Factors Associated with Tooth Loss in Older and Elderly Adults in Quilombo in Northeast Brazil

ARTIGO ORIGINAL

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Abstract: Background: Tooth loss may be due to the worsening of oral conditions influenced by social, economic, psychological, and behavioral factors. Knowledge of such associations can help in the elaboration of public policies aimed at the quality of oral health of quilombola. **Objective**: To investigate variables associated with tooth loss in older adults and elderly people aged 50 and over in a Brazilian quilombo. **Methods**: Cross-sectional study with quilombolas in the quilombo in Maranhão. Socioeconomic and demographic information, profile of use of health services, self-perception and oral health conditions were collected. An oral examination was performed to count the number of teeth and participants were categorized as having lost up to 12 teeth or more than 12 teeth. Fisher's exact and Chi-square tests were used to assess associations between the variables of interest and tooth loss. The significance level adopted was 0.05. **Results**: A total of n= 64 quilombolas evaluated. The frequency of tooth loss greater than 12 teeth was 71.9%. Age ≥60 years was associated with a higher prevalence of tooth loss ($p<0.01$), when compared to participants aged between 50 and 59 years (82.9% vs. 52.2%, respectively). The loss of more than 12 teeth was more frequent among those who did not perceive the need for dental treatment ($p<0.05$) (82.4% vs. 60.0%, respectively). **Conclusion**: Advanced age and the negative perception of the need for dental treatment contribute to the increase in tooth loss in quilombolas over the years, demonstrating the lack of dental care aimed at this population segment.

Keywords: Social Conditions, Group with Ancestors of the African Continent, Oral Health Education, Quilombola Communities

Resumo: Perdas dentárias podem ser decorrentes do agravamento das condições bucais influenciadas por fatores sociais, econômicos, psicológicos e comportamentais. O conhecimento de tais associações pode auxiliar na elaboração de políticas públicas voltadas à qualidade da saúde bucal de quilombolas. **Objetivo**: Investigar variáveis associadas à perda dentária em idosos e adultos com 50 anos ou mais de um quilombo brasileiro. **Métodos**: Estudo transversal com quilombolas do Maranhão. Foram coletadas informações socioeconômicas e demográficas, perfil de utilização de serviços de saúde, autopercepção e condições de saúde bucal. Foi realizado exame bucal para contagem do número de dentes e os participantes foram categorizados em terem perdido até 12 dentes ou mais de 12 dentes. Os testes exato de Fisher e qui-quadrado foram utilizados para avaliar associações entre as variáveis de interesse e as perdas dentárias. O nível de significância adotado foi de 0,05. **Resultados**: Um total de n= 64 quilombolas foram avaliados. A frequência de perdas dentárias maiores que 12 dentes foi de 71,9%. Idade ≥60 anos foi associada a maior prevalência de perda dentária ($p<0,01$), quando comparado aos participantes com idade entre 50 e 59 anos (82,9% vs. 52,2%, respectivamente). A perda de mais de 12 dentes foi mais frequente entre aqueles que não perceberam a necessidade de tratamento odontológico ($p<0,05$) (82,4% vs. 60,0%, respectivamente). **Conclusão**: A idade avançada e a percepção negativa da necessidade de tratamento odontológico contribuem para o aumento da perda dentária em quilombolas ao longo dos anos, demonstrando a carência de assistência odontológica voltada a esse segmento populacional.

Palavras-chave: Condições Sociais, Grupo de Ancestrais do Continente Africano, Educação em Saúde Bucal, Comunidades Quilombolas.

1. Introduction

One of the greatest challenges to the health of the population is oral conditions [1], especially severe tooth loss, classified in 2019 as the 22nd largest cause of health disability, 31st in prevalence and 56th in incidence. Considered as the main outcome in oral health, tooth loss derives from several risk factors accumulated throughout the individual's history [2].

Given this, there is an increase in interest and research estimating the magnitude, determinants and impacts of oral diseases in populations in situations of social vulnerability (3-4). Studies that estimate the burden of oral diseases in minority groups, such as quilombolas, have strategic importance in the permanent monitoring of social inequalities in health and are important as a subsidy in the formulation and implementation of public policies [5].

