

Use Of Medicinal Plants In The Mauixi Indigenous Community, Roraima During The Covid-19 Pandemic

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Abstract:

This qualitative study, a type of experience report, describes the use of traditional health practices during the COVID-19 pandemic in the indigenous community of Mauixi, in Roraima, focusing on the species of plants used and the community members' perceptions of the effectiveness of these treatments. During the pandemic, the valorization of traditional medicine emerged as a viable alternative, where teas and plant extracts were used to treat COVID-19 symptoms, demonstrating cultural resilience and the importance of traditional knowledge. The study highlights an increase in the use of traditional practices, including intensified transmission of this knowledge, in response to the rise in cases within the community. Globally, Traditional, Complementary, and Integrative Medicine (TCIM) practices are recognized for treating individuals holistically and are a valuable resource for improving global health. In Brazil, the integration of these practices into the Unified Health System (SUS) was strengthened by the National Policy on Integrative and Complementary Practices, promoting the integration of these practices into conventional care. The research underscores the need for more studies to strengthen indigenous traditional medicine in Brazil, considering the effectiveness of these practices based on community reports, and highlights the importance of continuous education that integrates traditional and interdisciplinary knowledge for the health of indigenous people.

Key Word: Traditional, Complementary, and Integrative Medicine; Cultural Resilience; Indigenous Peoples; Indigenous Health; Permanent Health Education.

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I. Introduction

Since the earliest civilizations, popular health practices have remained relevant, evolving based on the experiences and life stories of different peoples¹. The health of indigenous peoples in Brazil is profoundly

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influenced by their sociocultural characteristics and the historical processes of social and economic changes, including the expansion of frontiers and the introduction of new pathogens, resulting in epidemics². A recent example is the COVID-19 pandemic, which originated in Wuhan, China, in 2019 and quickly spread globally, noted for its severity and containment challenges³.

During the pandemic, traditional medicine gained prominence as a viable alternative, with practices such as teas and syrups proving effective in treating symptoms. This valorization of traditional medicine is especially significant in contexts like the Mauixi indigenous community in Roraima, where medicinal plants are used both preventively and curatively. The transmission of these traditional knowledge bases was intensified with the rise in COVID-19 cases in the community, underscoring the importance of maintaining and strengthening these practices⁴.

Globally, 80% of the population in developing countries turns to traditional medicine for primary health care, with medicinal plants being a prevalent option due to their accessibility and low cost. In Brazil, the use of medicinal plants is promoted owing to the vast plant diversity and the low cost of these practices, considered accessible and effective alternatives by health programs and professionals⁵.

Medicinal plants, whether cultivated or wild, have historically been recognized for their therapeutic properties, representing a millennia-old legacy transmitted across generations and integrating the rich cultural tradition of communities^{6,7}. These practices date back to ancient civilizations, where they were considered the principal "remedies"⁷.

Complementary Health Practices, including the significant use of plants in forms such as teas and extracts, are commonly adopted globally for health promotion. In Brazil, particularly in the Amazon region, integrating medicinal plants into the treatment of various diseases is a frequent practice. Recognizing the extensive use of phytotherapy, the Brazilian Ministry of Health established the National Policy on Medicinal Plants and Herbal Medicines in 2006⁸. This policy prioritizes safety and efficacy within the context of public health and seeks to align socioeconomic development with environmental preservation, both locally and nationally. Moreover, it values diversity and regional and environmental specificities as one of its fundamental principles^{9,10}.

The concept of differentiated care is still being defined, representing a significant challenge in indigenous health. It is crucial that healthcare professionals respect the particularities of each culture to provide appropriate and effective healthcare^{11,12}.

This descriptive study, employing a qualitative approach and experiential reporting, aims to observe and present more accurately the reality of the Mauixi indigenous community in Boa Vista-Roraima, during the COVID-19 pandemic. According to Polit and Beck¹³ (2018), descriptive research is crucial for the detailed analysis of events or situations, allowing for a deeper and more substantiated understanding of the experiences encountered. Experience reports, in turn, are works that detail the specificities arising from particular experiences and provoke significant reflections on the studied phenomenon¹⁴.

