Dental health status and Oral Health-Related Quality of Life in older people of Puerto Montt, Chile.

Estado de salud dental y Calidad de Vida Relacionada a Salud Bucal en personas mayores, de Puerto Montt, Chile.

Evelyn Piticar.[1]
Lorena-Mirtala Orellana.[2]

Affiliations:
[1]Facultad de Odontología, Universidad de Concepción, Concepción, Chile.
[2]Departamento de Prevención y Salud Pública Odontológica, Facultad de Odontología, Universidad de Concepción, Concepción, Chile.

Corresponding author: Lorena Orellana. Facultad de Odontología, Universidad de Concepción, Chile. Avenida Roosevelt 1550, Concepción, Chile. **Phone:** (56-41) 2204232. E-mail: lorenaorellana@udec.cl

Abstract: Introduction: Older people tend to have poor oral health, which can affect their quality of life. This study aimed to explore the relationship of the Oral Health-Related Quality of Life (OHRQoL) with sociodemographic variables and the dental health status of older people who belong to Elderly Clubs in the district of Puerto Montt, Chile. **Material and methods:** A cross-sectional study was carried out in 140 elderly people from Elderly Clubs in the district of Puerto Montt, Chile. Sociodemographic and dental variables were studied using a questionnaire and clinical examination. The GOHAI instrument validated in Chile was applied to measure the OHRQoL. **Results:** The mean of the total GOHAI was 50.8±8.6 points, and the median was 53. Of the 140 elderly people, 87.9% were females, the means of age and years of education were 73.2±6.2 and 7.5±4.4 years, respectively. 30% were edentulous, the number of remaining teeth was 7.8±8.1, the OHI-S was 1.3±1.0. 85.7% wore dentures, and the time of denture wearing was 8.8±9.4 years. Significant associations were found between the total GOHAI and non-belonging to an indigenous people (*p*=0.024), being edentulous (*p*=0.006), and the presence of healthy teeth (*p*=0.039). **Conclusion:** The GOHAI showed a significant relationship with not-belonging to an indigenous ethnicity, being edentulous, and the number of healthy teeth. The OHRQoL was higher in males, with formal education, edentulous, dentated without teeth mobility, with complete dentures, and moderate denture hygiene.

Keywords: Oral health; Quality of life; Older people.

Resumen: Introducción: Las personas mayores suelen presentar una salud bucal deficitaria, la que puede repercutir en su calidad de vida. El objetivo fue explorar la relación de la Calidad de Vida Relacionada a Salud Bucal (CVRSB) con variables sociodemográficas y del estado de salud dental en personas mayores pertenecientes a clubes del Adulto Mayor de la comuna de Puerto Montt, Chile. **Material y Métodos:** Se realizó un estudio transversal en 140 personas mayores de clubes del Adulto Mayor en Puerto Montt. Mediante cuestionario y examen clínico se estudiaron variables sociodemográficas y

dentales y se aplicó el instrumento GOHAI validado en Chile para medir CVRSB. **Resultados:** La media del GOHAI total fue de 50.8±8.6 puntos y la mediana fue de 53. De las 140 personas mayores, 87.9% eran mujeres, las medias de edad y escolaridad fueron 73.2±6.2 y 7.5±4.4 años, respectivamente. El 30% era desdentado total, el número de piezas remanentes fue de 7.8±8.1, el IHO-S fue de 1.3±1.0. El 85.7% utilizaba prótesis, el tiempo de uso fue de 8.8±9.4 años. Se encontraron asociaciones significativas entre total GOHAI y la no-pertenencia

a pueblo indígena (*p*=0.024), desdentamiento general (*p*=0.006) y la presencia de dientes sanos (*p*=0.039). **Conclusión:** El GOHAI presentó relación significativa con la no-pertenencia a pueblo Indígena, desdentamiento general y número de dientes sanos. La CVRSB fue mayor en hombres, con educación formal, edéntulos, dentados sin movilidad, portadores de prótesis totales e higiene de prótesis regular.

Palabra Clave: Salud bucal; Calidad de vida; Personas mayores.

INTRODUCTION.

