Patients' perception and use of medicinal plants for chronic disease in a community from Rio Grande do Sul

Percepção dos pacientes e uso de plantas medicinais para doenças crônicas em comunidade do Rio Grande do Sul

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ABSTRACT
The popular use of medicinal plants to treat health problems is well known and disseminated from generation to generation, but little is known about toxicity and interactions. Therefore, this work aims to verify the perception about the use of medicinal plants for chronic patients in a community located in Rio Grande do Sul. A cross-sectional study was carried out with chronic diseases' patients from the municipality of Novo Hamburgo, RS that are users of medicinal plants. Sociodemographic data, clinical characteristics and aspects related to the use of medicinal plants were evaluated for 100 users of medicinal plants, predominantly female (90%) and mean age was 54.8 years. Most have incomplete elementary education (55%) and 95% of those interviewed receive a monthly family income of 1 to 3 minimum wages. There were 318 citations of plant species, of which 63 were different types. The most used were chamomile (*Matricaria chamomilla* L, 9.4%), lemon grass [*Cymbopogon citratus* (DC.) Stapf, 8.4%), pennyroyal (*Mentha pulegium* L., 6.2%) and macela [*Achyrocline satureioides* (Lam.) DC., 5%]. Regarding the preparation method, 52% of the patients performed infusion, 39% decoction, 7% decoction and infusion and 2% consumed in the mate. Most of the results on the medicinal plants used are consistent with the findings in the literature and it is noticed that a great part of interviewees knows that, even being natural products, medicinal plants may be dangerous.

Keywords: medicinal plants, popular knowledge, phytotherapy.

RESUMO
O uso popular de plantas medicinais para tratar problemas de saúde é bem conhecido e disseminado de geração em geração, mas pouco se sabe sobre toxicidade e interações. Portanto, este trabalho tem como objetivo verificar a percepção sobre o uso de plantas medicinais por pacientes crônicos em uma comunidade localizada no Rio Grande do Sul. Foi realizado um estudo transversal com pacientes portadores de doenças crônicas do município de Novo Hamburgo, RS, usuários de plantas medicinais. Dados sociodemográficos, características clínicas e aspectos relacionados ao uso de plantas medicinais foram avaliados para 100 usuários de plantas medicinais, predominantemente do sexo feminino (90%) e a média de idade foi de 54,8 anos. A maioria possui ensino fundamental incompleto (55%) e 95% dos entrevistados recebem renda familiar mensal de 1 a 3 salários mínimos. Houve 318 citações de espécies de plantas, das quais 63 eram de tipos diferentes. As mais utilizadas foram camomila (Matricaria chamomilla L, 9,4%), capim-limão [Cymbopogon citratus (DC.) Stapf, 8,4%], poejo (Mentha pulegium L., 6,2%) e macela [Achyrocline satureioides (Lam.) DC., 5%]. Em relação ao método de preparo, 52% dos pacientes realizavam infusão, 39% decocção, 7% decocção e infusão e 2% consumiam no mate. A maioria dos resultados sobre as plantas medicinais utilizadas está de acordo com os achados da literatura e percebe-se que grande parte dos entrevistados sabe que, mesmo sendo produtos naturais, as plantas medicinais podem ser perigosas.

Palavra-chave: Plantas medicinais, conhecimento popular, fitoterapia.

1 INTRODUCTION

Plant species arouse the interest of human beings since their existence. Through the search for food, men have chosen plants containing certain therapeutic properties for the treatment of their diseases[1]. According to data from the World Health Organization (WHO), approximately 80% of the world population uses traditional practices in primary health care and 85% from the total amount of medicinal plants (MP) used[2]. In Brazil, several factors motivate the population to search increasingly more for plant species, due to their easy access and to the high cost of medications[3].

In order to guarantee the integrality in health care, the Brazilian Ministry of Health presented in 2006 the National Policy on Integrative and Complementary Practices (PNPIC) with the objective of implementing actions and services of Traditional Chinese Medicine/acupuncture, homeopathy and phytotherapy in the care provided by the *Sistema Único de Saúde* (SUS). In the same year the PNPIC was approved, which established guidelines for the progress of actions aimed at guaranteeing safe access and rational use of MP and phytotherapeutics to the population, as well as the sustainable use of biodiversity[4]. Phytotherapy is defined as the treatment with medicinal plants in their various pharmaceutical forms without the use of separate active principles for the purposes of healing or minimization of symptoms[5].

