



ORAL HEALTH RELATED QUALITY OF LIFE IN PATIENTS WEARING REMOVABLE DENTURES AND RELATED FACTORS

Fabiane Schreiner^{1,2}, Poliana Alexandra Martinello¹, Maria Izabel Wuchryn¹, Lucielle Cristina Cecchin¹, Márcia Helena Baldani¹, Alfonso Sanchez Ayala¹, Nara Hellen Campanha¹

¹ Department of Dentistry, State University of Ponta Grossa, Ponta Grossa, Paraná, Brazil.

² Department of Dentistry, Regional Integrated University of Alto Uruguay and Missions, Erechim, Rio Grande do Sul, Brazil.

CORRESPONDING AUTHOR: snzcd@yahoo.com

ABSTRACT

Aims: This study aimed to describe the sociodemographic and behavior variables, oral characteristics and denture factors that could influence the oral health-related quality of life (OHRQoL) in patients wearing removable.

Materials and methods: The sample included 61 partially and completely edentulous individuals. The Oral Health Impact Profile-14 (OHIP-14) determined the OHRQoL. Sociodemographic and behavior indicators were registered. Symptoms of temporomandibular disorders were evaluated, as well the severity and time of edentulism, the number of occlusal pairs, the number of decayed, missing and filled teeth, and the presence of denture stomatitis were also determined. The type and time of the denture use, occlusal vertical dimension, integrity and hygiene of the current denture, and the number of dentures previously used were evaluated. The data analysis employed Chi-square and Spearman correlation tests, and logistic regression.

Results: The OHIP-14 scores were moderate or high in 45.91% of the sample. The worst ratings were obtained for psychological discomfort and physical pain. Only denture time showed a protective role against the low oral health-related quality of life ($p < 0.05$).

Conclusion: The results suggest that higher satisfaction with the removable denture and the longer denture time are variables that influence oral health-related quality of life, but only denture time has a protective role against the worst quality of life rates.

KEYWORDS: Dental prosthesis. Prosthodontics. Quality of life. Tooth loss.
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INTRODUCTION

Quality of life is a general concept that involves several levels from the rating of social and community well-being to the perception of the conditions of groups or individuals in a certain cultural environment¹. The World Health

Organization (WHO) defines the quality of life as individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns². Thus, quality of life may be affected by

physical health, emotional state, individuality degree, community interactions, individual beliefs, and their relationship with the ambiance³.

Health-related quality of life is a component of quality of life, defined as the multidimensional assessment of

health perception, functional states, ability to perform activities and duration of life, and must consider the context in which the subject is immersed⁴. In this sense, the assessment of Oral Health Related-Quality of life (OHRQoL) describes the individual's degree of comfort when eating, sleeping and engaging in social relations, self-confidence, and perception regarding their oral health.³ OHRQoL corresponds to the impact of oral health or disease on an individual's daily functioning, well-being or overall quality of life⁵.

The measurement of OHRQoL has an important role in clinical decision-making. For this purpose, the Oral Health Impact Profile (OHIP) has

been used to evaluate the perception of the impact of oral disorders⁵. Initially consisting of 49 items (OHIP-49), this measurement was composed of seven dimensions: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap⁶. To simplify the questionnaire and make its use more practical, a short form of the earlier 49-item instrument, the OHIP-14 consisting of 14 items was planned, achieving a full measure of the dysfunction, discomfort, and disability attributed to oral conditions^{7,8}.

Although the current supported or retained implant denture therapies are the ideal choices for oral

rehabilitation by the improvement of OHRQoL⁹, treatment with mucous-supported dentures is the most common alternative for edentulous subjects, especially due to the cost-effective ratio. Edentulous patients wearing conventional complete (CD) or partial (RPD) dentures often present impaired OHRQoL^{7,8}. And, although the replacement of dentures after a period of wear results in improved satisfaction, this does not necessarily have significant social impacts. Consequently, the construction of new dentures leads to considerable variations in the OHRQoL⁹.

Table 1. Categorical variables of characteristics of studied removable denture wearers (n = 61).

