Correlates of partial tooth loss and edentulism in the Brazilian elderly

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Abstract - Background: In South American older adults the association between tooth loss and demographic, predisposing and enabling factors has not been determined. The purpose of this study was to evaluate the association between partial and complete tooth loss and demographic, predisposing, enabling and need factors, and quality of life variables in the Brazilian older adults. Methods: In this cross-sectional study, 5349 subjects aged 65-74 years were evaluated using conglomerate random sampling. Data collection included dental examinations and questionnaires evaluating demographic, predisposing, enabling and need factors, and quality of life variables. Multinomial logistic regression was carried out to evaluate correlates of tooth loss. The number of teeth was set as the outcome and categorized as: edentulous, subjects with 1-19 teeth, and subjects with 20 or more teeth. Results: Predisposing factors including age, female gender and schooling were independently associated with edentulism. Female gender was associated with partial tooth loss. The only enabling factor associated with edentulism was car ownership. Need factors were associated with edentulism and partial tooth loss. Edentulous subjects perceived the need for dental treatment less frequently. Quality of life factors were associated with partial tooth loss and edentulism. Subjects with 1-19 teeth and edentulous subjects were more likely to rate their chewing ability as not good. Edentulous subjects were more likely to rate their speech ability and their dental appearance as good. Conclusions: The results indicate that tooth loss and edentulism were complex phenomena, with intricate predisposing, demographic, enabling and need factors playing a role.

During the previous decade, the possible effects of oral health on general health have been shown in older adults (1). Specifically, tooth loss has been found to have an independent association with chronic diseases, such as coronary heart disease (2, 3), electrocardiographic abnormalities (4) and mortality (1). These associations may develop because tooth loss adversely affects diet and nutritional intake, nutritional status, and body mass index (5), all maintained by a natural and functional dentition. In edentulous subjects, numerous studies have shown that ingestion of nutrients (5, 6), and the intake of nutrient-rich foods, particularly vegetable and fibers, is lower (6). In dentate



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subjects, having 21 or more teeth increases the chance of having an acceptable body mass index (5, 7). For example, an impaired dentition, having fewer than five occluding pairs of posterior teeth, is associated with a lower health eating index and reduced intake of several nutrients (8).

In older adults, tooth loss impacts oral healthrelated quality of life (9–12), and a multifactorial assessment measured by questionnaires, such as the Oral Health Impact Profile (OHIP), quantifies the social impact of oral disorders on well-being (13). In other words, the OHIP quantifies the decrements in life satisfaction caused by oral and dental diseases, and subsequent limitations in oral and social functioning (13). Tooth loss may also be assessed by the various factors that influence oral health beliefs and personal health practices as elucidated by health behavior and belief models (14). These include predisposing factors such as age (15-20), ethnicity (15), and education (20). Enabling factors include income (18, 21-23) or limited financial resources (17). Need factors include negative attitudes toward dental health (17), substance abuse such as tobacco use (18-21, 23, 24), and increased levels of dental disease (16, 17) such as periodontal disease (23). Of these factors, the perceived need for and availability of care providers, measured by frequency of dental visits, are major determinants in oral health behaviors. Oral health behaviors mediate oral health outcomes (14) such as the number of teeth. Demographic, enabling and predisposing factors are independently associated with tooth loss. These determinants, however, have largely been studied using the older adult population in the USA incorporated into the oral health behavior model (25). In these populations, oral health behaviors negatively impact utilization rates of dental services with income and lack of a regular source of care resulting in more dental disease episodic care. These behaviors are reinforced by negative disease-preventive attitudes that disallow care-seeking behaviors for preventive services.

In South American older adults the association between tooth loss and demographic, predisposing and enabling factors has not been determined. The purpose of this study was to evaluate the association between partial and complete tooth loss and demographic, predisposing, enabling and need factors, and quality of life variables in Brazilian older adults.

Methods

Cross-sectional data for this study were provided by the SB Brasil survey. SB Brasil, a national epidemiological survey of oral diseases, was conducted between 2002 and 2003 (26).

Using conglomerate random sampling, SB Brasil surveyed different macroregions of Brazil accounting for different city sizes, representative of urban and rural populations, and age groups. Age groups were defined using WHO criteria (27) and included infants (18–36 months), adolescents (5- to 12-yearold age groupings), teenagers (15–19 years of age), adults (35–44 years of age), and older adults (65–74 years of age). Sample size calculation was performed with the assistance of data from another national survey of oral diseases conducted in 1986 (28).

