Oral health of homebound older adults followed by primary care: a cross sectional study

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Abstract

Objective: to characterize the life, health, and oral health conditions of homebound older people registered in the primary care teams and oral homecare provided. *Method:* cross-sectional, household based study with a convenience sample, in Florianópolis, southern Brazil. Data collection through a questionnaire and clinical oral examination which included sociodemographic variables, condition of teeth and mucosa, oral hygiene, access to dental care and dentist providing homecare. Absolute and relative frequency analysis and bivariate analysis (chi-square, CI=95%) were performed. *Results:* 123 older people participated with mean age of 81.3 years, 62.6% were women. Living with a caregiver were 87%, 60% were domiciled for up to 5 years, and 89.4% were frail. Regarding the presence of teeth, 56.1% were edentulous and 40.5% had from 1 to 8 teeth. Root remains were observed in 12.8%, untreated caries lesions in 25.2%, visible biofilm in 69.9%, tooth mobility in 57.7% and mucosal lesions in 8.9% of the elders; 45.5% needed help with oral hygiene and 24.4% did not perform daily mouth cleaning. The difficulty in accessing dental care due to homeboundness was reported by 32.5% and home visits provided by the dentist occurred in only 16.3%. *Conclusion:* the oral health of the older adults studied is poor due to the presence of oral problems that require intervention. There is dependence on third parties for oral care, which is not consistently guaranteed at home. The study points to the need for dental homecare provided by public health services.

Keywords: Aged. Oral Health. Primary Health Care. Frailty. Homebound Persons.

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INTRODUCTION

The aging process is complex and, with senility, it can lead to deterioration in the functionality of older adults, thus increasing the chances of compromising their health - general and oral - and the living conditions of this population - disabilities, frailty, and dependence[1,2]. Chronic degenerative comorbidities associated with advanced age can compromise the quality of life of older adults, since they lead to loss of independence and autonomy, resulting in an increase in the number of older adults living restrictedly in their homes (homebound) due to the accumulation of frailty[1,2].

The literature reports a prevalence of homebound older adults of 5.6% in the US[3], 17.7% to 19.5% in Israel[4], and 24.1%[5] in Spain. In Brazil, it is estimated that 4.9% of older adults are bedridden[6]. These numbers are relevant, because home isolation is strongly associated with negative outcomes for older adults[6,7], such as pressure ulcers[8], depressive symptoms[6,7], poor nutritional health[9], oral diseases[10], and sarcopenia[11]. When coupled with social isolation, home isolation increases the risk of mortality[12]. Although the literature reports an improvement in the living and health conditions of the population in general, due to political, economic, social, and environmental progress, as well as advances in public health and medicine, the occurrence of oral diseases in older adults is still prevalent[13]. Limited access to oral health services throughout life increases the risk and severity of oral diseases, with compromised overall health[13]. The oral situation of older adults becomes even more serious for those who are homebound, because, in addition to the oral health demands, there are barriers related to physical limitations, cognitive impairment, and dependence on others, resulting in reduced access to dental services[10,14], worse oral health status, and greater need for care[10,15,16].

The literature points out that the home environment influences the difficulty of access to health services by older adults, and that living alone influences the need for oral health care in the home context[4]. In addition, financial constraints prevent older adults from accessing dental services[13,17]. The home care provided to older adults in primary health care (PHC) aims to ensure completeness with actions that meet the needs of this specific population. With the home visits, and the diagnosis of the reality, it is possible to plan interventions that are necessary for each family. Through the home-based and multidisciplinary PHC action, the oral health team comes into contact with the reality of homebound older adults and their caregivers[14,18]. However, with the overload of clinical care services, preventive and preservation actions are hindered, which leads to low frequency and low prioritization of home care actions involving oral health professionals[18,19].

Studies that contribute to depict the current oral health condition of the homebound older adult population, their quality of life, and their demands and those of their caregivers, can provide important data to help in the planning of home and multidisciplinary care actions in the context of PHC organization. Thus, this study aimed to characterize the conditions of living, health, and oral health of homebound older adults registered by the PHC teams in Florianópolis, capital of the state of Santa Catarina, southern Brazil, as well as the oral health care provided at home.

METHODOLOGY

Type of Study and Context

This is a cross-sectional study, carried out in the context of primary health care services in Florianópolis, capital of the state of Santa Catarina (SC), southern Brazil. This city has a high human development index (HDI=0.847). According to the 2010 Census, people aged 60 years and over represent 48136 people in this city, 11.4% of the population.