Categorical variables	n	%
OHIP-14		
Low	33	54.10
Moderate	22	36.07
High	6	9.84
Gender		
Male	15	24.59
Female	46	75.41
Education		
High school	19	31.15
Elementary school	42	68.85
Employment		
Worker	24	39.34
Retired	37	60.66
Physical activity		
Yes	29	47.54
Not	32	52.45
Medical history		
Absent	21	34.43
Present	40	65.57
TMD		
Absent	27	44.26
Present	34	55.74
Edentulism		
Partial	36	59.02
Total	25	40.98
Removable denture		
Partial	26	42.62
Complete	35	57.38
Denture integrity		
Yes	46	75.41
Not	15	24.59
Vertical dimension		
Normal	22	36.07
Decreased	39	63.93
Denture stomatitis		
Absent	42	68.85

Present	19	31.15
Biofilm		
Absent	32	52.46
Present	29	47.54
Calculus		
Absent	43	70.49
Present	18	29.51

OHIP-14 = Oral Health Impact Profile-14; TMD = temporomandibular disorder.

Besides other impaired oral characteristics, such as decayed teeth and gum disease, the National Brazilian Oral Health Survey performed in 2010 revealed that more than 3 million elders needed CD in both arches and 4 million needed RPD in either arcade¹⁰. Partial and full edentulism have different influences on variables associated and predictive of perceived oral health and denture satisfaction¹¹ and prosthetic factors related to well-being¹². The satisfaction with the provision of new removable dentures has been associated with OHRQoL improvement¹¹, and OHIP-14 have also been positively related to the frequency of wearing, cleaning, and stability of the prostheses, and self-reported oral health⁷.

However, opposing results found between patients' satisfaction with the treatment and dentists' assessment of the quality of CD and RPD make these relationships confusing¹³. Since the objective of socio-dental studies is to identify possible relationships among clinical and non-clinical variables, the aim of this study was to describe the sociodemographic and behavior variables, oral characteristics and denture factors that could influence

the OHRQoL in patients wearing removable dentures of State University of Ponta Grossa, Paraná, Brazil. The null hypothesis of this work was that quality of life is not affected by sociodemographic and behavioral variables, oral characteristics, and prosthetic factors.

MATERIALS AND METHODS

Sample

Convenience sampling for this cross-sectional study was carried out by selecting sixty-one partially and completely edentulous individuals, with a mean age of 56.05 ± 12.33 years, 46 females, from the patient's seeking treatment at the Prosthodontics Clinic of the State University of Ponta Grossa for eight months. Inclusion criteria were the use of removable dentures (complete or partial dentures) at least in one of the jaws for one year. Presence of not controlled medical conditions (reported by patient's anamnesis), poor cognitive status (judged by observation of patients and ability to answer questions), support tissues severely resorbed (analyzed by panoramic radiographs), moderate or severe periodontal disease (verified by periodontal exam and analysis of periapical radiographs), and teeth with

pulpitis, pulp necrosis or presenting open carious lesions with pulp tissue exposed (assessed by the examiners) were considered as exclusion criteria. Those who accepted to participate were submitted to examination for inclusion or exclusion criteria. Data for all variables in this work were collected through personal interviews with two calibrated examiners ($\kappa > 0.8$). All volunteers received instructions about the evaluation procedures and signed an informed consent form approved by the Ethics Committee in Human Research of the institution (Protocol n^o 13319/09).

Sociodemographic and behavior variables

Information was collected and adapted from the National Brazilian Oral Health Survey¹⁰. The education variable was categorized as having completed elementary school or less, or at least high school, and the factor employment was classified as worker or retired. Physical activity (a topic of the National Brazilian Oral Health Survey) was dichotomized as yes or no, and medical history variables as absent or present.

Table 2. Numerical variables of characteristics of studied removable denture wearers (n = 61).

Numerical variables	Mean	SD
OHIP-14	17.90	12.83
Age (year)	56.05	12.33
Income (R\$)	1535.49	1022.36
DMFT Index	46.95	11.10
Number of anterior OP	2.14	2.08
Number of posterior OP	1.28	1.80
Edentulism time (year)	27.25	12.69
Denture Satisfaction (score)	5.92	3.73
Denture time (year)	22.15	13.44
Quantity of dentures	2.28	1.57

OHIP-14 = Oral Health Impact Profile-14; DMFT = decayed, missing, and filled teeth index; OP = occlusal pairs.