Data collection, using dental examinations and interviews (Questionnaire), was performed between May 2002 and October 2003 in the subject's residence. Variables included sociodemographic, oral health beliefs, behaviors, and need information. Demographic, oral health beliefs, oral health behaviors, and need variables were self-reported. The exceptions were presence of oral mucosa lesions and fluoridation of water supply. Dental status was evaluated using DMFT index according to the criteria proposed by WHO (27). Periodontal status and presence of oral mucosa lesions were also evaluated according to the criteria proposed by WHO (27). Data regarding periodontal status were not used in the present analysis. Examinations were performed with flat dental mirrors and CPI 'ball point' periodontal probes under natural light conditions. The sum of teeth rated as M (missing because of dental caries, periodontal disease, or other reasons) was used to calculate the number of missing teeth per subject and, consequently, the number of teeth per subject (i.e. 32 minus the sum of missing teeth). The information about fluoridation of city's water supply was obtained with the administrators of the water supply systems of the cities where dental examinations took place.

Under the direction of the central coordinating committee of SB Brasil, 24 h of theoretical training sessions were provided for dentists and for their assistants prior to data collection. An additional 16 h of clinical training was provided for 1250 dentists who performed the dental examinations during data collection.

Study sample

We performed a secondary analysis on the age subgroup of SB Brasil data consisting of older adults, 65–74 years of age (study sample). The study sample included 5349 subjects of which 3275 (61.2%) were females (versus 54.6% of females in this age group according to the last Brazilian census in the year 2000) and 2757 (51.7%) were non-whites (versus 37.91% of nonwhites among subjects aged \geq 65 years according to the last Brazilian census). Our response rate was 85%. Of this study sample, 87.3% resided in urban areas (versus 81.7% of subjects in this age group living in urban areas according to the last Brazilian census).

Ethics

The study was carried out after the approval of the Brazilian National Committee of Ethics and all participants provided written informed consents.

Study variables

The variables selected for this study analyzed tooth loss in comparison with utilization and prevention variables explained by the Oral Health Belief Model, quality of life variables, and the presence of oral mucosa lesions. In the Oral Health Belief Model, utilization of dental services is explained by predisposing, enabling, and need. Predisposing variables included age, race (white and non-white), gender, and level of education (schooling). Enabling variables included geographic localization (urban or rural), monthly family income (Brazilian currency -Real), residence status, and car ownership. Need variables included individual perceived need (dental visit history, oral health, and dental need) and community-derived perceived need (water fluoridation and dissemination of preventive information). Finally, quality of life variables queried for the impact of oral problems on social well-being (Tables 1 and 2).

Statistical analysis

Chi-squared tests were performed for the dichotomous variables; for the continuous variables one-way analysis of variance or Kruskal-Wallis tests were used for testing differences across groups. To compare partial and complete tooth loss (edentulism), the number of teeth was set as the outcome. To establish these groups, WHO and Federation Dentaire Interancionale (FDI) 'Global Goals for Oral Health in the year 2000' criteria for tooth loss for the age group studied were used (29). Edentulism was defined as subjects with no remaining teeth (0). Partial tooth loss was categorized into two subgroups: subjects with 1-19 teeth and subjects with 20 or more teeth. The value for rejection of the null hypothesis was set at P < 0.05.

Correlates of edentulism and partial tooth loss were examined using series of multinomial logistic regression models. Odds ratios (ORs) and 95% confidence intervals (CI) were calculated for the variables of interest with tooth loss. All variables that showed association at P < 0.25, as well as those with clinical epidemiological relevance were included (30). Variables that did not significantly contribute to the model were eliminated and a new model was developed. From this comparison, a reduced model was found that demonstrated only significant associations. Analyses were performed

Oral Health Behavior Factor	Study variables
Predisposing	Age
1 0	Gender
	Schooling
Enabling	Geographic localization (urban/rural)
C	Family income
	Residence status (own/rent or lent)
	Car ownership (yes/no)
Need: individual perceived need	Dental visit history: Have you ever been to a dentist (yes/no)?
*	How long since your last visit to the dentist (0 to 2 years/more than 2 years)?
	Dental need: How would you classify your oral health (good/poor)?
	Presence of oral mucosal lesion (yes/no)?
Community perceived need	Fluoridation of water supply (yes/no)?
~ ~	Have you received information about prevention (yes/no)?

