

ORAL HEALTH STATUS OF ELDERLY PEOPLE ACCORDING TO CONDITION AND DEGREE OF FUNCTIONAL DEPENDENCE IN THE DISTRICT OF PAIHUANO, CHILE

Estado de salud oral de personas mayores según situación y grado de dependencia funcional, Comuna de Paihuano, Chile

Thabata Castañón-Molina,¹ Lorena-Mirtala Orellana.²

1. Facultad de Odontología, Universidad de Concepción, Chile.

2. Departamento de Prevención y Salud Pública Odontológica, Facultad de Odontología, Universidad de Concepción, Chile.

ABSTRACT

Introduction: Population aging represents a significant social cost due to its association with systemic and oral diseases. The present study aimed to determine the oral health status of a group of elderly people (EP) treated at the Family Health Care Center (CESFAM, for its acronym in Spanish) in the district of Paihuano, Chile, according to their condition and degree of functional dependence.

Materials and Methods: A cross-sectional study was conducted on 108 elderly people (EP), both with and without functional dependence, all of them enrolled at the CESFAM of the district of Paihuano, Chile. Sociodemographic, medical, and dental variables were assessed through a questionnaire and clinical examination.

Results: The mean number of crowns, healthy crowns and missing crowns in the dependent group was 2.9 ± 5.3 , 1.5 ± 3.2 , and 27.7 ± 7.9 , respectively, while in the independent group, these values were 11.5 ± 8.7 , 6.4 ± 5.3 , and 20.4 ± 0.3 , respectively. The mean Simplified Oral Hygiene Index (OHI-S) for EP with and without dependence was 1.3 ± 0.8 . Maxillary edentulism was observed in 72.2% of dependent individuals and in 24.1% of independent individuals, while mandibular edentulism affected 63.0% of dependent individuals and 13.0% of independent individuals.

Conclusion: Dependent EP had fewer crowns, fewer healthy crowns, and a higher number of missing crowns than independent EP. The IHO-S indices were categorized as fair for both dependent and independent individuals. Dependent EP had a higher prevalence of edentulism than their independent counterparts.

Keywords: Oral health; Elderly people; Functional dependence; Oral hygiene; Dental status.

RESUMEN

Introducción: El envejecimiento de la población representa un gran costo social por las enfermedades sistémicas y bucodentales asociadas. El objetivo fue determinar el estado de salud oral de un grupo de personas mayores (PM) pertenecientes al Centro de Salud Familiar (CESFAM) Paihuano, Chile, según situación y grado de dependencia funcional.

Materiales y métodos: Se realizó un estudio transversal en 108 PM con y sin dependencia funcional pertenecientes al CESFAM de Paihuano. Mediante un cuestionario y examen clínico se estudiaron variables sociodemográficas, médicas y dentales.

Resultado: La media del número de coronas, coronas sanas y coronas perdidas en el grupo con dependencia fue $2,9 \pm 5,3$; $1,5 \pm 3,2$ y $27,7 \pm 7,9$ respectivamente, mientras en el grupo independiente estos valores fueron $11,5 \pm 8,7$; $6,4 \pm 5,3$ y $20,4 \pm 0,3$ respectivamente. La media del Índice de Higiene Oral Simplificado (IHO-S) para PM con y sin dependencia fue $1,3 \pm 0,8$. El 72,2% de las personas con dependencia y el 24,1% de las independientes era edéntulo maxilar, por otra parte, 63,0% de las personas con dependencia y 13,0% de las independientes era edéntulo mandibular.

Conclusión: Las PM con dependencia presentaron un menor número de coronas, coronas sanas y mayor número de coronas perdidas que las PM independientes. Los índices de IHO-S fueron categorizados como regular en personas dependientes e independientes. Las PM con dependencia presentaron mayor prevalencia de edentulismo que las personas independientes.

Palabras Clave: Salud bucal; Persona mayor; Dependencia funcional; Higiene bucal; Estado dental.

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

CITE AS:

Castañón-Molina T & Orellana LM. Oral health status of elderly people according to condition and degree of functional dependence in the district of Paihuano, Chile. J Oral Res. 2024;13(1):393-408. doi:10.17126/joralres.2024.035

Received: December 21, 2023.

Accepted: March 26, 2024.

Published online: December 31, 2024.

ISSN Print 0719-2460

ISSN Online 0719-2479

INTRODUCTION

Due to current demographic changes, the number of people reaching old age worldwide has increased significantly. Older adults currently account for 12% of the population, a figure expected to double in the next 30 years, quadrupling the number of octogenarians and resulting in a marked feminization of old age.¹⁻⁸ In Chile, the Ministry of Health (MINSAL) defines Elderly People (EP) as those over 65 years of age. This is established in guidelines and definitions of strategy indicators such as: Technical Guidelines for the Care of EP,⁹ Application of the Preventive Medicine Examination for the Elderly (EMPAM, for its acronym in Spanish),¹⁰ National Comprehensive Health Plan for EP,¹¹ and the Geriatrics Manual for Physicians.¹² As life expectancy increases, so does the number of adults with chronic degenerative diseases that can cause disability and deterioration in their quality of life.⁹⁻¹⁴

The current global health scene is in a state of alert regarding the SARS-CoV-2 virus (COVID-19) pandemic. This virus threatens humans to varying degrees, from mild flu-like symptoms to even causing death, mostly in high-risk groups. EP belong to this last category due to their high burden of chronic diseases and weakened immune systems.^{1-3,15-20}

Considering this, new challenges and questions arise from the dental perspective regarding the relationship between oral diseases and comorbidity, mortality and/or vulnerability of EP, especially those that are functionally dependent.^{3,21-24}

The Chilean Ministry of Health (MINSAL) defines functionality as the ability to perform basic activities of daily living (BADL) across psychologically, physically, and socially domains.⁹⁻¹² Functionality is the most prototypical

indicator for assessing health in EP. In Chile, functionality is assessed using the Barthel index. This index classifies individuals as independent people (capable of performing BADL) and dependent individuals (unable to perform BADL and requiring constant support).^{9,10,25} Frailty is not considered in this classification because of the lack of a standardized and quantifiable definition.