The research was submitted to the Human Research Ethics Committee and approved under decision 3.230.210. Participants were provided with a hard copy of the Informed Consent Form (ICF). All of them agreed to participate in the research by signing the ICF. When the older adult lacked the capacity to express consent, it was given by the responsible caregiver.

Participants and Eligibility Criteria

The study population consisted of individuals aged 60 years and older who are homebound (restricted to their home for some reason). A homebound older adult is considered to be one who has disability(ies) (physical, mental, and/or other) that result(s) in a limited ability to move out of the home[7]. People that were eligible for the study were older adults registered and cared for in PHC. In cases where the older adults were physically, mentally or emotionally unable to answer the survey, caregivers (who needed to be over 18 years old) represented them. Those who were hospitalized at the time of data collection were excluded.

Sampling Plan

The sample size calculation was based on the 2010 Census data, which counted 48423 people over 60 years old in the municipality. Of these, an estimated proportion of 4.9% were bedridden[6]. Considering a homogeneous sample, a sampling error of 5% and a confidence level of 95%, we reached the number of 223 people.

To reach this number, we used convenience sampling, stratified in two stages. In the first stage, 20 coverage areas of health teams were chosen (out of 120 in the municipality), five in each of the municipality's four Sanitary Districts. It was estimated that there would be 10 to 12 homebound older adults followed up per health team. In the second stage, in each coverage area, the corresponding team was asked, in person or by telephone, for an updated list of the homebound older adults followed up in PHC, with name, address, telephone number, and date of birth. All the people on the list were sorted by date of birth in a spreadsheet.

In possession of the lists, the 20 health teams were contacted again by the researchers and invited to contribute to the continuation of the study, allowing them to participate in the home visits to the older adults. In cases where it was not possible to go with the members of the health teams, contact was directly via telephone, by one of the researchers. In the case of acceptance after the telephone contact, the researcher's visit to the home was previously scheduled. Older adults and/or caregivers who refused to participate in the survey after the first contact by the researchers, either in person at the time of the home visit or by telephone, who were not at home after three attempts at in-person contact by the research team, or had moved, were considered as sample loss.

The initial sample of the study was defined after the health teams made available the lists of older adults. Considering the 20 lists provided, and after applying the inclusion and exclusion criteria, a total of 236 homebound older adults were counted. During the data collection process, there were 31 losses.

Variables

We collected data on the sociodemographic, living and health, and oral health conditions of the homebound older adults, and on the oral health care performed at home.

To outline the profile of the participant older adults, the sociodemographic variables were: gender, age (at the time of collection), family income (total household income, in minimum wages), education (years of formal education), presence of a caregiver, length of time homebound (in years, at the time of collection; when less than 11 months, it was rounded up to one).

The Kihon Checklist[2,20,21], a multidimensional assessment instrument, was used to assess health and living conditions. It includes the following domains: physical strength, nutrition, eating, socialization, memory, mood, and lifestyle, consisting of 25 yes/no answer items. Because most of the older adults are bedridden, the item regarding the measurement of weight and height, to measure the Body Mass Index of the older adults, was replaced by the Measurement of Calf Circumference[22]. The overall score and score of each domain[21] were evaluated, namely:

- Lifestyle (items 1 to 20): the frail older adults scored 10 points or more;
- Physical strength (items 6 to 10): three points or more indicate low physical strength;

- Nutrition (items 11 and 12): two points indicate low nutritional status;
- Eating (items 13 to 15): two points or more in this domain suggests impaired eating;
- Socialization (items 16 and 17): a negative answer to question 16 or 17 indicates homeboundedness;
- Memory (items 18 to 20): one point or more in the memory domain suggests low cognitive function;
- Mood (items 21 to 25): two points or more in the mood domain indicates risk of depression.

The oral health condition, assessed by means of a clinical oral examination, considered the following variables: presence of visible dental biofilm on teeth and/or prostheses (yes/no); number of natural teeth; number of caries lesions; number of residual roots; presence of fistula or exudate (yes/no); and presence of tooth mobility (yes/no); oral mucosa lesions/alterations (yes/no).

Regarding oral care performed at home, the variables were: daily oral cleaning (yes/no); need for assistance in oral hygiene (yes/no); difficulty in accessing dental care when needed due to being homebound (yes/no), and dental surgeon home visits (yes/no).