This report is significant because it addresses the interaction between traditional and contemporary health practices in a context of global health crisis, providing insights into the cultural resilience and adaptability of the indigenous communities of Roraima state in the face of modern challenges, such as the COVID-19 pandemic. It thus highlights the importance of public policies that integrate and value indigenous traditional knowledge within the healthcare system, respecting and promoting cultural practices in health care.

The paper is organized into five sections: the introduction, which contextualizes the theme and defines the objectives of the study; the experience report, which describes in detail the traditional practices adopted by the community during the pandemic; the discussion, which analyzes the implications of these practices in relation to existing literature and public policies; the concluding remarks, which summarize the main findings and suggest directions for future research; and the references, which list the works cited throughout the study.

Therefore, the study investigated how traditional practices of using medicinal plants were adapted or transformed by the Mauixi indigenous community in Boa Vista-Roraima, in response to the COVID-19 pandemic. The general objective is to describe the experiences of this community during the pandemic, focusing on the traditional practices adopted, the species of plants used, and the community members' perceptions of the efficacy of these traditional treatments.

II. Experience Report

This experience report was prepared by a student of the Bachelor's Degree Program in Indigenous Collective Health Management at the Insikiran Institute of Higher Indigenous Education at the Federal University of Roraima (UFRR). The study was conducted in the municipality of Boa Vista, Roraima, from April 3, 2020, to March 30, 2022.

For the conduct of the study, the student, an indigenous member of the Macuxi people and a resident of the community, obtained authorization from the leadership and other residents. Information was collected through informal dialogues with residents, community leaders, and health professionals working at the Polo Base de Saúde Vista Alegre, which serves the Mauixi indigenous community. These dialogues focused on the identification and

use of medicinal plants by the community. It is important to emphasize that, for this report, the authorization of an ethics committee was not necessary, since the conversations were informal and of a public nature, without the exposure of sensitive or personal data.

The Mauixi indigenous community is located in the Baixo São Marcos region, part of the São Marcos Indigenous Land, situated 70 km from Boa Vista, the capital of the state of Roraima. This area was officially recognized by decree no. 312, dated October 29, 1991, and spans 654,110 hectares, subdivided into three areas: Alto, Médio, and Baixo São Marcos, encompassing a total of 43 communities. According to Manduca¹⁵, this indigenous land is notable for its diverse landscape, which includes open grassland areas in the south and mountain ranges in the north, and for the variety of peoples that inhabit it, such as the Macuxi, Taurepang, and Wapichana.

The vegetation of the São Marcos Indigenous Land is characterized by the presence of rainforest and *lavrado*, a local term used to designate the savanna. Specifically, the community that is the subject of this study is located in a *lavrado* area, characterized by open vegetation and forests typical of warm regions, with a period of 60 days without annual rainfall. The savannas of Roraima, regionally known as *lavrado*, are the largest savanna areas in the Brazilian Amazon and are part of the "Rio Branco Rupununi" landscape complex, which extends to Guyana and Venezuela, as described by Barbosa and Miranda¹⁶ and Barbosa¹⁷.

The Mauixi indigenous community, located in the Roraimense *lavrado* region, is known for its rich diversity of native plants with therapeutic properties. Among the species most utilized by the community are *caimbé*, *salva do campo*, *douradão*, *copaíba*, *súcuba*, *jenipapo*, *paricarana*, *pata de vaca*, and *erva de passarinho*. These plants are popularly recognized in the region by their local names and are frequently used in traditional medicinal practices. Below, we present the map of the São Marcos Indigenous Land, where the Mauixi community is located (**Figure 1**).

Figure 1: Map of the São Marcos Indigenous Land



Source: Socio-Environmental Institute (ISA), INDIGENOUS LANDS IN BRAZIL, 2022 (Link: <https://terrasindigenas.org.br/en/terras-indigenas/3799>)

The São Marcos Indigenous Land, where the Mauixi community is currently located, originated from lands that previously belonged to the São Marcos farm, founded by "Captain Nicolau de Sá Sarmiento" on an undetermined date. After the founder's death, the farm was taken over by the state. The Mauixi community was established in 1974, when the first family arrived in the region in search of better resources for hunting, fishing, and farming, which were scarce in their previous place of residence.