Table 1. Oral Health behavior study variables derived from the Oral Health Behavior Model

Variable	Measure
Oral health dental functioning	How do you classify your chewing ability (good/not good)?
Ũ	How do you classify your speech ability (good/not good)?
Social functioning	How do you classify the appearance of your teeth and mouth (good/not good)?
C C	Does any oral health problem interfere with your social contacts (yes/no)?

using the SPSS 12.0 (SPSS Inc., Chicago, IL, USA) software for statistical analysis.

Results

The mean age of the study sample was 68.8 years. Of the study sample, 54.8% (2931 subjects) were edentulous, 35.6% (1902 subjects) had 1–19 teeth, and 9.6\% (516 subjects) had 20 or more teeth.

Predisposing factors

For the variables age and schooling, there was a significant difference (P = 0.01) between subjects categorized as edentulous, those having 1–19 teeth, and those having 20 or more teeth (a functioning dentition). For the variable gender, there was a significant difference (P = 0.001) between the outcome measures. There was no significant difference between the outcome measures for race (Table 3). In the univariate analysis, tooth loss increased with age, lower educational attainment, and being female.

Enabling factors

For family income and car ownership (P = 0.001) there was a significant difference between the outcome measures. There was no significant difference between outcome measures for the variable geographic localization (Table 4) or for the variable residence status. In the univariate analysis, tooth

loss increased with lower monthly family income and lack of car ownership.

Need factors

For individual perceived need, there was a significant difference (P = 0.001) between the outcomes. For community perceived need, there was a significant difference between the outcomes for the variable dissemination of preventive information, but not for water fluoridation. In the univariate analysis, tooth loss increased in those who had seen a dentist but whose last visit was over 2 years ago. Edentulous subjects rated their oral health good more frequently and perceived a need for dental care less frequently than others (Table 5). The prevalence of tooth loss decreased with dissemination of preventive information. Fluoridation of water supply did not differ between outcome measures (Table 5).

Quality of life

For oral and social functioning, there was a significant difference (P = 0.001) between each variable's outcome measures. In the univariate analysis, edentulous subjects and subjects with 20 or more teeth rated their chewing ability and speech ability as good more frequently than subjects with 1–19 teeth. The univariate analysis showed that edentulous subjects rated their dental appearance good more frequently than subjects with 1–19 teeth or with a functioning dentition.

Table 3. Predisposing health behavior characteristics of the sample regarding partial tooth loss and edentulism

Variable	Outcome measure	Edentulous	1–19 teeth	20 or more teeth	P-value
Age	Mean in years (±SD)	69.06 (±3.20)	68.46 (±3.11)	68.18 (±3.05)	0.001
Race	White (% of total)	1444 (49.4)	888 (46.8)	243 (47.3)	0.182
	Non-white	1477 (50.6)	1009 (53.2)	271 (52.7)	
Gender	Male (% of total)	865 (29.5)	901 (47.4)	308 (59.7)	0.001
	Female	2066 (70.5)	1001 (52.6)	208 (40.3)	
Schooling	Mean in years (±SD)	2.39 (±2.92)	3.17 (±3.52)	3.79 (±4.21)	0.001

Table 4.	Enabling	health	behavior	characteristics	of th	e sample	regarding	partial	tooth l	loss and	edentulism.

Variable	Edentulous	1–19 teeth	20 or more teeth	<i>P</i> -value
Geographic localization				
Urban (% of total)	2538 (86.7)	1663 (87.4)	465 (90.1)	0.09
Rural	391 (13.3)	239 (12.6)	51 (9.9)	
Family income				
Mean in Reais (±SD)	984.10 (±4754.00)	1139.94 (±5318.71)	1531.53 (±6436.22)	0.001
Residence status				
Own (% of total)	2531 (86.4)	1687 (87.8)	453 (87.8)	0.054
Rent/lent	400 (13.6)	215 (12.2)	63 (12.2)	
Car ownership				
Yes (% of total)	421 (14.4)	337 (17.8)	133 (26.0)	0.001
No	2499 (85.6)	1559 (82.2)	378 (74.0)	