Data Collection Procedures

Four teams, each composed of a dental surgeon and an undergraduate dental student, as an assistant, participated in a 4-hour training session to standardize the workflows, instruments, and criteria. Data collection took place between September 2, 2019 and March 17, 2020, the latter date defined by the impossibility of continuing collection due to the Covid-19 pandemic. Prior to this, a pilot study was conducted in a coverage area not randomly selected in the sampling process. This served to test and improved the instruments, as well as to help organize the fieldwork.

Data collection was carried out in the homes, by means of a questionnaire answered by the older adults or caregivers. Afterwards, the dentist performed a clinical examination using a wooden tongue depressor and under artificial light (flashlight). The bedridden older adult was interviewed and examined in bed, otherwise sitting on a chair or sofa. The information collected was recorded by the student, in a Google Forms® form specifically created for the research. In the absence of an internet connection, paper forms were used.

Data Analysis

The data were processed first by descriptive statistical analysis of the variables. Bivariate analysis was also performed using chi-squared test and Fisher's exact test (CI=95%), with gender, age (</≥ 80 years), education (≤/> 4 years), and income (≤/> 3 minimum wages) as independent variables. The dependent variables were the dimensions of the Kihon checklist and those related to oral health condition and care at home. A statistical significance level of 95% was adopted.

RESULTS

A total of 123 homebound older adults participated in the study, 52.1% of the initial total number of homebound older adults followed up by the PHC teams. In addition to the 31 losses, it was not possible to contact 82 more older adults to reach the calculated sample size, due to the early interruption of the collection. The 123 older adults were distributed in the four Sanitary Districts of the municipality: 44 in the Center, 43 in the South, 21 in the North, and 15 in the Mainland.

Table 1 presents the sociodemographic characterization of the participants, with a predominance of women (62.6%), corresponding to the age range between 70 and 79 years (35%), average of 81.3 years (min. 61 and max. 107 years) with up to four years of education (61%), with an income of up to three minimum wages (70.7%), homebound for up to four years (52%), and with a caregiver on a daily basis (87%).

Table 1. Sociodemographic characterization (N=123). Florianópolis, 2019/2020.

Variables		n	(%)	CI 95%
Gender	Male	46	37.4	29.3-46.2
	Female	77	62.6	53.7-70.6
Age range	60 to 69 years old	13	10.6	6.2-17.2
	70 to 79 years old	43	34.9	27.1-43.7
	80 to 89 years old	39	31.7	24.1-40.3
	90 years or older	28	22.8	16.2-30.9
Education	1-4 years	75	61.0	52.1-69.1
	5 or more years	48	39.0	30.8-47.8
Length of time homebound	1-4 years	64	52.0	43.2-60.6
	5 or more years	59	48.0	39.3-56.7
Total household income	1-3 MW*/month	87	70.7	62.1-78
	>3 MW/month	29	23.6	16.9-31.8
	No income	7	5.7	2.7-11.2
Presence of caregiver	No	16	13.0	8.1-20
	Yes	107	87.0	79.9-91.8

*Minimum wage (MW) reference in the year 2019 = R$1158.00.

CI=Confidence interval.

Source: survey data.

Regarding life and health condition, frailty (89.4%), low physical strength (95.1%), risk of depression (73.2%), social limitation (69.9%), and low cognitive function (65.9%) stood out (Table 2).

The oral health of the homebound older adults was marked by edentulism (56.1%), visible biofilm (69.9%), and caries lesions (57.4%). The need for help to perform oral hygiene on a daily basis was identified (45.5%), as well as the lack of this self-care (24.4%). Difficulty in accessing dental care due to being homebound was reported by 32.5% of the participants, and home visits by a dental surgeon were reported by only 16.3% of the participants (Table 3).

Table 4 presents the data distribution regarding living and health condition, oral health, need for help with oral hygiene, difficulty to access dental services, and dentist home visit, according to gender and age. Regarding gender, there was a statistically significant association (p<0.05) for physical strength, number of natural teeth, and residual roots. Women have more compromised physical strength, have a higher frequency of edentulism or the presence of 9 or more teeth, and fewer residual roots when compared to men. There was no statistical association when considering the difference in distribution between the age groups under 80 and 80 and over.

