Quality of life related to complete denture

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ABSTRACT

Full edentulism is characterized by the complete loss of permanent teeth, resulting in aesthetic, structural and functional changes which can negatively impact quality of life, and which are minimized through rehabilitation with complete dentures. The aim of this study was to compare oral health-related quality of life in patients with complete original dentures three months after installation of new dentures and two years after fabrication of new complete removable dentures. In this longitudinal comparative study, 15 volunteers of both genders, aged 50 to 82 years, who sought treatment at the Department of Dentistry of the Federal University of Rio Grande do Norte, participated in the preparation of new dentures. The Brazilian version of the Oral Health Impact Profile for edentulous patients (OHIP-EDENT) was used to evaluate quality of life. Data analysis was performed descriptively and with hypothesis testing using the Friedman and Wilcoxon tests with 5% significance level. In relation to the OHIP-EDENT domains, there was a difference for chewing discomfort and inability to chew between baseline and two years. However, there was no difference between the evaluated periods in the areas of pain and orofacial muscle discomfort, psychological inability and social disability. Improvement indicators in patient quality of life were observed in the area of discomfort and inability to chew between baseline and 2 years.

Key words: *Stomatognathic System; Mouth Edentulous, Mesh Pubmed; Complete Denture; Quality of life.*

Qualidade de vida relacionada à prótese total

RESUMO

O edentulismo completo caracteriza-se pela perda total dos dentes permanentes, resultando em alterações estéticas, estruturais e funcionais, podendo impactar negativamente na qualidade de vida, sendo minimizado através da reabilitação com a prótese dentária. O objetivo deste estudo foi comparar a qualidade de vida relacionada à saúde oral em pacientes com a prótese original completamaxilar e mandibular, três meses após instalação da nova prótese e dois anos depois da confecção da nova prótese total bimaxilar removível. Nesse estudo comparativo longitudinal, participaram 15 voluntários, com faixa etária entre 50 e 82 anos, de ambos os sexos, que buscaram tratamento no Departamento de Odontologia da Universidade Federal do Rio Grande do Norte, para a confecção de novas próteses. Utilizou-se a versão brasileira do Oral Health Impact Profile para pacientes edêntulos (OHIP-EDENT) para avaliar a qualidade de vida. A análise dos dados foi realizada de forma descritiva e analítica com os testes de Friedman e Wilcoxon, com nível de significância de 5%.Em relação aos domínios do OHIP-EDENT, verificou-se diferença para desconforto e incapacidade mastigatória entre a avaliação inicial e após dois anos. Nos domínios Dor e desconforto orofacial, Incapacidade Psicológica e Incapacidade Social, não ocorreram diferenças entre os períodos avaliados. Foram observados indicadores de melhora na qualidade de vida dos pacientes, no domínio desconforto e incapacidade mastigatória entre a avaliação e a 2 anos.

Palavras-chave: *Sistema estomatognático; Edêntulo; Prótese total; Qualidade de vida.*

INTRODUCTION

Complete edentulism is defined as a complete loss of permanent teeth[1], and is very common worldwide in the elderly population[2] aged 65[1] to 74 years[2,3]. It also characterizes a reality of the Brazilian population assessed in the latest epidemiological survey conducted in 2010 by the Ministry of Health. Survey results showed that 15.4% of the older adult

population was edentulous and needed complete dentures[4]. The 2013 National Health Survey found that 11% of individuals aged over 18 years were completely edentulous, with a higher proportion among women aged 60 years or older. Although complete loss of teeth is not necessarily a part of the natural aging process, age is one of the most prominent factors[5]. Other common factors are biological processes such as tooth decay, periodontal disease, trauma and oral cancer, and non-biological factors including dental procedures, the quest for healthcare, and socioeconomic and cultural factors[1]. Edentulism outcomes include changes to functional, neuromuscular and physiological[6] levels. Functional capacity includes chewing and speech, psychological status includes self-esteem and satisfaction with appearance, and social aspects involve pain and discomfort related to oral health[7-9]. Over time, the total loss of teeth leads to atrophy of support structures and loss of muscle tone, which have adverse effects on facial aesthetics[5] and also involve chewing, swallowing and speech functions[10]. Thus, proper oral function is not only associated with the ability to perform jaw movements and physiological parameters, but also with comfort and aesthetics, which can affect the quality of life[8].