However, in general terms, it is described as the state characterized by impaired autonomy and recently acquired difficulties in performing BADL, all of which are conditions preceding dependence.^{26,27}

Although the oral health status of vulnerable or dependent EP is considered of great importance, evidence about their actual oral health conditions remains limited. However, it is believed that they have different characteristics than those who belong to the independent elderly people classification (IEP). According to national studies, dependent elderly people (DEP) show a higher DMFT score and higher total edentulism index than those reported for IEP.^{28,29} In addition, DEP are often reported to have a “poor” or “deficient” oral hygiene, which is one of the most prevalent dental problems in this population. This stresses the need to improve education and training of caregivers regarding oral care practices.^{23,24,28-32}

Restrictions on access to dental care due to the COVID-19 pandemic build more barriers to those already existing for EP. They typically experience poor oral health characterized by high rates of caries, tooth loss, advanced periodontal disease, dry mouth, and pre-cancer/cancer states. As a result, an even greater deterioration in their oral health status is expected. At the national level, the situation in Chile is also critical since the last National Health Survey revealed worse oral health indicators among EP compared to the rest of the

age groups.^{33,34} At the same time, according to the Third National Disability Survey, EP are the group with the highest rates of dependence in Chile across its different degrees.³⁵

Home dental care must be established within a framework of equality, diversity, and human rights in health and social assistance. Since 2019, Chile has incorporated dentists into the team of the Home Care Program for People with Severe Dependence, a health initiative aimed at expanding health coverage for this group of individuals.²⁵ This program focuses on the population that absolutely requires home care, without considering those who have slight or moderate dependence, who can still attend health centers, although with varying degrees of difficulty.²⁵ The situation in the district of Paihuano is more complex and requires improvements due to its unique characteristics: it is an entirely rural community, has a high prevalence of adults and elderly people (EP), 95% of its population is reliant on the public health system, has poorly maintained and unpaved roads that make access difficult, towns are far from each other, has limited public transportation, and weak internet and radio network coverage.

This creates even more barriers for people to access health care services and, consequently, it affects even more so to those who have a greater need to receive care due to their higher degrees of dependence. The expected consequences of inadequate access to dental care result in worse oral conditions, posing a new challenge for dentists. To address this situation, it is imperative to assess the oral health of DEP to identify their main problems and deficiencies and guide efforts towards implementing guidelines focused on improving their oral health conditions.^{1,5}

To guide health care based on epidemiological science, allocate and optimize resources

at the national level, address gaps in different areas (education, prevention, and treatment), and enable successful planning of health programs, it is essential to understand the oral health status of this age group across their varying degrees of functional dependence.

Therefore, the objective of this study was to determine the oral health status and oral hygiene habits of a group of EP from the district of Paihuano, categorized by their degree and condition of functional dependence.

MATERIALS AND METHODS

A cross-sectional study was conducted to assess the oral health status of a group of EP enrolled at the Family Health Care Center (CESFAM) of the district of Paihuano, Chile. The study evaluated their condition and degree of functional dependence through a questionnaire and a clinical examination conducted between the months of March 2020 and July 2021.

The study was approved by the Ethics Committee of the Faculty of Dentistry at Universidad de Concepción (C.E.C. N°26/19). Participants were invited to take part in the study freely and voluntarily. They were previously informed that they could decline or withdraw their participation at any time. All participants were asked to sign an informed consent form.

The study population consisted of all dependent elderly people (DEP) who were enrolled at the CESFAM of Paihuano during 2019, totaling 67 individuals. However, between October 2019 and July 2021, there were 5 new admissions and 18 discharges, including 12 due to death and 6 due to change of residence. A total of 54 DEP belonging to the Home Care Program of the District of Paihuano remained, accounting for approximately 12% of the elderly population. Additionally, a convenience

sample of independent elderly people (IEP) who attended the CESFAM of Paihuano was obtained, equal in size to the dependent group (n=54), and aligned, as much as possible, by age range, sex, and place of origin.

The inclusion criteria were as follows:

Being 65 years of age or older, enrolled at the CESFAM of Paihuano, with an EMPAM classification of self-sufficient rating with/without risk and Barthel Index score (BI) of 100 points for IEP; and EMPAM classification of dependent and a BI score of <100 points for DEP. The exclusion criteria included EP who could not undergo the oral examination due to their health condition or who were in an agonizing or terminal state.

To collect the data, a questionnaire was designed and administered by the lead researcher. The questionnaire included socio-demographic variables of EP, such as age, sex, nationality, marital status, place of residence, indigenous affiliation, highest educational level completed, type of retirement or pension, and type of health insurance. It also gathered sociodemographic variables of the EP caregivers: age, sex, nationality, family relationship, residence, wage, and highest educational level completed.

The health status of each EP was also recorded, including their condition and degree of functional dependence through the application of the EMPAM and BI. Based on the scores, the following classifications were considered: elderly person with slight dependence (SLDEP), with a score between 60 and 99 points, elderly person with moderate dependence (MODEP), between 40 and 55 points; and elderly person with severe dependence (SEVDEP), with a score of 35 or fewer points.

The presence and number of pathologies, and the administration and number of medications were also recorded.

The following variables were obtained through an oral examination:

- Dental Status: crown and root status of each tooth, according to the criteria recommended by the WHO.³⁶
- Simplified Oral Hygiene Index (IHO-S) by Greene and Vermillion.
- Community Periodontal Index of Treatment Needs: modified CPITN.
- Edentulousness: visual inspection of the jaws to assess tooth loss in each jaw.
- Prosthesis Wearer: presence or absence of removable prosthesis, recorded following the WHO³⁶ criteria.
- Prosthesis Hygiene: according to Vigild's criteria for prosthesis hygiene.
- Soft tissue/mucosa status: modified recording system according to WHO³⁶ criteria.

The dental examination was performed by the previously trained lead researcher. The interobserver Kappa coefficient of agreement for dental status was 0.96, and the weighted Ordinal Kappa value for the OHI-S variable was 0.85. Both values obtained corresponded to the "Excellent" category according to the Landis and Koch assessment.

The examinations were conducted either in a dental clinic at the CESFAM, following the WHO³⁶ criteria or at home in the case of DEP participants, according to the Home Dental Care Guidelines of the Chilean Ministry of Health.²⁵

For the statistical analysis, univariate and bivariate descriptive analysis were used, with frequency tables for qualitative variables and summary measures for quantitative variables

Table 1.

