Research Article

Evaluation of the Oral Health Situation of a Brazilian Indigenous Population

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Abstract

In view of the absence of studies that characterize the epidemiology of oral pathologies in the indigenous villages of the state of Tocantins, this study aims to describe this reality through the application of dental health indices (DMF-T and the quantification of use and need for prostheses), clinical evaluation and questionnaires that characterize the individual in the socioeconomic and demographic context through a cross-sectional observation system. From this methodology, it is shown that, to date, 268 individuals were evaluated in two villages (Canuanã and Txuiri) located on the Bananal Island. Of these people, 69.1% need rehabilitation with prostheses and 17 had some alteration in soft tissues, requiring laboratory investigations from biopsies. Furthermore, there is an average of 7.26 teeth decayed, missing or filled by each person's mouth. Analyzing this result from the perspective of independent variables, it is pointed out that "age" is significant ($p < 0.05$) for the occurrence of caries pathology. Besides, for a young population, this represents a very high result, which should be used as a precept for the articulation of preventive and curative odontological measures in the tribes analyzed, since this assertion is supported by the National Policy of Attention to Health of Indigenous People of Brazil.

Keywords: Indigenous Organizations; Health of Indigenous Peoples; Health Services; Dentistry; Epidemiology

Abbreviations

CEULP: Centro Universitário Luterano de Palmas; DMF-T: Decayed, Missing and Filled Teeth; IBGE: Brazilian Institute of Geography and Statistics; SPSS: Statistical Package for the Social Sciences; UL-BRA: Universidade Luterana do Brasil; WHO: World Health Organization.

Introduction

From the construction of a historical process that undid the perpetuity of the action of basic rights, today, indigenous peoples constitute one of the most marginalised and disadvantaged social groups [1]. As a dental reflex of this categorization, it is indicated that these people coexist with edentulism five times more frequently than the non-indigenous population [1].

In this context, it is known the epidemiological invisibility of these people, through the presence of widely dispersed studies, precluding the accurate analysis of a significant indigenous population in the Brazilian territory [2,3].

From this perspective, the difficulty in constructing ways to improve the representativeness of health indices is inferred, since cross-sectional studies are responsible for indicating pathways that should guide public and collective health measures [4].

With this low tendency of interventions in relation to indigenous problems, especially in the field of oral health, and the existence of studies that focus only on the region of the Xingu National Park [3], excluding people from other regions, observes the Justification for this study. Therefore, we intend to develop a cross-sectional analysis with a social understanding of the causal factors of oral pathologies in soft and hard tissues, mainly through the application of validated indexes [5].

The relevance of these analyses becomes public by means of reports describing an average of 9.85 decaged teeth, lost or filled in their population of Amazonian origin [6]. A value considered too high for a population of adolescents and of moderate character for adults [5].

Therefore, living in a nation where the guarantee of access to the health of indigenous people through public measures is an acquired right [7], it is the duty of odontological epidemiology to identify the prevalence of oral vicissitudes and correlate it with its causal factors in order to solve the problem.

Materials and Methods

This is a purely methodological research, with a qualitative-quantitative approach in a descriptive way, using a transversal procedure to obtain its results. In addition, the present study was submitted and approved by the Research Ethics Committee of CEULP/ULBRA under Protocol 105354/2017.

Within the territorial perspective, it is indicated that this is a partial analysis, in which only two tribes (Canuanã and Txuiri) were evaluated located on the Bananal Island, in the state of Tocantins.

In addition, this research is based on applications of the De-cayed, Missing and Filled Teeth index (DMF-T) for the population assessed [5] and qualitative analyses on the use and necessity of dental prosthesis [8]. In addition, clinical examinations of soft tissues were used for a complete intraoral dental examination.

From the social point of view, it is indicated that the questionnaire validated by the Project SB Brasil 2010 [8] was used to assist in the socio-economic and demographic characterization of the population.

It is indicated that these evaluations will be carried out under the acceptable biosafety conditions to guarantee the health of the evaluators and evaluated during the consultations that prioritize the control of risks with the use of personal protective equipment (gloves, masks, glasses and cap) and with all sterilized instruments.

