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Medicinal plants among riverside Community Health Agents: knowledge, use, form of preparation and indication

Plantas medicinais entre Agentes Comunitários de Saúde Ribeirinhos: conhecimento, uso, forma de preparação e indicação

Plantas medicinales entre los agentes de salud de las comunidades ribereñas: conocimiento, uso, forma de preparación e indicación

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ABSTRACT

Objective: to describe knowledge, use, form of preparation and indication for health problems of medicinal plants among community health agents from the riverside region. **Method:** a descriptive, cross-sectional study among 117 community health agents from the riverside, carried out between August and November 2018, on the habits of consumption of medicinal plants, use associated with industrialized medicines, learning, part used, form of preparation, indication and health problems. The study was approved by the Research Ethics Committee. **Results:** the most commonly used medicinal plants were Capim Santo (Cymbopogon citratus) (11.1%), Erva Cidreira (*Melissa officinalis*) (9.3%) and Boldo (*Vernonia condensata*) (6.5%). There was a significant association between plant consumption and age, schooling, health problems and plants in the yard. **Conclusion:** the development of strategies to promote knowledge about medicinal plants and their appropriate use among riverine CHAs can promote self-care in remote areas of the Brazilian Amazon.

Descriptors: Amazonian Ecosystem; Rural Population; Community Health Workers; Plants, Medicinal.

RESUMO

Objetivo: descrever conhecimento, uso, forma de preparação, indicação para problemas de saúde de plantas medicinais entre Agentes Comunitários de Saúde ribeirinhos. **Método:** estudo descritivo, transversal, entre 117 Agentes Comunitários de Saúde Ribeirinhos, realizado entre agosto a novembro de 2018, sobre os hábitos de consumo de plantas medicinais, uso associado a medicamentos industrializados, aprendizado, parte utilizada, forma de preparação, indicação e problemas de saúde. O estudo foi aprovado pelo Comitê de Ética em Pesquisa. **Resultados:** as plantas medicinais mais utilizadas foram o Capim Santo (*Cymbopogon citratus*) (11,1%), Erva Cidreira (*Melissa officinalis*) (9,3%) e o Boldo (*Vernonia condensata*) (6,5%). Houve associação significativa entre consumo de plantas e faixa etária, escolaridade, problemas de saúde e plantas no quintal. **Conclusão:** o desenvolvimento de estratégias de promoção do conhecimento sobre plantas medicinais e seu uso adequado entre os ACS ribeirinhos, pode promover o autocuidado com a saúde nas áreas remotas da Amazônia brasileira.

Descritores: Região Amazônica; População Rural; Agentes Comunitários de Saúde; Plantas Medicinais.

RESUMEN

Objetivo: Describir el conocimiento, el uso, la forma de preparación e indicación para problemas de salud de plantas medicinales entre agentes comunitarios de salud de la región ribereña. **Método:** estudio descriptivo, transversal, entre 117 agentes comunitarios de salud ribereños, realizado entre agosto y noviembre de 2018, sobre los hábitos de consumo de plantas medicinales, uso asociado a medicamentos industrializados, aprendizaje, parte utilizada, forma de preparación, indicación y problemas de salud. El Comité de Ética de Investigación aprobó el estudio. **Resultados:** las plantas medicinales más utilizadas fueron Zacate limón (*Cymbopogon citratus*) (11,1%), Melisa (*Melissa officinalis*) (9,3%) y Boldo de Bahía (*Vernonia condensata*) (6,5%). Hubo una asociación significativa entre el consumo de plantas y la edad, la escolaridad, los problemas de salud y las plantas que tenían en su patio. **Conclusión:** El desarrollo de estrategias para promover el conocimiento sobre plantas medicinales y su uso apropiado entre los ACS ribereños puede promover el autocuidado respecto a la salud en áreas remotas de la Amazonia brasileña.

Descriptores: Ecosistema Amazónico; Población Rural; Agentes Comunitarios de Salud; Plantas Medicinales.