These populations live in communities characterized as spaces inhabited by remaining black people and descendants of slaves, who keep alive their cultural and religious traditions, kinship and identity marked by resistance to oppression, denial of their rights and racial segregation [6]. In general, quilombolas live in communities in geographically isolated locations and have a low socioeconomic and demographic level. They are characterized by the high prevalence of basic health problems, related to precarious living conditions, including oral health [7]. The negative self-perception of oral health, reported by these individuals, has been shown to be associated with the oral clinical condition found [3].

Oral diseases such as caries and periodontal disease constitute a public health problem, and tooth loss is its main sequelae [8]. These diseases disproportionately affect the poorest and most socially disadvantaged individuals disadvantaged, since there is a strong and consistent association between socioeconomic level and the occurrence and severity of oral diseases. This association occurs from early childhood to old age [9]. These data point to greater concern about the epidemiological reality of quilombola individuals [10].

This population presents, in addition to problems related to oral health, difficult access to dental services. It is necessary that such problems be addressed considering geographic factors, age groups, prevalence of oral diseases, hygiene habits, quality of life and access to dental services [11]. Furthermore, tooth loss results in a decrease in chewing capacity, making it difficult and limiting the consumption of various foods, affecting speech and causing aesthetic damage [12].

These conditions have a negative impact on individuals' quality of life. The World Health Organization (WHO) defines 20 as the minimum number of permanent teeth necessary for individuals to participate in social activities and achieve adequate chewing function [13]. Quilombola elderly people have life stories linked to dental problems [3]. However, the scarcity of epidemiological studies regarding the quilombola population is still a challenge in Brazil [14].

There is little evidence addressing oral health conditions in quilombola populations [15] mainly involving elderly people [7]. Available data related to this age group reveal that elderly quilombolas have poor oral health and a higher prevalence of edentulism, ranging from 52 to 53.4% [15] compared to epidemiological picture of Brazilian elderly people whose percentage is 38.4% to 46.4% [16].

The Brazilian Institute of Geography and Statistics, through census, reveals the unprecedented mapping of the quilombola population, denoting a new scenario focused on these individuals [17]. Historically, the Northeast is marked by precarious health indicators. This panorama contributes to a greater concern in studying the quilombolas of the Northeast, since health care is even more fragile in this region [18].

However, there is still little data on the oral health of quilombolas in the State of Maranhão [19], which contains the largest proportion of municipalities with recognized quilombola communities [18]. Furthermore, quilombo Santa Rosa dos Pretos in Itapecuru-Mirim in Maranhão is a community of great political and cultural relevance for the State and for Brazil, due to its representation in other States in the struggles for environmental conflicts in ethnically occupied territories in Maranhão [20]. Therefore, the objective of this study was to investigate the factors associated with tooth loss in older adults and elderly quilombolas in this community.

2. Methodology

2.1. Study design and location

This is a cross-sectional study, adopting the recommendations of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), with a household and population-based approach, carried out in the Santa Rosa dos Pretos quilombo, municipality of Itapecuru-Mirim, State of Maranhão. The data for this research were obtained from the initial study on "Evaluation of access to health services, oral health and the relationship with food insecurity and the consumption of ultra-processed foods in quilombola communities in the State of Maranhão" conducted between December 2018 and February 2020.

2.2. Ethical considerations

The research was approved by the Research Ethics Committee (CEP) of the Federal University of Maranhão under protocol number (nº 2.421.894) and Certificate of Presentation of Ethical Appreciation (CAAE: 79264216.6.0000.5087).

2.3. Eligibility Criteria

For the inclusion criteria, the following were considered in this study: quilombola, that person who self-determines belonging to this group. For the purposes of Decree No. 4,887/2003, the remnants of quilombo communities are considered to be ethnic-racial groups, according to criteria of self-attribution, with their own historical trajectory, endowed with specific territorial relationships, with a presumption of black ancestry related to resistance to historical oppression [21], living in the quilombo for at least 12 months, being over or equal to 50 years old and both sexes. The response criterion was considered to be individuals who agreed to undergo the clinical examination and answer the questionnaire. The exclusion criteria were: living for less than 12 months, having consulted an oral health service outside the municipality of residence and not being a descendant of a quilombola father or mother. Individuals with some cognitive impairment, according to the family's own assessment, with hearing impairment were excluded.

