



Curricularization of a Technical Course in Oral Health at the High School Level for the Indigenous Community in Xingu: An Environmental Analysis

Sergio Rodrigues¹, Marcelo Palinkas^{1*}, Selma Siéssere¹, Maria Fernanda Rodrigues dos Santos², Wilson Mestriner-Júnior³, Isabela Hallak Regalo¹, Caio Vieira de Barros Arato⁴, Carla Moreto Santos¹ and Simone Cecilio Hallak Regalo¹

¹Department of Basic and Oral Biology, Faculty of Dentistry of Ribeirão Preto, University of São Paulo, São Paulo, Brazil

²Department of Medicine, UNAERP, Ribeirão Preto, São Paulo, Brazil

³Department of Stomatology, Collective Health and Forensic Dentistry, Faculty of Dentistry, Faculty of Dentistry of Ribeirão Preto, University of São Paulo, São Paulo, Brazil

⁴Department of Dentistry, Faculty of Dentistry of Piracicaba, FOP, UNICAMP, Brazil

*Corresponding Author: Marcelo Palinkas, Department of Basic and Oral Biology, Faculty of Dentistry of Ribeirão Preto, University of São Paulo, São Paulo, Brazil.

DOI: 10.31080/ASDS.2023.07.1691

Received: July 18, 2023

Published: August 04, 2023

© All rights are reserved by Marcelo Palinkas., et al.

Abstract

Background: It is important to emphasize oral health and adopt care practices that address physical, social, and community aspects of a culture to promote health. This descriptive observational study aimed to perform a geographic and cultural environmental analysis of the indigenous peoples of Xingu with the intention of adapting/adjusting a curriculum model for a dental health technician course.

Materials and Methods: Data collection was based on studies published in databases such as PubMed, SciELO, and LILACS, as well as grey literature sources such as the Federal Constitution, laws, government documents, and parliamentary records. The descriptors used were health care, dentistry, evidence-based dentistry, indigenous peoples, Indians, and Xingu, combined with boolean operators <and> and/or <or>. Qualitative and quantitative methodological studies were included to ensure maximum coverage of the topic.

Results: The study underscores the importance of adapting and adjusting the dental health technician curriculum to address local specificities and preserve evidence-based dentistry principles. This adaptation is vital in bolstering cultural, geographic, and collective aspects, attracting human resources, and defining a healthcare model for the indigenous community of Xingu. The primary focus lies in promoting health, implementing preventive measures, and ensuring access to curative treatments.

Conclusion: The adaptation/adjustment of the dental health technician curriculum is crucial in providing effective dental care to the indigenous community of Xingu. By considering the region's unique characteristics and integrating evidence-based dentistry principles, a health model can be developed to better meet the community's needs. This approach aims to improve healthcare practices, promote oral health, and address preventive and curative measures. Implementation of these measures is expected to significantly enhance the overall oral health of the indigenous community of Xingu.

Keywords: Indigenous Population; Xingu; Oral Health; Technician; Dentistry

Abbreviations

CFE: Federal Council of Education; DMFT: Decayed, Missing, Filled Teeth; DSEI: Special Indigenous Health Districts; FUNAI: National Indian Foundation; FUNASA: National Health Foundation; LILACS: Latin American and Caribbean Literature on Health Sciences; NGOs: Non-governmental organizations; SasiSUS: Indigenous Health Care Subsystem; SciELO: Scientific Electronic Library Online; SUS: Unified Health System; TSBs: Dental Hygienists; UBS: Basic Health Unit; UNIFESP: Federal University of São Paulo; WHO: World Health Organization

Introduction

With the aim of promoting health, particularly in relation to oral health, care practices, whether curative, preventive, or promotional, must address the challenges imposed by various factors that shape the social and community aspects of a particular culture. Evidence-based practice primarily involves adapting dialogue and tools to the reality of the community in which a specific clinic or action is proposed to be carried out [1].

Therefore, it is important to understand and adapt to various factors, including epidemiological, social, and structural factors that shape the community, especially indigenous communities settled in different Brazilian states, given their language, communication, and understanding of health and care models, which often differ from the traditionally and commonly employed models in non-indigenous Brazilian society [2].