Sociodemographic characteristics of the group of elderly people according to condition and degree of functional dependence.

Variable	Category	Dependent elderly people									
		IEP		SLDEP		MODEP		SEVDEP		Total	
		(n=54)		(n=26)		(n=18)		(n=10)		(n=54)	
		N	%	N	%	N	%	N	%	N	%
Sex	Male	19	35.2	7	26.9	7	38.9	2	20.0	16	29.6
	Female	35	64.8	19	73.1	11	61.1	8	80.0	38	70.4
Nationality	Chilean	54	100	26	100	17	94.4	10	100	53	98.1
	Spaniard	0	0.0	0	0.0	1	5.6	0	0.0	1	1.9
Marital status	Married	25	46.3	5	19.2	5	27.8	5	50.0	15	27.8
	Cohabitant	1	1.9	1	3.8	0	0.0	0	0.0	1	1.9
	Divorced	1	1.9	1	3.8	0	0.0	0	0.0	1	1.9
	Separated	6	11.1	0	0.0	0	0.0	0	0.0	6	11.1
	Single	12	22.2	3	11.5	2	11.1	1	10.0	0	0.0
	Widowed	9	16.7	16	61.5	11	61.1	4	40.0	31	57.4
	Place of residence	Alcohuaz	0	0.0	0	0.0	1	5.6	0	0.0	1
	Cochiguaz	7	13.0	0	0.0	1	5.6	0	0.0	1	1.9
	Horcón	7	13.0	1	3.8	3	16.7	2	20.0	6	11.1
	Monte grande	2	3.7	2	7.7	4	22.2	1	10.0	7	13.0
	Paihuano	18	33.3	9	34.6	2	11.1	2	20.0	13	24.1
	Pisco Elqui	11	20.4	8	30.8	4	22.2	4	40.0	16	29.6
	Quebrada de Paihuano	4	7.4	3	11.5	0	0.0	1	10.0	4	7.4
	Quebrada de Pinto	3	5.6	0	0.0	2	11.1	0	0.0	2	3.7
	Tres Cruces	1	1.9	3	11.5	1	5.6	0	0.0	4	7.4
	Chapilca	1	1.9	0	0.0	0	0.0	0	0.0	0	0.0
Indigenous affiliation	Yes	11	20.4	2	7.7	1	5.6	1	10.0	4	7.4
	No	43	79.6	24	92.3	17	94.4	9	90.0	50	92.6
Educational level	Preschool	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Incomplete primary education	24	44.4	20	76.9	15	83.3	8	80.0	43	79.6
	Complete primary education	7	13.0	2	7.7	1	5.6	0	0.0	3	5.6
	Incomplete high school education	5	9.3	1	3.8	0	0.0	0	0.0	1	1.9
	Complete high school education	7	13.0	2	7.7	1	5.6	1	10.0	4	7.4
	Incomplete university education	0	0.0	1	3.8	1	5.6	0	0.0	2	3.7
	Complete university education	11	20.4	0	0.0	0	0.0	1	10.0	1	1.9
Retirement	Basic Solidarity Pension	29	53.7	23	88.5	13	72.2	7	70.0	43	79.6
	Pension	22	40.7	3	11.5	4	22.2	3	30.0	10	18.5
	None	3	5.6	0	0.0	1	5.6	0	0.0	1	1.9
Health insurance system FONASA (public health)	Level A	1	1.9	0	0.0	1	5.6	1	10.0	2	3.7
	Level B	45	83.3	25	96.2	17	94.4	8	80.0	50	92.6
	Level C	1	1.9	1	3.8	0	0.0	1	10.0	2	3.7
	Level D	7	13.0	0	0.0	0	0.0	0	0.0	0	0.0

IEP: Independent elderly people. **SLDEP:** Slight dependence. **MODEP:** Moderate dependence. **SEVDEP:** Severe dependence.

(Mean ± Standard deviation). The SPSS-23 program was used for the analysis.

RESULTS

A total of 108 EP enrolled at the CESFAM of Paihuano were evaluated, of which 54 were DEP and 54 IEP. The age range of the DEP group was 67-99 years, with a mean age of 86.3±7.2 years, while the IEP group had an age range of 65-87 years and a mean age of 72.9±5.1 years.

Among the DEP group, 26 (48.15%) were classified as SLDEP, 18 (33.3%) as MODEP,

and 10 (18.52%) as SEVDEP. The mean ages measured in years for the SLDEP, MODEP, and SEVDEP groups were 88.1±6.9, 72.9±6, and 84.2±8.2, respectively. Significant differences were observed in the variable marital status: the DEP group showed a tendency towards being “widowed”, while individuals in the IEP group were predominantly “married”. In both groups, incomplete primary education was the most common educational level.

However, a large percentage of IEP had completed higher education (20.4%), compared to only 1.9% in the DEP group (Table 1).

Regarding the sociodemographic background of DEP caregivers, their ages ranged from 25

Table 2.

Sociodemographic characteristics of caregivers of dependent elderly people according to degree of dependence.

Variable	Category	Degree of dependence						Total	
		Slight (n=26)		Moderate (n=18)		Severe (n=10)		Dependent (n=54)	
		N	%	N	%	N	%	N	%
Sex	Male	1	3.8	1	5.6	1	10.0	3	5.6
	Female	25	96.2	17	94.4	9	90.0	51	94.4
Family relationship	Cohabitant/Spouse	2	7.7	1	5.6	2	20.0	5	9.3
	Brother/sister, brother-in-law/sister-in-law	2	7.7	1	5.6	0	0.0	3	5.6
	Daughter/son	15	57.7	10	55.6	6	60.0	31	57.4
	Granddaughter/grandson	1	3.8	0	0.0	0	0.0	1	1.9
	Another relative	4	15.4	4	22.2	1	10.0	9	16.7
	Other non-relative	2	7.7	2	11.2	1	10.0	5	9.3
Residence in the same place of the elderly person	Yes	20	76.9	17	94.4	10	100.0	47	87.0
	No	6	23.1	1	5.6	0	0.0	7	13.0
Wage	Yes	1	3.8	3	16.7	3	30.0	7	13.0
	No	25	96.2	15	83.3	7	70.0	47	87.0
Educational level	Pre-school	0	0.0	0	0.0	0	0.0	0	0.0
	Incomplete primary education	6	23.1	1	5.6	5	50.0	12	22.2
	Complete primary education	6	23.1	3	16.7	2	20.0	11	20.3
	Incomplete high school education	2	7.7	3	16.7	2	20.0	7	13.0
	Complete high school education	8	30.8	7	38.9	0	0.0	15	27.8
	Incomplete higher technical education	1	3.8	1	5.6	0	0.0	2	3.8
	Complete higher technical education	3	11.5	1	5.6	1	10.0	5	9.3
	Incomplete university education	0	0.0	0	0.0	0	0.0	0	0.0
Complete university education	0	0.0	2	11.2	0	0.0	2	3.8	

Table 3

Health status of the group of elderly people according to condition and degree of functional dependence.