The use of MPs in SUS has been increasing, so that in 2017, in Rio Grande do Sul (RS), was established the State Relation of Medicinal Plants of interest of the Unified Health System and complementary lists (REPLAME), through the Regulatory Ordinance SES/RS 588/2017, which includes native, exotic and naturalized species most used by the population of RS. The State Schedule for Health Research Priorities[6] is one of its attributions. In this context, this work aims to verify the perception about the use of MP for chronic patients in a community located in RS.

2 MATERIALS AND METHODS

A cross-sectional study was carried out with 100 patients with chronic diseases (CD) and users of MP from Novo Hamburgo, RS in the period from 2017 to 2018. Patients with CD such as diabetes, hypertension, dyslipidemia and depression who use MP were included in this study. The participants of this research were over 18 years old and agreed to participate in the study, by signing the informed consent form (ICF), aware of its nature and its objectives.

The research project was approved by the Research Ethics Committee of University Feevale (protocol 1.948.129) and meets the guidelines and norms of research on human beings (National Health Council Resolution No. 466/2012). Signing the ICF was requested to the subjects involved in the research in two copies, informing the objective of the study as well as ensuring the privacy of their participation.

The research instrument for data collection includes a structured questionnaire, which characterized clinical, social and demographic variables, as well as aspects related to the use of MP. In order to accomplish that, participants were asked about age, sex, schooling, monthly family income, weight, height and alcohol or tobacco use. They were also questioned about their disease and how long it had been diagnosed; besides what medications they take, as well as dose, indication and how much time they use them.

In addition, it was verified which MP is used, the extension and the reason of its use, the form of preparation and posology. It was also discussed how patients started using MP and their opinion on the importance of using them for the treatment as well as if they believe that plants are more effective than medicines. It was also asked what patients think of plants causing harm, if used erroneously, and if they would like to have more information on the use of plants. Moreover, this study also asked about which health professional they would choose to ask for guidance on the correct use of MP. The bibliographical search for indications of mentioned plants occurred through their scientific name, with bibliographical support from the work of Backes and Nardino[7].

All the information collected was stored in a database in the SPSS 25.0 statistics software. It was performed a descriptive analysis of data, which were expressed as percentage, mean and standard deviation.

3 RESULTS AND DISCUSSION

3.1 SOCIO, DEMOGRAPHIC AND CLINICAL PROFILE

Concerning the socio-demographic profile (Table 1), among the 100 patients who accepted to participate in the present study, female predominance was verified (90%). The mean age was 54.8 years, 90% declared themselves as non-smokers and all as non-alcoholic. Most of the participants have incomplete elementary education (55%) and 95% receive a monthly family income of 1 up to 3 minimum wages.

Table 1 – Social demographic profile of the patients with chronic diseases and users of medicinal plants from Novo Hamburgo, RS is the period from 2017 to 2018

	Characteristic	Frequency (n = 100)
Gender	Female	90 %
	Male	10 %
Age (years)	Mean	54.8 years
	25 – 34	4 %
	35 – 44	14 %
	45 -54	32 %
	55 – 64	31 %
	65 – 74	15 %
	75 – 84	4 %
Education	Incomplete elementary education	55 %
	Complete elementary education	13 %
	Incomplete high school	3 %
	Complete high school	23 %
	Post-secondary education	6 %
Income	1 – 3 minimum wages	95 %
	3.5 – 5 minimum wages	5%
Smoking status	Yes	10 %
	No	90 %
Alcoholism	Yes	0 %
	No	100 %

Moraes et al.[8] found 72.28% of women interviewed (among a sample of 101 participants) in the study and Carvalho et al.[9] also observed in their research that 71% of the interviewees were female. Moreover, in this same study, it was verified the predominance of people whose income was up to 3 minimum wages. According to these authors, women interviewed spent much time at home in household tasks, acquiring their knowledge on MP through conversations with family and friends. On the occasion of illness, they sought help drinking "teas".

