Original Article

Oral health profile of participants of an elderly cohabitation program in the state of Santa Catarina, Brazil

Perfil de saúde bucal dos participantes de um programa de convivência de idosos em Santa Catarina, Brasil

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Resumo

Introdução: Programas de convívio e interação social tem melhorado vários aspectos da qualidade de vida de idosos. **Objetivo:** Este estudo observacional avaliou a saúde bucal e a percepção de saúde bucal de participantes de um programa de convívio de idosos em Santa Catarina, Brasil. **Material e método:** Duzentos e trinta e cinco participantes do programa Cidade do Idoso foram examinados/entrevistados por estudantes calibrados. O exame bucal considerou: índice de dentes cariados, perdidos e obturados (CPO-D), Índice Periodontal Comunitário (IPC), índice de Perda de Inserção Periodontal (PIP), uso e necessidade de prótese e presença de lesões de mucosa bucal. A percepção de saúde bucal foi verificada pelo Índice de Avaliação de Saúde Bucal Geriátrica (GOHAI). Os dados foram analisados com estatística descritiva e teste qui-quadrado (α=0,05). **Resultado:** O CPO-D médio foi de 24,3 dentes, com ênfase à categoria 'perdidos'. Necessidade de prótese superior e inferior correspondeu a 53,6 e 71,1%, respectivamente; 55% apresentaram lesões de mucosa bucal. Uma percepção de saúde bucal moderada prevaleceu (43%), com um escore médio do GOHAI de 29,9. Uma percepção negativa nas dimensões física e dor/desconforto foi estatisticamente associada com a necessidade de prótese inferior (p<0,05). **Conclusão:** Os participantes do programa Cidade do Idoso apresentaram uma saúde bucal precária e uma percepção de saúde bucal predominantemente moderada. A necessidade de prótese inferior foi associada a uma percepção negativa de saúde bucal.

Descritores: Idoso; saúde bucal; odontologia.

Abstract

Introduction: Cohabitation and social interaction programs have been shown to enhance several aspects of the quality of life of the elderly. **Objective:** This observational study assessed the oral health and oral health perception of participants of an elderly cohabitation program in the state of Santa Catarina, Brazil. **Material and method:** Calibrated dental students examined/interviewed 235 participants of the program. The oral examination considered Decayed, Missing, and Filled Teeth (DMFT) index, Community Periodontal Index (CPI), Periodontal Attachment Loss (PAL), use and need of prostheses, and presence of oral mucosal lesions. Oral health perception was verified with the Geriatric Oral Health Assessment Index (GOHAI) questionnaire. Data were analyzed with descriptive statistics and chi-square test (α=0.05). **Result:** The mean DMFT index was 24.3 teeth, with emphasis on the 'Missing' category. Upper and lower prosthetic needs were 53.6 and 71.1%, respectively. Fifty-five per cent of participants presented oral mucosal lesions. Moderate oral health perception prevailed (43%), with mean GOHAI score of 29.9. The negative perception on physical and pain/discomfort dimensions was statistically associated with lower prosthetic need (p<0.05). **Conclusion:** The participants of the cohabitation program presented poor oral health and prevalence of moderate oral health perception. Lower prosthetic need was associated with negative perception.

Descriptors: Elderly; oral health; dentistry.

INTRODUCTION

Population aging is a recent global phenomenon involving both developed and developing countries. In Brazil, for instance, life expectancy changed expressively in the 20th century, with significant increase from 1900 to 1950 and 2000 (35, 43, and 68 years old, respectively). Estimations are that the life expectancy of Brazilians in 2025 will be of 80 years old[1].

This aging tendency has required adjustments in health care services, increasing the focus on health problems of the elderly and including the demand for interdisciplinary approaches. In this context, the poor oral health profile of Brazilian elderly people[2] has called attention of other health professionals who interact with this population more often than dentists[3]. Their concern is because oral health may affect and be affected by systemic health, generating physical and psychosocial effects[4].

Historically, individual or collective actions toward the oral health of the elderly population have been scarce and poor[5], resulting in high indexes of tooth loss and functional, social, and psychological consequences[6]. In addition, elderly people used a surgical-restorative model of dentistry with a highly mutilating and cumulative character[6].

Current dentistry uses an approach that is less invasive and more preventive. Several oral diseases may be avoided through preventive and educational measures to the elderly. For Sheiham, Watt[7], oral diseases present common risk factors of other important chronic diseases, such as cardiovascular diseases, cancers, and lesions of other origin. Therefore, a preventive interdisciplinary approach involving health professionals and other sectors of society may provide satisfactory results to this age segment.