2.4. Data collect

Data were obtained from households with more members aged 18 years or older, in order to obtain greater representation of the population, taking as a reference the studies by [22], based on from a survey carried out at the main Family Health Strategy (ESF) unit in the region, obtained from mapping carried out by community health agents. Households eligible for the initial survey were selected by lottery. For this study, only data was extracted from older adult participants aged 50 years or older [16].

From a reference point, the Quilombola Social Assistance Reference Center (CRAS), homes were visited in a spiral, given the variability of space occupation (community located in a rural area). All participants in the selected household aged 18 or over were interviewed and examined. The interviews were carried out by researchers, previously trained and calibrated in a pilot study (Kappa agreement maximum value 1.00), using structured, pre-coded and pre-tested questionnaires.

For this research, the variables education and income came from the New Critério Brasil, developed by the Brazilian Association of Research Companies [23], socioeconomic and demographic data such as: "sex, race, age, marital status, assistance benefit and self-assessment of health, were adapted from the study by Araújo et al[24]. From the criteria of the World Health Organization [25] data were obtained on "decayed, lost and filled teeth". In the exams, the following codes were considered: "0 – healthy tooth, 1 – decayed, 2 – restored with cavities, 3 – restored without cavities, 4 – lost due to cavities, 5 – lost for other reasons". From the manual of the primary health care assessment instrument: Primary Care Assessment Tool – Oral Health of Adults [26], questions were extracted about "access to dental services, last dental appointment, health plan, dental plan".

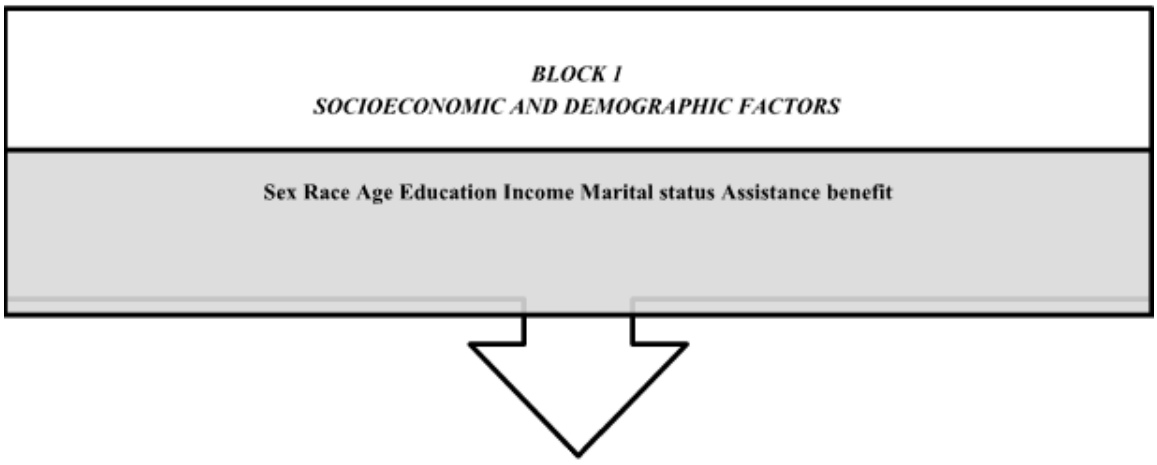
2.5. Oral Examination

Oral examinations were carried out with individuals sitting in a common chair, using artificial light in the brightest environments in the home. The teeth were dried with gauze and the number of decayed, missing and filled teeth was evaluated [25], according to the DMFT index. Each condition was recorded on a form for the epidemiological survey. The exams were carried out using a wooden spatula to remove the mucosa and sterilized #4 flat mouth mirrors to help visualize the teeth, a WHO exploring probe and Complete Personal Protective Equipment (PPE).

2.6. Questionnaire and variables

The dependent variable selected for this study was tooth loss (≤12 teeth and >12 teeth). For the independent variables, some questions of interest and previously related to the outcome were selected and the questionnaire was organized into three blocks **(Figure 1).**

The first block included: sex (male; female), self-reported race/color, categorized as: black, brown, white, yellow and indigenous according to the criteria of the Brazilian Institute of Geography and Statistics [27]; age was categorized (50-59 years) for older adults and (60 years or more) for the elderly, education (<8 years of complete study, ≥8 years of complete study), marital status (with partner, without partner) , monthly family income (≤1 minimum wage; >1 minimum wage) based on the minimum wage in force at the time of collection (R$998.00), assistance benefit (no; yes). The second block included four questions about oral health services. This block also included a question about self-perception of oral health, related to the perception of the need for dental treatment. Self-perceived health is a good indicator of the health status of population groups [28]. The third block included data from the assessment of oral condition, considering decayed, missing and filled teeth.