Oral health has been frequently excluded from the concept of general health, and from public health services.[1] Diseases such as caries, pulpitis, and periodontitis cause discomfort in the patients, affecting their daily life. Oral problems may cause social, economic, and psychological concerns that affect the quality of life of those who suffer from them.[2] In this way, the "Oral Health-Related Quality of Life" (OHRQoL) refers to the perception of an individual concerning how their oral health influences their quality of life and their general and psychosocial well-being.[1,2] This has become a concept widely used to evaluate the impact of oral conditions and the effect that dental treatments have on the patients.[3]

Although it is a subjective concept, a relationship has been found between the perception of poor quality of life and poor oral health.[4] In turn, demographic and socioeconomic factors can influence the OHRQoL as much as clinical variables.[5] In older people, OHRQoL is associated with socioeconomic status, frequency of dental check-ups, self-perceived chewing ability, caries, and the number of remaining teeth. In denture wearers, other related factors are the denture status, satisfaction with the denture, pain in the mouth, ulcerations, perception of poor denture retention, halitosis, and dry mouth.[6]

One of the biggest oral problems in older people is tooth loss,[7] which is considered the most prevalent consequence of preventable oral diseases. Some teeth are lost due to caries, periodontal disease, trauma, infections, or orthodontic indication.[8] Tooth loss is usually considered a characteristic of aging,

and therefore, not enough treatments are carried out in this age group; painful teeth are simply extracted.[1] Toothlessness affects functions such as speech, chewing ability, and appearance.[2,9] Removable denture are a common treatment for tooth loss;[10,11] however, in addition to chewing, denture wearers may experience problems in social and emotional aspects, compared to those who have natural teeth.[12] It has been shown that implant-supported dentures can improve the quality of life of the patient;[6] however, many older people present systemic conditions and bone resorption, which makes this treatment difficult.[13]

During the last decades, OHRQoL has become a more relevant topic in dentistry, resulting in the development of instruments for its measurement.[14] One of them is the Geriatric/General Oral Health Assessment Index (GOHAI), created by Atchison and Dolan in 1990. It consists of a 12-item questionnaire that measures oral function problems and the psychosocial impact of oral disease. It also evaluates the effectiveness of dental treatments received by the patient.

The items involve problems that affect older people in three dimensions:

1) Physical function (includes eating, speaking, and swallowing);

2) Psychosocial function (concern and self-awareness about oral health, self-image, and limitation of social contact due to oral problems); and

3) Pain or discomfort in the mouth.[12,15] It was initially intended for use in older people, but later studies were carried out in populations of different ages. The word "Geriatric" was then replaced by "General" without modifying the original acronym.[16] The GOHAI is a widely

used instrument for OHRQoL measurements.[3,6,7,12]

Starting from the idea that quality of life is related to oral health, and that this is associated with satisfactory oral health,[17] it is possible to presume that older people have a reduced quality of life, due to cumulative oral damage. Old people represent a particular population, not only due to pre-existing pathologies but also because they may have restricted access to medical and dental care.[18]

A high prevalence of chronic diseases has been reported in the increasing population of elderly people in Chile.[4] One hundred percent of people between 65-74 years have had caries, and 30% of them are edentulous.[1] Previous studies in the country that have used the GOHAI report a low level of satisfaction with the use of complete dentures, especially in the masticatory function,[12] and have reported a negative perception of the OHRQoL.[4]

The aim of this study was to explore the relationship of Oral Health-Related Quality of Life (OHRQoL) with sociodemographic variables and the dental health status in older people who belong to elderly clubs in the district of Puerto Montt, Chile.

MATERIALS AND METHODS.

A cross-sectional study was carried out following the STROBE guidelines in a group of older people who belong to elderly clubs in the district of Puerto Montt, Los Lagos Region, Chile. Visits were made to the different selected centers, with prior coordination with their leaders. The sample was collected, a questionnaire and the GOHAI instrument were applied, and a clinical examination was carried out on each elderly person between October 2017 and April 2019.

The study was approved by the Bioethics Committee of the School of Dentistry of Universidad de Concepción (CIYB N° 023/17). All the older people who participated in the study signed the corresponding informed consent.