Table 3. Frequency and percentage (%) of OHIP-14 dimensions for each single item (n = 61).

OHIP-14 item	Answers				
	Never	Rarely	Sometimes	Repeatedly	Always
Functional limitation					
Trouble pronouncing words	30 (49.18%)	3 (4.92%)	10 (16.39%)	9 (14.75%)	9 (14.75%)
Taste worse	38 (62.30%)	2 (3.28%)	6 (9.84%)	3 (4.92%)	12 (19.67%)
Physical pain					
Painful aching	13 (21.31%)	14 (22.95%)	19 (31.15%)	4 (6.56%)	11 (18.03%)
Uncomfortable to eat	18 (29.51%)	5 (8.20%)	13 (21.31%)	3 (4.92%)	22 (36.07%)
Psychological discomfort					
Self-conscious	20 (32.79%)	6 (9.84%)	10 (16.39%)	4 (6.56%)	21 (34.43%)
Tense	27 (44.26%)	7 (11.48%)	8 (13.11%)	3 (4.92%)	16 (26.23%)
Physical disability					
Diet unsatisfactory	30 (49.18%)	1 (1.64%)	8 (13.11%)	4 (6.56%)	18 (29.51%)
Interrupt meals	32 (52.46%)	7 (11.48%)	12 (19.77%)	4 (6.56%)	6 (9.84%)
Psychological disability					
Difficult to relax	43 (70.49%)	2 (3.28%)	6 (9.84%)	1 (1.64%)	9 (14.75%)
Been embarrassed	24 (39.34%)	3 (4.92%)	10 (16.39%)	2 (3.28%)	22 (36.07%)
Social disability					
Irritable with others	24 (39.34%)	3 (4.92%)	10 (16.39%)	2 (3.28%)	22 (36.07%)
Difficulty doing jobs	47 (77.05%)	3 (4.92%)	6 (9.84%)	2 (3.28%)	3 (4.92%)
Handicap					
Life unsatisfying	39 (63.93%)	5 (8.20%)	7 (11.48%)	3 (4.92%)	7 (11.48%)
Unable to function	54 (88.52%)	2 (3.28%)	0 (0.00%)	1 (1.64%)	4 (6.56%)

OHIP-14 = Oral Health Impact Profile-14

Age and income were considered as numerical variables. Satisfaction with the dentures was also evaluated by means of a visual analog scale (VAS) using scores from 0 to 10 in a simple and valid manner, in which 0 represented the lowest rating (worst possible outcome) and 10 the highest (best possible outcome)¹⁴.

Oral characteristics

Symptoms of temporomandibular disorders (TMD) were evaluated using the Brazilian version of Fonseca's Anamnestic Simplified Index¹⁵. This index comprises ten questions related to common related symptoms of temporomandibular disorders and orofacial pain, and it has been widely used in Brazilian studies to estimate the severity of TMD¹⁶⁻¹⁹. The instrument is a one-dimension questionnaire, consisting of 10 questions with a three-point scale (0 = no, 5 = sometimes and 10 = yes). Although this Index involves the sum of

scores (0 – 100 points) for diagnostic severity, only a dichotomy profile was considered: 0 – 15 (absence of TMD) and 20 – 100 (presence of TMD).

The severity of edentulism was defined as partial or total edentulism, and the number of anterior and posterior occlusal pairs (OP) was determined clinically by counting antagonist teeth in the maximum intercuspidal position. The edentulism time (years) was also numerically measured by the question: "When did you lose your last tooth?". The status of remaining teeth was recorded through the Decayed, Missing and Filled Teeth (DMFT) Index²⁰. Lesions presenting visual cavities, dentine alterations detectable through the enamel, and softened structures were diagnosed as dental caries. White or brown spot lesions and rough surfaces or retentive fissures to probing were not considered. The existence of denture stomatitis was diagnosed by the recognition of the pathologic

characteristics included in Newton's criteria²¹.