After collecting all the data, they were typed into a spreadsheet previously planned in the statistical Package for social Sciences (SPSS) program with the variables to be studied. After all the data entered, they were analyzed by a binary logistic regression, where a hierarchy established between a dependent variable (for this text is defined mainly the presence and absence of caries disease) and its Proximity to the various independent variables of this study.

In this perspective, proximity levels were established between the independent variables and their relationship with the presence of caries. At the distal level, the socioeconomic and demographic characteristics were highlighted; The use of dental services is at the intermediate level and self-perceived oral health is representative of a proximal level of caries [9].

Results and Discussion

It is inferred that, for this partial-nature analysis, data from 268 individuals were collected through the application of socio-economic and demographic characterization questionnaires, besides the use of a clinical examination that was used to describe the situation of soft tissues and the teeth, these with the application of the DMF-T index.

It is also described that adult women are part of the most prevalent population group of this analysis, as described in Table 1, where it is possible to observe the description of all socio-demographic and economic factors of the evaluated.

Variables	Canuanã N (%)	Txuiri N (%)	Total N (%)
Sex			
Male	77 (44,0)	41 (44,6)	118 (44,2)
Female	97 (55,4)	51 (55,5)	148 (55,4)
Age group			
Childhood	32 (18,3)	18 (19,6)	50 (18,7)
Kid	28 (16,0)	20 (21,7)	48 (18,0)
Teenager	31 (17,7)	20 (21,7)	51 (19,1)
Adult	64 (36,6)	30 (32,6)	94 (35,2)
Elderly	20 (11,4)	04 (4,3)	24 (9,0)
Rooms used			
1 or 2 bedrooms	34 (64,2)	23 (42,6)	56 (52,8)
3 or 4 bedrooms	17 (32,1)	28 (51,9)	45 (42,4)
5 or 6 bedrooms	02 (3,8)	03 (5,6)	05 (4,7)
Income (in minimum wage)			
Less than 1 minimum wage	24 (64,9)	24 (57,1)	48 (60,8)
Between 1 and 2 minimum wages	09 (24,3)	13 (31,0)	22 (27,8)
Between 2 and 3 minimum wages	03 (8,1)	02 (4,8)	05 (6,3)
Greater than 3 minimum wages	01 (2,7)	03 (7,1)	04 (5,1)
Scholarity			
Illiterate	09 (17,0)	04 (7,5)	13 (12,2)
Until the fifth grade	07 (13,2)	0 (0,0)	07 (6,6)
Elementary School Incomplete	15 (28,3)	23 (43,4)	38 (35,8)
Complete Primary Education	10 (18,9)	03 (5,7)	13 (12,2)
Incomplete High School	05 (9,4)	08 (15,1)	13 (12,2)
Complete High School	05 (9,4)	12 (22,6)	17 (16,0)
Incomplete Higher Education	01 (1,9)	02 (3,8)	03 (2,8)
Full Higher Education	01 (1,9)	01 (1,9)	02 (1,8)

Table 1: Socio-demographic and economic data of the evaluated population.

Moreover, in the case of the socioeconomic characterization of the population, it is possible to indicate that most of the individuals evaluated have a monthly income lower than a minimum wage. These data are similar to those described in the literature, since some authors indicated that 26.04% of the Indians evaluated by the

National Oral Health Survey [10] had income lower than r $500.00 and 54.16% received R $501.00. R $1,500.00 [2].

In addition to this financial and demographic perspective, it was observed the need to conduct an analysis of the use of dental services by the population studied - as presented in table 2. This analysis is necessary since the access to the dental surgeon is an intermediary condition for the outcome of oral pathologies, such as caries [9].