The study population consisted of people over 60 years of age who belonged to elderly clubs in the district of Puerto Montt. The sample size was calculated based on multiple linear regression, including eight terms in the model. Following a recommendation of 20 repetitions per term, a desirable value of 160 subjects was obtained. Random cluster sampling (Centers for the Elderly) was performed without replacement, including all individuals in each cluster, in order to reach the

desirable sample. Of a total of 93 centers registered in the district for the year 2017, 15 centers were selected, where an acceptable total of 140 informed consents was obtained (Figure 1). The inclusion criteria were male or female aged 60 or over and belonging to one of the selected centers. The exclusion criteria were older people who were not in a physical or mental condition to participate in the study, or who were not present at the club when the data was collected.

To collect the data, an operator and a trained assistant applied a specially designed questionnaire, which included sociodemographic variables such as: age, sex, nationality, years of completed schooling, educational level, marital status, type of income, health insurance type, urban/rural residence, and belonging to an indigenous ethnicity. Additionally, a section dedicated to health history was included: pre-existing pathologies, administration and number of medications. Subsequently, the Geriatric/General Oral Health Assessment Index (GOHAI) was applied. This instrument, developed by Atchison and Dolan in 1990, was validated in 2010 for its application in Chilean populations older than 60 years.[19] The version used in Chile shares similarities with a previous GOHAI version proposed for Spanish-speaking populations.[14]

This assesses three domains: Physical Function (questions 1-4), Psychosocial Function (questions 5-10), and Pain/Discomfort in the mouth (questions 11-12). The responses were registered using a 5-point Likert scale, where "Always" was equal to 1 point and "Never" to 5 points, which were finally added to obtain an overall score, which allowed the following categorizations: poor OHRQoL (12-27 points), moderate (28-43 points), and good (44-60 points).[19]

Finally, a dental health status datasheet was completed by means of an oral exam. The variables included were:

- Dental Status: status of each tooth, according to the WHO criteria.[20] Third molars were excluded.

- Dental Mobility: measured with two metal instruments, applying pressure in the vestibule-palatal/lingual direction.

- Oral Hygiene: Simplified Oral Hygiene Index (OHI-S) by Greene and Vermillion.[21]

- Tooth loss: visual inspection of the jaws, determining missing teeth.

- Denture wearing: use (or not) of removable denture, registered according to the WHO criteria.[20]

- Denture hygiene: according to Vigild's criteria for

prosthesis hygiene.[22]

- Time of denture wearing: time in years during which each participant has used their last removable prosthesis.

The dental examination was performed by a previously calibrated operator, who obtained a Kappa Coefficient of Agreement of 0.95 for the dental status and an Ordinal Kappa value with square weights of 0.94 for the OHI-S. Both values corresponded to the "almost perfect" category according to Landis *et al.*[23] valuation. Within each center, a box was set up to perform the oral exam, following the WHO criteria.[20] Biosecurity measures were implemented and carefully followed while examining each participant.