Such adjustment and incorporation of the reality of the studied community should be a *sine qua non* condition for the ethics of the proposed research object, as spaces should not be seen as mere geographical boundaries devoid of experiences, but as “social spaces” composed of subjects, cultures, relationships, beliefs, and structures that shape their own peculiarities and require consideration when being investigated, especially when such investigation suggests experimentation with the aim of “improving” the local condition [3].

Following the aforementioned logic, a partnership process between the university that conducted this study and the indigenous community in the Xingu region, Mato Grosso, proposes, through an understanding of the local reality and considering local specificities, the adaptation/adjustment of a dental health technician course for indigenous peoples. This adaptation is based on evidence-based practice, thus ensuring alignment with the principles of evidence-based dentistry.

The objective of this study was to conduct a geographic and cultural environmental analysis of the indigenous peoples of Xingu with the intention of adapting/adjusting a curriculum model for a dental health technician course for the local community.

A main motivation of this study is to perform a geographical and cultural environmental analysis of the indigenous peoples of Xingu. By conducting this analysis, researchers can identify specific oral health needs and challenges faced by this community. This information is essential to design a dental health technician curriculum that is relevant and effective in addressing prevalent oral health issues within the indigenous community.

Materials and Methods

As this study involved observational and descriptive research using secondary data, the data collection process relied on critical observation of previously published scientific research available in major databases. Combinations of keywords were adapted for each of the six selected electronic databases as sources of information: Embase, PubMed (including Medline), LILACS, LIVIVO, Scopus, and Web of Science. Additionally, grey literature sources such as Google Scholar and OpenGrey were utilized, including the Federal Constitution, laws, government documents, and parliamentary records.

The inclusion criteria were as follows: literature, both published and grey, discussing the subject in Portuguese, English, or Spanish; qualitative and quantitative methodological studies. The exclusion criteria were as follows: literature not in Portuguese, English, or Spanish. Articles published between 1977 and 2021 were selected.

Results

The results of this study highlight the importance of adapting and adjusting the curriculum of a dental health technician course, considering local specificities and the need to preserve evidence-based dentistry concepts. This adaptation is crucial to reinforce cultural, geographical, and collective preferences, as well as to attract human resources and define a health model that meets the needs of the indigenous community of Xingu, encompassing aspects of promotion, prevention, and healing. The study also mentions the national policy for indigenous healthcare, emphasizing the significance of respecting the conceptions, values, and practices related to the health-disease process inherent to each indigenous society and its different experts. Additionally, the study emphasizes the need to provide technical training and capacity building for residents so that they can provide appropriate healthcare to their own community, eliminating dependence on external assistance.

In epidemiological terms, the current health situation of indigenous peoples in Brazil is addressed, highlighting the transition that many groups are undergoing from a situation of low prevalence of oral diseases to high prevalence, especially dental caries, due to socioeconomic and cultural changes resulting from contact with Western society. Finally, the study addresses the regulation of the Dental Health Technician (TSB) profession in Brazil, mentioning the importance of adapting the course curriculum to meet the needs of local indigenous tribes, as well as the need to pay attention to the clinical and educational actions of TSBs without the physical presence of a dentist, if there is adequate technical training.

Discussion

Indigenous population and the rights achieved

Portugal's colonial history in Brazil caused aggression, human rights abuses, land seizures, and slavery, particularly affecting African slaves and indigenous peoples. These aggressions led to devastating consequences, wiping out entire populations at times. However, in the era of the republic and with the exploration of ethnic identities by anthropologists and sociologists, there has been a growing recognition of indigenous rights and increased study of their culture [4].

The Federal Constitution of 1988, also known as the Citizen Constitution, is Brazil's current governing document. It is the seventh constitution since independence in 1822 and is considered “citizen oriented.” The constitution grants various rights to indig-

enous peoples and ethnic minorities, acknowledging their original rights over the lands they traditionally occupy. Article 231 specifically recognizes that these lands are intended for their permanent possession, allowing exclusive use of the natural resources within them [5].

It is evident that despite constitutional rights, various legal mechanisms have been employed to undermine the rights that have been achieved, particularly in the last legislative period with the exploitation tactics and continuous dismantling of policies and institutions that protect indigenous peoples in Brazil, such as the National Indian Foundation (FUNAI).