Variables	N (%)
Have you ever been to the dentist?	
Yes	98 (89,9)
No	9 (8,3)
Do not know/Did not respond	2 (1,8)
Total	109 (100)
Where was the last consult with the dentist?	
Public service	75 (73,5)
Private Service	17 (16,7)
Health plan or agreements	5 (4,9)
Others	1 (1,0)
Never went to the dentist	2 (2,0)
Do not know/Did not respond	2 (2,0)
Total	102 (100)
When was the last consult with the dentist?	
Less than a year	41 (39,4)
One to two years	25 (24,0)
Three years or more	16 (15,4)
Others	5 (4,8)
Never went to the dentist	2 (1,9)
Do not know/Did not respond	15 (14,4)
Total	104 (100)
What was the reason for the last consult with the dentist?	
Inspection	27 (25,7)
Prevention	7 (6,7)
Pain	23 (21,9)
Extraction	8 (7,6)
Treatment	32 (30,5)
Never went to the dentist	3 (2,9)
Do not know / Did not respond	5 (4,8)
Total	105 (100)
How do you judge the treatment of the last consult in the dentist?	
Very good	11 (11,3)
Good	61 (62,9)
Regular	12 (12,4)
Bad	6 (6,2)
Too bad	3 (3,1)
Never went to the dentist	2 (2,1)
Do not know/Did not respond	2 (2,1)
Total	97 (100)

Table 2: use of dental services.

From these analyses, it is described that 8.3% of the population has never been to the dentist and, of those who have been, it is observed a predominance of the use of public service to solve the problems developed by 75% of those evaluated.

In a proximal view of oral pathologies [9], it is described that 78.1% of those questioned believe that they need dental treatment, although 57.9% indicate that they did not feel toothache in the last 6 months. Furthermore, the questionnaire revealed that 46.2% of the patients were satisfied or very satisfied with their teeth, contrary to the 26.4% who described dental dissatisfaction and the 19.8% who were neutral to any description.

In this sense, using the methodology described by the DMF-T index, graph 1 describes the overall mean of this index for the entire population evaluated, generating an average result of 7.26 decayed, lost or filled teeth in each individual's mouth. It should be emphasized that the second component of the index (about the missing teeth) was the most prevalent, followed by the carious and filled component.

Graph 1: Mean of DMF-T results and their components across the evaluated population.

In a similar perspective, the results of the application of the dmf-t index to the deciduous dentition in graph 2 are described. For the infant population, a more significant result is indicated for the component that describes the average decayed teeth, followed by the components "filled" and "with indicated extraction".

Graph 2: Mean of the results of the dmf-t and its components throughout the evaluated population.

Regardless of the index applied for the basic analysis of the measurement of decayed, missing and filled teeth, these are results with an average categorized as "high" from the perspective of people up to 12 years old. However, these values are classified as low for an adult population, where a moderate DMF-T exceeds the average of 9 [5].

In a comparative context, it is described an evaluation (Brasil 1-118) of 308 individuals who identified themselves as indigenous within the regions analyzed by a cross-sectional study. Of these, it is pointed out that the average DMF-T found in this population was 10.9, a moderate value [2,5].

However, it is noteworthy that, in addition to our study use a population lower than that highlighted by an analysis performed at the national level, lower results are also described from the perspective of the index used. But, it is salutary to describe that in both studies it is possible to describe a significant prevalence of caries and missing teeth in the populations observed.

With this interpretation, it is indicated the need for analysis to observe which aspects of the life of the Indians are influencing their oral health. This reasoning becomes significant based on the postulates described in the literature [1], which indicate indigenous vulnerability, since this population experiences edentulism five times more often than non-indigenous people.

To achieve this goal, a binary logistic regression was used through the dichotomy between the presence and absence of a disease with the regional prevalence studied in this study: caries. Observing the possibility of this analysis, a linear view of the several independent variables analyzed was performed in order to verify whether they all complied with the principle of non-multicollinearity required.

To accomplish this statistical interpretation of the variables, the presence of caries was correlated with a hierarchy of factors that correlate to this pathology, at distal, intermediate or proximal levels [6,9,11].

Initially, an analysis was made based on sociodemographic factors, characterized at a level distal of caries (Table 3). From this, it was concluded that the variables "Age" and "Sex" were relevant for the construction of the model and, for the latter variable, there are no significant differences between the results predicted by the model and those observed in the distributed population, according to the results of the Hosmer and Leme show test.