A low level of schooling was observed among the interviewees, which contributed to a low family income. This leads to the increase in demand for low-cost therapeutic resources, such as the use of MP for the treatment of diseases. Corroborating this information, the study by Santos et al.[10] showed 56.1% of prevalence of incomplete elementary school, while for Ruas et al.[11] the result was 43% and for Dos Santos Souza et al.[12] the result was 80% with low level of education.

Depression, hypertension, diabetes, hypercholesterolemia and hypothyroidism were the most cited CD by the interviewees. Table 2 illustrates, beyond the disease, the time needed for diagnosis, the medicine used and its time period. Regarding the time

necessary to diagnose the disease, there is a variation of a few months up to 33 years and it can be observed that during that interval there was some type of treatment.

Table 2 - Chronic diseases and pharmacological treatment in patients with chronic diseases and users of medicinal plants from Novo Hamburgo, RS is the period from 2017 to 2018

Disease	Diagnostic time	Drug	Time of use
Depression	*8 mouth - 22 years*	Fluoxetine 15 mg	2 years
		Fluoxetine 20 mg	8 mouths - 12 years
		Sertraline 50 mg	15 – 22 years
		Sertraline 100 mg	1 year
		Sertraline 200 mg	6 years
		Citalopram 10 mg	1 year
		Citalopram 20 mg	2 years
		Amitriptyline 25 mg	8 years
Arterial hypertension	*4 mouths - 33 years*	Hydrochlorothiazide 25 mg	1 - 30 years
		Losartan 50 mg	1 - 20 years
		Enalapril 10 mg	6 mouths - 30 years
		Enalapril 20 mg	4 mouths - 10 years
		Spironolactone 25 mg	4 years
		Atenolol 25 mg	30 years
		Atenolol 50 mg	2 - 7 years
		Amlodipine 2,5 mg	2 years
		Amlodipine 3 mg	3 years
		Amlodipine 5 mg	2 - 10 years
		Amlodipine 25 mg	3 years
		Captopril 25 mg	1 - 5 years
		Verapamil 80 mg	10 years
		Atensin 100 mg	10 years
		Propranolol 40 mg	33 years
		Atenolol + chlorthalidone 50/12.5 mg	8 years
Hypercholesterolemia	*2 mouths - 20 years*	Simvastatin 20 mg	2 mouths - 7 years
	1 mouth - 15 years	Simvastatin 40 mg	2 - 20 years
Hypothyroidism		Levothyiroxine 25 mcg	2 years
		Levothyiroxine 75 mcg	2, 8, 15 years
		Levothyiroxine 100 mcg	1 mouth - 10 years
		Levothyiroxine 150 mcg	15 years
		Levothyiroxine 500 mcg	5 years
Diabetes	*1 - 22 years*	Metformin 850 mg	1 -22 years
		Metformin 500 mg	2 – 20 years
		Glibenclamide 4 mg	20 years
		Glibenclamide 5 mg	2 - 22 years
		NPH insulin	15 years

3.2 GENERAL ASPECTS ON THE USE OF MP

Among the interviewees, 74% use MP to treat themselves when they are sick, and 56% began to use those resources by advice of someone (Table 3). These data corroborate findings of Silva et al.[13], who interviewed 43 individuals and obtained a total of 73% of

respondents who use plants due to recommendation. De Paula Alves et al.[14], in a study with 20 participants, found that 90% of the interviewees use plants because of someone's suggestion.

Table 3 - Use of medicinal plants among the patients with chronic diseases and users of medicinal plants from Novo Hamburgo, RS is the period from 2017 to 2018

Characteristic		Frequency (n = 100)
Use medicinal plants to treat themselves	Yes	74 %
	No	26 %
Started use	Someone's suggestion	56 %
	Free will	36 %
	Media	8 %
Preparation method	Infusion	52 %
	Decoction	39 %
	Decoction and infusion	7 %
	Mate	2 %

In relation to the preparation method, 52% of patients use infusion, 39% decoction, 7% decoction and infusion and 2% drink with yerba mate, locally known as *chimarrão* or mate (Table 3). Dos Santos Souza et al.[12] found similar results in comparison with the present study, in interviews with 95 participants in Curitiba. The predominance of brewing method was infusion (51%), followed by decoction (21%), mate (9%) and others techniques (maceration, syrups, tinctures, compresses, ointments, in natura consumption, baths and inhalations, 19%) as Silva et al.[13] They verified that 83% of interviewees used plants as teas, both by decoction and by infusion, but the predominance remained with the infusion method, presenting a total of 40% in interviews with 43 participants.