Programs dedicated to social interaction specifically for the elderly are opportunities to disseminate interdisciplinary work and enhance the positive response to satisfactory preventive health practices[8]. In Brazil, most programs are held at universities, such as the universities for senior citizens (UnATIs) programs[9]. In the city of Chapecó, Santa Catarina, Brazil, the municipal government maintains a program called City of the Elderly (*Cidade do Idoso*), since 2008. The participants go through a general health check-up before participating in activities that involve gymnastics, yoga, pilates, supervised walking, and water aerobics. The program also offers lunch, music and dance classes, various games, as well as literacy and basic computer classes to the elderly[10].

Although there are similar programs in Brazil, they differ significantly as to their concepts, goals, and maintainers, which makes each program unique. Therefore, this study aimed to assess the oral health profile of elderly people participating in the City of the Elderly program, as well as to verify whether the oral health perception of these participants correspond to the oral health status objectively assessed.

MATERIAL AND METHOD

This cross-sectional study was performed in the City of the Elderly program, in Chapecó, Santa Catarina, Brazil, from March 2016 to November 2016. The study proposal was designed according to the World Medical Association Declaration of Helsinki and it was approved by the institutional Ethics Committee, under protocol no. 1.266.459.

The population of the study included the participants of the City of the Elderly program (approximately 1000 participants, as provided by the program administrator) who presented a minimum frequency of 70% in the activities with which they were involved. A sample size of 278 subjects was calculated using the finite population formula in an online calculator (Select Statistical Services)[11], as well as the following parameters: 50% sample proportion estimate, 5% sampling error, and 95% confidence interval. Subjects older than 60 years who accepted to participate and did not present neurodegenerative conditions previously diagnosed were included in the study.

Sex (male/female) was collected as the independent variable. Oral health was assessed considering the variables proposed by the World Health Organization[11], as follows:

i) Use and need of upper and lower dental prosthesis.

ii) Decayed, missing, and filled teeth (DMFT) index subdivided into crown and root. A tooth was considered decayed when there was visual evidence of cavity that could be confirmed in the occlusal, buccal, and lingual aspects of the tooth by probing with the CPI probe.

iii) Edentulism and lack of functional dentition. Edentulism was considered the lack of all teeth, while lack of functional dentition considered the existence of less than 20 teeth[12].

iv) Community Periodontal Index (CPI), which was assessed as the presence and depth of periodontal pockets, subgingival calculus, and gingival bleeding in index teeth per sextants at probing, with a specially designed probe. The CPI probe is designed with a 0.5 mm ball tip, a black band between 3.5 and 5.5 mm, and rings or marks at 8.5 and 11.5 mm (25). The CPI was coded as 0 (healthy), 1 (bleeding on probing), 2 (subgingival calculus detected during probing, but the black band of the probe is entirely visible), 3 (periodontal pocket of 4-5 mm and gingival margin within the black band of the probe), 4 (periodontal pocket of 6 mm or more and black band of the probe not visible), X (sextant excluded, less than two teeth present).

v) Periodontal Attachment Loss (PAL) assessed by probing of the same index teeth. The exposure of the cemento-enamel junction (CEJ) is taken as reference, determining the presence of gingival recession. The PAL was coded as 0 (attachment loss of 0-3 mm, CEJ not visible, and CPI between 0-3 mm), 1 (attachment loss of 4-5 mm, CEJ within the black band), 2 (attachment loss of 6-8 mm, CEJ between the upper limit of the black band and the 8.5 mm ring), 3 (attachment loss of 9-11 mm and CEJ between the 8.5 and 11.5 mm rings), 4 (attachment loss of 12 mm or more, CEJ beyond the 11.5 mm ring), X (sextant excluded, less than two teeth present). For both periodontal indexes, the worst condition was registered.

vi) Presence of oral mucosal lesions, categorized as normal mucosa or presence of lesion. Upper and lower labial mucosa and labial sulcus, commissures of dorsal and ventral surfaces and margins of the tongue, oral mucosa, palate, floor of the mouth, retromolar area, and upper and lower gingiva were evaluated. The presence of lesion was determined based on clinical criteria. There was no biopsy to confirm the diagnosis, but patients with oral mucosal lesions were referred to university dental clinics.