Table 5 presents the distribution of the same data, according to the education and income of the older adults. Regarding education, there was a statistically significant association (p<0.05) for lifestyle, physical strength, mood, and the number of natural teeth. Older adults with less formal education are more frail, have compromised physical strength, have a higher risk of depression, and are more edentulous, when compared to those with more formal education There was no statistical association when considering the differences between income groups.

Table 2. Life and health condition according to the Kihon Checklist (N=123). Florianópolis, 2019/2020.

Domains		n	%	CI 95%
Lifestyle	Not Frail	13	10.6	6.2-17.2
	Frail	110	89.4	82.7-93.7
Physical Strength	Normal	6	4.9	2.2-10.2
	Compromised	117	95.1	89.7-97.7
Nutrition	Normal	104	84.6	77.1-89.8
	Poor Nutritional Status	19	15.4	10.1-22.8
Eating	Normal	66	53.7	44.8-62.2
	Compromised	57	46.3	37.7-55.1
Memory	Normal	42	34.1	26.3-42.8
	Low Cognitive Function	81	65.9	57.1-73.6
Mood	No Risk of Depression	33	26.8	19.7-35.2
	Risk of Depression	90	73.2	64.7-80.2
Socialization	No Limitation to Go Out	37	30.1	22.6-38.6
	Limitation to Go Out	86	69.9	61.3-77.3

CI=Confidence interval.

Source: survey data.

Table 3. Oral health condition and oral care at home (N=123). Florianópolis, 2019/2020.

Variables		n	%	CI 95%
Visible biofilm	No	37	30.1	22.6-38.7
	Yes	86	69.9	61.3-77.3
Number of natural teeth	0	69	56.1	47.2-64.5
	1-8	28	22.8	16.2-30.9
	9 or more	26	21.1	14.8-29.1
Caries lesions*	No	23	42.6	30.3-55.8
	Yes	31	57.4	44.1-69.6
Number of residual roots*	0	26	48.1	35.3-61.1
	1	19	35.2	35.3-61.1
	2 or more	9	16.7	9-28.7
Fistula/Exudate*	No	53	98.1	90.2-99.6
	Yes	1	1.2	1.4-8.6
Tooth mobility*	No	43	79.6	67.1-88.2
	Yes	11	20.4	11.7-32.9
Mucosal changes	No	112	91.1	84.6-94.9
	Yes	11	8.9	5-15.3
Performs/receives daily oral hygiene	No	30	24.4	17.6-32.6
	Yes	93	75.6	67.3-82.3
Needs help with oral hygiene	No	67	54.5	45.6-63
	Yes	56	45.5	37-54.3
Difficulty of access to dental services	No	83	67.5	58.7-75.1
	Yes	40	32.5	24.8-41.2
Dentist home visit	No	103	83.7	76.2-89.2
	Yes	20	16.3	10.4-24.2

*In dentates (n=54).

Source: survey data.

Table 4. Bivariate analysis of the distribution of data on living and health condition, oral health, and oral care at home, according to gender and age. Florianópolis, 2019/2020.