The changes caused by total loss of teeth can be minimized through rehabilitation with dental prostheses, which is the most economical and common treatment[2,8,9,11]. Its purpose is to restore the harmony of the stomatognathic system and general health[9]. Acceptance of complete dentures requires psychosocial and functional adaptation, a process that can be influenced by patient expectations[12] and perceptions[7], which may involve quality of life. As defined by the World Health Organization, the term quality of life refers to "an individual's perception of their position in life in the cultural context and systems values in which they live and in relation to their goals, expectations, standards and concerns"[13].

Oral health-related quality of life thus plays a crucial role in the process of prosthetic rehabilitation, which includes functional, psychological and social aspects[7]. The aim of this study was to compare oral health-related quality of life with the previous dentures to oral health-related quality of life three months and two years after fabrication and fitting of the new complete removable dentures.

MATERIALS AND METHODS

A descriptive, comparative longitudinal study was approved by the Research Ethics Committee of the Onofre Lopes University Hospital under number 578.993. All participants were informed regarding study objectives and procedures, which were described in the Informed Consent Form, with patient consent and signature requested. Participants were selected among individuals who visited the Department of Dentistry of the Federal University of Rio Grande do Norte to have conventional complete dentures made. Inclusion criteria were individuals who had been fully edentulous for over a year and conventional complete upper and lower denture users needing new dentures. Participants who had motor difficulties, evident cognitive deficiencies in everyday actions or pathological changes of the alveolar edges were excluded.

The instrument used to assess the impact of quality of life was the Brazilian version of the *Oral Health Impact Profile* for edentulous patients (OHIP-EDENT), validated by Souza et al.[12]. Quality of life was evaluated in three stages: during the use of the old dentures, and after three months and two years of using the new dentures. The sample consisted of 15 individuals of both genders. It should be noted that much of the sample was lost over the course of the assessments, and the number of participants was reduced from 36 original participants to 22, and finally to 15 individuals. The OHIP-EDENT is an inventory consisting of 19 questions grouped into four subscales described by Souza et al.[14], emphasizing "pain and discomfort in orofacial muscles", "masticatory discomfort and inability", "psychological discomfort and inability" and "social inability". The options for the answers are: never, sometimes and almost always, which are assigned the scores of "0", "1" and "2", respectively. Higher scores represent worse oral health-related quality of life.

Statistical analysis was performed with SPSS version 20.0 for Windows. The Shapiro-Wilk test was used to evaluate the normality of data distribution, finding that the variables did not have normal distribution. The Friedman test was used to verify whether the sample showed any significant difference between the three periods evaluated by means of multiple comparisons. The *post hoc* analysis was performed using therection in order to identify in which periods there were differences. A 5% ($p \leq 0.05$) significance level was considered.

RESULTS

The final sample consisted of 13 females (86.67%) and 2 males (13.33%). Average age was 63.73 years, standard deviation 7.67, with minimum age 50 and maximum age 82 years. Average time of edentulism was 26.6 years with standard deviation 12.8. The usage time of the dentures was categorized into equal to or less than 5 years (4 - 26.67%), and more than 5 years (11 - 73.33%). The distribution of OHIP-EDENT areas between periods evaluated is shown in Table 1.

The area of masticatory discomfort and inability showed a difference between baseline and two years. There was no difference between the evaluated periods in the areas of orofacial muscle pain and discomfort and psychological inability and social inability (Table 2).

DISCUSSION

Average age above 60 years agrees with data reported in other studies[9, 15, 16]. Higher prevalence of females has also been reported in other studies[16,17], which may be explained by the fact that women are more concerned about caring for their oral health and seek treatment more often than men do[18]. For quality of life, we found no significant difference for discomfort and chewing inability between baseline and 2 years, highlighting the improvement in patient quality of life.