Various research on ethnic identities highlights the need to examine their influence on the field of law and the recognition of indigenous identity as per the Federal Constitution. Although the Constitution is seen as a significant step in acknowledging the rights of indigenous peoples, its practical effectiveness in ensuring such recognition still requires substantial improvement. Some jurists openly criticize the Constitution, labeling it a “soulless constitution” as it grants rights to minorities without providing the necessary enforcement and protection to fully uphold those rights.

It is important to highlight that in addition to fundamental rights grounded in the principles of human rights and the United Nations Charter, the rights of indigenous peoples are based on the recognition and preservation of their cultural identity. Their culture should not be subjected to any judgment, interference, or adjustment by non-indigenous colonizers. This is because various authors and ethnologists have raised criticisms regarding the oppressive role of Europeans during their arrival in Brazil [1].

Therefore, it is essential to recognize the ethnic identities of diverse indigenous peoples based on legal, moral, and ethical principles in order to understand their culture and way of life, including their understanding of health. This recognition allows for the adaptation of tools used in non-indigenous or “white” culture, as preferred by colonizers, to promote autonomy and enable independence in various ways of practicing healthcare, for instance [6].

The term “practicing healthcare” should be understood in an individual and minimally communal manner, according to the cultural criteria established by a particular group of people, such as indigenous peoples. This is because the understanding of knowledge varies across different societies. Therefore, cultural adaptation of programs proposed by non-indigenous individuals should be a *sine qua non* condition for the emancipation, autonomy, and independence of indigenous peoples who will utilize these tools [7].

Thus, as previously mentioned, as a fundamental basis for indigenous rights, the International Labour Organization Convention No. 169, adopted in 1989, states in Article 2, verbatim: “Art.

2. The governments shall have the responsibility for developing, with the participation of the peoples concerned, a coordinated and systematic action to protect the rights of these peoples and to guarantee respect for their integrity.” This convention emphasizes the importance of government responsibility in collaboration with indigenous peoples to protect their rights and ensure respect for their integrity [8].

Therefore, in addition to the legal and juridical aspects, these regulations presuppose cultural respect based on moral and ethical criteria, aiming to establish ethnic integrity without the influence and propositions of non-indigenous individuals on indigenous peoples [7,9]. The parameters for these regulations should be based on local knowledge through prior cultural immersion, particularly in a delimited ethnographic context that respects the established knowledge and practices within the historical and constructive process of that society.

To address indigenous health specifically, the I National Conference on Indigenous Health Protection in 1986 and the II National Conference on Health for Indigenous Peoples in 1993 were held because of recommendations from the VIII and IX National Health Conferences, respectively. These conferences proposed the establishment of a differentiated care model based on the strategy of Indigenous Special Sanitary Districts (DSEI) to ensure indigenous peoples’ right to universal and comprehensive health access.

This approach aims to meet the perceived needs of the communities and involve the indigenous population in all stages of planning, implementation, and evaluation of health actions.

It is argued, however, that despite the significant progress aimed for and achieved through these conferences, it is necessary to provide means for the empowerment of the community. This empowerment should not be seen as a passive role in the process but as an active participant, including in the act of practicing healthcare and professionalization [7].

National policy for indigenous peoples’ health care

The National Policy for Indigenous Peoples’ Health Care, approved by Ordinance No. 254 of the Ministry of Health on January 31, 2002, is a significant regulatory milestone for the Ministry of Health. It aims to improve the conceptualization of health and healthcare services for indigenous peoples. However, it criticizes the use of non-indigenous human resources in healthcare as detrimental to their well-being. This policy was regulated by Decree No. 3,156 in 1999, which outlines the conditions for healthcare assistance to indigenous peoples. Additionally, Provisional Measure No. 1,911-8 addresses the transfer of resources and assets from FUNAI to FUNASA for healthcare activities. To strengthen this approach, Law No. 9,836/99 establishes the Indigenous Health Care Subsystem within the Unified Health System (SUS).

The implementation of the National Policy for Indigenous Peoples' Health Care necessitates adopting a complementary and differentiated service model to protect, promote, and restore health. This approach aims to uphold indigenous people's citizenship and considers local biological and social specificities. Following the policy's adoption, FUNASA and FUNAI shared responsibilities for indigenous health care, leading to fragmented and conflicting actions. This has resulted in setbacks in the progress of care achieved through political and institutional endeavors. Both entities had previously formed partnerships with municipalities, indigenous and non-governmental organizations, universities, research institutions, and religious missions.