INTRODUCTION

The use of plants for medicinal purposes is a widespread and documented practice dating back to the early civilizations[1]. Data from the World Health Organization (WHO) reveal that eight out of ten individuals depend on traditional medicine for their basic health needs, and nearly 85% of this practice involves the use of Medicinal Plants (MPs), their extracts, and their active ingredients globally[2].

Brazil possesses the largest share of global biodiversity, with a notable emphasis on plants. The broad availability of plant species enhances their popular medicinal use in the country[3]. Despite technological advancements in the global

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pharmaceutical industry, with the rise in the number of drugstores or pharmacies, the use of plants for therapeutic purposes is experienced in remote areas of the Amazon region[4].

In the state of Amazonas, particularly in rural areas, there exists a population strongly identified by its cultural aspects: the ribeirinho population. Ribeirinhos are groups of individuals residing in floating houses or along riverbanks, sustaining themselves through hunting, fishing, and cultivation[4,6]. This population possesses extensive knowledge about MPs, and information about their use in the form of home remedies has been passed down from generation to generation to prevent and treat health issues in their communities[5].

In some communities, it is common to associate MPs with a "natural" concept, leading to a misconception that they are healthy and pose no risks to health. Although the empirical consumption is characteristic, improper use can result in severe intoxication and even death[7].

Community Health Agents (CHAs) play a crucial role in these communities, as they are local members capable of establishing bonds with the population and understanding the social determinants of the health-disease process. However, these healthcare providers need to possess adequate knowledge about the use of MPs, as studies indicate that the habit of consuming MPs is prevalent among them[9,10].

Public policies, such as the National Policy of Integrative and Complementary Practices (NPICP) and the National Policy of Medicinal Plants and Phytotherapeutics (NPMP),[3] aim to promote the rational use of MPs. Nevertheless, information regarding the consumption of MPs among healthcare providers, especially CHAs residing in remote areas of the Brazilian Amazon, is still in its early stages.

Considering the reality of rural populations in the interior of the state of Amazonas, where limitations in access to healthcare services are common due to the vastness of the region, and CHAs sometimes constitute the sole healthcare providers present in the communities, it is crucial to recognize the dynamics of MP use by CHAs.

In this context, the guiding question formulated was: how does the knowledge, use, preparation, and recommendation of medicinal plants occur among Ribeirinho Community Health Agents in the interior of the Amazon?

The study aimed to describe the knowledge, use, preparation methods, and recommendations of medicinal plants for health issues among Ribeirinho Community Health Agents.

METHOD

This descriptive, cross-sectional study with a quantitative approach was conducted between August and November 2018 in the municipality of Coari, Amazonas, Brazil. Coari is situated in the central region of the state of Amazonas, approximately 363 km from the capital, Manaus, and access to the municipality is facilitated by river or aerial routes. The estimated local population in 2020 was 85,910 inhabitants, with approximately one-third residing in rural areas (ribeirinho communities), dispersed along the banks of rivers, lakes, and streams[12].

The study forms were administered by previously trained interviewers from the Institute of Health and Biotechnology at the Federal University of Amazonas. Interviews with the Community Health Agents (CHAs) took place during their monthly visits to the urban area of the municipality for the updating of data related to ribeirinho populations (rural area). These meetings are organized by the Municipal Health Department. Consequently, interviews were conducted after the meetings to minimize research costs, eliminating the need for travel to the rural zone. For data organization, the data collection order was arranged in blocks, according to the geographical area of CHA activity, totaling 8 major areas (Alto Solimões; Médio Solimões; Baixo Solimões; Lago de Coari; Lago do Mamiá, Rio Piorini, Rio Copeá, and Codajás Mirim).

The eligibility criterion was being employed in the CHA role, as per the list provided by the local Municipal Health Department. Exclusion criteria included being absent from the CHA role or being unavailable after at least three contact attempts by the research team.

The population comprised the total number of professionals listed by the Municipal Health Department, resulting in 117 CHAs. Following an explanation of the study and its objectives, the participants were presented with the consent form. All participants agreed to participate by signing the document and received a copy.