Variable	Category	Without dependence		With dependence							
		Independent		Degree of dependence						Total Dependent	
		(n=54)		(n=26)		(n=18)		(n=10)		(n=54)	
		N	%	N	%	N	%	N	%	N	%
Disease	Presence	46	85.2	26	100.0	18	100.0	10	100.0	54	100.0
	Absence	8	14.8	0	0.00	0	0.00	0	0.00	0	0.00
Number of diseases	1	14	30.4	8	30.8	3	16.7	0	0.00	11	20.4
	2	15	32.6	8	30.8	5	27.8	1	10.0	14	25.9
	3	8	17.4	3	11.5	4	22.2	3	30.0	10	18.5
	4	7	15.2	4	15.5	4	22.2	3	30.0	11	20.4
	5	2	4.30	2	7.70	1	5.60	2	20.0	5	9.30
	6	0	0.00	1	3.80	1	5.60	1	10.0	3	5.60
Use of medications	Yes	42	77.8	23	88.5	18	100.0	10	100.0	51	94.4
	No	12	22.2	3	11.5	0	0.00	0	0.00	3	5.60

Variable	Category	Without dependence		With dependence							
		Independent		Degree of dependence						Total Dependent	
		(n=42)		(n=23)		(n=18)		(n=10)		(n=51)	
		N	%	N	%	N	%	N	%	N	%
Number of medications	1	13	31.0	3	13.1	3	16.7	0	0.00	6	11.8
	2	5	11.9	1	4.30	2	11.1	0	0.00	3	5.90
	3	5	11.9	2	8.70	2	11.1	3	30.0	7	13.7
	4	7	16.7	5	21.7	1	5.60	1	10.0	7	13.7
	5	7	16.7	3	13.1	6	33.3	3	30.0	12	23.5
	6	3	7.10	4	17.4	2	11.1	1	10.00	7	13.7
	7	1	2.40	4	17.4	2	11.1	1	10.00	7	13.7
	8	0	0.00	1	4.30	0	0.00	1	10.00	2	3.90
	11	1	2.40	0	0.00	0	0.00	0	0.00	0	0.00

to 90 years, with an average age of 54.7 ± 12.2 years. According to the degree of dependence, the average age of the caregiver measured in years for SLDEP, MODEP, and SEVDEP was 56.19 ± 11.6 , 50.94 ± 11.8 , and 57.40 ± 13.9 , respectively (Table 2).

Regarding health conditions, the mean number of diseases for DEP was 2.9 ± 1.5 , compared to 2.3 ± 1.2 for IEP. There were no significant differences according to degree of dependence (SLDEP 2.5 ± 1.5 , MODEP 2.9 ± 1.4 , and SEVDEP 3.9 ± 1.2). The mean number of

medications for DEP was 4.5 ± 1.98 , compared to 3.3 ± 2.2 for IEP.

Based on the degree of dependence, the mean did not present significant differences (SLDEP 4.1 ± 2.1 ; MODEP 4.1 ± 2.0 , and SEVDEP 4.9 ± 1.7) (Table 3).

Regarding the oral health status of the evaluated EP, a maximum of 21 dental crowns and roots were found in DEP and 29 in IEP. Differentiating by degree of dependence, there were 21, 19, and 13 crowns in the SLDEP,

Table 4

Dental status, Simplified Oral Hygiene Index (OHI-S) and Community Periodontal Index of Treatment Needs (CPITN) of the group of elderly people according to condition and degree of functional dependence.

Indicator		Without dependence		With dependence Degree of dependence				Total			
		Independent (n=54)		Slight (n=26)		Moderate (n=18)		Severe (n=10)		Dependent (n=55)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dental status of the crown	Number of crowns	11.5	8.7	2.8	5.5	3.00	5.50	3.40	4.8	2.90	5.3
	Healthy	6.40	5.3	1.5	3.2	1.70	3.40	1.50	2.8	1.50	3.2
	Carious	0.50	1.0	0.3	0.7	1.00	1.70	1.20	2.2	0.70	1.5
	Filled with caries	0.20	0.4	0.2	0.5	0.00	0.00	0.10	0.3	0.10	0.4
	Filled without caries	3.50	8.8	0.8	2.0	0.30	0.80	0.60	1.4	0.60	1.6
	Missing	20.4	0.3	29.2	5.5	25.4	10.7	27.6	6.9	27.7	7.9
	Sealed	0.04	0.3	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.0
	Fixed prosthesis	1.000	4.0	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.0
	Unerupted	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.00	0.0
Dental root status	Number of roots	11.7	8.8	2.90	5.6	3.50	6.0	3.90	4.8	3.30	5.5
	Healthy	9.30	8.7	1.90	4.4	2.40	5.1	1.90	3.7	2.10	4.5
	Carious	0.70	0.3	0.70	1.3	1.00	1.4	1.80	2.6	1.00	1.7
	Filled with caries	0.10	0.3	0.04	0.2	0.00	0.0	0.10	0.3	0.04	0.2
	Filled without caries	0.10	1.5	0.20	0.7	0.10	0.5	0.10	0.3	0.20	0.5
	Missing	20.3	8.9	29.1	5.6	26.8	9.0	27.1	6.9	27.9	7.1
	Sealed	0.20	1.4	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
	Fixed prosthesis	0.50	3.5	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
	Unerupted	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0
Indicator		Without dependence		With dependence Degree of dependence				Total			
		Independent (n=41)		Slight (n=7)		Moderate (n=7)		Severe (n=4)		Dependent (n=18)	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Simplified Oral Hygiene Index (IHO-S)	Plaque Index (PI-S)	1.6	1.0	1.9	1.0	1.5	1.0	1.8	1.0	1.7	1.0
	Calculus Index (CI-S)	0.9	0.9	0.8	0.8	1.0	0.9	1.2	0.9	0.9	0.8
	Total Index (OHI-S)	1.3	0.8	1.3	0.8	1.2	0.8	1.6	0.8	1.3	0.8
Community Periodontal Index of Treatment Needs (CPITN)		Without dependence		With dependence Degree of dependence				Total			
		Independent (n=50)		Slight (n=9)		Moderate (n=5)		Severe (n=5)		Dependent (n=19)	
Code		N	%	N	%	N	%	N	%	N	%
0		0	0.0	1	11.0	0	0.00	0	0.00	1	5.30
1		8	16.0	1	11.0	0	0.00	0	0.00	1	5.30
2		22	44.0	5	55.6	5	100.0	5	100.0	15	78.9
3		13	26.0	2	22.2	0	0.00	0	0.00	2	10.5
4		7	14.0	0	0.00	0	0.00	0	0.00	0	0.00