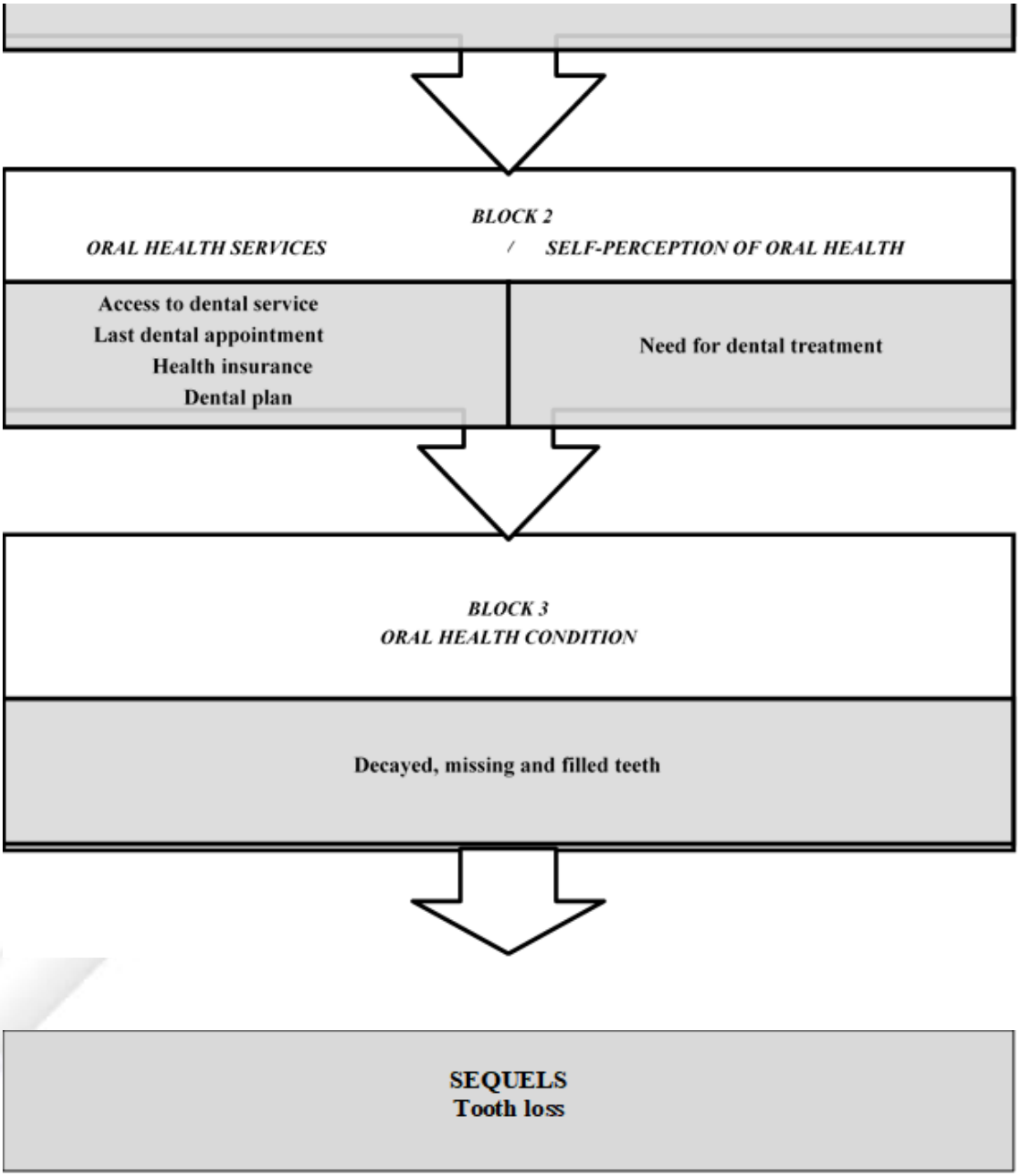


Figure 1. Categorization of independent variables selected by block in the questionnaire.