At the time this family arrived, the land had not yet been officially recognized as indigenous. They consulted the administrator of the São Marcos farm, reported their intentions and difficulties, and received authorization to settle in the area. With the arrival of this family, the locality was initially called Mawiisi, a name that was later adapted to Mauixi to facilitate understanding. The name Mauixi derives from Jauari, a typical plant found on the banks of the Uraricuera River that runs through the region. Currently, the Mauixi community consists of about 40 families, totaling approximately 156 inhabitants, predominantly of the Macuxi people (**Figure 2**).

Figure 2: Entrance to the Mauixi Community



Source: Soares, 2021

During the period from 2020 to 2022, the world faced significant challenges due to the pandemic of the novel coronavirus. As a resident of an indigenous community and a student in the Indigenous Collective Health Management program, I observed the realities faced by the community, especially the scarcity of medications during routine consultations at the local health post. This situation highlighted the lack of access to alternatives, particularly to traditional medicine.

In indigenous communities, it is common to have native plants used in the treatment of diseases. However, the proper use of these plants depends on the instruction of elders or individuals knowledgeable in the techniques of preparation and application, so that traditional medicine can be correctly utilized by everyone.

According to Gonçalves¹⁸, the implementation of traditional indigenous medicine within the Unified Health System (SUS) is still precarious and lacks more efficient initiatives. There is an urgent need to strengthen these practices through public policies and actions of cultural and symbolic revitalization carried out by indigenous peoples, aiming to preserve and recover their subjectivities. Despite the importance of studies and research on this topic, they are still in their infancy, which maintains significant gaps in the formulation of public policies and practices that ensure access to this type of care, including in the Special Indigenous Health Districts (DSEIs).

With the arrival of the novel coronavirus, the limited dissemination of knowledge about traditional medicine in the Mauixi community, combined with the absence of treatments with proven efficacy, led residents affected by the disease to seek traditional medicines. However, it was observed that many did not know how to prepare the plants or which ones to use, thus turning to elders and individuals who still possess this knowledge. Although medicinal plants were available in homes or with neighbors, there was a lack of understanding on how to use them properly.

This practice is an activity transmitted across generations among community members, including elders, women, and health professionals, such as the Indigenous Sanitation Agent (AISAM) and the Indigenous Health Agent (AIS). However, the introduction of Western medicine which relies on medical diagnostics and localized therapies using chemical drugs and surgeries into indigenous communities has led to a decline in this tradition of learning. Consequently, traditional medicine is being replaced, interrupting the transmission of ancestral knowledge.

Faced with the severity of the disease and its rapid spread, the tuxauas, leaders, and representatives of the communities in the Baixo São Marcos region, convened to adopt preventive measures. These measures included the construction of sanitary barriers at the checkpoint, restriction of entry and exit on specific days (allowed only for residents upon a term signed by the tuxaua), guidance to leave only when absolutely necessary, mandatory use of masks and hand sanitizer, and suspension of festivities, meetings, and any event that could generate crowds.

During the enforcement of these measures, few cases of coronavirus were detected. With the arrival of the vaccine, the sanitary barriers were gradually lifted. However, initially, there was resistance to vaccination by the majority of the community's residents, fueled by rumors that the vaccine was a strategy to reduce the indigenous population. This left the population vulnerable to the disease, and during this period, more coronavirus cases were confirmed. Over time, as they observed that vaccinated people did not experience problems, the residents began to accept vaccination, and the majority ended up getting vaccinated. Nevertheless, some residents persisted in their resistance and, as of the observation date, had not been immunized, choosing to sign a waiver for the vaccine, given that the doses reserved for the community were limited.

In the Mauixi indigenous community, during the first wave of infection, only two positive cases of COVID-19 were confirmed. Despite the imposed restrictions, residents continued with their daily activities, such as hunting, fishing, conversational gatherings among family members, soccer games at dusk, and evangelical worship services, maintained by the two denominations present in the locality. However, face-to-face classes were suspended; the responsible teacher adapted to this reality, supporting students through printed activities and online guidance when necessary. Community meetings also remained suspended during this period.