The preparation method is important in order to obtain a greater amount of the active principle, to avoid the degradation of thermolabile compounds and also to reduce the degree of toxicity[15]. Thus, the preparation of MP for use in the treatment of diseases is a very important point to avert adverse effects. It should be noted that conducts indicated at the guidance for a correct use of MP, including preparation, storage and dosing, needs to be transmitted to the population, avoiding their adverse effects[16]. In this respect, the National Formulary of Phytotherapeutics, which integrates the Brazilian Pharmacopoeia, was published by the National Agency of Sanitary Vigilance (ANVISA) in 2011[17], which brings monographs of phytomedicines and the standardized preparation

of phytotherapeutic formulations. In 2018 the First Supplement of the Phytotherapeutic Form of the Brazilian Pharmacopoeia[18] was published, updating the previous one.

For brewing teas, it is necessary to take care regarding the container used. It is suggested to use clay, crockery, stainless steel or enameled bowls. From day to day, teas can ferment, so it is important to prepare them daily. The most widely used ways of preparation are infusion, decoction and maceration[19]. In this compendium, it is recommended the infusion method, which consists of putting boiling water on the herbs and leaving them covered for 10 minutes. It is suitable for leaves and flowers. Decoction requires placing chopped herbs in a container with cold water and boiling them for 5 to 30 minutes, depending on the number of herbs used, straining them after. It is adequate for hard parts, such as roots and stalks[20].

When questioned about the importance of the use of MP in their lives and treatments, 46% of respondents answered that it is very important, 41% said it is important, 10% think it is unimportant and 3% had no opinion. Participants were also asked whether plants were more effective than medicines, and 41% said they have the same importance, 29% said no, 27% said yes and 3% had no opinion. In addition, they were questioned whether MP causes harm if used incorrectly, and 89% answered yes, while 11% said no. Those who answered "no" claim that "it's all natural".

According to Oliveira & Araújo[21], it is established the idea that the indiscriminate use of in natura plants or their derivatives can cause damage to health, opposing the popular understanding that "if it’s natural, it’s good; if it doesn't help, at least it doesn’t hurt". There is a tendency to use MP by concluding that it is all natural, non-toxic and does not harm health. However, this conception is wrong, since there are an enormous variety of plants that can be harmful to the human organism and present high toxicity[22].

The adverse effects resulting from the use of phytotherapics and MP come from the false idea that being "natural" implies being non-toxic. Interactions of plant constituents and phytotherapics with other medications may generate a condition of toxicity. Variables such as age, gender and physiological conditions may aggravate the adverse effects. The use of MP without correct guidance and proper preparation may cause undesirable effects, damage to the body and even affect the recovery of patient's health. It is responsibility of health care professionals, especially the pharmacist, to indicate the importance of the rational use of plants and phytotherapics, demonstrating that natural alternatives can also be dangerous[23, 24].

In Brazil, MP are used with little or no confirmation of their pharmacological properties. They are often used for different purposes in relation to the ones already confirmed. Adverse effects occur very frequently, and the research and control of the sale of products in open fairs, markets or natural products stores are still in an early stage[25]. When questioned which professional they would choose to ask for guidance on MP, the most cited were physician (47 %) and pharmacist (45 %), followed by nurse (17 %), dentist (4 %) and others. The growing consumption of MP leads to frequent requests for pharmaceutical and clinical guidance. The users go to pharmacies and physicians asking for information and clarification on the use of those plants[26]. Regarding the media chosen to obtain more information on MP use indicates that most people would like to attend lectures on the subject.

3.3 PRINCIPAL MP

There were 318 citations of plant species divided into 63 different types. Some of them were cited only once and others repeatedly (30 citations). Table 4 shows the aforementioned plants, as well as the reason for their use. Information on popular usage present in the literature was also included for comparison purposes. In this research, the 12 plants most cited were selected in order to discuss the preparation, the reason for the use and the recommendation in the literature. These were mentioned in at least 10 questionnaires and represent 62% of the total number.

