low-educated participants. Such factors collaborate to and directly affect the oral health status as they are associated with knowledge about hygiene and care habits, and consequently highlight the need for dental actions aimed at health promotion and care and disease prevention, which is confirmed by research [26] carried out in Chile.

A large difference in quality of life was observed between white people and black people and *pardos* (mixed-race Brazilians). Participants with white skin color presented a better mean OHIP score (8.0) and statistical significance (p=0.036). Such finding suggests that their oral health-related quality of life is much better compared to that of black people, *pardos*, and/or other skin colors. This difference may be due to cultural reasons, factors related to discrimination and multidimensional aspects that may be associated with ethnic and racial disparities [27].

The epidemiological survey carried out in Brazil in 2010 [10] showed that Brazilian adults aged 35-44 years had a mean of 1.48 decayed teeth. In the same survey, only 0.9% of adults were caries-free.

Different from the aforementioned finding, it was observed that a great number of users of PHC centers (119; 45.07%) had no visible cavities, a finding that was statistically significant (p<0.001). This leads to think that public services may have provided more effective prevention programs and that people may be more concerned about their oral health.

In the present study, the interviewees who had three or more visible cavities (48; 18.18%) also presented data that suggested a lower quality of life compared to those with less than three cavities, with a statistically significant difference of p<0.001. This finding is supported by studies carried out in Makkah city, Saudi Arabia [28], where adults with higher caries experience presented lower quality of life.

The presence of gingivitis in the interviewees had an impact on their quality of life. The participants reported increased stress, irritability, discomfort, bad breath, decreased social interaction, and dissatisfaction with appearance, which had an effect on OHIP-14 scores. Likewise, research carried out in London [29] also demonstrated that the impact of periodontal disease on quality of life was mainly related to a significant association of periodontal problems with pain, nervousness, psychological distress, and functional, physical and psychological limitations of patients.

In this context, the lack of preventive and conservative oral health care actions targeted at these patients has a direct negative impact on their well-being [20].

The oral function, which encompasses a set of processes such as chewing, swallowing and phonation, is one of the points of quality of life. Thus, any type of injuries or harms to the oral cavity can impair and brings discomfort to the patient, as found in the results pointed out by the present study and confirmed by the study carried out in Quebec [21]. In addition to these problems, psychological and physical aspects may worsen the patient's condition. Therefore, the care of these people should be prioritized given the risks and severity of the disease. However, prevention and self-examination programs are necessary in order to raise awareness of the main actions one should take when faced with any type of injury, blister, patch or mouth sores.

The fact that the research was performed with people seeking care in primary care centers, the findings may not reflect the real dimension of the association between oral health condition and quality of life, and may constitute a limitation of the study. Although the data cannot be extrapolated to other populations, the findings showed that quality of life was influenced by the state of oral health, although many participants reported having a good quality of life.

However, tooth loss is still seen in a cultural way as a result of time and aging, that is, it is not considered a consequence of oral or stomatognathic diseases. There is still a need for improvement in the quality of primary health care services, as well as in the work process of health teams and professionals, in cultural standards, and in health education, in order to eliminate diseases such as caries and minimize the impact of oral health problems on quality of life.

V. CONCLUSION

The analysis of data allowed observing that the quality of life was influenced by oral health status, although many participants reported having a good quality of life. There is still a need for improvement in the quality of primary health care services, as well as in the work process of health teams and professionals, in cultural standards, and in health education, in order to eliminate

diseases such as caries and minimize the impact of oral health problems on quality of life.

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