Denture factors

The type of removable denture was classified as partial or complete (CD or RPD). The denture experience was investigated through the questions: "How long have you been wearing denture(s)?" and "How many dentures have you worn throughout your life?". The occlusal vertical dimension was evaluated through the association of the metric, phonetic and esthetic methods, and categorized as normal or altered. Moreover, the lack of dentures integrity was determined if cracks and/or unrepaired fractures were identified. The denture hygiene was also tested by the presence or absence of biofilm and calculus deposits using a disclosing solution, Replak® (Dentsplay Sirona, São Paulo, Brazil).

Assessment of OHRQoL

Data was collected through the short version of the Oral Health Impact Profile (OHIP-14) validated for Brazilian subjects²². This questionnaire assesses seven subjective dimensions: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability, and handicap. The subjects answered each question according to the frequency of the impact in the last six months on a five-point Likert scale: 0, never; 1, rarely; 2, sometimes; 3, repeatedly; 4, always. The dimensions and the total score were calculated by summing the number of impacts reported. The maximum obtainable impact score was 56 points, with higher scores indicating poorer OHRQoL. The OHIP-14 final impact scores were classified as low (0-18.9), moderate (19-37.9) and high (38-56)²³.

Statistical analysis

Data were explored using IBM® SPSS® Statistics 22 software (IBM Corporation, Armonk, NY), and all statistical inferences were performed with 2-tailed trials assuming a 5%

significance level. The frequency of patients in each category of variables was determined for the overall OHIP-14 data and low, moderate, and high OHIP-14 scores. The OHIP-14 scores were dichotomized using median splits and a chi-square test was conducted to associate the dichotomist categories of gender, education, employment, physical activity, medical history, TMD, edentulism, type of removable denture, denture integrity, vertical dimension, stomatitis, biofilm, and calculus with OHRQoL. Numerical variables (age, income, satisfaction with the dentures, edentulism time, DMFT, denture time, quantity of dentures and occlusal pairs) were related to OHRQoL by applying the Spearman correlation test (ρ). Binary logistic regression analysis was used to evaluate the influence of the variables in the presence of worse OHIP-14 scores. Forward stepwise selection was performed based on the probability of the Wald statistics. At each step, the most significant variable was included in the model until all the remaining variables had a statistically significant contribution to the model.

RESULTS

The categorical and numerical variables considered are shown in **Tables 1** and **2**, respectively. Thirty-five subjects (57.37%) wore at least a unimaxillary CD and, although these subjects were seeking treatment, the mean satisfaction score was 5.92 ± 3.73 . Overall, the mean of OHIP-14 was 17.90 ± 12.83 , where the values corresponding to 45.91% of the sample were classified as moderate or high (**Tables 1** and **2**).

At least 14.75% of participants answer "Always" for some type of functional limitation (14.75%), 18.03% for physical pain, 26.23% for psychological discomfort, 9.84% for physical disability, 14.75% for psychological disability, 4.92% for social disability and 6.56% for handicap. The most problematic aspects were psychological discomfort and physical pain, where 34.43% and 36.07% of the subjects were self-conscious and uncomfortable eating, respectively. Meantime, the subjects presented fewer problems with handicaps related to life dissatisfaction (11.48%) and unable to function (6.56%) (**Table 3**).

Table 4. Frequency of categorical variables, and bivariate analysis according to median splits OHIP-14 scores (n = 61).

Categorical variables	OHIP-14 scores ≤ 16		OHIP-14 scores ≥ 17		Statistical	
	n	%	n	%	Chi-square	P
Gender					0.671	0.413
Male	9	29.03	6	20.00		
Female	22	70.97	24	80.00		
Education					1.681	0.195
High school	12	38.71	7	23.33		
Elementary school	19	61.29	23	76.67		
Employment					2.160	0.142
Worker	15	48.38	9	30.00		
Retired	16	51.61	31	70.00		
Physical activity					0.794	0.373
Yes	13	41.94	16	53.33		
Not	18	58.06	14	46.67		
Medical history					0.131	0.717
Absent	10	32.26	11	36.67		
Present	21	67.74	19	63.33		
TMD					0.435	0.510
Absent	15	48.39	12	40.00		
Present	16	55.56	18	60.00		