The community has a health post (**Figure 3**), which is part of the Special Indigenous Sanitary District East Roraima (DSEI East-RR) and the Vista Alegre Base Pole. This post was constructed by the residents themselves and is in poor condition. There is a significant lack of basic equipment. On days when dental services are provided, for example, the dentist needs to bring their own treatment chair and shares a cramped space with the nurse, which compromises the privacy of both users and professionals. Additionally, the residents' medical records are stored in a single cardboard box, due to the absence of an appropriate place for their organization.

Figure 3: Health Post of the Mauixi Community



Source: Soares, 2021

At the Mauixi community health post, two Multidisciplinary Indigenous Health Teams (EMSI) operate. The first team consists of a nurse, a nursing technician, a dentist, and her assistant. The second team includes a nurse, two nursing technicians, one of whom is responsible for vaccination. Currently, only one doctor serves the entire region, which has previously led the community to go more than five months without medical consultations due to a shortage of professionals.

The activities at the health post include collective weighing, conducted monthly, and the team consultations, which occur twice a month, once with each team, following a predetermined schedule. On warm days, the technician responsible for vaccinations conducts the consultations in the community's maloca, a space also used for lectures and as a waiting area for appointments with the doctor or nurse (**Figure 4**).

Figure 4: Maloca of the Mauixi Community



Source: Soares, 2021

Despite the various challenges faced, the care provided by the multidisciplinary health team in the Mauixi community is considered the primary alternative for the prevention and treatment of diseases, relegating traditional medicine to a secondary role. The difficulties observed include the frequent lack of medications at the health post, which has raised questions within the community about the absence of traditional medicines, especially given the richness and diversity of native plants cultivated by the residents. With the onset of the COVID-19 pandemic, this issue has become even more pressing.

Currently, not only Indigenous peoples but also the entire world faces uncertainties regarding the treatment of COVID-19, leading many to seek alternative treatments, with medicinal plants being one of the most common options. This search for alternatives reflects the need to integrate traditional medicine more deeply into health practices, utilizing local knowledge to complement conventional treatments.

As COVID-19 cases were confirmed in the community, relatives of those afflicted by the disease, driven by the scarcity of pharmaceutical medications, began seeking information on traditional medicines that could aid in treatment. Among the most sought-after remedies were teas made from boldo, eucalyptus, and lemon peel, as well as syrups made with honey and copaiba bark. These medicines were often prepared using native plants, such as field sage (**Figure 5**) and Aranto (**Figure 6**), leading to common discussions among residents about recipes for possible traditional treatments for COVID-19.

Figure 5: Field Sage (Native Plant)



Source: Soares, 2021

Figure 6: Aranto (Cultivated Plant)



Source: Soares, 2021

In addition to using native plants, many residents also cultivate medicinal plants in small gardens at their homes. This practice has facilitated not only the sharing of recipes but also the exchange of medicinal plants among them.

During the pandemic period, it was possible to experience situations that highlighted the urgency of continuing to pass on knowledge of traditional medicine to the youth and the general Indigenous population. It was not only the local residents who sought recipes within the community; often, people from neighboring communities, such as Vista Nova and Três Irmãos, both approximately 7 km away, also looked for plants or recipes.

On a specific occasion, a resident of the Três Irmãos community was observed sharing a recipe that had been effective for her: tea made from field sage plant with lemon juice, which was prepared and left out overnight to dew, helping to alleviate the cough and fatigue caused by COVID-19. Another recipe valued by the community involved roasted cashew nuts. After being roasted, the nuts are crushed in a mortar until they turn to ash, which is used to prepare a tea, aiding in cough relief and reducing fatigue. Besides these, another popular recipe was the use of jatobá bark, employed as a decongestant. The bark is soaked and the resulting water is ingested. Included are images of plants whose barks were used for medicinal purposes (**Figures 7 and 8**).

Figure 7: Jatobá (Native Tree)



Source: Soares, 2021

Figure 8: Sucuba (Native Tree)



Source: Soares, 2021

Due to the absence of pharmacological medications with guaranteed efficacy during the pandemic, health teams faced a lack of treatment alternatives for patients with COVID-19 or its after-effects. This situation could have been mitigated if, before working in Indigenous areas, the Specialized Indigenous Health Teams (EMSI) had received guidance on the traditional medicine available in the region, which is rich in fertile soils for medicinal plants. Continuing and permanent education proves to be an important tool in the health-disease-care process and specialized attention.