Table 4 – The principal medicinal plants mentioned by patients with chronic diseases and users of medicinal plants from Novo Hamburgo, RS is the period from 2017 to 2018

Plant	Mentions	Reason for use	Popular use in literature
Chamomile *Matricaria chamomilla* L.	30 (9.40 %)	Soothing, digestive, flu and colic	Stomach pain, indigestion and nervousness [28].
Lemon Grass *Cymbopogon citratus* (DC.) Stapf	26 (8.20 %)	Soothing, hypertension, flu, headache and insomnia	Nervous breakdowns, diuretic [33], antispasmodic e sedative [34].
Pennyroyal *Mentha pulegium* L.	20 (6.30 %)	Flu, colds, headache, cough, soothing and diuretic	Digestive disorders, amenorrhea, gout, colds and increased urination [37-39].
Yerba mate *Ilex paraguariensis* St. Hil.	16 (5.00 %)	Habit	Improving lipid metabolism [41], antioxidant activity [42] and anti-inflammatory [43].
Macela *Achyrocline satureioides* (Lam.) DC.	16 (5.00 %)	Flu and digestive	Problems in the digestive system, nervous and menstrual cramps, soothing [45], expectorant, antidiarrheal [46].
Rose of Sharon *Hibiscus syriacus* L.	15 (4.70 %)	Weight loss and diuretic	Diuretic effect, uricosuric, antimicrobial, mild laxative, sedative, antihypertensive, antitussive, reduces total lipids, cholesterol and triglycerides levels [48], decreases adipogenesis [49].
Forskohlii *Plectranthus barbatus* Andrew	14 (4.40 %)	Digestive	Analgesic, sedative, gastrointestinal tract [51].
Lemon verbena *Aloysia triphylla* (L'Herit.) Britt	14 (4.40 %)	Flu, malaise and nervousness	Digestive, diuretic, soothing, cardiotonic, stimulant, emmenagogue and anxiolytic [54].
Peppermint *Mentha x piperita* L.	14 (4.40 %)	Digestive, flu and tranquilizer	Antispasmodic and antiflatulent [17,18]. Expectorant, carminative, antispasmodic [27].
Ginger *Zingiber officinale*	11 (3.50 %)	Flu and weight loss	Antioxidant [56], treatment of nausea and vomiting in pregnant [57], hepatoprotective [58].
Guaco *Mikania glomerata* Sprengel	11 (3.50 %)	Flu, cough and sore throat	Anti-inflammatory [59], treatment of respiratory diseases [60].
Anis eseed *Pimpinella anisum* L.	10 (3.16 %)	Soothing and digestive	Antispasmodic, inhibitor of intestinal fermentation and carminative [61].

Chamomile (*Matricaria chamomilla* L.) was the most cited plant, reaching 9.4% of responses. The use, according to the interviewees, is orally and the reason for use was related to soothing, digestion, flu and cramps. Regarding the preparation method, 19 individuals mentioned that they prepare it by infusion, 10 by decoction and 1 by decoction and infusion. According to the Brazilian Phytotherapics Form by ANVISA[17,18], the correct method of preparation would be by infusion and the indications of use are as antispasmodic, anxiolytic and mild sedative. The use of chamomile as medication is legalized by the Normative Instruction No. 02 of May 13th 2014[27], which publishes the "List of phytotherapeutic medicines of simplified registration" and the "List of traditional phytotherapeutic products of simplified registration". The plant appears as a simplified registration phytotherapeutic medicine and the use claim would be as intestinal antispasmodic and for functional dyspepsia. In the Normative Instruction, the preparation method is not mentioned. It is often consumed as tea, being used for stomach discomfort, indigestion and nervousness. It can also be used externally to treat hemorrhoids, sores on the oral mucosa and skin scars[28]. In relation to pharmacological properties, there are several scientific studies proving antidiarrheal, antisecretory, antispasmodic, antioxidant, anti-inflammatory, antihyperglycemic and antimicrobial action, among others[29-31]. It is remarkable that interviewees know the claim of use of this plant, since their answers match the findings in the literature.