Edentulism					0.455	0.500
Partial	17	54.84	19	63.33		
Total	14	45.16	11	36.67		
Removable denture					1.314	0.252
Partial	11	35.48	15	50.00		
Complete	20	64.52	15	50.00		
Denture integrity					0.137	0.711
Yes	24	77.42	22	73.33		
Not	7	22.58	8	26.67		
Vertical dimension					0.191	0.662
Normal	12	38.71	10	33.33		
Decreased	19	61.29	20	66.67		
Denture stomatitis					0.132	0.717
Absent	22	70.97	20	66.67		
Present	9	29.03	10	33.33		
Biofilm					0.143	0.705
Absent	17	54.84	15	50.00		
Present	14	45.16	15	50.00		
Calculus					1.454	0.228
Absent	24	77.42	19	63.33		
Present	7	22.58	11	36.37		

OHIP-14 = Oral Health Impact Profile-14; TMD = temporomandibular disorder.

The frequency of each categorical and numerical variable according to dichotomized OHIP-14 scores are presented in **Table 4** and **Table 5**, respectively. Bivariate association was not found between any categorical variable and OHIP-14 groups. Nevertheless, correlations ($p < 0.05$) were found between OHIP-14 and denture satisfaction, and denture time (**Table 4** and **Table 5**).

After performing the Forward stepwise method, only denture time could predict ($p < 0.05$) the presence of worse OHIP-14 scores (**Table 6**). Thus, more time of wearing removable dentures showed a significant protective role against higher OHIP-14 scores. This model showed specificity (capacity to classify participants in the low OHIP-14 category) of 58.06% and sensibility (ability to recognize participants with moderate or high OHIP-14) of 63.33%, presenting an overall correct classification rate of 60.66%.

DISCUSSION

Quality of life assessment questionnaires influence public health practices as they allow understanding

and complementing clinical data with the opinions of patients, assessing physical, psychological, and social well-being, and not assessing the absence or presence of disease²⁴. The oral condition can impact an individual's daily functioning, well-being, or general quality of life. This study evaluated the variables that could influence the OHRQoL of patients wearing removable dentures (both RPD and CD), where longer denture time and higher denture satisfaction were correlated with low OHIP-14 scores, but only more time wearing removable dentures showed a significant protective role against higher OHIP-14 scores.

Patients had on average more than 20 years of edentulism, denture time, and previous experience of having worn about two removable dentures. More than half of the sample showed low OHIP-14 scores, therefore a high OHRQoL, and presenting moderate denture satisfaction. It was also found that higher rates of OHRQoL correlated with satisfaction degree and long-term wearing of removable dentures, which partially rejects the null hypothesis of the present work.

Explanations of the tolerance of the elderly in relation to oral conditions and prostheses come from a positive perception of oral health and adaptation to tooth loss with the passing of years¹¹.

It was possible to observe a greater impact of OHIP-14 scores on the women, without statistically significant difference, as well in the study by Caglayan et al. (2009)²⁵. In this study, there is a higher prevalence of female participants, which supports the hypothesis that women tend to be more concerned about oral health and seek dental treatment²⁶. Schooling was also associated, without statistically significant difference, with the OHIP-14 scores, corroborating other studies²⁷⁻²⁹ that related the detriment of OHRQoL with patients' low education level. However, since no statistically significant difference was found, is not possible to relate gender and education in OHRQoL.

Table 5. Frequency of numerical variables, and bivariate analysis according to median splits OHIP-14 scores (n = 61).

Numerical variables	OHIP-14 scores ≤ 16		OHIP-14 scores ≥ 17		Statistical	
	Mean	SD	Mean	SD	Rho	P
Age (year)	57.61	13.67	54.43	10.76	-0.157	0.228
Income (R\$)	1424.52	809.40	1650.17	1207.50	0.046	0.727
DMFT Index	48.94	10.17	44.90	11.87	-0.176	0.176
Number of anterior OP	2.03	2.06	2.27	2.15	0.052	0.690
Number of posterior OP	1.26	1.88	1.30	1.74	0.061	0.643
Edentulism time (year)	28.97	13.13	25.47	12.19	-0.148	0.256
Denture Satisfaction (score)	6.90	3.36	4.90	3.61	-0.290	0.024*
Denture time (year)	26.39	14.54	17.77	10.77	-0.312	0.014*
Quantity of dentures	2.39	1.65	2.17	1.51	-0.107	0.414

*Significant difference compared to other categories ($\alpha = 0.05$).