Table 5

Edentulism, prosthetic use and prosthetic hygiene in the group of elderly people according to condition and degree of functional dependence.

		Dependence		Degree of dependence				Total			
		Independent		Slight		Moderate		Severe		Dependent	
		(n=54)		(n=26)		(n=18)		(n=10)		(n=54)	
		N	%	N	%	N	%	N	%	N	%
Edentulousness	Total maxillary dentition	2	3.7	0	0.0	0	0.0	0	0.0	0	0.0
	Partial maxillary dentition	39	72.2	6	23.1	6	33.3	3	30.0	15	27.8
	Maxillary Edentulous	13	24.1	20	76.9	12	66.7	7	70.0	39	72.2
	Total mandibular dentition	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Partial mandibular dentition	47	87.0	8	30.8	7	38.9	5	50.0	20	37.0
	Mandibular edentulous	7	13.0	18	69.2	11	61.1	5	50.0	34	63.0
		Dependence		Degree of dependence				Total			
		Independent		Slight		Moderate		Severe		Dependent	
		(n=29)		(n=11)		(n=9)		(n=3)		(n=23)	
		N	%	N	%	N	%	N	%	N	%
Use of removable upper prosthesis	Upper total denture	10	34.5	9	81.8	8	88.8	2	66.7	19	82.6
	Upper partial denture	19	65.5	2	18.2	1	11.2	1	33.3	4	17.4
		Dependence		Degree of dependence				Total			
		Independent		Slight		Moderate		Severe		Dependent	
		(n=16)		(n=5)		(n=6)		(n=1)		(n=12)	
		N	%	N	%	N	%	N	%	N	%
Use of removable lower prosthesis/denture	Lower total denture	4	25.0	3	60.0	5	83.3	1	100.0	9	75.0
	Lower partial denture	12	75.0	2	40.0	1	16.7	0	0.00	3	25.0
		Dependence		Degree of dependence				Total			
		Independent		Slight		Moderate		Severe		Dependent	
		(n=29)		(n=11)		(n=9)		(n=3)		(n=23)	
		N	%	N	%	N	%	N	%	N	%
Hygiene of removable prostheses/denture	Good	11	37.9	2	18.2	8	88.9	1	33.4	11	47.8
	Fair	14	48.3	6	54.5	0	0.0	2	66.6	8	34.8
	Poor	4	13.8	3	27.3	1	11.1	0	0.00	4	17.4

MODEP, and SEVDEP groups, respectively. Both DEP and IEP groups had a Simplified Oral Hygiene Index of 1.3 ± 0.8 .

In 69 EP, CPTIN could be measured despite the high percentage of missing teeth (20.3 teeth in IEP and 27.9 teeth in DEP), obtaining means of 2.4 ± 0.9 in IEP, 1.9 ± 0.6 in DEP, with no significant differences based on the degree of dependence (SLDEP 1.9 ± 0.9 , MODEP 2.0 ± 0.0 , and SEVDEP 2.0 ± 0.0) (Table 4).

Concerning the use of prostheses/dentures, upper prostheses were more commonly used in both DEP (42.6%) and IEP (53.7%), compared to the use of lower prostheses (DEP 22.2% and IEP 29.6%).

When analyzed by degree of dependence, the use of upper prostheses was 42.3%, 50.0%, 30.0%, and the use of lower prostheses was 19.2%, 33.3%, and 10.0% for SLDEP, MODEP, and SEVDEP groups, respectively (Table 5).

Table 6

Frequency of soft tissue and mucous membrane lesions in the group of elderly people according to condition and degree of functional dependence.

Soft tissue and mucosal lesions	Without dependence		With dependence degree of dependence						Total	
	Independent		Slight		Moderate		Severe		Dependent	
	(n=13)		(n=3)		(n=6)		(n=3)		(n=12)	
	N	%	N	%	N	%	N	%	N	%
Subprosthetic stomatitis	6	46.0	0	0.0	0	0.0	1	33.0	1	8.0
Irritative hyperplasia	4	31.0	0	0.0	0	0.0	1	33.0	1	8.0
Intraoral staining	1	8.0	2	67.0	1	17.0	0	0.0	3	25.0
Angular cheilitis	1	8.0	0	0.0	0	0.0	1	34.0	1	8.0
Osteoma	1	7.0	0	0.0	0	0.0	0	0.0	0	0.0
Dentoalveolar abscess	0	0.0	0	0.0	1	16.0	0	0.0	1	8.0
Geographic tongue	0	0.0	0	0.0	1	17.0	0	0.0	1	8.0
Leukoplakia	0	0.0	0	0.0	2	33.0	0	0.0	2	17.0
Traumatic ulcer	0	0.0	0	0.0	1	17.0	0	0.0	1	8.0
Angioma	0	0.0	1	33.0	0	0.0	0	0.0	1	9.0

DISCUSSION

In this study, it was observed that the oral health status and oral hygiene habits of DEP and IEP enrolled at CESFAM Paihuano were generally deficient, mainly due to missing teeth. However, it was observed that DEP had a higher number of missing teeth, with a significant difference of 8 teeth in relation to IEP, therefore indicating a greater tendency towards edentulism, despite similar oral hygiene practices.