The health crisis sparked interest in traditional medicine, but after the decline in COVID-19 cases, the appreciation of this knowledge began to wane. The persistent problem of the lack of pharmacological medications could be partially resolved if traditional remedies were more accessible. It is essential that Indigenous youth appropriate this knowledge to ensure the continuity of this culture.

The implementation of courses, workshops, and lectures on traditional medicines in schools and at the local health post could be an effective strategy for disseminating this knowledge. Additionally, the participation of the multidisciplinary health team is crucial. Often, these professionals enter communities without prior knowledge of the local culture or the richness of the native and cultivated medicinal plants, limiting themselves to the use of pharmacological medications. Including this training in the preparation of the teams could enrich the care provided and better integrate traditional and contemporary health practices.

Merhy¹⁹ points out that the effects on the resolution of health services involve building the competence of workers, which is expressed through the production of care and impacts the ways of living of others in the process of subjectivation of such ethical-political subjects. Therefore, this reinforces the need to develop skills that transcend the technical, addressing the ethical, cultural, and political impact of actions on the lives of health service users. The training and continuous development of competencies for health professionals are essential to ensure that health care contributes positively to the transformation and well-being of the individuals served.

III. Discussion

The coronavirus was officially described in 1937, having been isolated in domestic animals. By 1960, it was referred to as a virus causing moderately severe respiratory effects in humans and was named "corona" due to its shape resembling a crown^{20, 21}.

The novel coronavirus, SARS-CoV-2, since its emergence in 2019, has triggered a global pandemic, drastically impacting public health, economies, and healthcare systems worldwide. This new strain has proven to be highly contagious and potentially lethal, challenging scientists and medical professionals to develop vaccines and treatments in record time. The global response to the pandemic required unprecedented collaboration among countries, health institutions, and the scientific community, highlighting the importance of international cooperation and preparedness to address global health crises^{22, 23}.

Traditional, Complementary, and Integrative Medicines (TCIM) encompass a broad range of health practices rooted in the theories, beliefs, and experiences of various global cultures. These practices are employed not only to treat and prevent physical and mental illnesses but also to promote overall well-being and health. Recognized by the World Health Organization (WHO) as a valuable resource for enhancing global health, TCIM supplements conventional medicine by treating individuals holistically, addressing their physical, mental, emotional, and spiritual dimensions^{24, 25}.

The modalities included in Traditional, Complementary, and Integrative Medicines (TCIM) range from acupuncture, herbal medicine, homeopathy, and anthroposophic medicine to culturally specific techniques such as Ayurvedic medicine from India, Traditional Chinese Medicine, and various indigenous healing practices that utilize herbs, traditional rituals, and spiritual practices. The primary objective of these medicines is not only to alleviate symptoms but also to identify and treat the underlying causes of diseases, thereby promoting a balanced and sustainable state of health^{24, 26}.

The practices of Traditional and Complementary Medicine that could be considered traditional in Brazil (with the exception of phytotherapy), such as religious practices and traditional healers like prayer healers and shamans, were not explicitly incorporated into the National Policy on Integrative and Complementary Health Practices (PNPIC), despite their existence in some municipalities²⁵. Brazil has adopted primary health care or basic attention as a public policy, structured by the Family Health Strategy (FHS)²⁷, and it is relevant to observe how Traditional and Complementary Medicine has been inserted and integrated into this and other Unified Health System (SUS) services.

In Brazil, Traditional and Complementary Medicine has been recorded in the Unified Health System (SUS) since the 1980s²⁸. Its integration into the SUS was intensified following the National Policy on Integrative and Complementary Practices (PNPIC). This policy expressly legitimized the public provision of phytotherapy, homeopathy, Traditional Chinese Medicine/acupuncture, and anthroposophic medicine²⁹.

Traditional, complementary, and integrative medicines constitute an important model of healthcare by considering the individual in their entirety, uniqueness, and complexity, taking into account their sociocultural insertion with an emphasis on the professional/user relationship, which contributes to the humanization of care.