3. Results

The 64 individuals participated in the study, with a mean age of 66.7 ±12.4 years. **Table 1** presents the socioeconomic and demographic profile of the studied population. The sample presented tooth loss >12 teeth in 71.9% of participants. The majority of the sample was composed of women (53.1%), aged 60 years or over (64.1%), black (62.5%), with less than 8 years of study (53.1%), income monthly family income of up to 1 minimum wage (75%), receiving assistance benefits (64.1%) and living with a partner

(57.8%). Tooth loss of more than 12 teeth was more common among participants aged 60 or over (82.9%), when compared to participants aged between 50 and 59 years (52.2%).

In **Table 2** it was observed that most quilombolas reported having access to dental services (60.9%), but the vast majority had not used oral health services for more than 1 year (90.6%). 90.6% of respondents did not have any health plan interviewed, including dentistry (95.3%). Around 53.1% of individuals did not perceive the need for dental treatment, with this variable being significantly associated with tooth loss, with a higher frequency (82.4%) among those who lost more than 12 teeth.

Table 1. Distribution of demographic and socioeconomic factors according to tooth loss in quilombolas (n=64). Santa Rosa dos Pretos, MA, Brazil, 2018-2020.

Variables	Total		Tooth loss ≤12 teeth (n = 18) 28.1%		>12teeth (n 46) 71,9%		*p*
	n	(%)	n	(%)	n	(%)	
Sex							0,3
Feminine	34	(53,1)	8	(23,5)	26	(76,5)	
Masculine	30	(46,9)	10	(33,3)	20	(66,7)	
Age range							<0,01*
50 to 59 years old	23	(35,9)	11	(47,8)	12	(52,2)	
60 years or more	41	(64,1)	7	(17,1)	34	(82,9)	
Skin Color							0,5
Black	42	(62,5)	13	(32,5)	27	(67,5)	
Brown	22	(38,5)	5	(22,7)	17	(77,3)	
Marital status							0,5
With partner	37	(57,8)	12	(32,4)	25	(65,6)	
No companion	27	(42,2)	6	(22,2)	21	(77,8)	
Education							0,8
<8 years of complete study	34	(53,1)	9	(26,5)	25	(73,5)	
≥8 years of completed study	30	(46,9)	9	(30,0)	21	(70,0)	
Monthly family income							0,5
Up to 1 minimum wage	48	(75,0)	15	(31,2)	33	(68,8)	
More than 1 minimum wage	16	(25,0)	3	(18,8)	13	(81,2)	
Assistance benefit							
Yes	41	(64,1)	13	(31,7)	28	(68,3)	
No	23	(35,9)	5	(21,7)	18	(78,3)	

*Indicates statistically significant differences (p ≤0.05).

Table 2. Distribution of factors related to dental care according to category of tooth loss in quilombolas (n=64). Santa Rosa dos Pretos, MA, Brazil, 2018-2020.

Variables	Total		Tooth loss ≤12 teeth (n = 18) 28.1%		Tooth loss >12teeth (n 46) 71,9%		*p*
	n	(%)	n	(%)	n	(%)	
Access to dental service							1,0
Yes	39	(60,9)	7	(28,0)	18	(72,0)	
No	25	(39,1)	11	(28,2)	28	(71,8)	
Last dental appointment							1,0
Up to 1 year	6	(9,4)	2	(33,3)	4	(66,7)	
More than 1 year	58	(90,6)	16	(27,6)	42	(72,4)	
Has a health plan							0,7
Yes	6	(9,4)	1	(16,7)	5	(83,3)	
No	58	(90,6)	17	(29,3)	41	(70,7)	
Has a dental plan							0,5
Yes	3	(4,7)	0	(0)	3	(100)	
Não	61	(95,3)	18	(29,5)	43	(70,5)	
Perceived need for dental treatment							0,05*
Yes	30	(46,9)	12	(40,0)	18	(60,0)	
No	34	(53,1)	6	(17,6)	28	(82,4)	

*Indicates statistically significant differences (p ≤0.05).

4. Discussion

This study showed two important findings regarding tooth loss in the quilombola population studied: First, there is an association with advancing age of quilombola individuals and tooth loss. Second, the data found on the perception of the need for treatment show significant associations between a greater number of missing teeth and not perceiving the need for dental treatment. Furthermore, the school needs to be concerned about how health information is analyzed by students, as understanding how children receive and process health information, what are the beliefs they have and what topics they value is an important step in effectively adapt the message to this group and develop programs for health education in the future [30].