It is emphasized a positive relation ($p < 0.05$) for the presence of caries and the age of individuals in the population [12]. Even with this perspective, this study still consists of an analysis where in this relevant variable there are observed values divergent from those expected by the mathematical sample (Hosmer and Lemeshow > 0.05).

Related variable	Omnibus test for the model	OR	IC (95%)	Naguelkerke R² (%)	Test Hosmer and Lemeshow	p
Village	0,306	0,735	0,405 – 1,334	0,6	-	0,312
Age	0,024*	0,983	0,971 – 0,996*	4,1	0,071	0,011*
Sex	0,041*	0,776	0,443 – 1,359	4,5	0,000*	0,375

Table 3: Relationship between sociodemographic factors to the presence of caries.

Continuing with the analyses, still at the distal level of caries, table 4 indicates the relationship of this disease with socioeconomic factors, in order to indicate a heterogeneous distribution of the disease in view of the variables that assessed the schooling and monthly income of the population. Moreover, it was indicated that these characteristics lead the model to explain only 0.2% to 0.3% of the variations in the presence of cavities, according to the results of the Naguelkerke R2 test. This perspective is not based on data found in some studies [11], which cite the positive association between high income and absence of caries.

Related variable	Omnibus test for the model	OR	IC (95%)	Naguelkerke R² (%)	Test Hosmer and Lemeshow	p
Schooling	0,721	1,045	0,819 – 1,335	0,2	0,424	0,722
Monthly income	0,911	0,924	0,488 – 1,749	0,3	0,460	0,808

Table 4: Relationship between socioeconomic factors to the presence of caries.

In an intermediate view of the proximity to caries disease, we describe the access to dental services described by the population itself and its relationship with the presence of caries disease and its multifactorial definition (Table 5). However, it is inferred that, for the data found, this system had little influence on the variations in the prevalence of this pathology.

Related question	Omnibus test for the model	OR	IC (95%)	Naguelkerke R^2 (%)	Test Hosmer and Lemeshow	p
Did you ever go to the dentist?	0,570	1,458	0,393 – 5,406	0,4	0,426	0,573
Where was the last dental consultation?	0,519	1,741	0,752 – 2,195	1,8	0,250	0,358
When was your last dental appointment?	0,719	0,976	0,743 – 1,282	1,9	0,884	0,860
What was the reason for the last dental consultation?	0,818	0,946	0,742 – 1,205	2,1	0,846	0,652
What did you think about the last dental consultation?	0,793	1,231	0,782 – 1,938	3,3	0,345	0,370

Table 5: Relationship between access to dental services to the presence of caries.

In addition, it is pointed out that this access to dentistry, from the perspective of indigenous peoples, should be well analyzed, since some studies [13] indicate that the distance from the villages to the health centers is the main responsible for the lack of use of these services.

Table 6 shows the relationship between self-perception in oral health and caries disease, since this self-knowledge is described as a factor at the proximal level to the disease [9].

Related variable	Omnibus test for the model	OR	IC (95%)	Naguelkerke R^2 (%)	Test Hosmer and Lemeshow	p
Level of satisfaction with the teeth in the mouth	0,203	1,258	0,881 – 1,798	2,2	0,938	0,207
Believing you need dental care	0,440	1,067	0,459 – 2,481	2,3	0,139	0,881
Presence of toothache in the last 6 months	0,391	1,645	0,711 – 3,804	4,1	0,580	0,245
Pain range felt in the last 6 months	0,142	1,55	0,972 – 2,473	9,3	0,460	0,06
Consider using or replacing a prosthesis	0,198	0,854	0,533 – 1,369	9,8	0,543	0,512
Presence of problems caused by teeth	0,288	1,127	0,403 – 3,152	9,9	0,656	0,820

Table 6: Relationship between self-perception of oral health and presence of caries.