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Table 5	Need	health	behavior	characteristics	of the	sample	regarding	partial	tooth 1	oss and	edentulis	sm
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Variables	Outcome measure	Edentulous	1 to 19 teeth	20 or more teeth	P-value
Individual perceived need: dental visit history					
Have you ever been to a dentist?	Yes	2809 (96.0)	1754 (92.4)	463 (90.3)	0.001
,	No	116 (4.0)	144 (7.6)	50 (9.7)	
How long since your last visit to dentist?	0 to 2 years	535 (19.1)	732 (41.9)	248 (53.7)	0.001
0,	>2 years	2263 (80.9)	1017 (58.1)	214 (46.3)	
Individual perceived need: dental need	5				
How would you classify your oral health?	Good	1730 (63.4)	733 (40.8)	216 (43.9)	0.001
5	Poor	997 (36.6)	1062 (59.2)	276 (56.1)	
Do you perceive need for dental treatment?	Yes	1123 (38.5)	1425 (75.1)	380 (74.4)	0.001
5 1	No	1794 (61.5)	473 (24.9)	131 (25.6)	
Presence oral mucosa lesion?	Yes	2391 (82.2)	1592 (84.4)	462 (89.9)	0.001
	No	517 (17.8)	294 (15.6)	52 (10.1)	
Need: community perceived need					
Fluoridation of water supply?	Yes	1475 (50.3)	900 (47.3)	261 (50.6)	0.103
	No	1456 (49.7)	1002 (52.7)	255 (49.4)	
Dissemination of preventive information:	Yes	1071 (36.7)	781 (41.2)	236 (46.0)	0.001
Have you ever received information about prevention?	No	1851 (63.3)	1116 (58.8)	277 (54.0)	

Values are given as n (%).

Table 6. Quality of life characteristics of the sample regarding partial tooth loss and edentulism.

Variables	Outcome measure	Edentulous	1-19 teeth	20 or more teeth	P-value
Oral functioning					
How do you classify your chewing ability?	Good	1411 (55.1)	754 (42.8)	289 (59.2)	0.001
, , , , , , , , , , , , , , , , , , ,	Not good	1152 (44.9)	1008 (57.2)	199 (40.8)	
How do you classify your speech ability	Good	1623 (64.2)	1016 (58.5)	340 (70.7)	0.001
	Not good	905 (35.8)	721 (41.5)	141 (29.3)	
Social functioning	0				
How do your appearance of your	Good	1551 (60.3)	658 (37.1)	201 (40.9)	0.001
teeth and mouth?	Not good	1023 (39.7)	1115 (62.9)	291 (59.1)	
Does any oral health problem interfere	No	1912 (76.6)	1106 (65.8)	316 (69.8)	0.001
with your social contacts?	Yes	585 (23.4)	574 (34.2)	137 (30.2)	

Values are given as n (%).

Edentulous subjects agreed less frequently that oral health problems interfere with their social contacts (Table 6).

Correlates of tooth loss

Based on multinomial logistic regression models, the following predisposing factors evaluated were associated with edentulism: age (OR 1.08, 95% CI 1.04–1.12), gender and schooling (OR 0.93, 95% CI 0.90–0.96). Edentulous subjects were 4.04, whereas subjects with 1–19 teeth were 1.77 more likely to be female (Table 7).

The only enabling factor associated with edentulism by means of the multinomial logistic regression was car ownership. Edentulous subjects were 1.37 more likely of not having a car than subjects with a functioning dentition. Enabling factors were not independently associated with 1–19 teeth (Table 7).

Several need factors were associated with edentulism and 1–19 teeth by means of the multinomial logistic regression. Dental visit history was associated with edentulism and partial tooth loss. Subjects whose last visit to a dentist was over 2 years ago were 4.17 more likely to be edentulous and 1.56 more likely to have 1-19 teeth. Dental needs were also associated with edentulism and partial tooth loss by means of the multinomial logistic regression. Edentulous subjects were 2.02 more likely to rate their oral health as good, whereas subjects with 1-19 teeth were 1.35 more likely to rate their oral health as good when compared with subjects with a functioning dentition. Edentulous subjects were also 4.50 less likely to perceive the need for dental treatment than subjects with a functioning dentition. Presence of oral mucosa lesions was associated with edentulism and partial tooth loss (subjects with 1-19 teeth) (Table 7).