Regarding the statistical analysis, a univariate descriptive analysis was performed with frequency tables for qualitative variables and summary statistics for quantitative variables (mean±standard deviation for variables with symmetrical distribution and median for skewed distribution). For the GOHAI, reliability was calculated (Cronbach's α), normality was contrasted (Kolmogorov-Smirnov test), and a description of the total score was made, by dimension and by item, and then it was described as an ordinal variable with its categorization.[19]
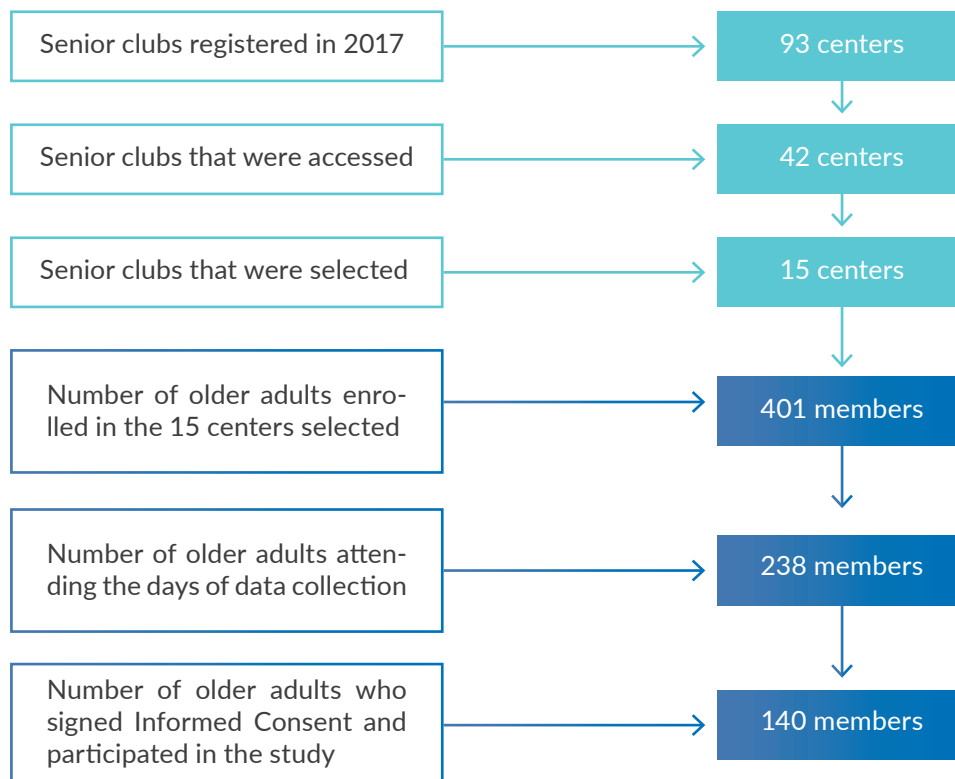
To analyze the relationship between the variables and the total GOHAI, a comparison of measures of central tendency and bivariate correlation analysis (Spearman's Rho coefficient, ρS) was performed. Finally, a multivariate analysis was carried out through multiple linear regression, considering the total GOHAI as response variable. Contrasts were considered significant at 5%. The SPSS-23 program was used.

RESULTS.

The GOHAI scale showed good reliability (Cronbach's alpha=0.86). The total GOHAI did not show normality ($p<0.001$). The skewness was -1.084. The mean of the total GOHAI value for the studied sample was 50.8±8.6 points, the median was 53, with a range between 20 and 60 points. 79.3% had a good OHRQoL (n=111), 19.3% moderate (n=27), and 1.4% poor (n=2). The results per item are shown in Table 1.

The means and standard deviations according

Figure 1. Sample flowchart.

Senior clubs registered in 2017	93 centers
Senior clubs that were accessed	42 centers
Senior clubs that were selected	15 centers
Number of older adults enrolled in the 15 centers selected	401 members
Number of older adults attending the days of data collection	238 members
Number of older adults who signed Informed Consent and participated in the study	140 members

to averaged dimensions (sum of the score of the items divided by the number of items that make up each dimension) were: Physical Function 4.2±0.9, Psychosocial Function 4.2±0.8, and Pain/Discomfort 4.3±0.9. The final sample obtained corresponded to 140 elderly people, between 60 and 87 years old, with a mean age of 73.2±6.2 years. The mean schooling years completed was 7.5±4.4. The sociodemographic data of the sample and their relationship with the GOHAI are shown in Table 2.

Both age and years of education did not present a statistically significant association with the total GOHAI score (ρS=-0.008; p=0.925, and ρS=0.137; p=0.107, respectively). When analyzing the relationship between the GOHAI and the sociodemographic variables, a statistically significant relationship between OHRQoL and belonging to an indigenous group was found.

A comparison of the means of the total GOHAI score

Table 1. Descriptive statistics of the GOHAI and distribution of the responses for each item (n=140).