The dependent variable was considered to be the use of at least one MP in the last thirty days preceding the study. The independent variables included sociodemographic information, encompassing items such as age, gender, education, race, and family income in Brazilian Reais according to the current year.

Information regarding the consumption of MPs included the following questions: cultivation of MPs in the home garden, combined use of MPs with allopathic medications, source of learning about MP usage, perception of usage, common and scientific names, plant part used, preparation method, who recommended it, and for what health issue

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the medicinal plant was used. The MPs identified in the study were classified using the Trópicos Database, which contains taxonomic information about MPs[13]. All data on the MPs were self-reported in the interviews, with no techniques employed for the collection or analysis of the plants.

Data analysis was performed using descriptive and inferential statistics using the SPSS® version 20.0 software. Qualitative variables were expressed in absolute and relative frequencies. To identify associations between the outcome variable (MP consumption) and sociodemographic variables, the Chi-square test was employed, considering a significance level of 5% ($p < .05$).

The study strictly adhered to the Guidelines and Regulatory Norms for Research Involving Human Subjects, established by Resolutions 466/12 and 510/16 of the National Health Council (linked to the Ministry of Health). The study received approval from the Research Ethics Committee of the proposing institution.

RESULTS

A total of 117 ribeirinho CHAs were interviewed, among whom 55 had consumed MPs in the 30 days preceding the research (47.0%). The majority of CHAs who consumed MP were female (52.7%), within the age range of 18 to 35 years (27.3%), living with companions (94.5%), with incomplete elementary education (40.0%), and a monthly family income above one minimum wage (65.5%).

Regarding health conditions, 65.5% of the CHAs who consumed MPs reported having some form of illness. Additionally, variables related to MP information revealed that the majority had MPs in their home gardens (96.4%), slightly over half consumed the plants along with allopathic medications (50.9%), and believed that MPs posed no harm to health (54.5%). A significant portion of the CHAs stated that knowledge about the use of these plants was passed down by family members (80.9%). Table 1 presents the results of association tests between the consumption of medicinal plants and sociodemographic variables.

Table 1: Association between the consumption of medicinal plants and sociodemographic variables, health conditions, and the mode of use of medicinal plants. Coari, AM, Brazil, 2018.

		Consumption of medicinal plants			
		Yes	No		
Variable		**n (%)**	**n (%)**	**Total**	***p*-value***
Sex	Male	26 (47.3)	34 (54.8)	60 (51.3)	.414
	Female	29 (52.7)	28 (45.2)	57 (48.7)	
Age range (years)	18 to 35	11 (34.4)	21 (65.6)	32 (27.3)	.007
	36 to 42	8 (29.6)	19 (70.4)	27 (23.1)	
	43 to 51	17 (54.8)	14 (45.2)	31 (26.5)	
	Over 51	19 (70.4)	8 (29.6)	27 (23.1)	
Marital status	Lives with a companion	52 (94.5)	55 (88.7)	107 (91.5)	.260
	Lives alone	3 (5.5)	7 (11.3)	10 (8.5)	
Education	Incomplete elementary education	22 (40.0)	14 (22.6)	36 (30.8)	. 047
	Complete elementary education	9 (16.4)	5 (8.1)	14 (12.0)	
	Incomplete high school education	7 (12.7)	12 (19.4)	19 (16.2)	
	Complete high school education	17 (30.9)	31 (50.0)	48 (41.0)	
Family income	Up to 1 minimum wage (SM)	19 (34.5)	24 (38.7)	43 (36.8)	. 641
	Above 1 minimum wage (SM)	36 (65.5)	38 (61.3)	74 (63.2)	
Health problems	Yes	36 (65.5)	27 (43.5)	63 (53.8)	.018
	No	19 (34.5)	35 (56.5)	54 (46.2)	
Plants in the home garden	Yes	53 (96.4)	43 (69.4)	96 (82.1)	<.000
	No	2 (3.6)	19 (30.6)	21 (17.9)	
Consumption of plants in conjunction with allopathic medication	Yes	28 (50.9)	25 (40.3)	53 (45.3)	.251
	No	27 (49.1)	37 (59.7)	64 (54.7)	
Belief that plants cannot be harmful to health	Yes	25 (45.5)	27 (43.5)	52 (44.4)	.836
	No	30 (54.5)	35 (56.5)	65 (55.6)	
Learned to use medicinal plants from	Family	44 (80.0)	49 (81.7)	93 (80.9)	.561
	Friends/Neighbors	6 (10.9)	3 (5.0)	9 (7.8)	
	Media	2 (3.6)	2 (3.3)	4 (3.5)	
	Others	3 (5.5)	6 (10.0)	9 (7.8)	