Concerning lemon grass (*Cymbopogon citratus* (DC.) Stapf), individuals use it orally for sedative, hypertension, headache, flu and insomnia reasons. On the preparation method, 16 interviewees mentioned that they prepare it by infusion, 8 by decoction and 2 by infusion and decoction. According to the Brazilian Phytotherapics Form by ANVISA[17,18], the correct method for preparation would be by infusion and recommendations of use would be as antispasmodic, anxiolytic and mild sedative. That plant appears as a traditional phytotherapeutic product of simplified registration in the Normative Instruction No. 02 of May 13th 2014[27] and the use claim would be as carminative, antispasmodic and mild anxiolytic. Lemon grass is used in food and its compounds do not present toxicity to humans[32]. In Brazil, the main indication for use are nervous breakdowns, but studies indicate a quick diuretic action of the plant, being effective for lowering blood pressure, however the mechanism of action is not clearly elucidated[33]. According to the studies of Tôrres et al.[34], the crude extract of lemon grass leaves presents chemical components with antispasmodic and sedative activity, as well as antiseptic action against Gram-positive bacteria that cause respiratory tract infections.

Besides presenting antimicrobial activity, it also presents other functions that have been observed when used as teas, macerated or in compresses and baths. Antispasmodic, antipyretic, sedative, anti-inflammatory and diaphoretic activities are prominent[35,36].

Pennyroyal (*Mentha pulegium* L.), by its turn, was orally used for flu, cold, headache, cough, soothing and as diuretic. Concerning the preparation method, 14 individuals mentioned that they prepared it by infusion, 5 by decoction and 2 by decoction and infusion. It is used in the home treatment of digestive disorders, amenorrhea, gout, colds and to increase urination[37-39]. In a study conducted by Gonçalves et al.[40], 85.71% of interviewees reported to brew the tea by infusion.

As for yerba mate (*Ilex paraguariensis*), the mentioned reason for usewas only habit, but there are studies demonstrating an improvement in lipid metabolism[41], antioxidant activity[42] and anti-inflammatory activity [43]. The extracts of the plant are popular because they present polyphenols, promoting antioxidant effects. Studies have indicated that extracts reduced hyperglycemia, regularized oxidative stress parameters and prevented peripheral neuropathy. It is suggested that the plant compounds may assist in providing therapeutic alternatives for the treatment of diabetes mellitus[44].

About macela (*Achyrocline satureioides*), people use it orally for flu and digestive reasons. Concerning its preparation, 7 individuals mentioned infusion, 7 decoction, 1 decoction and infusion and 1 in the mate. Macela is indicated for problems in the digestive system, cramps of nervous and menstrual origin and soothing[45], as well as expectorant, antidiarrheal[46], and according to the Brazilian Phytotherapics Form by ANVISA[17,18] is also recommended as anti-dyspeptic, antispasmodic and anti-inflammatory. Infusion is the proper brewing method. Research conducted by De Souza et al.[47] have shown that macela extract combines flavonoids with synergistic anticancer activity and potential for in vivo studies.

In relation to rose of Sharon (*Hibiscus syriacus* L.), interviewees mentioned oral use for weight loss and diuretic reasons. Regarding the preparation method, 11 participants said they prepare it by infusion, 3 by decoction and 2 by decoction and infusion. Studies have shown diuretic, uricosuric, antimicrobial, mild laxative, sedative, antihypertensive and antitussive effects, as well as reducing total lipids, cholesterol and triglycerides levels. More recently, there are indications that rose of Sharon appears to have antioxidant, antimutagenic, antitumor and antileukemic activity [48]. Research concludes that rose of Sharon tea is able to decrease adipogenesis, reducing the fat in abdomen and hips areas. However, it is not yet clear which substance is responsible for

this benefit, but is assumed to be the antioxidant action of flavonoids anthocyanin and quercetin[49]. Ali et al.[50] performed tests in rats to evaluate paracetamol hepatotoxicity, and rose of Sharon extract was orally administered in place of water to evaluate its effects. As a result, the extract has significantly improved some of the liver function tests, however further testing should be done to assess both safety and efficacy. Meanwhile, the extract can potentially be used to mitigate paracetamol hepatotoxicity.