The self-perception on oral health was collected through the application of the Portuguese version of the Geriatric Oral Health Assessment Index (GOHAI)[13], which contains 12 3-point Likert scale questions involving physical, psychosocial, and pain/discomfort dimensions. The simple sum of points corresponding to the answers (1-Always; 2-Sometimes; 3-Never) generate a final self-perception score, which may be high (34-36 points), moderate (30-33 points), or low (<30 points).

A specialist in operative dentistry trained four third-year dental students and slide presentations and discussion sessions were used. Calibration tests were performed in 12 elderly people of both sexes. A Kappa coefficient of agreement of 0.831-1.00 between the examiners and the gold standard examiners was achieved.

The clinical examinations were performed in the healthcare center of the program using sterile gauze, dental mirror, and CPI probe, under artificial light. The examiners applied the GOHAI questionnaire in person.

The data were tabulated in the Statistical Package for Social Sciences (SPSS) 20.0 and analyzed using descriptive statistics and chi-square test ($\alpha=0.05$). The use and need of prostheses were dichotomized to help establishing associations with sex and oral health perception.

RESULT

A total of 235 participants were examined/interviewed. One hundred and fifty (63.8%) were women. Considering the sample achieved was lower than the sample size estimated, the test power for most outcomes was calculated using the G* Power 3.1 package (Universität Düsseldorf, Düsseldorf, Germany). The two-tailed post-hoc function of one-sample t-test and one-proportion binomial test were used, confronting data with the results of both the Brazilian Oral Health Survey SBBrasil[2] and Costa et al.[14] for the dimensions of the GOHAI. The lowest test power achieved varied between 0.4 and 0.447 for subgingival calculus and shallow and deep pockets, in the CPI index. For all other variables, test power was 0.831-1.000. Table 1 presents the results of the DMFT index and Table 2 presents the frequencies of the oral health assessment.

Table 1. Mean (SD) index of decayed, missing and filled teeth for crown and root of elders

	Minimum	Maximum	Mean (SD)
DMFT – crown			
Decayed	0	4	0.17 (0.57)
Missing	0	28	21.6 (7.61)
Filled	0	20	2.6 (4.07)
Total	8	31	24.37 (4.48)
DMFT – root			
Decayed	0	9	0.13 (0.73)
Missing	0	28	21.59 (7.64)
Filled	0	7	0.26 (0.89)
Total	0	28	21.98 (7.42)

Table 2. Results of oral health assessment (n=235)

	n (%)	95% CI
Prosthetic use		
Upper arch	217 (92.3)	88.9-95.7
Low arch* (n=234)	180 (76.6)	71.2-82.0
Prosthetic need		
Upper arch* (n=234)	126 (53.6)	47.2-60.0
Low arch* (n=233)	167 (71.1)	65.3-76.9
Edentulism		
Yes	99 (42.1)	35.8-48.4
No	136 (57.9)	51.6-64.2
Lack of Functional dentition		
Yes	210 (89.4)	85.5-93.3
No	25 (10.6)	6.7-14.5
DMFT – Crown		
Decayed	25 (10.6)	6.7-14.5
Missing	234 (99.6)	98.8-100.4
Filled	116 (49.4)	43.0-55.8
DMFT – Root		
Decayed	15 (6.4)	3.3-9.5
Missing	234 (99.6)	98.8-100.4
Filled	27 (11.5)	7.4-15.6
*Presence of mucosal oral lesion***		
Lip	13 (5.5)	2.6-8.4
Commissures	1 (0.4)	-0.4-1.2

Table 2. Continued…

	n (%)	95% CI
Buccal mucosa	13 (5.5)	2.6-8.4
Retromolar area	3 (1.3)	-0.1-2.7
Labial sulci	1 (0.4)	-0.4-1.2
Alveolar ridge	18 (7.7)	4.3-11.1
Hard palate	109 (46.4)	40.0-52.8
Community Periodontal Index (CPI)		
Normal	15 (6.4)	3.3-9.5
Bleeding	14 (6.0)	3.0-9.0
Calculus	18 (7.7)	4.3-11.1
Shallow pocket	2 (0.9)	-0.3-2.1
Deep pocket	1 (0.4)	-0.4-1.2
Excluded sextant	185 (78.7)	73.5-83.9
Periodontal Attachment Loss (PAL)		
0-3mm	27 (11.7)	7.6-15.8
4-5mm	19 (8.0)	4.5-11.5
6-8mm	2 (0.9)	-0.3-2.1
9-11mm	1 (0.4)	-0.4-1.2
+12mm	1 (0.4)	-0.4-1.2
Excluded sextant	185 (78.9)	73.5-83.9

*Number of participants for the variable; ** Based on clinical diagnosis/no complementary exam was performed.