Variables	Gender			Age		
	Female n(%)	Male n(%)	*p* value	<80 n(%)	≥80 n(%)	*p* value
Lifestyle						
Not Frail	6(46.2%)	7(53.8%)	0.195	7(53.8%)	6(46.2%)	0.654
Frail	71(64.5%)	39(35.5%)		52(47.3%)	58(52.7%)	
Physical Strength						
Normal	01(16.7%)	05(83.3%)	**0.027****	2(33.3%)	4(66.7)	0.681
Compromised	76(65.0%)	41(35.0%)		57(48.7%)	60(51.3)	
Nutrition			0.645			
Normal	66(63.5%)	38(36.5%)		53(51.0%)	51(49.0%)	0.120
Poor Nutritional Status	11(57.9%)	08(42.1%)		06(31.6%)	13(68.4%)	
Eating						
Normal	38(57.6%)	28(42.4%)	0.215	34(51.5%)	32(48.5%)	0.397
Compromised	39(68.4%)	18(31.6%)		25(43.9%)	32(56.1%)	
Memory						
Normal	27(64.3%)	15(35.7%)	0.781	19(45.2%)	23(54.8%)	0.663
Compromised	50(61.7%)	31(38.3%)		40(49.4%)	41(50.6%)	
Mood						
No Risk of Depression	21(63.6%)	12(36.4%)	0.886	15(45.5%)	18(54.5%)	0.736
Risk of Depression	56(62.2%)	34(37.8%)		44(48.9%)	46(51.1%)	
Socialization						
No Limitation to Go Out	22(59.5%)	15(40.5%)	0.637	14(37.8%)	23(62.2%)	0.129
Limitation to Go Out	55(64.0%)	31(36.0%)		45(52.3%)	41(47.7%)	
Number of natural teeth						
9 or more teeth	16(61.5%)	10(38.5%)	0.034*	15(57.7%)	11(42.3%)	0.179
1 to 8 teeth	12(42.9%)	16(57.1%)		16(57.1%)	12(42.9%)	
Edentulous	49(71.0%)	20(29.0%)		28(40.6%)	41(59.4%)	
Caries lesions						
No	13(56.5%)	10(43.5%)	0.077	12(52.2%)	11(47.8%)	0.144
Yes	15(48.4%)	16(51.6%)		19(61.3%)	12(38.7%)	
Residual roots						
No roots	20(64.5%)	11(35.5%)	0.014*	19(61.3%)	12(38.7%)	0.153
1 root	09(47.4%)	10(52.6%)		07(36.8%)	12(63.2%)	
2 or more roots	02(22.2%)	07(77.8%)		06(66.7%)	3(33.3%)	
Tooth mobility						
No	72(64.3%)	40(35.7%)	0.218	52(46.4%)	60(53.6%)	0.350
Yes	05(45.5%)	06(54.5%)		07(63.6%)	04(36.4%)	
Needs help with oral hygiene						
No	46(68.7%)	21(31.3%)	0.129	32(47.8%)	35(52.2%)	0.960
Yes	31(55.4%)	25(44.6%)		27(48.2%)	29(51.8%)	

to be continued

Continuation of Table 4

Variables	Gender			Age		
	Female n(%)	Male n(%)	*p* value	<80 n(%)	≥80 n(%)	*p* value
Difficulty of access to dental services						
Yes	24(60.0%)	16(40.0%)	0.695	23(57.5%)	17(42.5%)	0.142
No	53(63.9%)	30(36.1%)		36(43.4%)	47(56.6%)	
Dentist home visit						
No	63(62.4%)	38(37.6%)	0.912	49(48.5%)	52(51.5%)	0.795
Yes	14(63.6%)	08(36.4%)		10(45.5%)	12(54.5%)	

*Chi-squared test; $p<0.05$

** Fisher's exact test; $p<0.05$

Source: survey data.

Table 5. Bivariate analysis of the distribution of data on living and health condition, oral health, and oral care at home, according to education and income. Florianópolis, 2019/2020.

Variables	Education			Income		
	1 to 4 years n(%)	> 4 years n(%)	*p* value	1 to 3 MW n(%)	> 3 MW n(%)	*p* value
Lifestyle						
Not Frail	4(30.8%)	9(69.2%)	**0.018****	9(69.2%)	3(23.1%)	0.947
Frail	71(64.5%)	39(35.5%)		78(70.9%)	26(23.6%)	
Physical Strength						
Normal	00(0.0%)	06(100.0%)	**0.003****	03(50.0%)	2(33.3%)	0.373
Compromised	75(64.1%)	42(35.9%)		84(71.8%)	27(23.1%)	
Nutrition			0.832			
Normal	63(60.6%)	41(39.4%)		73(70.2%)	24(23.1%)	0.502
Poor Nutritional Status	12(63.2%)	07(36.8%)		14(73.7%)	05(26.3%)	
Eating						
Normal	39(59.1%)	27(40.9%)	0.645	47(71.2%)	16(24.2%)	0.835
Compromised	36(63.2%)	21(36.8%)		40(70.2%)	13(22.8%)	
Memory						
Normal	21(50.0%)	21(50.0%)	0.072	27(64.3%)	11(26.2%)	0.332
Compromised	54(66.7%)	27(33.3%)		60(74.1%)	18(22.2%)	
Mood						
No Risk of Depression	15(45.5%)	18(54.5%)	0.033*	22(66.7%)	10(30.3%)	0.465
Risk of Depression	60(66.7%)	30(33.3%)		65(72.2%)	19(21.1%)	
Socialization						
No Limitation to Go Out	25(67.6%)	12(32.4%)	0.149	25(67.6%)	10(27.0%)	0.213
Limitation to Go Out	50(58.1%)	36(41.9%)		62(72.1%)	19(22.1%)	
Number of natural teeth						
9 or more teeth	11(42.3%)	15(57.7%)	0.047*	16(61.5%)	09(34.6%)	0.592
1 to 8 teeth	16(57.1%)	12(42.9%)		21(75.0%)	06(21.4%)	
Edentulous	48(69.6%)	21(30.4%)		50(72.5%)	14(20.3%)	