However, the agreements entered had limited definition of objectives, goals to be achieved, and impact indicators on the health of the indigenous population. It is important to clarify that, as previously mentioned, in addition to overcoming the fragmented aspect of care for this population, the specificities of indigenous territories should be considered, such as their demographic, epidemiological, and cultural characteristics [7].

Therefore, regardless of the failures and limited gains achieved, the purpose of this policy is to guarantee indigenous peoples' access to comprehensive health care in accordance with the principles and guidelines of the SUS. It encompasses social, cultural, geographic, historical, and political diversity in order to overcome the factors that make this population more vulnerable to major health issues among Brazilians. It recognizes the effectiveness of their traditional medicine and their right to preserve their culture.

Guidelines for the indigenous component of the national oral health policy

A document released by the Ministry of Health in 2011, titled "Guidelines for the Indigenous Component of the National Oral Health Policy," presents the Ministry of Health guidelines for organizing oral health care for indigenous peoples, considering their characteristics and specificities. These guidelines constitute the basic political axis for proposing the reorientation of conceptions and practices in the field of oral health [10], aiming to foster a new work process focused on care production while respecting autonomy, cultural differences, and the extremely diverse mosaic formed by Brazil's indigenous peoples. Recognizing that the population of Brazil's indigenous peoples understands the holistic function of the body and health, the adaptation of the work process to the proposed care model requires, among other points, as discussed:

The role of oral health professionals goes beyond technical dental work, and they should embrace interdisciplinarity and multiprofessional collaboration. This approach involves interacting with other fields to gain a holistic understanding of individuals, considering their socioeconomic and cultural context. Comprehensive care entails joint efforts in promotion, protection, prevention,

treatment, healing, and rehabilitation at both individual and collective levels. Social behaviors directly impact individual perspectives, emphasizing the significance of collective actions.

To effectively address the health of indigenous peoples, it is crucial to shift from the Westernized model to one that incorporates the spiritual dimension in defining the health-disease process. Understanding other factors influencing the health-disease process, such as recovery and rehabilitation, is essential. A culturally sensitive model of care that values indigenous perspectives can guide various oral health activities, acknowledging that certain treatments may not align with the group's beliefs.

Indigenous traditional health systems are based on a holistic approach to health, where the harmony of individuals, families, and communities with the surrounding universe is a guiding principle [7]. Healing practices respond to each community's internal logic and are the product of their relationship with the spiritual world and the beings of the environment in which they live. These practices and conceptions often represent resources of health with empirical and symbolic efficacy. They should be considered to empower local inhabitants and acknowledge the significance of their symbols and myths in the process of illness and healing.

Therefore, improving the health status of indigenous peoples does not occur simply through the transfer of knowledge and technologies from biomedicine, treating them as passive recipients devoid of knowledge and practices related to the health-disease process. Instead, it requires a diverse exchange of knowledge (from indigenous and non-indigenous sources) that, together and in a complementary manner, intensify care and promote an improvement in quality of life [7].

The principle that permeates all guidelines of the National Policy for Indigenous Peoples' Health Care is respect for the conceptions, values, and practices related to the health-disease process inherent to each indigenous society and its various experts. Therefore, engaging with these knowledge systems and practices should be encouraged to achieve improvements in the health status of indigenous peoples.

Special indigenous health districts (DSEI)

The DSEI is a dynamic and culturally sensitive service organization model. It caters to local and decentralized indigenous populations, aiming to rationalize and improve healthcare measures. The DSEI's objective is to reorganize the health network, provide qualified health care, and manage administrative activities, all while encouraging social control in accordance with local specificities.

Each district organizes an orderly network of primary health care services within indigenous areas, integrated and hierarchically structured with increasing complexity, and linked to the SUS

(Unified Health System) network. It is important to note that this process, despite being integrative, primarily considers the biomedical model, including hierarchical classification of care. This approach has been surpassed in the construction of the Western healthcare model, which emphasizes health promotion and strategic literacy to prevent the onset of adversities [11].