According to the degree of functional dependence, no significant differences were found between SLDEP, MODEP, and SEVDEP. Few published dental studies have examined the oral health status and oral hygiene habits of DEP at different degrees of dependence. Most research is based on frailty, which is considered a previous state to functional dependence. Furthermore, by definition, frailty encompasses a wide range of interpretations globally, making it difficult to compare with the results of this study. Based on the relationship between functional dependence and oral health status, it could be assumed that EP

might have better oral health in states prior to functional dependence, such as frailty. Most studies that report the variable “functional dependence” originate from Chile,^{2,7,24,27-33} and many have not been published as formal articles.^{7-9,20,24,26,28,29}

In addition, few of them report comparisons between dependence groups, instead they provide general results for the adult population,²³ for DEP or exclusively SEVDEP or “bedridden”,²⁷ individuals. It is relevant to note that the comparison with these studies is not ideal, since all of them were conducted in urban communities in their entirety or in a percentage greater than 70%. This contrasts with the district of Paihuano, a completely rural community. Another factor to consider when making comparisons with international studies is the variability in the tools used.

In Chile, the Barthel Index is only one of the indicators that allow measuring functionality and to define dependence, although there are also other indices such as the Katz Index, the Red Cross Functional Scale, and the Lawton

and Brody Scale.²⁸ Studies from other countries related to functional dependence originate predominantly from nursing research, so their approach, and therefore their results, are based on a different perspective, evaluating variables other than dental ones, further complicating direct comparisons.¹⁸

When evaluating the mean number of crowns, the IEP group had four times the number of existing crowns compared to the DEP group. Aguirre²⁹ reported an average of double the number of crowns, while Achurra *et al.*,³⁰ reported similar to those found in this study. According to the degree of dependence, values close to 3 were obtained for SLDEP, MODEP, and SEVDEP, aligning with findings by Muñoz *et al.*,³¹ When reviewing the root status, the mean number of roots in the mouth was five times higher for the IEP group. On the other hand, the mean values of the number of roots for both DEP and IEP were higher than the mean values of the number of crowns, suggesting the presence of teeth as root remains, similar to the findings reported by Quinteros *et al.*²⁷

Regarding OHI-S, both IEP and DEP groups showed a trend towards fair hygiene, which differs from the findings of Quinteros *et al.*,²⁷ and Taboada-Aranza *et al.*,²³ who reported poor oral hygiene. Due to the high prevalence of edentulism in a large part of the population, CPTIN could not be measured. When evaluating edentulism, only "total dentition" was present in the upper arch of the IEP group, with a predominant trend towards "partial dentition".

In contrast, in the DEP group the predominant trend was edentulism, consistent with the degree of dependence, similar to that reported by Oñate²⁴ (85.4% edentulism in dependent EP), Muñoz *et al.*,³¹ (high level of upper and lower edentulism reaching 51.3%), Achurra *et al.*,³⁰ (55% edentulism in SEVDEP) Morales *et al.*,³² (58.8% total edentulism at national level in EP),

and Aguirre²⁹ (40% edentulism in DEP). These figures are much higher than those reported by Kotronia *et al.*,⁶ (20% edentulism), Dahl *et al.*,¹⁰ (66% of EP with functional dentition, defined as 20 or more teeth). The existing evidence supports the premise "the greater the independence, the greater the number of teeth". In relation to the lower arch, unlike the upper arch, no individuals with a full set of teeth were observed. Edentulism was prevalent in DEP, while a trend towards partial dentition was observed in IEP, consistent with Oñate²⁴ (70%).

When comparing both arches, there was a greater tendency to edentulism in the upper arch for both IEP and DEP groups, in agreement with Achurra *et al.*,³⁰ The latter is also related to the greater use of prosthetic devices in the upper arch than in the lower arch. When analyzed according to functional grade, there were no significant differences, consistent with the findings of Muñoz *et al.*,³¹ Total edentulism should be considered as a risk factor for nutritional problems in EP, contributing to the perpetuation of poor general health.²⁷ The high percentage of edentulism was also reflected in the percentage of prosthesis use, which was slightly higher than that observed by Achurra *et al.*³⁰ (38.6%).

Among individuals in the DEP group who used prostheses or dentures for both the upper and lower arches, there was a clear tendency to use complete prostheses. In contrast, the group without dependence (IEP) showed a greater tendency to use partial prostheses or dentures, which is directly related to the number of teeth present in the mouth.

These findings agree with those reported by Oñate²⁴ (complete prostheses/dentures were used by 73.2% of DEP individuals in the upper arch and 34.1% in the lower arch), and Achurra *et al.*,³⁰ (complete prostheses were used in 57.1% of cases compared to

42.9% for partial prostheses/dentures). The hygiene of the prosthetic devices showed a tendency towards good hygiene in the DEP group, while fair hygiene predominated in the IEP group. Differentiating according to degree of dependence, a greater tendency towards fair hygiene was observed in individuals in the SLDEP and SEVDEP groups, while in the MODEP group, there was a greater tendency towards good hygiene. This could be attributed to the assistance provided by the caregiver, the caregiver's training in oral hygiene, or a perceived prioritization of prosthetic care over general oral hygiene. One in five of the elderly people examined presented some type of lesion in soft tissue and/or mucosa, which is half the prevalence reported by Aguirre²⁹ (40%).

The most common lesion was subprosthetic stomatitis, similar to what was observed by Oñate²⁴ (39%), Aguirre²⁹ (22.7%), Morales *et al.*,³² (22.3%), Muñoz *et al.*,³¹ (22.3%), and Achurra *et al.*³⁰ (24%). This is probably directly linked to the use of prosthetic devices and the habits associated with their use, such as wearing prostheses/dentures while sleeping, and to the professional training of the dentist to frequently distinguish and diagnose this lesion more frequently than other types of lesions. The percentage of leukoplakia found in the group of EP with moderate dependence was higher than that documented by Aguirre,²⁹ who reported that this lesion did not occur in any individual in their study.