to be continued

Continuation of Table 5

Variables	Education			Income		
	1 to 4 years n(%)	> 4 years n(%)	*p* value	1 to 3 MW n(%)	> 3 MW n(%)	*p* value
Caries lesions						
No	10(43.5%)	13(56.5%)	0.061	12(52.2%)	09(39.1%)	0.141
Yes	17(54.8%)	14(45.2%)		25(80.6%)	06(19.4%)	
Residual roots						
No roots	16(51.6%)	15(48.4%)	0.166	20(64.5%)	10(32.3%)	
1 root	09(47.4%)	10(52.6%)		13(68.4%)	05(26.3%)	0.690
2 or more roots	05(55.6%)	04(44.4%)		08(88.9%)	01(11.1%)	
Tooth mobility						
No	69(61.6%)	43(38.4%)	0.647	78(69.6%)	27(24.1%)	0.593
Yes	06(54.5%)	05(45.5%)		09(81.8%)	02(18.2%)	
Needs help with oral hygiene						
No	40(59.7%)	27(40.3%)	0.751	47(70.1%)	16(23.9%)	0.984
Yes	35(62.5%)	21(37.5%)		40(71.4%)	13(23.2%)	
Difficulty of access to dental services						
No	49(59.0%)	34(41.0%)	0.525	60(72.3%)	17(20.5%)	0.335
Yes	26(65.0%)	14(35.0%)		27(67.5%)	12(30.0%)	
Dentist home visit						
No	64(63.4%)	37(36.6%)	0.244	72(71.3%)	22(21.8%)	0.313
Yes	11(50.0%)	11(50.0%)		15(68.2%)	7(31.8%)	

*Chi-squared test; p<0.05

** Fisher's exact test; p<0.05

MW=Minimum wage.

Source: survey data.

DISCUSSION

The results of this study reinforce the literature on the precarious oral health condition of the older adult population in general[13], and especially of those homebound[10,15], who have a worse self-perception of oral health and more difficulties in eating and chewing when compared to those that are not homebound[15]. This scenario is the result of an oral health care model that excludes the older adult population group, with little preventive care, focused on curative procedures, and mutilating dental elements, combined with individual habits and behaviors that are harmful throughout life[13]. Likewise, this study identified both past (tooth loss) and present (untreated caries lesions or residual roots) problems, which demand some type of dental care.

Taking these findings into account, it is important to discuss the need for oral health care for homebound older adults, in order to have a positive impact on health and quality of life indicators. It is important to consider the observed influence of gender and the educational level of the homebound older adults[3] on health and oral health conditions, which reflect the repercussions of the life course and the pattern of utilization of health and oral health services. Therefore, as there is a proportional increase in the number of older adults in the population[1], we face a new problem to be addressed through public

policies, especially health policies. New care strategies are necessary, since the service offers in this field do not exactly match the needs of older adults[17,23].

Most of the study participants had a frail condition. In these circumstances, it is important to know the limitations imposed by this situation, which include physical, psychological, emotional, and social aspects[2,28]. This condition can result in compromised functions and the need for long-term care, including oral health care[24,25].

By observing that this older adult population has functional limitations, a longitudinal evaluation of the frail condition enables the anticipation of actions that provide less chance of future disabilities and need for care[2,20,21]. It is initially up to the PHC, through health teams, to identify the relationships between oral and general health conditions of these older adults, visualizing the complexity of demands and problems considered in their health context, thus leading to better planning and provision of care, as well as better orientation for the formulation of public policies[26].

Similar to other studies[27,28], the results indicate that homebound older adults have poor oral health due to having visible biofilm, untreated cavities, and residual roots, situations that require an intervention. The participants were mostly edentulous, even with the current tendency of older adults to retain teeth[13]. A lower percentage of edentulism (24%) was observed in homebound North American older adults. However, among those with teeth, 45.6% needed exodontia, and 78.9% had at least one tooth with caries lesions[10]. These numbers are even worse considering the observation that 96% had never received a visit from a dentist after becoming homebound; 58.6% had seen a dentist more than 3 years ago[10]. In Brazil, the poor oral health condition of older adults is also recognized, a situation that is worse among those who are institutionalized and homebound, due to the presence of edentulism and high prevalence of tooth loss, caused mainly by cavities[26]. Data from Brazil also indicate little use of dental services after the older adult becomes homebound, since the vast majority report not having seen a dentist in 5 years[26]. This pattern seems to be different from what occurs with medical consultations. A study conducted in Brazil indicated that bedridden older adults had 4 or more medical appointments in the year prior to the survey[6].