Oral functioning was independently associated with edentulism and tooth loss. Edentulous subjects were 2.28 more likely, whereas subjects with

Variable	Edentulous OR (95% CI)	1–19 teeth OR (95% CI)
Predisposing factors		
Age (years)	1.08 (1.04–1.12)	NS
Gender		
Male	1.00 (ref.)	1.00 (ref.)
Female	4.04 (3.20-5.09)	1.77 (1.44 to 2.21)
Schooling (years)	0.93 (0.90-0.96)	NS
Enabling factors		
Car ownership		
Yes	1.00 (ref.)	NS
No	1.37 (1.03–1.81)	NS
Need factors		
Individual perceived need: dental visit history		
How long since your last visit to the dentist?		
0–2 years	1.00 (ref.)	1.00 (ref.)
>2 years	4.17 (3.28-5.30)	1.56 (1.24 to 1.96)
Individual perceived need: dental need		
How would you classify your oral health		
Poor	1.00 (ref.)	1.00 (ref.)
Good	2.02 (1.52-2.69)	1.35 (1.03–1.78)
Do you perceive the need for dental treatment?		
Yes	1.00 (ref.)	NS
No	4.50 (3.46–5.87)	NS
Oral mucosa lesion present?		
No	1.00 (ref.)	1.00 (ref.)
Yes	2.15 (1.50-3.08)	1.57 (1.10 to 2.23)
Quality of life factors		
Oral functioning		
How do you classify your chewing ability?		
Good	1.00 (ref.)	1.00 (ref.)
Not good	2.28 (1.71-3.04)	2.18 (1.66–2.87)
How do you classify your speech ability?		
Not good	1.00 (ref.)	NS
Good	1.89 (1.42-2.52)	NS
Social functioning		
How do you classify your appearance of your tee	eth and mouth?	
Not good	1.00 (ref.)	NS
Good	1.95 (1.47–2.58)	NS

Table 7. Adjusted odds ratios (ORs) and 95% confidence intervals (95% CI) of the variables related to partial tooth loss and edentulism

NS, not significant.

1–19 teeth were 2.18 more likely to rate their chewing ability as not good than subjects with a functioning dentition. Edentulous subjects were 1.89 more likely to rate their speech ability as good. Social functioning was independently associated with edentulism, but not with partial tooth loss. Edentulous subjects were 1.95 more likely to rate the appearance of their teeth and mouth as good (Table 7).

Discussion

Our findings indicate that, among the Brazilian elderly, predisposing, enabling, individual perceived need, and quality of life factors were independently associated with tooth loss and edentulism. This is, at least to our knowledge, the first study providing such evidence using a large and representative sample of elderly subjects in South America. These results support findings from previous studies performed in the US where oral health behaviors and beliefs were associated with oral hygiene practices (31) and more dental disease, including tooth loss (25).

Predisposing variables were associated with both edentulism and partial tooth loss. The results revealed that less educated subjects were particularly more prone to be edentulous than their counterparts, confirming the evidence that higher educational level is associated with lower risk for tooth mortality (22). Higher educational attainment is a significant predictor of more positive oral health beliefs (32), which may influence dental care service utilization leading to tooth loss (14).

Age was another predisposing sociodemographic variable associated with edentulism. This result is in agreement with some previous investigations where aged subjects were more prone to have fewer teeth (33). However, the cross-sectional design of this study does not allow us to examine if the association between age and edentulism observed results from the aging process itself or results from an age cohort effect. Evidence from birth cohort analysis, however refutes the commonly held belief that edentulism is a natural consequence of aging. Instead, the results from the study of Sanders et al. (34) suggest that today's Australian elderly had experiences of oral disease and/or dental care as younger adults that were much more invasive than the experience of today's younger adults.

Female gender was another predisposing variable independently associated with edentulism, and the only sociodemographic variable associated with partial tooth loss, confirming previous findings from the literature (33, 35, 36), including a study performed in a representative adult, urban population of south Brazil where female subjects were more likely to have lost teeth than male subjects (23). However, the reasons why female subjects tended to be more likely to have fewer teeth remain to be elucidated (33). It can be speculated that female subjects lose more teeth because they are more sensitive to their dental needs, experiencing more tooth loss from intervention and services.

Although family income was not associated with partial tooth loss or edentulism, these subjects were less likely to have a car, a proxy variable of income in our study which is a variable thought to be an indicative of family wealth (36). These results are in accordance with evidence from a Chinese study where family possessions were independently associated with tooth loss among subjects aged 65–74 years, indicating that financial restraints may have led to extractions of teeth that could, otherwise, be treated. Additionally, low socioeconomic level has been associated with increased risk for tooth loss among southern Brazilian adults (23). Ability to pay for non-extraction treatment alternatives is known to be a significant risk indicator for tooth loss (17).