DMFT = decayed, missing, and filled teeth index; OP = occlusal pairs.

More than one-third of the subjects were “Always” uncomfortable eating (36.07%). According to Koshino et al. (2006)³⁰, eating satisfaction and comfort when chewing with dentures influence physiological and psychological health, which can be related to the answer “Always” in others OHIP-14 dimensions, as “self-conscious” (34.43%) and “been embarrassed” (36.07%) (Table 3). The edentulism condition involves lower tongue motor and oral manipulative skills, oral sensory function, and bite force, and hyposalivation^{31,32}. Chewing is affected since the supporting tissues are subjected to discomfort, compression, and denture shifting³¹. Each patient develops different oral experiences with new removable dentures, involving sensorimotor changes as well as the integration of higher brain-center functions related to past experiences, expectations, and attitudes³².

It is reported that despite CD and RPD patients having differences in OHIP-14 items there is no OHRQoL

difference between CD and RPD patients³⁴, and the OHRQoL is significantly improved, regardless of the type of prosthodontic treatment³⁵. Adaptation and satisfaction with dentures have been established to continue over two years to overcome the gradual deterioration of denture quality³⁶. However, even subjects with wearing time of 6 to 45 years can be satisfied despite their advanced denture age¹³. In mucous-supported dentures, the improvement may be related to changes that may take place slowly in the bone and mucosa of the mandibular residual ridge. The surface tension forces at the periphery contribute to denture retention, but the most important concerns are good base adaptation and border seal³⁷. Moreover, the therapy of edentulous patients also involves psychological variables. Although the use of new dentures was not associated with personality, a negative relationship between neuroticism and satisfaction was found at three months and two years³⁸. Other possible denture

variables, such as retention and stability may explain the complementary ratio (39.34%) for regression model performance.

Another option for prosthetic treatment is the use of dental implants in partial and fully edentulous patients. Many studies^{9,39,40} found a better improvement of OHRQoL with implant supported prostheses than conventional prosthodontic treatment. Therefore, the indication of implant supported prostheses is a good option to improve the OHRQoL; in addition, the increase in public health policies for this dental treatment can promote the well-being of people with low socioeconomic scores²⁷. It is important to consider a bigger sample for future studies, describing the OHRQoL variables with different prostheses (CD, RPD and implant supported dentures).

Table 6. Logistic regression model for increased OHIP-14 (scores ≥ 17) by Forward Wald method (n = 61).

Explanatory variables	B	SE	p	Odds ratio	95% confidence interval	
					Lower	Upper
Denture time*	-0.052	0.022	0.015	0.949	0.910	0.990
Constant	1.117	0.540	0.038	3.057	-	-

*Continuous variable.

B = partial regression coefficient; SE = standard error.

CONCLUSION

The results of this study suggested that the higher the satisfaction with the removable denture and the longer denture time are variables that influence OHRQoL, but only denture time has a protective role against higher OHIP-14 scores. Sociodemographic, behavioral, and oral characteristics did not influence OHRQoL.