Items	Mean	SD	Me	Always		Often		Sometimes		Seldom		Never	
				n	%	n	%	n	%	n	%	n	%
Physical Function													
1. How often did you limit the kinds or amounts of food you eat because of problems with your teeth or denture?	4.1	1.2	5.0	3	2.1	15	10.7	32	22.9	2	1.4	88	62.9
2. How often could you not swallow well or comfortably?	4.5	1.0	5.0	2	1.4	11	7.9	13	9.3	6	4.3	108	77.1
3. How often have your teeth or dentures prevented you from speaking the way you wanted?	4.4	1.1	5.0	3	2.1	9	6.4	21	15.0	10	7.1	97	69.3
4. How many times did you feel discomfort when trying to eat what you wanted?	4.0	1.2	5.0	4	2.9	19	13.6	30	21.4	13	9.3	74	52.9
Psychosocial Function													
5. How often did you limit contacts with people because of the condition of your teeth or denture?	4.6	0.8	5.0	0	0.0	4	2.9	16	11.4	8	5.7	112	80.0
6. How often were you unpleased or not happy with the looks of your teeth, gums or dentures?	4.2	1.2	5.0	7	5.0	7	5.0	24	17.1	15	10.7	87	62.1
7. How often were you worried or concerned about problems with your teeth, gums or dentures?	3.8	1.2	4.0	4	2.9	20	14.3	37	26.4	19	13.6	60	42.9
8. How often did you feel nervous or self-conscious because of problems with your teeth, gums or dentures?	4.0	1.3	5.0	4	2.9	21	15.0	22	15.7	13	9.3	80	57.1
9. How often did you feel uncomfortable eating front of people because of problems with your teeth, gums or dentures?	4.2	1.2	5.0	4	2.9	17	12.1	15	10.7	12	8.6	92	65.7
10. How often did you avoid laughing or smiling because of unattractive teeth or gums?	4.3	1.1	5.0	1	0.7	13	9.3	22	15.7	7	5.0	97	69.3
Pain or Discomfort													
11. How often have you had pain or discomfort around your mouth?	4.4	1.0	5.0	0	0.0	9	6.4	24	17.1	13	9.3	94	67.1
12. How often were your teeth or gums sensitive to hot, cold or sweet foods?	4.3	1.1	5.0	3	2.1	9	6.4	23	16.4	13	9.3	92	65.7

SD: Standard Deviation. **Me:** Median.

Table 2. Sociodemographic characteristics of the sample and relation with GOHAI (n=140).

Variable	Total sample (n=140)		GOHAI categorization						Total GOHAI		$p^†$
			Poor (12-27)		Regular (28-43)		Good (44-60)				
	n	%	n	%	n	%	n	%	Mean	Me	
Gender											
Male	17	12.1	0	0.0	3	17.6	14	82.4	52.5	55.0	0.362[a]
Female	123	87.9	2	1.6	24	19.5	97	78.9	50.5	53.0	
Nationality											
Chilean	139	99.3	2	1.4	27	19.4	110	79.1	50.8	53.0	0.471[a]
Others (Italian)	1	0.7	0	0.0	0	0.0	1	100.0	45.0	45.0	
Level of Education											
Illiterate	6	4.3	0	0.0	2	33.3	4	66.7	47.8	49.0	0.199[b]
Primary	72	51.4	1	1.4	16	22.2	55	76.4	49.9	51.0	
Secondary	45	32.1	1	2.2	4	8.9	40	88.9	52.8	55.0	
Higher	17	12.1	0	0.0	5	29.4	12	70.6	50.1	53.0	
Marital status											
Widower	58	41.4	0	0.0	11	19.0	47	81.0	51.3	54.0	0.189[b]
Married	57	40.7	2	3.5	7	12.2	48	84.2	51.4	54.0	
Single	18	12.9	0	0.0	6	33.3	12	66.7	49.3	51.0	
Separated	7	5.0	0	0.0	3	42.9	4	57.1	45.4	46.0	
Income											
Retirement	65	46.4	0	0.0	15	23.1	50	76.9	51.0	53.0	0.300[b]
State retirement pension	54	38.6	1	1.9	10	18.5	43	79.6	49.8	52.5	
Work income	1	0.7	0	0.0	0	0.0	1	100.0	60.0	60.0	
More than one income	16	11.4	1	6.3	1	6.3	14	87.5	52.8	55.0	
None	4	2.9	0	0.0	1	25.0	3	75.0	51.5	53.5	
Insurance											
Public	117	83.6	2	1.7	21	17.9	94	80.3	51.0	53.0	0.057[b]
Private	5	3.6	0	0.0	1	20.0	4	80.0	48.6	53.0	
Others	6	4.3	0	0.0	0	0.0	6	100.0	57.0	58.0	
None	12	8.5	0	0.0	5	41.7	7	58.3	46.3	45.0	
Residence area											
Urban	139	99.3	2	1.4	27	19.4	110	79.1	50.7	53.0	0.339[a]
Rural	1	0.7	0	0.0	0	0.0	1	100.0	58.0	58.0	
Indigenous ethnicity											
Yes	20	14.3	1	5.0	6	30.0	13	65.0	46.5	47.0	0.024[*a]
No	120	85.7	1	0.8	21	17.5	98	81.7	51.5	54.0	

Me: Median. **†:** *p* refers to comparison of means or medians of GOHAI. **a**: Mann-Whitney test. **b**: Kruskal-Wallis test. ***:** Statistically significant.