Among the responsibilities of the DSEIs, the following stand out: preparation of human resources for intercultural work, monitoring of health actions targeted at indigenous peoples, coordination of indigenous traditional health systems, promotion of appropriate and rational use of medications, promotion of healthy environments, and protection of indigenous health [12].

The indigenous population and the Xingu national park

The Xingu National Park was established by Decree No. 50,455 on 04/14/1961, signed by President Jânio Quadros and regulated by Decree No. 51,084 on 07/31/1961. Adjustments were made through Decrees No. 63,082 on 08/06/1968, and No. 68,909 on 07/13/1971, with the final perimeter of the park being demarcated in 1978. The park, located in the northern and central-west regions of Brazil, was created to protect indigenous communities and native peoples. However, due to involvement from the legislative and executive branches of Mato Grosso, land within the park's perimeter was granted to colonization companies. The park is named after the Xingu River, a tributary of the Amazon River that runs through the region.

Indigenous peoples are found in all Brazilian states except Piauí and Rio Grande do Norte, residing in 579 indigenous lands that cover around 12% of the national territory. Some also live in urban areas, facing vulnerabilities due to Brazilian inequalities influenced by neoconservative capitalism [10]. In 1991, the Xingu National Park had a population of 3,500 individuals from 15 distinct indigenous groups in three regions: Upper, Middle, and Lower Xingu [13]. Currently, the park covers an area of 27,000 km² and is home to an estimated 4,500 indigenous people, according to the 2010 census.

Brazil's total indigenous population is approximately 370,000, belonging to about 210 peoples speaking over 170 identified languages. Each group has unique ways of understanding and organizing their world, including social, political, and economic systems, as well as their relationship with the environment and territory. Respecting these differences is crucial, primarily based on the constitutional rights achieved by this ethnic minority.

Each outpost supports the logistics of projects and activities developed in the park, such as education and healthcare. In all of them, there is a Basic Health Unit (UBS), where indigenous health agents work. These agents are the first category of professionals that includes residents and act as traditional community health workers. There are also employees from the Federal University of

São Paulo (UNIFESP), which has a partnership with FUNASA. Additionally, there are eleven Surveillance Posts along the boundaries of the territory, located on the banks of the main rivers that form the Xingu [14,15].

The well-regulated Xingu Indigenous Park, with government support and collaborations with universities and associations, safeguards the preservation of indigenous culture in Brazil. Despite attempts to delegitimize them, the indigenous people in Xingu are protected from unauthorized invasion, ensuring limited contact with non-indigenous individuals unless involved in educational, healthcare, or infrastructure projects within the park. As discussed by several ethnographic and anthropological authors, the preservation of habits and ways of life has diminished with constant contact with the non-indigenous population. For example, the prolonged period of breastfeeding of babies is cited. As highlighted by Fagundes-Neto., *et al.* [16], most children are breastfed until the age of two and often continue breastfeeding during their mother's subsequent pregnancies. As a result, children preserve their oral instincts through extended breastfeeding and consistent feeding, which allows for efficient use of their dentition.

The diet of the Xingu peoples is based on cassava and its derivatives, such as beiju, flour, porridge, and fish caught in the tributaries of the Amazon River. Red meat is included in the Xingu diet during certain periods of the year and consists of monkey meat and certain birds like mutum and jacu. Fruits such as pequi, banana, orange, and various species of small coconuts are also part of their diet [16-18]. Alligator meat is highly appreciated and is part of the diet of specific ethnic groups.

For over forty years, UNIFESP, with the support of FUNASA, has been providing healthcare assistance to indigenous people in the Xingu National Park. Their efforts include training indigenous health agents, hiring nurses, doctors, and dentists to work within the park, and providing infrastructure, materials, and medications for the UBSS in the area. However, there is a lack of focus on developing the skills of residents through technical courses to enable them to serve their own community directly.

The healthcare provided by non-indigenous professionals follows a biomedical model with a curative-centered hierarchical concept. Specialized services are accessed through hospital care in Canarana or at UNIFESP for more complex cases. Dental healthcare faces a significant shortage in the Xingu National Park, but efforts are being made to address this issue through a partnership involving the Ribeirão Preto School of Dentistry, FUNAI, and UNIFESP under the Xingu Project, which aims to provide dental healthcare assistance.