Notes: **p<0,05, Chi-square test associating the dependent variable with sociodemographic information, health conditions, and medicinal plants.*
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The variables that showed a significant association ($p < .05$) with the consumption of MPs were age range, education, presence of health problems, and cultivation of MP in the home garden. Table 2 presents the species of plants consumed.

Table 2: Species of plants consumed by Community Health Agents according to purposes of use, preparation method, and part used (n=108). Coari, AM, Brazil, 2018.

Common Name – Scientific Name	Plants species *n* (%)	Purposes of use	Preparation method	Part used
Capim santo - *Cymbopogon citratus*	12 (11.1)	Emotional disturbances, headache, insomnia, otalgia, urinary tract infection	Tea	Leaf
Erva cidreira - *Melissa officinalis*	10 (9.3)	Emotional disturbances, headache, otalgia, fever, influenza, insomnia, constipation, abdominal pain, systemic arterial hypertension	Tea	Leaf
Boldo - *Vernonia condensata*	7 (6.5)	Pyrosis, abdominal pain, liver problems	Tea	Leaf
Copaíba - *Copaifera reticulata*	6 (5.6)	Abdominal pain, inflammation, joint pain	Tea, NS*	Bark
Algodão roxo -*Gossypium herbaceum L.*	5 (4.6)	Urinary tract infection, inflammation, ophidian accident, pelvic pain, vaginal cyst	Tea, NS	Leaf, branch, latex
Hortelã - *Mentha arvensis*	5 (4.6)	Abdominal pain, fever, influenza	Tea	Leaf
Limoeiro - *Citrus limon*	4 (3.7)	Influenza, emotional disturbances	Tea, Gargle	Leaf, fruit
Andiroba - *Carapa guianensis*	3 (2.8)	Influenza, inflammation in the limb, tonsillitis	Gargle, NS*	Oil
Arruda - *Ruta graveolens*	3 (2.8)	Abdominal pain, headache	Gargle, NS*	Leaf
Coirama - *Bryophyllum pinnatum*	3 (2.8)	Urinary tract infection, abdominal pain, pelvic pain	Tea	Leaf
Gravioleira - *Annona muricata*	3 (2.8)	Prostatitis, abdominal pain	Tea	Leaf, oil
Jambu - *Pilanthes acmella*	3 (2.8)	Abdominal pain, pyrosis, malaria	Tea	Leaf
Piranheira - *Guapira laxa*	3 (2.8)	Dorsalgia, abdominal pain, and itching	Tea	Bark
Abacateiro - *Persea americana*	2 (1.9)	Pelvic pain, abdominal pain	Tea	Leaf