In Brazil, until recently dental care was not part of the public health services available for elderly subjects. Dental visits are usually problem oriented in this age group, thus it is not surprising that subjects with fewer teeth were less likely to have been to a dentist in the 2 years previous to the study. This result shows some similarity with the findings reported by Gilbert et al. (17), although their study was longitudinal and subjects were younger and had at least one tooth at baseline evaluation.

Subjects with 1–19 teeth and edentulous subjects were more likely to report their oral health was good when compared with those with 20 or more teeth. These results are in accordance with the literature from a North American study suggesting that having no natural dentition is a significant predictor of positive perceived oral health (37), adding up evidence that partial tooth loss is also associated with better ratings of self-perceived oral health. It is hypothesized, although it may seem illogical to subjects who value their teeth, that the adoption of full dentures may represent an actual improvement in oral health for these subjects (37). However, the reason why there was an association between partial tooth loss and perception of oral health among Brazilian subjects aged 65-74 years remains unknown, requiring further studies.

The results of our study also indicate that aspects related to the perception of need for dental treatment were independently associated with partial tooth loss and edentulism among Brazilian subjects aged 65–74 years. Edentulous subjects were less likely to perceive the need for dental care in this study. This finding is in accordance with previous evidence showing that the edentulous elderly living in rural areas of Iowa, USA, were more likely to report fewer treatment needs than the dentate elderly (38).

Edentulism was an important risk indicator for oral mucosa lesions – which include oral cancer, pre-cancer lesions, and fungi infections – in the studied population. We believe that this association may be related to the effects of denture wearing on the development denture-related lesions such as stomatitis, traumatic ulcers, angular cheilitis, and hyperplasia (39). Denture stomatitis in particular has been associated with the continuous use of complete dentures (40).

The effects of tooth loss and edentulism on oral health dental functioning are reported to be significant in the literature (38). As expected, the number of remaining teeth had a significant impact on subjects' chewing ability, confirming findings from the literature (38, 41). Additionally, edentulous subjects reported speech difficulties more frequently than their counterparts, confirming results reported elsewhere for elderly subjects (38), apparently without interference in their social contacts. In addition, chewing and speech abilities are important components of some measures of oral health-related quality of life, which is reported to be significantly lower among elderly subjects with fewer teeth (12).

Satisfaction with oral esthetics represents a dimension of perceived oral health-related quality of life that emphasizes the importance of oral health with respect to the patient's self-image. In this study, edentulous subjects tended to rate the appearance of their teeth/mouth more favorably than subjects with 20 or more teeth. This is an interesting finding and we could also hypothesize that, as stated before, the adoption of full dentures represented an improvement in terms of oral health (37). This notion is supported by a previous Brazilian study showing that elderly subjects who did not need dental prosthesis reported less impacts in OHIP than those who needed it (42).

The data analyzed in this study were derived from the SB Brasil study, and the findings reported here are representative of the Brazilian elderly. These findings are significant not only because this sample is representative, but also because it is the first time that aged subjects were evaluated in a national oral health survey performed in Brazil. However, an important limitation of our study was that some behavioral factors, such as smoking (20, 21, 23, 24, 43), and systemic diseases, such as diabetes (20, 21), that are known to be key risk factors for tooth loss were not evaluated. It is also important to emphasize that subjects aged 75 years or more were not evaluated in the SB Brasil survey, representing another important limitation of this study.

Findings from this study indicate that Brazil was far from achieving the 'Goals for Oral Health in the year 2000' proposed by WHO and FDI as regards the number of teeth for this age group (29) (i.e. only 9.6% of the studied population had 20 or more teeth in this age group). The results also indicate that tooth loss and edentulism were complex phenomena, with intricate predisposing sociodemographic variables, enabling resources, perception of need for dental treatment, and oral health behavior playing a role in the studied population, and clear evidence of chewing difficulties and presence of oral mucosa lesion for those with <20 teeth. As the effects of tooth loss and edentulism are not negligible, including effects on general health and on oral health-related quality of life, public health policies that include educational practices oriented for elderly subjects and measures aiming to prevent tooth loss and minimize its effects, including prosthetic dentistry rehabilitation, are needed.

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