In order to address this lack and empower the local residents, efforts are being made to provide technical courses that would en-

able self-sufficiency, eliminating the need for external assistance. The aim is to implement a project for professional qualification of residents, which would not only provide sufficient human resources for the population but also ensure care provided by individuals who truly understand the local characteristics [15].

Epidemiology of indigenous peoples in Brazil

In such a way, the current health situation of Indigenous peoples in Brazil is exposed, encompassing the entire diversity of Indigenous cultures, disregarding the specificities of each tribe or region. Indigenous peoples face distinct situations of social tension, threats, and vulnerability. The expansion of economic fronts (extractivism, temporary wage labor, development projects) has been threatening the integrity of the environment in their territories and their knowledge, economic systems, and social organization.

In general terms, once in constant contact with Western societies, a common trajectory can be observed in the oral health of Indigenous peoples. Socioeconomic and cultural changes resulting from this process interfere with subsistence patterns and introduce new types of food, particularly processed foods, which cause significant alterations in oral health patterns. Generally, these groups transition from a situation of low to high prevalence of oral diseases, mainly dental caries [19,20].

In general terms, there is a demographic growth among Indigenous peoples in the country, which is usually associated with the conservation of the natural environment, stabilization of inter-ethnic relations, demarcation of Indigenous lands, and improved access to primary health care services. However, reliable global data on the health situation of this population is not available, but rather partial data generated by FUNAI, FUNASA, various non-governmental organizations (NGOs), or even religious missions that have been providing health care services to these peoples through special projects.

In some regions where the Indigenous population has a closer relationship with the non-Indigenous regional population, the emergence of new health problems related to changes introduced in their way of life, especially in terms of diet, can be observed: hypertension, diabetes, cancer, alcoholism, depression, and suicide are increasingly common problems in various communities, resulting from the pronounced and prolonged interaction with the surrounding population [7].

Nevertheless, the discontinuity of actions and the lack of professionals have led many Indigenous communities to mobilize in various ways, especially through their legally constituted organizations, to acquire knowledge and control over the diseases and conditions that have the greatest impact on their health. This has given rise to local and regional processes of training Indigenous health agents and valuing traditional Indigenous medicine, with the par-

ticipation of various institutions involved in Indigenous health care [15].

The training of the technical team, particularly Indigenous health agents and Indigenous nursing assistants, has been crucial in achieving good coverage in monitoring the growth and development of children up to five years of age. The prevalence of malnutrition remains high, although there is a perceived trend of reduction in recent years. As a measure to address the problem, food supplementation with multivitamins and iron is carried out, in addition to collective treatment of intestinal parasitic infections. Alongside biomedical measures, various meetings are held in communities to discuss food security, assess the social network of each at-risk or malnourished child, and consider the sociocultural aspects involved [11].

According to the manual published by the Ministry of Health in 2019, Indigenous health in the analysis of the health situation in the Indigenous Health Care Subsystem (SasiSUS), regarding access to basic dental care services in the Indigenous health care subsystem from 2015 to 2017, the data indicates that the coverage of the first national Indigenous programmatic consultation increased from 16.51% in 2015 to 29.15% in 2017, representing an increase of 12.63% in the analyzed period [21].

Therefore, it can be stated that 29.15% of the Indigenous population had at least one dental consultation in 2017, which is considered precarious and small, as less than half of the Indigenous population had contact with dental professionals at least once. The results show that the Xingu region is classified with low coverage of the first dental consultation, ranging from 0.1% to 20%.

The need for vocational training courses for the local population in the Xingu region is highlighted to address the shortage of trained healthcare professionals. Such training would enable access to a workforce capable of providing basic healthcare attention and evidence-based guidance, particularly in tackling prevalent issues like dental caries. A descriptive study by Lemos, *et al.* [2] revealed valuable insights into the oral health condition in the Xingu DSEI. Between 2006 and 2013, the coverage of the first programmatic dental consultation remained above 60%, except for 2009 and 2010 when it dropped to 44.7% and 53.4%, respectively. The access to programmatic dental treatment declined after 2008 but was reestablished from 2011 onwards. The study also found a correlation between the decrease in dental extractions and an increase in preventive care and guidance, indicating that specialized attention helps prevent the progression of dental diseases, reducing the need for extractions.