Brazil is a global reference in the field of TCIM regarding the integration of these practices into the public health system.

Indigenous peoples face challenges in effectively accessing the rights established by law, which guarantees their specific rights, recognizing their own forms of social organization, customs, languages, beliefs, and traditions. Education is a process of learning. In light of this situation, health education is being utilized to provide this right³⁰.

Landgraf, Imazu, and Rosado³¹ report that Continuing Education in Health subjects the daily routines of the work and training spaces of professionals in the indigenous area to analysis, providing a space for reflection on practices that are collaboratively constructed, generating among its effects involvement, institutional change, and experimentation³². For these formative spaces to be properly occupied, Ceccim³³ asserts that individuals need to be active, enabling this process of subjectivation, opening boundaries, deterritorializing behaviors and management from the possibility of new ways of being (as a health professional, student, manager, or patient) and producing health.

Health team meetings are essential spaces for the collective commitment of professionals to the objectives and guidelines of the Unified Health System (SUS). These spaces aim to reorganize health practices through the articulation among professionals with different practices, integration through interprofessionalism, flexibility of the boundaries present among such practices, and reflection on these to enable appropriate care in the context of communities. Thus, they are conducive and open spaces for conducting activities such as Continuing Education^{34, 35}.

The study by Alves¹¹ underscores the vital need for continuing education in health for non-indigenous professionals, especially to equip them to work effectively with indigenous communities in an intercultural context. It reveals that many of these professionals lack direct experience with such communities and often fail to implement health actions in a way that respects the complexity of the social, cultural, and political contexts of indigenous peoples. To address these gaps, the authors propose a curricular revision in higher education focused on cultural competence, which would enhance the quality of healthcare and increase sensitivity to the specific needs of the populations served, leading to better health outcomes and promoting mutual respect. This approach promotes a more inclusive healthcare service, integrating traditional and contemporary knowledge to improve health and well-being in indigenous communities.

IV. Conclusion

The National Policy for the Health Care of Indigenous Peoples (PNASPI)³⁶ and the concept of differentiated care should be considered an opportunity to provide healthcare, respecting the fundamental principles of the Unified Health System (SUS), with special emphasis on the principle of Equity. This approach highlights the need to tailor health services to the specific needs of indigenous peoples, recognizing their unique cultural and social characteristics.

Continuing Education emerges as a vital space for the meeting and interaction among various differences and singularities, whether of indigenous or non-indigenous individuals. It is essential that there be a fusion of traditional and interdisciplinary knowledge, promoting a dialogue that can lead to more significant and relevant health outcomes for each individual. The incorporation of these knowledges not only enriches the learning process but also enhances the relevance and applicability of the healthcare provided.

The primary focus of Continuing Education actions and activities is to engage in constructive dialogue with the everyday reality of indigenous peoples and health teams. This interaction must address equity and recognize the differences that characterize Brazil's rich cultural diversity. This process is crucial to ensure that indigenous health is treated with the depth and specificity it requires, reflecting the health system's commitment to social justice and respect for diversity.

This descriptive study employed a qualitative approach in the form of an experiential report and focused on the adaptation of traditional health practices during the COVID-19 pandemic in the Mauixi indigenous community in Boa Vista-Roraima. An increase in the use of traditional practices was observed, including teas and extracts from medicinal plants, as primary responses to COVID-19 symptoms. This account highlights cultural resilience and the importance of traditional knowledge, demonstrating the perceived efficacy of these practices within the community in question.

Although this study provides valuable insights into the use of traditional health practices during health crises, it is important to recognize its limitations. It was an experiential report focused on a single community, which may not represent the diversity of practices or perceptions among different Brazilian indigenous communities. Furthermore, the efficacy of the described practices is primarily based on community reports without rigorous scientific evaluation, which is necessary to validate these practices within clinical parameters established by the scientific community.

The expansion of these studies to other indigenous communities and the inclusion of meticulous evaluations are essential to better understand the impact and efficacy of traditional health practices. This will not

only strengthen the body of knowledge on indigenous traditional medicine but also support the integration of these practices into the Unified Health System, aligning with health policies that promote differentiated care and equity in health access for all Brazilians.

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