Table 3. Dentition and denture status of the sample and relation with GOHAI.

Variable	Total sample (n=140)		GOHAI categorization						Total GOHAI		p[†]
			Bad (12-27)		Regular (28-43)		Good (44-60)				
	n	%	n	%	n	%	n	%	Mean	Me	
Complete sample (n=140)											
Tooth loss											
Partial dentate	98	70.0	2	2.0	23	23.5	73	74.5	49.6	51.5	0.006[*a]
Edentulous	42	30.0	0	0.0	4	9.5	38	90.5	53.5	55.5	
Number of teeth											
0	42	30.0	0	0.0	4	9.5	38	90.5	53.5	55.5	0.035[*b]
1-10	56	40.0	2	3.6	17	30.4	37	66.1	48.0	49.0	
11-19	23	16.4	0	0.0	4	17.4	19	82.6	50.9	51.0	
≥20	19	13.6	0	0.0	2	10.5	17	89.5	53.0	54.0	
Type of denture											
No denture	20	14.3	0	0.0	3	15.0	17	85.0	51.8	53.0	0.266[b]
Full-mouth complete denture	39	27.9	0	0.0	4	10.3	35	89.7	53.3	54.0	
Full-mouth partial denture	12	8.6	1	8.3	2	16.7	9	75.0	50.9	55.0	
Full-mouth complete + partial	29	20.7	1	3.4	7	24.1	21	72.4	48.1	46.0	
Single complete denture	21	15.0	0	0.0	6	28.6	15	71.4	50.6	55.0	
Single partial denture	19	13.6	0	0.0	5	26.3	14	73.7	48.7	51.0	
Dentate sample (n=98)											
Tooth mobility											
Yes	13	13.3	0	0.0	3	23.1	10	76.9	49.4	52.0	0.921[c]
No	85	86.7	2	2.4	20	23.5	63	74.1	49.6	51.0	
Simplified Oral Hygiene Index											
Excellent	22	22.4	0	0.0	9	40.9	13	59.1	48.7	49.5	0.870[b]
Good	29	29.6	0	0.0	7	24.1	22	75.9	49.5	49.0	
Fair	43	43.9	2	4.7	6	14.0	35	81.4	50.2	53.0	
Poor	4	4.1	0	0.0	1	25.0	3	75.0	49.0	51.0	

Quantitative Variables, Dentate sample (n=98)				
Variable	Mean	SD	Correlation coefficient (ρS)	p[¥]
Dental status				
Healthy teeth	7.43	5.20	0.209	0.039*
Decayed teeth	0.70	1.10	-0.105	0.306
Filled teeth with caries	0.06	0.35	-0.019	0.856
Filled teeth without caries	2.63	3.28	0.044	0.667
Teeth with crowns	0.37	1.42	0.189	0.063
Missing teeth	16.81	7.42	-0.183	0.071
Remaining natural teeth	11.2	7.42	0.183	0.071

†: *p* refers to comparison of means or medians of GOHAI. ¥: *p* refers to Spearman's correlation coefficient. **a:** t-test. **b:** Kruskal-Wallis test. **c:** Mann-Whitney test. *****: Statistically significant. **SD:** Standard Deviation. **Me:** Median.

was made between illiterate older people and those who received formal education. The global means were 47.8 and 50.9, respectively, a difference that was not statistically significant (*p*=0.436).

Regarding health conditions, 95% of the surveyed elderly people declared having some pathology (n=133). The number of reported diseases was 2.7±1.6 chronic pathologies, with a range between 0 and 8. The most prevalent pathologies were cardiovascular (82.9%, n=116), musculoskeletal (30%, n=42) and diabetes mellitus (28.6%, n=40). A total of 92.9% took some type of medication regularly (n=130). The number of medications was 3±1.8, in a range between 0 and 8 drugs.