Similarly to the present research, Oñate²⁴ and Muñoz *et al.*,³¹ reported the presence of angular cheilitis in dependent people and indicated that these lesions had not been previously detected by either the elderly people or their healthcare providers. Therefore, in addition to the lack of awareness regarding the existence of these conditions, there is also a lack of knowledge about the need for treatment for the different lesions. While some of these lesions may be

less visible or more challenging to diagnose, certain conditions could be considered precancerous.

Consequently, they should be urgently incorporated at least in the examination of the oral mucosa, ideally by a dentist, during the usual visits of the healthcare staff provided under home care programs.

In relation to the oral health status observed, it is necessary to continue and expand the home dental care program to achieve broader coverage, improved communication, and more effective relationship between the treating professionals of the Home Care Program and the Patients with Severe Dependence.

The fundamental role that the caregiver plays in the oral hygiene of dependent people highlights the importance of working with caregivers by providing training in oral hygiene practices and identification of oral lesions (self-examination).

Considering all the limitations and difficulties of the study within the current health context, it would have been desirable to match the groups with and without functional dependence by age, sex, and place of residence to be able to make more meaningful comparisons and associations. For future research, it is suggested to expand the sample to include neighboring communities with similar characteristics to have a larger number of participants with different degrees of dependence and make the respective comparisons.

In addition, it is a priority to publish undergraduate studies presented in thesis format, as it provides population-level data at national scale that could be very valuable for future studies.

CONCLUSION

The oral health status of the individuals in the DEP group was more deteriorated than those in the IEP group. When comparing both groups, there was greater tooth loss, edentulism, unhealthy crowns, and roots with caries or remaining root fragments, and greater frequency of use of complete prosthesis/denture in DEP.

IEP participants made greater use of partial prostheses/dentures. No major differences were found based on the degree of dependence. Regarding hygiene habits, most EP reported performing oral hygiene twice a day, half indicated using toothpaste, and a large majority only used water (in the case of edentulism). Many participants indicated not cleaning their tongue. Most EP who used prostheses indicated cleaning them, and half of all EP, regardless of their functional status, wore their prostheses/dentures while sleeping.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interests.

ETHICS APPROVAL

The study obtained approval by the Ethics Committee of the Faculty of Dentistry, University of Concepción, Chile (C.E.C. N°026/19).

FUNDING

Self-funded.

AUTHORS' CONTRIBUTIONS

Thabata Castañón-Molina: Conceptualization, data curation, investigation, project administration, resources, supervision, validation, writing – original draft, writing – review and editing.


Lorena-Mirtala Orellana: Data curation, formal analysis, investigation, methodology, project administration, resources, supervision, validation, visualization, writing – review and editing.

ACKNOWLEDGEMENTS


To the Paihuano Family Health Center for facilitating access to its facilities, and especially to the elderly for contributing to this study.

ORCID

Thabata Castañón-Molina

 0009-004-0504-9548

Lorena-Mirtala Orellana

 0000-0003-2321-9913

PUBLISHER'S NOTE

All statements expressed in this article are those of the authors alone and do not necessarily represent those of the publisher, editors, and reviewers.

COPYRIGHT

This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms. © 2024.



PEER REVIEW

This manuscript was evaluated by the editors of the journal and reviewed by at least two peers in a double-blind process.

PLAGIARISM SOFTWARE

This manuscript was analyzed Ouriginal plagiarism detector software. Analysis report of document ID. 2022-05-17T03:40:00.0000000

ISSN Print 0719-2460 - ISSN Online 0719-2479.

<https://www.joralres.com/index.php/JOralRes/issue/archive>

REFERENCES

1. Porcel-Gálvez A, Badanta B, Barrientos-Trigo S, Lima-Serrano M. Personas mayores, dependencia y vulnerabilidad en la pandemia por coronavirus: emergencia de una integración social y sanitaria. *Enf clínica.* 2021;31(1):s18-s23.
2. Urquizar-Wilson M, Andrade C. Cuidando a mayores en Chile. Explorando las vivencias de hombres cuidadores de personas dependientes. *Rev internacional de Políticas de bienestar y trabajo social.* 2022;(17):275-304.
3. Marón S. COVID-19 y personas mayores, una mirada odontológica. Revisión sistemática. *Rev Fac Odont Univ Nac Cuyo.* 2020;14(2):17-25.
4. Nápoles I, Nápoles A. Social need of stomatological attention to the senior citizen with dysmobility. *Rev Hum Med.* 2021;21(1):209-223.
5. Cárdenas-Bahena Á, Velázquez-Olmedo LB, Falcón-Flores JA, García-Zámano IE, Montes-Salmerón RE, Reza-Bravo GG, Sánchez-García S. Autopercepción de la salud oral en adultos mayores de la Ciudad de México. *Rev Med Inst Mex Seguro Soc.* 2018;56(Suppl:1):54-63.
6. Kotronia E, Wannamethee G, Papacosta O, Whincup P, Lennon L, Visser M, Weyant R, Harris T, Ramsay S. Oral Health, Disability and Physical Function: Results from Studies of Older People in the United Kingdom and United States of America. *Journal of the American Medical Directors Association.* 2019;20(12):1654.e1-1654.e9.
7. Villablanca M, Sanhueza O. Afrontamiento, adaptación y calidad de vida de cuidadores de adultos mayores con dependencia funcional, adscritos a centros de salud familiar. Tesis. Concepción, Chile: Universidad de Concepción; 2018.
8. Bravo K, Saez R. Actitudes y prácticas de salud bucal en adultos mayores. Tesis. Guayaquil, Ecuador: Universidad de Guayaquil; 2021.
9. Chile. Ministerio de Salud. Subsecretaría de Salud Pública. División de Prevención y Control de Enfermedades; Departamento de Ciclo Vital. Orientación técnica para la atención de salud de las personas adultas mayores en atención primaria. Repositorio bibliográfico y patrimonial del MINSAL 2014. CHILE; 2014.
10. Chile. Ministerio de Salud. Subsecretaría de Salud Pública. División de Prevención y Control de Enfermedades; Departamento de Ciclo Vital. Manual de Aplicación del Examen de Medicina Preventiva del Adulto Mayor. MINSAL. 2016
11. Chile. Ministerio de Salud. Subsecretaría de Salud Pública. División de Prevención y Control de Enfermedades; Oficina de Salud Integral para Personas Mayores. Plan Nacional de Salud Integral para personas Mayores y su plan de Acción (2020-2030)- MINSAL Mayo 2021
12. Chile. Ministerio de Salud. Subsecretaría de Salud Pública. División de Prevención y Control de Enfermedades; Oficina de Salud Integral para Personas Mayores. Actualización de Manual de Geriátrica para Médicos 2019. MINSAL 2019.
13. Barboza-Solís C, Araya-Jiménez MJ, Stradi-Granados S, et al. Determinantes de la calidad de vida relacionada con la salud oral en adultos mayores de un centro diurno costarricense: Resultados de un estudio piloto. *Odovtos-Int J Dent Sc.* 2021;23(1):126-139.
14. Dahl, K, Calogiuri, G. B. Perceived oral health and its association with symptoms of psychological distress, oral status and socio-demographic characteristics among elderly in Norway. *BMC Oral Health.* 2018;18(93)1-8.
15. Dorado-Barbé A, Pérez J, Mercado E, Prado S. Percepción de la atención a personas mayores en la crisis covid-19: los centros de mayores del distrito de Ciudad Lineal de Madrid. *Revista Prisma Social.* 2022;(36):315-343.
16. Gutiérrez J, Montero J, Jiménez F, Guirola C, Martínez M, Gómez L. Variables asociadas con mortalidad en una población de pacientes mayores de 80 años y con algún grado de dependencia funcional, hospitalizados por COVID-19 en un Servicio de Geriátrica. *Rev Esp Ger y Geron.* 2020; 55(6):317325.
17. Ortiz X, Salinas R, Gámez D. La salud en el adulto mayor en tiempos de la covid-19. *Pluralidad y consenso.* 2020;(44):136-141.
18. Guzmán-Olea E, Agis-Juárez R, Bermúdez-Morales V, Torres-Poveda K, Madrid-Marina V, López-Romero D, Maya-Pérez E. Estado de salud y valoración gerontológica en adultos mayores mexicanos ante la pandemia por COVID-19. *Gac Med Mex.* 2020;156(5):420-425.