Alho - *Allium sativum*	2 (1.9)	Influenza	Tea	NS, leaf
Cajueiro - *Anacardium occidentale L.*	2 (1.9)	Diabetes Mellitus, inflammation in the limb	Tea	Bark
Jatobazeiro - *Hymenaea courbaril*	2 (1.9)	Dyslipidemia, prostatitis	Tea	Bark
Malvarisco - *Althaea officinalis*	2 (1.9)	Abdominal pain, cough	Tea, NS*	Leaf
Mastruz - *Chenopodium ambrosioides*	2 (1.9)	Joint pain, abdominal pain	Tea	Leaf
Sara tudo - *Justicia acuminatissima*	2 (1.9)	Abdominal pain, vaginal cyst	Tea	Bark, leaf
Alfavaca - *Ocimum selloi*	2 (1.9)	Urinary tract infection, renal colic	Tea	Leaf
Laranjeira - *Citrus sinensis*	2 (1.9)	Abdominal pain	Tea	Bark
Amororeira - *Morus alba L*	1 (0.9)	Dyslipidemia	Tea	Leaf
Babosa - *Aloe Vera*	1 (0.9)	Burn	In its natural state	Latex
Capitiú - *Siparuna guianensis*	1 (0.9)	Systemic arterial hypertension	Tea	Leaf
Quebra-pedra - *Phyllanthus niruri*	1 (0.9)	Renal colic	Tea	NS
Açaizeiro - *Euterpe precatória*	1 (0.9)	Malaria	Tea	NS
Sucuba - *Himatanthus sucuuba*	1 (0.9)	Vaginal cyst	Tea	Latex
Taperebá – *Spondias mombin L*	1 (0.9)	Urinary tract infection	Tea	Bark
Uchi - *Andira inermis*	1 (0.9)	Urinary tract infection	Tea	Bark
Amor crescido - *Portulaca pilosa*	1 (0.9)	Urinary tract infection	Tea	Leaf
Oliveira – *Olea europaea*	1 (0.9)	Dyslipidemia	Tea	Leaf
Cacaueiro -*Theobroma cacao L.*	1 (0.9)	Pelvic pain	Tea	Leaf
Cajuiri – Não identificado	1 (0.9)	Urinary tract infection	NS*	Bark
Catinga de mulata - *Tanacetum vulgare L.*	1 (0.9)	Abdominal pain	Tea	Leaf
Cibalena – Não identificado	1 (0.9)	Abdominal pain	Tea	Leaf
Crajirú - *Fridericia chica (Bonpl.)*	1 (0.9)	Myalgia	NS*	Leaf
Jucá - *Caesalpinia férrea*	1 (0.9)	Vaginal cyst	Tea	Bark
Pitangueira - *Eugenia uniflora*	1 (0.9)	Dyslipidemia	Tea	Leaf
Preciosa - *Aniba canellila*	1 (0.9)	Emotional disturbances	Tea	Bark
Seringueira - *Hevea brasiliensis*	1 (0.9)	Dorsalgia	Tea	Bark
Unha de gato - *Uncaria guianensis*	1 (0.9)	Urinary tract infection	Tea	Bark
Castanheira – *Berthorlletia excelsa*	1 (0.9)	Abdominal pain	Infusion	Bark
Pluma – Celosia argentea	1 (0.9)	Abdominal pain	Tea	Leaf
Hortelã japonesa – *Mentha arvensis L.*	1 (0.9)	Myalgia	NS*	Leaf