Regarding the dental health status, considering the total sample (n=140), there were 7.8±8.1 remaining teeth, with a range between 0 and 27, a value that had no statistically significant association with the total GOHAI (ρS=-0.074; *p*=0.388). Of the dentate patients, 44.9% had at least one decayed tooth (either primary or secondary caries). A total of 1097 teeth were examined, of which 728 were healthy (66.4%), 69 were decayed (6.3%), 6 were filled and had caries (0.5%), 258 were filled without caries (23.5%), and 36 had crowns (3.3%). The results of the variables of the dental health status and their relationship with the GOHAI are shown in Table 3.

Regarding the OHI-S, the total value was 1.28±1.0, being classified as "fair". The value of the "detritus" component was 0.27±0.51, and that of the "calculus" component was 1.01±0.81. The total OHI-S did not present a statistically significant association with the total GOHAI (ρS=0.064; *p*=0.532).

A total of 85.7% of the subjects wore dentures (n=120). Mean time of use was 8.8±9.4 years, with a range between 0.25 and 50. This variable did not present a statistically significant association with the total GOHAI score (ρS=0.112; *p*=0.223). When evaluating dentures hygiene, 45.8% of them were good (n=55), 45.0% moderate (n=54), and 9.2% poor (n=11). The mean GOHAI for the three denture hygiene categories were 49.5, 52.3, and 47.9, respectively. The comparison between these values was not statistically significant (*p*=0.142).

A multivariate analysis with multiple regression was carried out, using the total GOHAI score as the response variable, and sex, age, years of education, number of chronic conditions, number of medications, number of teeth, and denture wearing for the entire

sample (n=140), as independent variables.

Multivariate analysis was also performed considering the dentate sample (n=98), using the total GOHAI score as the response variable and as independent variables those previously indicated for the entire sample, adding the number of healthy, decayed, and filled teeth, teeth with crowns, dental mobility and OHI-S. No variable presented significance in the model in the total scores of the GOHAI, neither for the total sample nor for the dentate sample.

DISCUSSION.

This research aimed to explore the relationship between OHRQoL and sociodemographic variables and dental health status in older people who belong to elderly clubs in the district of Puerto Montt. However, the GOHAI was only related to the presence of healthy teeth and general tooth loss, but not to other variables related to dental health status. Regarding sociodemographic variables, age was similar to previous studies that obtained means ranging from 70-75 years.[1,4,7,10] A female prevalence was observed, similar to some studies,[24,25] but higher than other studies in which female participation reached 60-70%.[4,5,13,17,26] The mean years of study and the level of illiteracy were better indicators than other previous reports.[1,5,7,9,16,25]

Within chronic pathologies, the data obtained resembled a study where 90% of the sample suffered from some condition, with greater prevalence of cardiovascular pathologies.[7] The high burden of disease and the extensive use of medications are consistent with data reported in others previous studies.[1,7,17,26]

Regarding dental health status, all the elderly people had at least one missing tooth. The number of remaining teeth was similar to that reported by other studies.[6,17] Although more than 40% of the sample had at least one caries, the average number of caries was low. Most of the teeth were healthy, with no caries or restorations. This may be due to the fact that the elderly usually receive radical treatments, in which the pain is relieved with tooth extraction and rarely through conservative rehabilitation.[1] This may also explain the low proportion of filled and crowned teeth. The percentage of totally edentulous subjects was lower than that reported in other studies.[5,17] 85.7% wore a removable denture, a figure higher than the data reported by other authors.[8,24,26-28]

Regarding the GOHAI questionnaire, the mean and

median were classified as "Good OHRQoL", according to the classification proposed in Chile.[19] The mean was higher than that obtained in other studies.[4,6,17,18,25-27] No prevalence of any specific dimension was observed. The question "How often were you worried or concerned about problems with your teeth, gums, or dentures?" obtained the lowest value, both in mean and median, which implies that this question of the psychosocial dimension is most reported as a problem in the oral health-quality of life relationship.