REFERENCES

1. Felce D, Perry J. Quality of life: its definition and measurement. *Res Dev Disabil.* 1995; 16 (1):51-74. doi: 10.1016/0891-4222(94)00028-8.
2. Skevington SM, Lotfy M, O'Connell KA. WHOQOL Group: The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. *Qual Life Res.* 2004; 13 (2):299-310. doi: 10.1023/B:QURE.0000018486.91360.00.
3. Sischo L, Broder HL. Oral health-related quality of life: what, why, how, and future implications. *J Dent Res.* 2011; 90(11):1264-70. doi: 10.1177/0022034511399918.
4. Baiju RM, Peter E, Varghese NO, Sivaram R. Oral Health and Quality of Life: Current Concepts. *J Clin Diagn Res.* 2017; 11 (6): ZE21-ZE26. doi: 10.7860/JCDR/2017/25866.10110.
5. Alzoubi EE, Hariri R, Attard NJ. Oral health related quality of life impact in dentistry. *J Dent Health Oral Disord Ther.* 2017; 6 (6):183-188. doi: 10.15406/jdhodt.2017.06.00221.
6. Shaghaghian S, Taghva M, Abduo J, Bagheri R. Oral health-related quality of life of removable partial denture wearers and related factors. *J Oral Rehabil.* 2015; 42(1):40-8. doi: 10.1111/joor.12221.
7. Locker D, Matear D, Stephens M, Lawrence H, Payne B. Comparison of the GOHAI and OHIP-14 as measures of the oral health-related quality of life of the elderly. *Community Dent Oral Epidemiol.* 2001; 29(5):373-81. doi: 10.1034/j.1600-0528.2001.290507.x.
8. Elsyad MA, Elgamel M, Askar O, Al - Tonbary GY. Patient satisfaction and oral health related quality of life (OHRQoL) of conventional denture, fixed prosthesis and milled bar overdenture dor All-on 4 implant rehabilitation. A crossover study. *Clin Oral Impl Res.* 2019; 30(11):1107-1117. doi: 10.1111/clr.13524.
9. Brasil, Ministério da Saúde, Secretaria de Atenção à Saúde, Departamento de Atenção Básica. Projeto SB Brasil 2010. Condições de saúde bucal da população brasileira: resultados principais. Brasília: Ministério da Saúde, 2010.
10. Øzhayat EB, Gotfredsen K. Patient-reported effect of oral rehabilitation. *J Oral Rehabil.* 2019; 46 (4):369-376. doi: 10.1111/joor.12756.
11. Montero J, Lopez JF, Galindo MP, Vicent P, Bravo M. Impact of prosthodontic status on oral wellbeing: a cross-sectional cohort study. *J Oral Rehabil.* 2009;36(8):592-600. doi: 10.1111/j.1365-2842.2009.01968.x
12. De Lucena SC, Gomes SG, Da Silva WJ, Del Bel Cury AA. Patients' satisfaction and functional assessment of existing complete dentures: correlation with objective masticatory function. *J Oral Rehabil.* 2011; 38 (6):440-6. doi: 10.1111/j.1365-2842.2010.02174.x.
13. Gaspar MG, Dos Santos MB, Dos Santos JF, Marchini L. Correlation of previous experience, patient expectation and the number of post-delivery adjustments of complete dentures with patient satisfaction in a Brazilian population. *J Oral Rehabil.* 2013; 40 (8):590-4. doi: 10.1111/joor.12070.
14. Campos JA, Carrascosa AC, Bonafé FS, Maroco J. Severity of temporomandibular disorders in women: validity and reliability of the Fonseca Anamnestic Index. *Braz Oral Res.* 2014; 28:16-21. doi: 10.1590/s1806-83242013005000026.
15. Batista MJ, Lawrence HP, De Sousa ML. Impact of tooth loss related to number and position on oral health quality of life among adults. *Health Qual Life Outcomes.* 2014; 12:165. doi: 10.1186/s12955-014-0165-5.
16. Tay LY, Jorge JH, Herrera DR, Campanha NH, Gomes BP, Andre Dos Santos F. Evaluation of different treatment methods against denture stomatitis: a randomized clinical study. *Oral Surg Oral Med Oral Pathol Oral Radiol.* 2014; 118(1):72-7. doi: 10.1016/j.oooo.2014.03.017.
17. Oliveira BH, Nadanovsky P. Psychometric properties of the Brazilian version of the Oral Health Impact Profile-short form. *Community Dent Oral Epidemiol.* 2005; 33 (4):307-14. doi: 10.1111/j.1600-0528.2005.00225.x.
18. Oyapero A, Adeniyi AA, Sofola O, Ogbera AO. Impact of Oral Health Education and Oral Prophylaxis on Quality of life of Controlled Diabetic Patients in Lasuth. *J Oral Hyg Health.* 2015; 3:181. doi: 10.4172/2332-0702.1000181.
19. Graziani F, Tsakos G. Patient-based outcomes and quality of life. *Periodontol* 2000. 2020 Jun;83(1):277-294. doi: 10.1111/prd.12305.
20. Caglayan F, Altun O, Miloglu O, Kaia MD, Yilmaz AB. Correlation between oral health-related quality of life (OHQoL) and oral disorders in a Turkish patient population. *Med Oral Patol Oral Cir Bucal.* 2009;14:e573-8. doi: 10.4317/medoral.14.e573.
21. Koistinen S, Olai L, Ståhlacke K, Fälta A, Ehrenberg A. Oral Health-Related Quality of Life and associated factors among older people in short-term care. *Int J Dent Hygiene.* 2020; 18 (2):163-172. doi:10.1111/idh.12424.
22. Echeverria MS, Wunsch IS, Langlois CO, Cascaes AM, Silva AER. Oral health-related quality of life in older adults-Longitudinal study. *Gerodontology.* 2019;36(2):118-124. doi: 10.1111/ger.12387.
23. Han DH, Khang YH. Lifecourse socioeconomic position indicators and tooth loss in Korean adults. *Community Dent Oral Epidemiol.* 2017; 45 (1):74-83. doi: 10.1111/cdoe.12262.
24. Vendrame É, Goulart MA, Hilgert JB, Hugo FN, Celeste RK. Decomposing early and adult life social