Especially regarding the level of dental caries in Brazilian Indigenous communities, a systematic review published by Alves Filho, *et al.* [22] described that the most researched Indigenous ethnici-

ties were from Brazil, with a higher percentage of studies focusing on Indigenous communities from Xingu and Xavante (31.6%). One of the studies highlighted the positive association between tooth loss and increasing age among the Guarani Indigenous people in Brazil, with a higher proportion of gum bleeding among male adolescents and women presenting a higher number of excluded sextants due to tooth loss.

Two longitudinal studies with Xavante Indigenous people in Brazil indicated significant differences in the incidence of dental caries among different age groups and between sexes, concluding that, based on the analysis of the articles, it can be inferred that increasing age and sex differences are possible factors associated with the increase in dental caries and periodontal diseases among the Guarani and Xavante ethnicities located in Brazil.

In 2006, an epidemiological survey was conducted on the entire population over one year of age in the lower, middle, and eastern regions of Xingu Indigenous Park. The methodology used followed the guidelines recommended by the World Health Organization (WHO), and the clinical form was adapted from the model proposed for the national survey by the Ministry of Health. The prevalence of dental caries was assessed using the DMFT index (Decayed, Missing, Filled Teeth), which can range from 0 to 32. The information provided knowledge about the oral health situation in the communities, with the purpose of supporting actions to address the problem. According to data from UNIFESP's archive, the average DMFT of 12-year-old adolescents in the areas covered by the Pavuru, Diuarum, and Wawi base camps in 2006 was 2.54. This average is comparatively lower than the Brazilian average, which recorded 2.78 in 2003, and lower than the target set by the WHO in 2000, with an average of 3. However, the situation still falls short of the new WHO target established in 2010, which states that the average should be only 1 decayed tooth.

In this case, understanding the health practices of this population should be further explored, as their indices are lower than those of non-Indigenous populations, which cannot be solely explained by the absence of consumer goods such as fluoridated toothpaste and toothbrushes, as well as treated drinking water. Another possible analysis could relate to the direct relationship between prolonged breastfeeding and lower consumption of processed and cariogenic foods.

Regulation of the dental hygienist (TSB) in Brazil

Dental Hygienists (TSBs) are qualified professionals who work under the guidance and supervision of dentists and perform auxiliary tasks in dental care, focusing on the promotion, prevention, and control of oral diseases. The occupation of TSB was initially regulated by the Ministry of Education and the Federal Council of Education (CFE) through Opinion No. 460/75 (CFE, 1975),

based on the principles of the National Education Guidelines and Bases Law No. 5.692/71. Several years later, the occupation was recognized by the Federal Council of Dentistry through Decision 26/84 of 1984. However, it was only in December 2008 that Law No. 11.889 [23] was finally sanctioned by the Federal Government, regulating the profession and defining its competencies.

It should be noted that attention should be given to Law 11.899 and the proposal put forth by this project, which suggests the clinical and educational actions of TSBs without the presence of a dentist. Such attention should be discussed, as technical training and professionalization ultimately allow for the performance of various educational guidance procedures without the physical presence of a dentist.

Furthermore, it is worth highlighting that, according to Resolution 63 of 2005 by the CFO, Article 17 provides guidance on the minimum subjects that should be included in the curriculum of TSB courses. Thus, it can be demonstrated that these subjects are directly aligned with the epidemiological status of the discussed indigenous tribes, requiring only transcultural adaptation of the syllabi.

However, despite the gains proposed by the projects carried out so far through partnerships between FUNAI, FUNASA, universities, and the Ministry of Health, the objectives of equity, cultural respect, and autonomy with ongoing treatment are still far from being observed.

The suggested adjustments to the curriculum, considering local specificities, indigenous knowledge, and epidemiological aspects, are a sine qua non condition for greater effectiveness and efficiency of actions, which can construct an interdisciplinary and transcultural foundation for improving the quality of life of the indigenous population.

Conclusion

As much as possible, the adaptation/adjustment of the curriculum for a dental health technician course is necessary, considering the local specificities and the need to preserve evidence-based dentistry concepts while strengthening cultural, geographical, and collective preferences. This will make it feasible to attract human resources and define a health model that is as close to the ideal as possible for the indigenous community of Xingu, encompassing promotion, prevention, and curative aspects.