The high prevalence of tooth loss with advancing age found in this study corroborates the evidence found in the literature with elderly quilombola populations [3-5]. The association between age and tooth loss observed suggests that aging in this quilombola community requires greater oral health care. However, starting from a primitive concept that tooth loss is considered a natural consequence of life and advancing age [31], we believe that the quilombolas of Santa Rosa dos Pretos possibly had inadequate habits related to the prevention of oral diseases. Perhaps motivated by the imagination of the toothless elderly person as a natural reflection of human dentition and as a result of the lack of

information and clarifications on oral health prevention. Reports show that elderly people naturally accept the partial or total loss of teeth [3].

However, edentulism with advancing age is not just a consequence of the aging process. Controlling or preventing oral diseases throughout life makes it possible to grow old with dentate arches [32]. Evidence reports that tooth loss in elderly individuals, as being the expression of the cumulative effect of oral diseases over the years, such as caries and periodontal disease [33], may be due to factors related to the sociocultural context in which individuals are inserted. Some studies have verified the influence of these factors on the prevalence of edentulism. The worsening was noticed as the quilombola community moved away from the urban area and due to the presence of low socioeconomic conditions [34]. According to [35], tooth loss rates by 2040 will be around 85.96% in the Brazilian elderly population. However, in comparison to the epidemiological picture of Brazilian quilombolas, there is a more notable presence of edentulism, ranging from 66.7% to 90.5% in the elderly [10].

In line with the results of this research, we can infer that data on the high prevalence of tooth loss persists in this population group. As a direct consequence, the findings point to a great need for dental prosthetics with advancing age for the quilombolas of the Santa Rosa dos Pretos community. In this study, the majority of individuals did not perceive the need for dental treatment, and this variable was associated with a higher rate of tooth loss. We assume that the association found may be due to low Health Literacy (HL) in these individuals. This factor appears to be an important marker of social inequality [36] and should be understood as "the ability of individuals to obtain, process and understand basic information health to use services and make appropriate health decisions [37]".

There is a high number of people with low levels of HL, particularly elderly people with low levels of education and income. These present a greater burden of diseases, inability to use health services, generate more costs for services [38] and are related to more frequent use of emergency services [39] being a significant associated factor for tooth loss [2]. We believe that this condition also causes quilombolas to resort to oral health services only in cases of pain, where curative/restorative treatment is often no longer possible, with extraction being the most effective procedure for relieving the symptom. Pain as the main complaint for seeking dental services is reported in studies with quilombolas, followed by routine/maintenance consultation [5].

The perception of tooth loss as a resolution of pain may have led these individuals to understand that not having teeth represents an improvement in oral health. The agreement between the clinical condition of tooth loss and the perception of the need for treatment seems to occur only in more painful cases, while other milder oral problems are underestimated. According to our findings, it appears that the presence of pain and the impetus to treat it or not are conditioned by life experience and cultural factors. It is worth highlighting that, given the vulnerability and invisibility of this population, a condition of exclusion is created for a culture of immediate resolutions, where there is no place for prevention and health promotion [40]. The importance of tooth care in the future depends on how this is conveyed by parents during childhood, as well as by oral health professionals. It is necessary to reflect on how to develop healthy oral hygiene habits in quilombolas, if parents do not have access or do not know how to process such information for the future.

Aspects related to the delay in seeking oral health services found in this study raise questions inherent to the behavior of these individuals. SL has been considered an intermediate factor determining health behaviors and outcomes [34]. Thus, although the variable access to dental services did not present a statistically significant result, we observed that the majority of quilombolas reported having access to dental services, but had not used them for more than a year. Delays in seeking oral health services were also found in other studies with quilombolas [18].

It is possible that the lack of demand for the service is also due to the community being located in a rural, more isolated area, resulting in these individuals less frequenting the Basic Health Unit closest to the region, increasing the level of exposure to inequalities in oral health. The presence of a dental office in a rural area makes it possible for individuals to make greater use of adequate dental care. Furthermore, the lack of regular care can be observed in the reduced number of remaining teeth, resulting from mutilating surgical culture [32]. Additionally, we admit that tooth loss in the older adult and elderly age group in this community seems to reflect the lack of health promotion with a transformative nature that serves to direct individuals to reflect on the importance of oral health. Older people who are aware of their health status can adopt healthier behaviors and thus dilute the normally expected associations [33].