Note: NS*: not specified.

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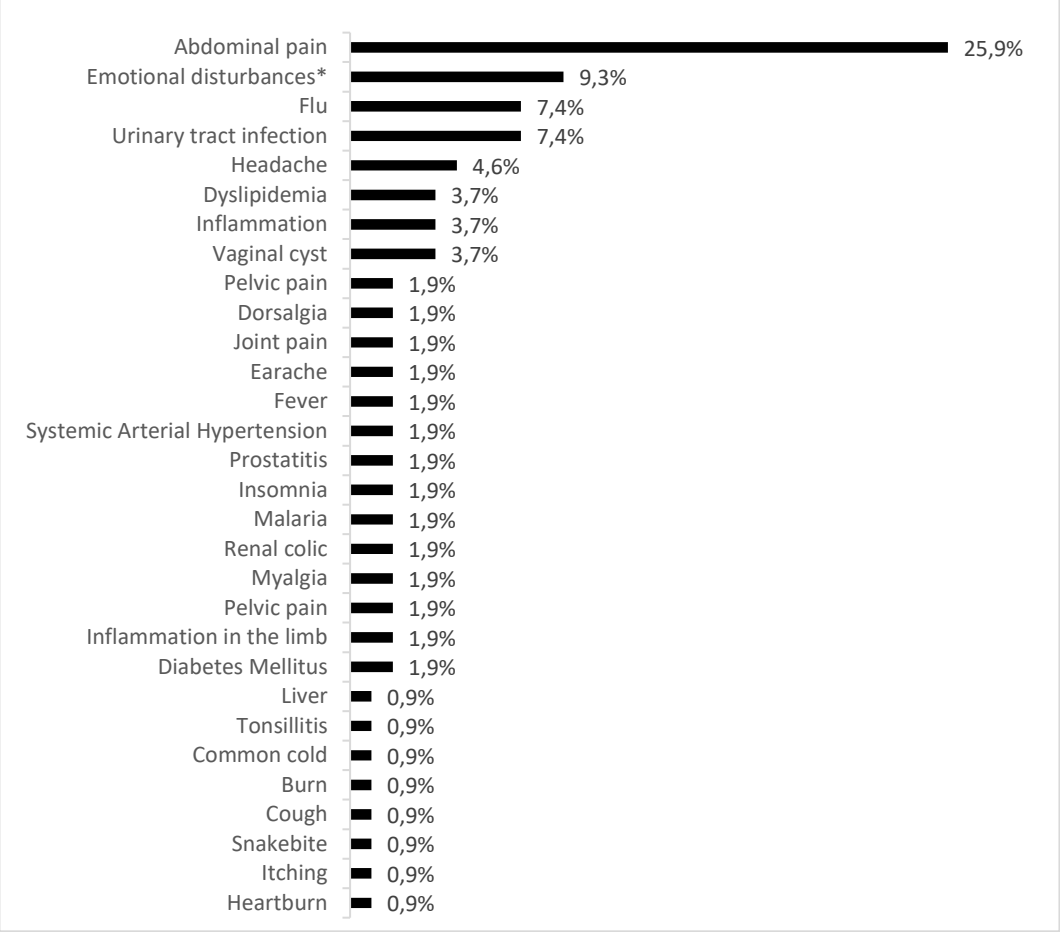
Regarding the species of MPs used, the use of 45 distinct plants was mentioned, consumed on 108 occasions. The most commonly used MPs as home remedies were *Capim Santo* (*Cymbopogon citratus*) (11.1%), *Erva Cidreira* (*Melissa Officinalis*) (9.3%), and *Boldo* (*Vernonia Condensata*) (6.5%). Table 3 presents the preparation method of the MPs.

Table 3: Distribution of the consumption of medicinal plants according to the parts used and preparation methods. Coari, AM, Brazil, 2018.

	Variable	*N* = 108 (%)
Preparation method	Tea	95 (88.0)
	Gargle	2 (1.9)
	Infusion	1 (0.9)
	In its natural state	1 (0.9)
	NS*	9 (8.3)
Part used	Leaves	71 (65.7)
	Bark	23 (21.3)
	Branches	1 (0.9)
	Oil	4 (3.7)
	Latex	3 (2.8)
	Fruits	3 (2.8)
	NS*	3 (2.8)

Note: NS*: not specified.

It was observed that tea preparations were the most commonly mentioned (88.0%). Regarding the plant part used, leaves were cited most frequently (65.7%). Data related to the main health issues reported for the indication of Medicinal Plant (MPs) use are presented in Figure 1.



Note: **Anxiety*
Figure 1: Purposes of medicinal plant use reported by Community Health Agents, Coari, AM, Brazil, 2018.

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The health issues mentioned by the participants were classified according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10). The main issues reported leading to the consumption of MPs were abdominal pain (25.9%), emotional disturbances (9.3%), followed by influenza (7.4%), urinary tract infection (7.4%), and headache (4.6%).

DISCUSSION

In the study, ribeirinho CHAs with low levels of education, of the female gender were identified, with higher consumption of MPs among those aged 51 and over, and those in stable unions were identified.