Conflict of Interest

Declare if any financial interest or any conflict of interest exists.

Bibliography

1. Ricardo B., *et al.* "Indigenous peoples in Brazil: 2011-2016". São Paulo: Instituto Socioambiental (2017).
2. Lemos PN., *et al.* "Oral health care in the Xingu Indigenous Park, Brazil, from 2004 to 2013: an analysis based on evaluation indicators". *Cadernos de Saude Publica* 34.4 (2018): e00079317.
3. Arantes R., *et al.* "Oral health among the Xavante Indians in Pimentel Barbosa, Mato Grosso, Brazil". *Cadernos de Saude Publica* 17.2 (2001): 375-384.
4. Martins CP. "Unlearning 8 hours a day: psychology and indigenous health". *Fractal: Revista de Psicologia* 33.3 (2021).
5. Brasil. "Constitution of the Federative Republic of Brazil of 1988". Brasília, DF: President of the republic (2016).
6. Wagner DF. "Ethnic identity, Indians and criminal law in Brazil: unsustainable paradoxes". *Revista Direito GV* 14.1 (2018).
7. Cardoso AM. "Indigenous health in Brazil: from vulnerable to protagonists". *Lancet* 400.10368 (2022): 2011-2014.
8. International Labor Organization (ILO). "Convention no. 169 on indigenous and tribal peoples and Resolution regarding ILO Brasilia action (2011).
9. Ribeiro BG. "Tecelãs Tupi do Xingu. Rio de Janeiro: Museu Nacional" (1982).
10. Leal VE., *et al.* "The concept of culture at the intersection of interdisciplinary debates: a case study-Aldeia Tapuia in Rubiataba, GO". *Interações (Campo Grande)* (2021).
11. Reis AC., *et al.* "Study of the evaluability of the Information System on Indigenous Health: potentialities and challenges for supporting local health administrative". *Cadernos de Saude Publica* 38.5 (2022): PT021921.
12. Brasil. "Ministry of Health. National Health Foundation. Guidelines for Oral Health Care in Special Indigenous Health Districts: Technical Manual". 2nd. edition. Brasília (2009).
13. Rigonato DD., *et al.* "Dental caries experience in Indians of the Upper Xingu, Brazil". *Revista do Instituto de Medicina Tropical de São Paulo* 43.2 (2001): 93-98.
14. Menezes MLP. "Xingu Indigenous Park: the construction of a state territory". Campinas: UNICAMP. (Anthropology of Indigenous Peoples). Master's dissertation (2000): 404.
15. Vicente RM., *et al.* "Working conditions of indigenous health professionals in the largest Polo Base in Brazil". *Cadernos de Saude Publica* 38.12 (2022): e00110321.
16. Fagundes-Neto U., *et al.* "Observations of the Alto Xingu Indians (Central Brazil) with special reference to nutritional evaluation in children". *The American Journal of Clinical Nutrition* 34 (1981): 2229-2235.
17. Regalo SCH., *et al.* "Electromyographic analysis of the orbicularis oris muscle in oralized deaf individuals". *Brazilian Dental Journal* 16.3 (2005): 217-222.
18. Moreto Santos C., *et al.* "Stomatognathic system function in indigenous people from Brazilian Xingu villages: an electromyographic analysis". *PLoS One* 15.12 (2020): e0243495.
19. Donnelly CJ., *et al.* "Plaque, caries, periodontal diseases, and acculturation among Yanomami Indians, Venezuela". *Community Dentistry and Oral Epidemiology* 5.1 (1977): 30-39.
20. Arantes R., *et al.* "Oral health among the Xavante Indians in Pimentel Barbosa, Mato Grosso, Brazil". *Cadernos de Saude Publica* 17.2 (2001): 375-384.
21. Brasil. "Ministry of Health. Indigenous health: analysis of the health situation at SasiSUS/Ministry of Health". Brasília (2019).
22. Alves Filho P., *et al.* "Factors associated with dental caries and periodontal diseases in Latin American indigenous peoples: a systematic review". *Revista Panamericana de Salud Pública* 35.1 (2014): 67-77.
23. Brasil. "Law 11,889 of December 24, 2008: Regulates the profession of Oral Health Technician - TSB and Oral Health Assistant - ASB" (2008).