If the original GOHAI categorization were used,[15] 34.3% of the sample studied would have good OHRQoL, 27.9% moderate, and 37.9% poor, and the mean and median values would fit within the "moderate" category. Another classification typifies the OHRQoL as "negative" or "positive" according to a cut-off of 57 points, used by a previous Chilean study.[4] According to this criterion, 75% of the sample would perceive the OHRQoL as poor. However, there is no conceptual equivalence between the original GOHAI, other versions in Spanish and the Chilean version of 2010,[29] limiting the use of these criteria of categorization.

Studying possible associations between OHRQoL and sociodemographic variables, it was found that males had slightly higher GOHAI scores, in agreement with other authors,[4,16] a relationship that has even been reported as significant.[18,27] In this research, these variables did not present a significant relationship, similar to other studies.[1,7,13,25] Likewise, there was not a significant relationship found between age and OHRQoL, which is in agreement with some authors,[13,25,30] but different from others.[16,18,28] According to the educational level, those who reached secondary education obtained higher GOHAI scores, and lower scores those who did not have a formal education. However, these differences were not statistically significant, contrary to other studies, in which the educational level or the fact of being illiterate was related to the OHRQoL.[1,6,18,27] A finding of the present study was the relationship between a higher total GOHAI score and not belonging to an indigenous people. Although it should be considered cautiously, since the number of older people not belonging to indigenous people (n=120) was 6 times greater than those who did belong (n=20), making them not very comparable groups.

Regarding dental health status, edentulous people obtained higher scores on the GOHAI than dentate people, with a statistically significant difference, similar to that reported in a previous study.[27] For the dentate sample, it was found that the greater the number of remaining teeth, the greater the OHRQoL, in agreement with other authors.[1,2,6,25-28]

For variables of dental status (n=98), a statistically significant relationship was also found between OHRQoL and the number of healthy teeth. No significant associations were found between the total GOHAI and tooth mobility, the OHI-S, and other variables such as the number of decayed teeth, filled with or without caries and with crowns, contrary to studies that have found relationships with some of these variables.[18,27,28]

Higher GOHAI scores were also found in people who used total upper and lower dentures, followed by those who did not use dentures. Those who used total and partial prostheses combined obtained lower scores, although this difference was not significant. This differs from the results obtained by another study that reported that partial dentures wearers had higher scores on the GOHAI.[9]

30% of the subjects were edentulous, and it is this group that obtained the highest GOHAI score, compared to the dentate ones. A possible explanation for this fact may be the belief that it is normal to lose teeth for different reasons throughout life.[1] Beliefs are not considered in objective measures of health but, they are important in a person's perception of their well-being.

OHRQoL is a difficult variable to use since a person can adapt or cope with a disease in multiple ways. Caries or periodontal disease can have long latency periods before presenting symptoms. It is important to motivate the patient to undergo periodic check-ups since a positive association between the OHRQoL and regular dental check-ups has also been reported.[24] There is also evidence of an increase in the OHRQoL after performing/restarting prescribed dental treatments.[10,11,13]

Among the limitations of this study is important to consider the type of sampling; this limits the generalization of the results. Information bias can be considered as another possible limitation, attributable to the use of questionnaires. The GOHAI is frequently used to represent changes reported by patients in the last three months, being a more suitable instrument to compare the evolution of some dental interventions.[7,10]

In conducting the study, no differentiation was made between those older people who had had any dental

intervention in the last three months and those who had not, and this may present limitations in the analysis of the results. On the other hand, the GOHAI validated in Chile is not conceptually equivalent to the original version or to other versions in Spanish, neither in dimensions nor categorization, being comparable only with studies that apply the same questionnaire.

CONCLUSION.

A good OHRQoL was associated with non-belonging to an indigenous people, being edentulous, and a greater number of healthy teeth in dentate patients. The overall GOHAI scores were higher in males, and in those with formal education. Regarding the variables of dental health status, those who had the highest scores were edentulous, dentate patients without tooth mobility, complete denture wearers, and with moderate denture hygiene.

Knowing the impact that oral conditions have on people's lives helps to raise awareness about the need for greater coverage in oral health, especially in older people, who have seen the damage of a lifetime reflected in their oral health, and affecting their well-being.

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