Despite government investment directed to quilombola communities and the creation of 1,536 Oral Health teams, within the scope of the Brasil Quilombola Program, and the initiative of the Brasil Sorridente program, dental care focused on prevention, treatment and rehabilitation services for this population still are insufficient [34]. Health inequalities continue to be captured by social indicators of older quilombolas, mainly in the State of Maranhão [33]. Thus, we found in the studied community a predominance of mutilating treatment. Possibly the result of the absence of effective dental care, which together with the low HL of these individuals results in the presence of these neglected diseases.

This study presented strengths. The topic related to old age and oral health in quilombolas brings challenges and dilemmas to existing public policies in the region. Despite the growth of public policies developed, not all of them are implemented or reach the remaining quilombo communities [35]. It reveals the scarcity of scientific evidence on oral health, especially on tooth loss in quilombola populations. Considering that SL is a factor that can be strongly associated with behaviors and aspects associated with tooth loss [36], this research opens the way for new studies, contributing to the advancement of knowledge on the subject. We agree with [37] that health literacy is an important tool for thinking about future public policies that can reduce the gap between a precarious clinical condition and the perception of having adequate oral health when, in fact, there are pathologies to be treated.

The tooth loss data were based on clinical dental examination, which provides greater veracity of the data collected, inherent to the analysis of variables, and not just the information given by the patient. Self-reported data may underestimate or overestimate associations. Another strong point is that we use the DMFT index, which allows us to measure cavities and edentulism, among other problems, contributing to greater scientific accuracy regarding the oral health situation of these individuals. This index is present in only part of the research with quilombolas, which can make it difficult to obtain a more accurate diagnosis of oral health problems in the context of Brazilian quilombolas [10].

In this scenario, the development of this research appears to be an essential strategy for transforming local reality. Research on socioeconomic and demographic aspects, as well as the health status of older quilombolas provides valuable information for managers and health professionals to implement social and health actions that seek to promote well-being, health and quality of life in this group [33]. Despite the strengths, the limitations of this study are related to the smaller sample size of participants, which demands a decrease in the power of the statistical analysis. However, these results are representative of the group of older adults and elderly people in the Santa Rosa dos Pretos community, which guarantees their internal validity. That said, it is worth reflecting on the reduction in the aging of the quilombola population. It is also worth noting that there is difficulty in accessing quilombola communities for the purposes of epidemiological studies.

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Research with a smaller sample size was also found in other studies with quilombola elderly people [38], 29 individuals [3], 9 individuals and 47 individuals [7]. Furthermore, the present study has the limitation of being a cross-sectional study and cannot offer support for causal inferences. As tooth loss is a sign of social inequity [24], we suggest that its high prevalence in the Santa Rosa dos Pretos quilombo is related to the lack of implementation of public policies aimed at the importance of educational, preventive and rehabilitative measures in oral health. Remembering that the reduction in tooth extraction practices and deprivation of access to services, resulting from social and age vulnerability, can impact inequities in oral health.

Primary Health Care (PHC) is considered the first level of care within the health system, and represents the gateway to services. However, it is observed that assistance is often unequal or unsatisfactory in relation to the demands of patients, especially those from highly vulnerable groups, such as quilombolas [26]. Therefore, knowing that health professionals are a key factor in promoting SL among the population [34], it is important to investigate the quality of oral health services that are offered in basic health units for these individuals. Institutions that offer training to dental professionals need to adopt cultural competency programs and make them a mandatory requirement for course completion. Lack of interest in the use of health services may highlight flaws in the cultural competence of professionals,

expressed by the inability of professionals to deal with people of different socioeconomic, age and cultural profiles [40].

5. Conclusion

Quilombolas from the Santa Rosa dos Pretos community, as they age, experience an increase in tooth loss over the years and do not realize the need for dental treatment, resulting from the socioeconomic and demographic vulnerability encountered. It is suggested that public policies be implemented aimed at these individuals in order to reduce inequalities and weaknesses that compromise the quality of oral health in this population segment.

Conflict of interest: we declare that there is no conflict of interest.

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