19. Díaz-Méndez F, Huerta-Fernández J. Oral Hygiene Protocol for Long-Term Establishments for Older Adults in a State of Pandemic COVID-19. Aspiration Pneumonia Prevention. *International journal of odontostomatology.* 2020; 14(4),508-512.
20. Altamirano S, Espinoza E. Calidad de vida de los adultos mayores en tiempos de covid-19. Tesis. Ambato, Ecuador: Universidad Técnica de Ambato; 2021.
21. Guallasamín R, Villacís I, Quezada M. Estado de salud bucal en personas con discapacidad, proyecto municipal “misión Social Rumiñahui”, Sangolquí-Ecuador. *Rev Odont Univ Central de Ecuador.* 2021;23(1);1- 8.
22. Tran TD, Krausch-Hofmann S, Duyck, De Almeida-Mello J, De Lepeleire J, Declerck D, Declerck A, Lesaffre E. Association between oral health and general health indicators in older adults. *Sci Rep.* 2018;8(8871).
23. Taboada-Aranza O. Loaeza-Galindo A. Hernández R. Caries y hábitos de higiene oral en un grupo de adultos mayores del Estado de México. *Rev ADM.* 2019;76(3):141-145.
24. Oñate M. Efecto de la salud oral en la calidad de vida de adultos mayores dependientes, comuna de Hualpén, 2015. Tesis. Santiago, Chile: Universidad Andrés Bello; 2015.
25. Chile. Ministerio de Salud. Subsecretaría de Salud Pública. División de Prevención y Control de Enfermedades; Departamento de Ciclo Vital. Orientaciones técnico administrativas para la ejecución del componente de atención odontológica domiciliaria programa odontológico integral 2020. Chile: MINSAL; 2020.
26. Chile. Ministerio de Salud. Subsecretaría de Salud Pública. División de Prevención y Control de Enfermedades; Departamento de Ciclo Vital. Orientación técnica de Atención Integral para personas mayores frágiles en unidades geriátricas de agudos(UGA) 2018. Chile: Minsal;2018.
27. Quinteros M, Nuñez L. Salud Oral en Adultos Mayores Postrados. *Int J. Odontostomat.* 2014;8(3):337-343.
28. Trigas-Ferrín M, Ferrerira-Gonzalez L, Meijide-Miguez H. Escalas de Valoración funcional en el anciano. *Gal Clínica, Soc Gal de Med Int.* 2011; 72(1): 11-16
29. Aguirre B. Estado de salud oral de adultos mayores dependientes pertenecientes al Programa de Cuidados Domiciliarios de la Comuna de Providencia. Tesis. Santiago, Chile: Universidad de Chile; 2013.
30. Achurra M, Chicago S, Berrios N. Estado de Salud Bucal de Adultos Mayores de 60 años del programa de atención domiciliaria al paciente con dependencia severa del Cesfam Rosario Marzo - Junio 2014. Tesis. Concepción, Chile: Universidad de Concepción; 2014.
31. Muñoz D, Flores P, Cueto A, & Barraza A. Salud Bucodental de Postrados Severos. *Int J Odontostomat.* 2012;6(2):181-87.
32. Morales A, Jara G, Werlinger F, Cabello R, Espinoza I, Giacaman R, Lee X, Carvajal P, Artega O, Cavalla F, Corral C, Baeza M, Rodríguez G, León S, Gambetta K, Gamonal G. Synopsis or the Oral Health Situation in Chile - Part II: Oral Health Surveys. *Int j interdiscip dent.* 2020;13(2):88-94.
33. León S, Giacaman R. Realidad y desafíos de la salud bucal de las personas mayores en Chile y el rol de una nueva disciplina: Odontogeriatría. *Rev. méd. Chile.* 2016; 144(4): 496-502.
34. León S, Giacaman R. Oral Health Inequalities for the Elderly in Times of COVID-19. Teledentistry and Minimal Intervention Dentistry as Solution Paths. *Int. j interdiscip. dent.* 2020 ; 13(3): 147-150.
35. Chile. Servicio Nacional de la Discapacidad. III Estudio nacional de la Discapacidad, III ENDISC 2022. Chile: SENADIS; 2022
36. World Health Organization. Oral Health Surveys: Basic Methods. Fifth Edition. Geneva, Switzerland: WHO; 2013.