Results were consistent with a study that reported a maximum age of 46 years[15]. This suggests that middle-aged CHAs may possess a deeper and more personal knowledge of medicinal plant use. This knowledge could have been acquired over their lifetimes, whether through family traditions or interactions within the community. Additionally, individuals in middle age often contend with a variety of health conditions, including chronic and acute illnesses, due to the natural aging process. This circumstance may prompt the search for alternative healthcare solutions, including the utilization of MPs. Furthermore, limited access to urban areas may lead these healthcare providers to seek health remedies within their communities.

Regarding education, the majority had incomplete primary education, diverging from studies where CHAs have completed secondary education[14,15]. The lower educational level of CHAs, combined with their mandatory residence in the communities where they work, may have contributed to the practice of MPs by these professionals. Constant exposure to local customs, culture, and health practices may have influenced this tendency. It is noteworthy that the education level identified among the professionals is deemed insufficient, as most lack the minimum qualification required to serve as CHAs, as stipulated by Law No. 13,595, dated January 5, 2018, which mandates the completion of secondary education to practice the profession[16].

Most CHAs who consumed MPs reported the presence of some type of ailment, with abdominal pain and anxiety being the most frequent complaints. It was observed that the majority had MPs in their home gardens, and slightly more than half of the subjects consumed these plants along with industrially manufactured medications. Concerning knowledge about MPs, the CHAs learned to use these plants from their families. The most consumed plants were *Capim Santo*, *Erva Cidreira*, and *Boldo*.

In a health survey conducted with adults from ribeirinho communities in the same region, abdominal pain stood out among the health problems[4]. This scenario may be associated with the high incidence of infectious parasitic diseases in the region, in addition to precarious hygiene and basic sanitation conditions[17]. Furthermore, it is crucial to consider that these professionals face unique challenges. The movement between communities, often carried out by canoe or on foot in rugged terrain, exposes CHAs to occupational risks such as encounters with venomous animals and violence on the rivers. These factors increase the risk of other health problems[4,6].

Concerning income, many CHAs engage in other activities in addition to their health-related functions, such as fishing and agriculture. These additional activities entail significant physical effort. The high workload resulting from the combination of these activities may be directly linked to an increase in health problems. Additionally, this overload may contribute to the development of psychosocial issues[4].

The majority of the CHAs reported having MPs in their home gardens, which is expected due to the vast availability of plant species in the Amazon rainforest. Furthermore, the presence of these plants in home gardens may be linked to traditional medicine practices, which are essential in many communities. In traditional medicine, local populations often rely on the therapeutic properties of specific plants to address potential health issues. These practices are frequently passed down through generations, reflecting the knowledge that communities possess about the medicinal properties of native plants. These results are also consistent with findings from a study conducted with ribeirinho communities in the interior of the Amazonas[18], which highlighted that the majority of respondents cultivate and obtain plants from their own home gardens.

In this dynamic context where health problems are often treated within the community, it was observed that half of the CHAs used MPs in conjunction with industrially manufactured medications. This finding is particularly concerning, especially when there is a lack of knowledge about the active ingredients of the plants used. This issue was also identified in studies conducted with CHAs, where 56.1%[19] and 47.5%[15] of CHAs reported using industrially manufactured medications in conjunction with MPs. Despite their beneficial effects, plants, when used with other substances and in an irrational manner, can lead to intoxication, nausea, irritations, edema, and even death[20].

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The acquisition of knowledge about MPs primarily occurred through family members. Similar data were found in a study conducted in Paraná-PR, where CHAs received information about MPs mainly from their parents[15]. The transmission of knowledge about medicinal plants involves a complex information network composed of social subjects, with the family usually at its core[21]. The value of this knowledge is immense, as it preserves traditional customs and biodiversity, and enables self-care in health in areas where healthcare services are lacking, such as in ribeirinho communities.

Regarding the species of MPs, 45 plants were mentioned, and consumed on 108 occasions, demonstrating the extensive availability of plants and the variability of their use. The most commonly used MPs align with those used in other Brazilian regions, in accordance with other studies that showed *Capim Santo* and *Erva Cidreira* as the most used plants[22,23].