Furthermore, table 6 shows the relationship between self-perceived oral health and caries disease, since this self-knowledge is described as a factor at the proximal level of the disease [9].

By observing the results, especially for the large scale established between the values of the confidence interval, it is indicated that, for the current population of the study, these variables were not significant for the model that correlated them with the presence of caries disease.

However, it should be noted that the variable "presence of problems caused by teeth" is subdivided into 9 other questions. They are: "Did you have trouble eating because of your teeth?"; "Do teeth bother while brushing?"; "Do the teeth make you nervous?"; "Does not come out by the tail of the teeth?"; "Did you stop practicing sport because of your teeth?"; "Did you have difficulty speaking because of your teeth?"; "Were your teeth ashamed to speak or smile?"; "Do your teeth get in the way of studying or working?" And "Did you stop sleeping because of your teeth?"

Grouping them into a single hierarchical block in the binary linear regression analysis, the Omnibus Test for the model has a statistically significant relevance (p = 0.048) and these questions are able to explain 31.3% of the variations in the dichotomy between the presence and absence of caries in the individuals, as observed

in the Naguelkerke R2 test. However, this significance is not observed in the Hosmer and Lemeshow test, indicating that there are statistical differences between the predicted and observed results for this model.

In addition, Table 7 indicates the application of the evaluation of the use and necessity of prosthesis in the population. It should be noted that the total percentage of 30% of the evaluated population requires the use of these devices to help maintain oral homeostasis. This result reflects the significant number of lost elements observed in the population (Graph 1) and resembles the 35.6% of people who have the self-perception of this urgency.

Variables	Canuanã N (%)	Txuiri N (%)	Total N (%)
Use of prosthesis			
Upper arch			
Dentures	15 (60)	1 (12,5)	16 (48,5)
Removable Partial Prosthesis	10 (40)	7 (87,5)	17 (51,5)
Lower arch			
Dentures	8 (53,3)	1 (33,3)	9 (50)
Removable Partial Prosthesis	6 (40)	2 (66,7)	8 (44,4)
One Fixed Partial Prosthesis	1 (6,7)	0 (0,0)	1 (5,6)
NEED FOR PROSTHESIS			
Upper arch			
Dentures	11 (35,5)	1 (11,1)	12 (30)
Removable Partial Prosthesis	2 (6,5)	1 (11,1)	3 (7,5)
One Fixed Partial Prosthesis	1 (3,2)	0 (0,0)	1 (2,5)
More than one Fixed Partial Prosthesis	17 (54,8)	7 (77,8)	24 (60)
Lower arch	16 (44,4)	2 (20)	18 (39,1)
Dentures	2 (5,6)	1 (10)	3 (6,5)
Removable Partial Prosthesis	0 (0,0)	0 (0,0)	0 (0,0)
One Fixed Partial Prosthesis	18 (50)	7 (70)	25 (54,4)
More than one Fixed Partial Prosthesis			

Table 7: use and need for prosthesis.

In a final analysis, it is pointed out that, from an enlarged view of the oral tissues, 17 patients (6.35% of the total study population) presented some alteration in the evaluation of the jugal mucosa, mouth floor, tongue and hard palate and soft palate. Of these, we highlight the significant prevalence of solid lesions greater than 3 millimeters [14], but it is inferred that no blisters or vesicles were found [15].

Conclusion

From the point of view of the DMF-T index, it is inferred the relevant results described by this partial analysis. The high prevalence of missing dental elements in the population evaluated is a factor to be highlighted. Within this characteristic, it is described

that the model indicates that the population variations of age and sex are significant factors for the modulation of the presence of caries.

It is also noteworthy that, in the economic sense, 60.8% of the evaluated individuals have lower incomes than a minimum wage and are users of the services provided by the unified Health System. Therefore, it is up to the dentist to identify and perform the necessary conducts for the control of oral pathologies that can be identified in soft and hard tissues. However, this goal can only be achieved with governmental participation, using precepts articulated by the National Health Care Policy of Indigenous People of Brazil.

Acknowledgements

Conflict of Interest

This research does not present a conflict of interests.

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