One hundred and thirty participants (55.3%) presented oral mucosal lesions. There was actinic cheilitis and fibroma in the lips, angular cheilitis in the commissures, leukoplakia and fibroma in the oral mucosa, leukoplakia in the retromolar region, and inflammatory hyperplasia in the labial sulcus. Inflammatory hyperplasia, fibrous hyperplasia, leukoplakia, erythroplakia, and hyperkeratosis were observed in the alveolar ridge and, in the hard palate, denture stomatitis was the most common lesion, followed by cases of hyperplasia by suction chamber.

Oral health perception was high for 52 participants (22.1% - 95%CI 16.8-27.8), moderate for 101 participants (43% - 95%CI 36.7-49.3), and low for 82 participants (34.9% - 95%CI 28.8-41.0). Table 3 presents the mean score for the different domains of the GOHAI. There were no significant associations between sex and use or need of dental prostheses, and edentulism or functional edentulism and oral health perception (p>0.05).

Table 3. Distribution and percentage of total values of the GOHAI index in its domains

	Possibilities of points	Mean points ± SD (% of the maximum value possible)
Physical domain	4-12	9.97 ± 2.99 (83.2)
Psychosocial domain	3-9	7.1 ± 1.76 (78.7)
Pain/discomfort domain	5-15	12.8 ± 3.55 (85.3)
Total GOHAI	12-36	29.9 ± 8.3 (83.1)

There was a significant association between use (χ^2= 29.523; p=0.0001) and need (χ^2= 19.939; p=0.001) of prostheses in the upper arch and the presence of oral mucosal lesion in the palate, which occurred in 43% of complete upper denture wearers and in 25.1% of those who needed complete dentures.

Table 4 presents the association between prosthetic need and the GOHAI questions on oral health perception. The need of upper dentures was not associated with oral health perception (p>0.05).

Table 4. Variables of the GOHAI index significantly associated to lower prosthetic need

	Lower prosthetic need			
	Needs (n/%)	Does not need (n/%)	χ^2	p
GOHAI question				
G1. In the last 3 months, how often did you limit the kinds or amounts of food you eat because of problems with your teeth or dentures?			9.770	0.008
Always	31 (13.2)	2 (0.9)		
Sometimes	25 (10.6)	9 (3.8)		
Never	113 (48.1)	55 (23.4)		
G2. In the last 3 months, how often did you have trouble biting or chewing any kinds of food?			16.057	0.0001
Always	49 (20.9)	6 (2.6)		
Sometimes	39 (16.6)	10 (4.3)		
Never	81 (34.5)	50 (21.3)		
G5. In the last 3 months, how often were you able to eat anything feeling discomfort?			9.120	0.010
Always	34 (14.5)	3 (1.3)		
Sometimes	38 (16.2)	15 (6.4)		
Never	97 (41.3)	48 (20.4)		
G9. In the last 3 months, how often were you worried or concerned about the problems with your teeth, gums or dentures?			8.476	0.014
Always	21 (8.9)	6 (2.6)		
Sometimes	38 (16.2)	5 (2.1)		
Never	110 (46.8)	55 (23.4)		

DISCUSSION

To the best of our knowledge, the City of the Elderly is the only program destined to the social interaction, learning, and health care of elderly people that is maintained by a municipal government in the Brazilian territory. The universities for senior citizens (UnATIs) programs currently represent the proposals closer to a university educational character[9]. Participants of the City of the Elderly program consider it a space to establish a new meaning to their life through the activities offered, in which they rediscover fun, dance, conversation, playing, and love.

Health monitoring is an integral part of the program, meaning the participants only take part in the activities after having their general health status monitored properly, but the program does not include oral health assessments. Therefore, it was expected that participants of the program would present problems similar to the general Brazilian elderly population. Our results indeed showed a slightly poorer oral health condition of the participants as compared with the Brazilian Oral Health Survey[2] and other surveys performed in southern Brazil[12,15]. However, we observed that the oral health perception of the elderly did not correspond to their actual oral health status, which was poorer. Additionally, the association between lower prosthetic need and the low grading in physical and pain/discomfort dimensions indicates an obvious oral health care demand for satisfactory eating habits.