The analysis categorized the average time of denture usage, with up to 5 years being used to understand the main morphological and functional changes referred to edentulous individuals. Sixty percent of our sample used the dentures for over five years. The literature indicates that the quality

Table 1: Distribution of OHIP-EDENT areas between the evaluated periods. Natal 2017.

Areas	Median	Q25 - Q75	
	Evaluation	6.00	5.00 - 7.00
Orofacial muscle	3 months	5.00	3.00 - 6.00
Pain and Discomfort	2 Years	2.00	2.00 - 6.00
	Evaluation	5.00	1.00 - 7.00
Masticatory	3 months	2.00	2.00 - 4.00
Discomfort and inability	2 Years	1.00	0.00 - 3.00
	Evaluation	1.00	0.00 - 7.00
	3 months	0.00	0.00 - 3.00
Psychological inability	2 Years	0.00	0.00 - 1.00
	Evaluation	0.00	0.00 - 2.00
	3 months	0.00	0.00 - 0.00
Social inability	2 Years	0.00	0.00 - 0.00

Table 2: Comparison of OHIP-EDENT areas in three evaluated periods. Natal 2017.

Areas	n	Evaluation	3 months	2 Years
Orofacial muscle	15	6.00 ^{ABC}	5.00 ^{BC}	2.00 ^{C}
Pain and Discomfort				
Masticatory	15	5.00 ^{EF}	2.00 ^{FG}	1.00 ^{G}
Discomfort and inability				
Psychological inability	15	1.00 ^{IJK}	0.00 ^{JK}	0.00 ^{K}
Social inability	15	0.00 ^{MON}	0.00 ^{NO}	0.00 ^{O}

The groups of letters on the medians represent multiple comparisons of the Friedman test ($p<0.05$). The medians or pairs of median values with different letters indicate that there are significant differences between the corresponding medians after Bonferroni correction ($p<0.0167$).

of dentures may decrease over time, and individuals may present problems in mastication[15] after the fourth[15] and fifth[9] year of use, thereby making it necessary to replace the dentures, which is in accordance with our data.

The main reasons for the change in dentures observed in this study and in agreement with other studies relates to lack of stability and retention[11]. These factors can be explained by the period of bone loss which results in the first year after tooth extraction, when the bone may lose up to 25% of its width and approximately 4 mm in height due to the continuous process of bone resorption[11]. A decline in the alveolar ridge of approximately 1mm per year is expected over the years, being four times higher in the mandible than in the jaw[9]. Resorption can cause poor adaptation of the resin base for dental prostheses, making them slightly loose around the residual bone edge. This factor and the problems caused by the reduced vertical dimension cause great discomfort when eating, which can significantly reduce the efficiency of chewing, thereby influencing patient nutrition as a result of food not being crushed, thus reducing nutrient absorption[5].

Measuring oral health-related quality of life enables evaluation of patient's subjective perception of their condition and constitutes a key factor for clinical practice, which is complemented by physical indicators[19], with the aim of improving the understanding and therapeutic direction of the professionals involved[14]. It should be noted that the rehabilitation success of dentures is based on the opinion of the individual, emphasizing denture stability, comfort, speech, ease of removal for cleaning, chewing and aesthetics[20]. The literature suggests the OHIP-EDENT with psychometric properties is a specific instrument to assess any changes in clinical aspects and the quality of life of edentulous individuals after prosthetic treatment[14].

The results of this study showed differences in the OHIP-EDENT subscales for masticatory discomfort and inability between baseline and 2 years, representing an improvement in quality of life with the use of the new dentures. Masticatory discomfort and inability are improved by correct intermaxillary positioning, tooth anatomy, the shape and fit of the base of the dentures on the supporting tissues, generating comfort[5]. The difference in the masticatory inability index can be improved by the restoration of the vertical dimension of occlusion, correct centric occlusion[11], restoration of the cusps for crushing food, improved chewing efficiency and aesthetics. Moreover, new functional molding from the edge provides greater retention and stability, resulting in patient comfort with the new dentures[5].