- position effects on oral health and chronic diseases in a cross-sectional study of Southern Brazil. *Community Den Oral Empidemiol.* 2018; 46 (6):601-607. doi: 10.1111/cdoe.12410.
25. Koshino H, Hirai T, Ishijima T, Tsukagoshi H, Ishigami T, Tanaka Y. Quality of life and masticatory function in denture wearers. *J Oral Rehabil.* 2006 May;33(5):323-9. doi: 10.1111/j.1365-2842.2005.01152.x.
26. Ikebe K, Matsuda K, Morii K, Furuya-Yoshinaka M, Nokubi T, Renner RP. Association of masticatory performance with age, posterior occlusal contacts, occlusal force, and salivary flow in older adults. *Int J Prosthodont.* 2006; 19 (5):475-81.
27. Kikutani T, Tamura F, Nishiwaki K, Kodama M, Suda M, Fukui T, et al. Oral motor function and masticatory performance in the community-dwelling elderly. *Odontology.* 2009; 97 (1):38-42. doi: 10.1007/s10266-008-0094-z.
28. Luraschi J, Korgaonkar MS, Whittle T, Schimmel M, Müller F, Klineberg I. Neuroplasticity in the adaptation to prosthodontic treatment. *J Orofac Pain.* 2013; 27 (3):206-16. doi: 10.11607/jop.1097.
29. Bae KH, Kim C, Paik DI, Kim JB. A comparison of oral health related quality of life between complete and partial removable denture-wearing older adults in Korea. *J Oral Rehabil.* 2006 May;33(5):317-22. doi: 10.1111/j.1365-2842.2005.01565.x.
30. Peršić S, Čelebić A. Influence of different prosthodontic rehabilitation options on oral health-related quality of life, orofacial esthetics and chewing function based on patient-reported outcomes. *Qual Life Res.* 2015 Apr;24(4):919-26. doi: 10.1007/s11136-014-0817-2.
31. Fenlon MR, Sherriff M. Investigation of new complete denture quality and patients' satisfaction with and use of dentures after two years. *J Dent.* 2004; 32 (4):327-33. doi: 10.1016/j.jdent.2004.01.007.
32. Darvell BW, Clark RK. The physical mechanisms of complete denture retention. *Br Dent J.* 2000; 189 (5):248-252. doi: 10.1038/sj.bdj.4800734.
33. Fenlon MR, Sherriff M, Newton JT. The influence of personality on patients' satisfaction with existing and new complete dentures. *J Dent.* 2007; 35 (9):744-8. doi: 10.1016/j.jdent.2007.06.003.
34. Yunus N, Massod M, Saub R, Al-Hashedi AA, Ali TBT, Thomason JM. Impact of mandibular implant prostheses on the oral health-related quality of life in partially and completely edentulous patients. *Clin Oral Impl Res.* 2015; 27(7): 904-909. doi: 10.1111/clr.12657.
35. Sánchez-Siles M, Ballester-Ferrandis JF, Salazar-Sánchez N, Gómez-García FJ, Moraleja-Ruiz R, Camacho-Alonso F. Long-term evaluation of quality of life and satisfaction between implant bar overdentures and conventional complete dentures: a 23 years retrospective study. *Clin Implant Dent Relat Res.* 2017; 20(2):208-2014. doi: 10.1111/cid.12576.