The poor oral health condition and treatment need observed in our study were expressed by high DMFT index, edentulism, prosthetic need, and presence of oral mucosal lesions, and they corroborate an oral health profile of the elderly in southern Brazil shown elsewhere[2,15]. According to the Brazilian Oral Health Survey, the general DMFT index of individuals aged 65-74 years is 27.5, with the "Missing" component accounting for 92% of the total index[2]. Our study identified 99.6% of missing teeth in the DMFT index. Consequently, a high percentage of null sextants was found during periodontal

assessment (approximately 79%), similar to a prior study[16] and lower than the record of the Brazilian National Survey for the elderly in southern Brazil (88.7%)[2]. Most of the existing teeth presented subgingival calculus (7.7%) and periodontal attachment loss of 4-5 mm (8.0%) as the worst periodontal conditions.

Edentulism was found in 42% of our participants, while lack of functional dentition reached 89%. This represents a chronic condition resulting from diseases and experiences lived in the course of life, which affects nutrition, phonation, chewing, aesthetics, and self-esteem[5,12,17,18]. It also indicates the resolution capacity of the public health system in managing oral health demands. Tooth loss is affected by biological, cultural, economic, and social factors[5,19]. Culturally, tooth loss has long been understood as a natural part of aging[6]. In addition, urgent oral health care for adults was usually limited to tooth extraction, leading to the burden of tooth loss[5]. Improvements in public oral health care, including the progressive offer of secondary and tertiary care, are recent. Therefore, time is required for verifying the full impacts of these improvements[5,20]. Functional edentulism was higher in our study than in another recent survey involving a southern Brazilian population[12], which confirms the distance from the global goal of 2020 proposed by the World Health Organization, the World Dental Federation, and the International Association for Dental Research for half of the elderly population to present functional dentition (21 or more teeth)[21].

The higher rate of upper denture wearers potentially relates to aesthetic and social aspects, considering that losing anterior teeth, mainly in the upper arch, affects social aspects such as smiling and speaking[20]. The use of complete upper dentures prevailed in our study (77.0%), followed by use of removable partial dentures (14.1%). Both percentages were higher than the means described in the National Survey SBBrasil for the elderly in southern Brazil (65.3% and 11.1%, respectively)[2]. The use of complete upper dentures was associated significantly with the presence of denture stomatitis in the hard palate, which was the most prevalent oral mucosal lesion. Similarly, 25% of individuals needing complete upper dentures also presented such lesion. Denture stomatitis is the most common oral mucosal lesion in community-dwelling elderly people and it is characterized by an inflammatory condition of the denture-bearing mucosa, mostly associated with *Candida* colonization[22].

More than 50% of participants presented some type of oral mucosal lesion and 69% of them presented denture stomatitis. Oral lesions have been described as highly prevalent in the elderly, especially denture stomatitis[15]. However, the presence of oral lesion was not associated with any domain of oral health-related self-perception. One potential explanation is that most lesions found are not likely to produce severe pain, which according to Melo et al.[23] is an important element for the report of negative impact on the oral health-related quality of life of the elderly. Our study did not show malignant lesions, but the importance of periodic oral self-examinations from the elderly population should be highlighted.

The oral health perception of our participants was mostly moderate, revealing a discrepancy with their actual oral health condition. This discrepancy was also found in a previous study[24] and it may be explained by personal values and beliefs that tend to naturalize the poor oral health of the elderly, leading to an overestimated oral health condition[14]. Additionally, considering the perspective of inclusion and social interaction provided by the program, difficulties faced due to oral problems might be potentially considered secondary. Moreover, the pain/discomfort dimension of the GOHAI corresponded to 85% of the total score, characterizing low pain perception in the sample studied. Living with chronic pain is also considered natural amongst the elderly[14], so much that this condition should be acute enough to interfere with functional aspects and to grade the oral health perception of this age group as low[23].

The psychosocial domain presented the lowest score in the GOHAI, corresponding to 78.7% of the total score possible and it was not associated with use or need of prostheses. This finding reinforces the fact that most of the prosthetic need was not associated with poor aesthetic issues

of the prosthesis. On the contrary, physical and pain/discomfort dimensions were significantly associated with lower prosthetic need, revealing that most individuals needing a new lower denture limit types or amounts of food, present trouble biting or chewing food, feel discomfort while eating, and are concerned with problems in their teeth, gums, or dentures (Table 4). These findings agree with those by Silva et al.[24], to whom the presence of functional dentition and the lack of need of complete dentures were associated to a more favorable oral health perception.

The participants of the City of the Elderly program present poor oral health, evidencing high tooth loss, high prosthetic need, and presence of oral mucosal lesion. The mean GOHAI score was 29.9 points, characterizing a prevalence of moderate oral health perception. The negative perception of physical and pain/discomfort dimensions was associated with lower prosthetic need.

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CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

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