In agreement with our findings, other studies have shown that a substitution for new dentures significantly improves quality of life[5,7,16,17,21]. Goiato et al.[5] evaluated the quality of life and patient perception before and after insertion of a new prosthesis in 60 patients with an interval of three months between evaluations, also using the OHIP-EDENT and resulting in significant impact on patient quality of life in all areas. However, in contrast to our study, they analyzed each issue in isolation. Komagamine et al.[16] determined factors related to self-assessment of dentures through the OHIP-EDENT and the masticatory performance before and after replacement of the dentures using a sample of 93 individuals, reporting that denture stability and retention provided better appearance and quality of life in edentulous patients, although they did not identify differences in mastication. In India[17], differences were observed after one month and six months of denture fitting when compared to pre-treatment. In relation to quality of life and gender, it was noted that women showed statistically significant differences in relation to men.

With regard to whether simplified and conventional manufacturing techniques of the dentures was related to oral health-related quality of life, one randomized study found no significant differences at three and six months[8]. Cardoso et al.[18] evaluated oral health-related quality of life and the efficiency of chewing in patients rehabilitated with mandibular overdentures of two implants and conventional dentures, finding that treatment with two mandibular implants on the dentures provides better efficiency in chewing and quality of life when compared with conventional prostheses.

It is interesting to note that while functional modifications provide a great deal of satisfaction to patients, facial appearance should also be taken into consideration. As stated by Nordenram et al.[22] regarding facial appearance, edentulous individuals live in a constant state of anxiety, and in some cases of self-recrimination for neglecting their oral health in the past and also worry about the perception of others. In addition, the appearance of premature

aging[22] is emphasized as a result of the loss of teeth causing a decrease in the lower third of the face, protrusion of the jaw, sharp nasolabial folds, arcuate cheeks, depressed labial commissures, and thin, drawn lips[23]. Changes in the orofacial muscles with the required prosthetic rehabilitation provide better self-esteem and confidence through rejuvenated appearance.

The use of dentures improves oral functions; however, denture adaptation deserves special attention because there are morphological and functional changes which may hamper denture fit and stability. The adaptation process seems to relate to the characteristics of the dentures, as well as the orofacial myofunctional situation due to the action of the muscular forces applied, which destabilize the dentures[10].

During the adjustment period, there may be functional difficulties such as lack of intelligibility in speech articulation, lack of saliva control, reduced mandibular and labial movements by virtue of the repositioning of teeth, refurbishment of the denture palate, and restoration of the vertical dimension of occlusion[24]. In addition to the aspects mentioned above, another important factor is the positioning and movement of the tongue, which operates in the functions of speech, mastication and deglutition. Furthermore, when people receive their new dentures, they may present tongue interposition in the production of dentilingual phonemes, so the aid of tongue contra movement for the retention and stability of jaw dentures through tactile sensation[25] should also be considered.

Concerning masticatory function, there is a decrease in perceptual and reduced or inaccurate sensorineural information which complicates the masticatory pattern organization because the texture of food is not accurately perceived as it is in subjects with teeth[10]. In addition to uncoordinated movements, a reduction in muscle strength for the incision and grinding of food occurs[23], as well as low masticatory efficiency[6,10,26]. A factor to be considered for the functional limitations described above refers to the time the evaluation was performed at approximately three months, and the adaptation process may occur in up to six months[10]. A limitation of this study is small sample size. It was noted that the adaptation period of conventional complete dentures can cause discomfort due to morphofunctional modifications, therefore myofunctional therapy is a possible treatment to assist in balanced performance of oral functions.

Regarding the sample and methodology employed, differences in discomfort and chewing inability between the initial evaluation and 2 years into wearing the dentures were confirmed, demonstrating an improvement in patient quality of life. This study emphasizes the importance of assessing relevant aspects of oral health-related quality of life of complete denture users. Further research should be conducted with larger samples and longer study periods.

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