Given that the oral health condition influences the general health condition of the older adults[10,16,29], the results are an alert to the situation of vulnerability in the health status of this population. Thus, we emphasize the need for caregivers/family members to be properly instructed on routine oral health care, handling and cleaning of teeth, prosthetics, and oral mucosa. Furthermore, it is important to pay due attention to the responsibility of the PHC team to identify and overcome these needs, by means of targeted actions that lead to the practice of correct oral hygiene and control of the presence of visible biofilm in homebound older adults.

Although there was the presence of visible plaque, caries lesions, residual roots, situations that create risk of infection, and exposure to pain, only a minority reported the presence of a dental surgeon throughout the homebound time. Therefore, it could be estimated that being homebound implied greater difficulty in accessing oral health services. Gluzman et al.[10] showed that almost all of the older adults investigated have not seen a dentist since they became homebound. Bonfá et al.[28] revealed that there are home visits by PHC professionals, especially by the community health agent and the physician; however, there is an absence of knowledge about the dental surgeon's work at home.

Although it was not considered as a study variable for the evaluation of homebound older adults' oral health, it is worth highlighting the results of the Eating domain of the Kihon Checklist, which was found to be compromised for almost half of the older adults. This domain is composed of items related to difficulty in chewing hard food and discomfort due to dry mouth, situations linked to the oral health condition of the older adults. Mikami et al.[29] report an association between chewing difficulty and dry mouth and decreased frequency of leaving the house. Also, a cross-sectional study, with follow-up after 6 years, showed that having chewing difficulty and having less than 20 remaining teeth are predictive conditions for homeboundedness. This effect was also seen in reverse, which indicates that being

homebound at the beginning of the study predicted chewing difficulty at follow-up[30].

The literature also points out relevant obstacles in the access to oral health care in this population, especially dental care. Since they cannot leave their homes because they have comorbidities, physical limitations, and loss of autonomy[30], there is a need for oral health care in their homes[31]. Therefore, it is necessary that the actions, especially those carried out by PHC, are within the reach of this population, through home care services, which must include the oral health team[32,33]. However, this study found that the presence of a dental surgeon (from both public and private services) performing consultations at home or home visits was minimal. Thus, not only is access to curative procedures limited, but it is also believed that preventive procedures such as the rational use of topical fluorides or the follow-up of potentially malignant oral lesions, for example, are neglected[10,27].

The assistance provided by PHC teams at home is planned by means of home care, planned as a PHC attribution, based on strategies that, due to being multidisciplinary, must include the oral health team. This care practice is very important for maintaining the health of older adults with some degree of functional capacity impairment, besides encouraging the effective participation of families in care[14,34]. Thus, providing oral health care to populations with limited access to traditional services at a clinic should be a priority for health systems[34,35].

This study has limitations arising from the convenience sampling strategy, sample losses, and the impossibility of follow-up due to the Covid-19 pandemic. Since they are not representative for the municipality, due to the convenience selection of the participants, the data cannot be generalized. Also, the care practices currently performed by PHC for the participants, other than home visits, were not explored in this research. This would be worth investigating for better understanding the context of care of the older adults. We suggest the continuation of studies on the oral health of homebound older adults in order to build the best evidence on oral health care practices in this context and population, in public health services, that result in better indicators of health and well-being.

CONCLUSION

The homebound older adults presented frailty and precarious oral conditions due to having oral problems that require intervention, such as: residual roots, untreated caries lesions, tooth mobility, and the presence of biofilm. Dependence on other people for oral care, which is not consistently guaranteed, at home, was identified, suggesting a situation of vulnerability.

Therefore, the study pointed out the need for dental care and oral health care at home on a continuous basis. In the scope of public health services, we advocate the full incorporation of oral health care at home, through actions developed in primary care by health and oral health teams. The need for investment in health promotion and oral disease prevention actions throughout life is also considered, to avoid the accumulation of dental needs in the complex situation of being homebound in old age.

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