Concerning the use of the plant to address health issues, *Capim Santo* was employed to treat problems such as urinary tract infections, *Erva Cidreira* for emotional imbalances and headaches, among other things, and *Boldo* for gastrointestinal problems. It is important to note that the therapeutic properties of some of these plants have been scientifically validated[25-31], while others may pose health risks, as in the case of *Boldo*, which can be detrimental to the liver. There is evidence indicating that *Boldo* may lead to the development of conditions such as unexplained jaundice or elevated liver enzyme levels, especially in older adults[32].

In this study, it was evident that ribeirinho CHAs made use of MPs relying on sources of information lacking scientific validation, notably from family members and friends/neighbors. These findings align with a study conducted in a municipality in Bahia, where the majority of healthcare providers (90.3%) lacked knowledge about programs or policies related to the use of MPs[19]. This discovery highlights the information and training deficit in this specific area, emphasizing the need to implement Continuous Health Education to fill this knowledge gap and enhance the performance of healthcare providers regarding this topic.

The parts of MPs most commonly used for consumption, as reported by the interviewees, were the leaves, with tea as a preparation method.

The ease of obtaining leaves can be justified by their availability throughout the year and their ease of harvest. As for the use of tea, it may be associated with the simplicity of preparation. These results have also been observed in studies where tea was the consumption method most utilized (87.4%), and leaves had the highest number of mentions of their use (62%)[33,34].

The use of MPs is an important self-care instrument among ribeirinho populations, with replication among CHAs. Additionally, knowledge about dosage and long-term use toxicity is necessary. Despite being cataloged, some of these plants lack scientific validation of their actions and the interactions among them that could potentiate their effects.

It is emphasized that it is crucial to invest in more comprehensive research on MPs, including clinical studies to validate their therapeutic properties, toxicity assays, and drug interactions. It is believed that through this, it will be possible to ensure the safe use of MPs, promoting integration between traditional practices and conventional medicine, as well as improving the quality of healthcare provided to ribeirinho populations in the Amazon region.

Study limitations

A limiting factor in conducting the study was the self-reported nature of the information collected about the plants, which could potentially alter the results due to the misidentification of medicinal plants or memory bias. Additionally, the physical and mental strain on the research participants resulting from the extensive journey to the urban zone may have impacted the quality and reliability of the information provided.

Another limitation of the study was its general nature concerning the consumption of MPs among the ribeirinho CHAs. This approach underscores the need for more in-depth research to accurately assess the toxicological and pharmacological profile of the consumption of these substances within the ribeirinho population.

CONCLUSION

The consumption of medicinal plants is a common practice among ribeirinho CHAs. The study highlighted the extensive availability of different plant species in the region, with the use of various parts, including leaves, bark, fruits, branches, and latex, to address a variety of health issues.

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Considering that medicinal plants play a culturally significant role in the self-care of the health of ribeirinho populations due to their widespread availability and low financial costs, it is imperative to develop strategies that promote the knowledge and proper use of these plants. These strategies should aim to sustainably and inclusively strengthen the Brazilian National Health System in remote areas of the Brazilian Amazon.

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Conceptualization, A.S.M.G. and M.P.S.; methodology, A.S.M.G., M.P.S., R.S.M., A.F.G., and P.A.V.L.; validation, A.S.M.G.; formal analysis, M.P.S., R.S.M. and A.F.G.; investigation, M.P.S., R.S.M., A.F.G, S.F.S., M.H.S.R., J.K.A.P., P.A.V.L., and A.S.M.G.; resources, A.S.M.G. and M.P.S.; data curation, A.S.M.G., M.P.S. and P.A.V.L.; manuscript writing, M.P.S., A.S.M.G., R.S.M. and A.F.G.; manuscript review and editing, M.P.S., R.S.M., A.F.G, S.F.S., M.H.S.R., J.K.A.P., P.A.V.L. and A.S.M.G.; visualization, A.S.M.G., M.P.S., R.S.M. and A.F.G.; supervision, A.S.M.G.; project administration, M.P.S. All authors have read and agreed to the published version of the manuscript.