The oral use of the forskohlii (*Plectranthus barbatus* Andrews) was cited by participants for helping digestion. On the preparation method, 10 individuals mentioned that they prepare it by infusion, 2 by decoction and 2 by decoction and infusion. According to Brazilian Phytotherapics Form[17,18], the indication of use is as anti-dyspeptic and the proper preparation method is infusion. The leaves have substances that contain analgesic activity and show no adverse effect. It was verified mild sedative activity, which may be related to analgesic, as well as bactericidal and fungicidal activity, not yet clarified in the literature. Alkaloids exhibit choleretic properties – which stimulate bile flow. In addition to actions in the gastrointestinal tract, the substance boldine still has anti-inflammatory and antipyretic activity, since it acts in inhibition of prostaglandin synthesis[51]. The antioxidant effect may be associated with the ability to sequester hydroxyl and peroxyl radicals[52]. Studies have shown that boldine is able to reduce in vivo oxidation of low-density lipoprotein (LDL)[53].

In relation to lemon verbena [*Aloysia triphylla* (L'Herit.) Britt], respondents use it orally due to flu, malaise and nervousness. Regarding the brewing method, 7 participants mentioned that they prepare it by infusion, 5 by decoction and 2 by decoction and infusion. It is used as digestive, diuretic, soothing, cardiotonic, stimulant, emmenagogue and anxiolytic[54]. Studies by Abderrahim et al[55] have shown that aqueous extracts have antioxidant potential.

Regarding peppermint (*Mentha x piperita* L.), its use is oral for digestion, flu and as a tranquilizer. About the preparation method, 6 individuals mentioned that they prepare it by infusion, 6 by decoction and 2 by decoction and infusion. According to the Brazilian Phytotherapics Form[17,18], peppermint is indicated as antispasmodic and antiflatulent, and according to Normative Instruction No. 02 of May 13th 2014[27] the use claim would be as expectorant, carminative, antispasmodic and for treatment of irritable bowel syndrome.

The oral use of ginger (*Zingiber officinale*) was mentioned by participants for flu and weight loss. Regarding the preparation method, 5 answered that they prepare it by infusion, 3 by decoction, two in the mate and one by decoction and infusion. The extracts

of different vegetables were analyzed by Kaur & Kapoor[56], among them was the ginger, and the authors classified it in the group of vegetables that had high antioxidant activity. On the other hand, Vutyavanich et al.[57] evaluated the efficacy of ginger in the treatment of nausea and vomiting in pregnant women, and this effect was confirmed, however the mechanism of action has not yet been well elucidated. For Lai et al.[58], it was observed the hepatoprotective efficacy and the mechanism of action of ginger essential oil against fatty liver disease, and the result indicated a potent hepatoprotective effect.

Concerning guaco (*Mikania glomerata* Sprengel), the reason for use was for flu, cough and sore throat by oral ingestion. About the preparation method, 7 respondents mentioned that they prepare it by infusion, two by decoction, one in the mate and one by decoction and infusion. According to the Brazilian Phytotherapics Form[17,18], guaco is indicated as an expectorant. It also appears as a bronchodilator, as disposed at Normative Instruction No. 02 of May 13th 2014[27.] It was verified that the hydroalcoholic extract of guaco is capable of producing anti-inflammatory activity when induced in mice with allergic pneumonitis[59]. Furthermore, studies have described that guaco acts causing bronchodilation and relaxation of respiratory smooth muscle, which corroborates with the indication for the treatment of respiratory diseases[60].

In relation to anise seeds (*Pimpinella anisum* L.), participants mentioned oral use for soothing and digestive purposes. For the brewing method, 6 individuals said they prepare it by infusion and 4 by decoction. According to the Brazilian Phytotherapics Form[17,18], anise seed is indicated as anti-dyspeptic and antispasmodic. It also appears as expectorant and carminative in Normative Instruction No. 02 of May 13th 2014[27.] Studies conducted by Nascimento et al.[61] stated that anise seed is used as antispasmodic, inhibitor of intestinal fermentation and carminative. Tests performed by Boskabadady & Ramazani-Assari[62], on the other hand, have verified the bronchodilator action of anise seed essential oil, as well as ethanolic and aqueous extracts. In addition, they verified antibacterial and antioxidant activity for Gram positive and negative bacteria[63].

Among the plants mentioned, 20 are part of the National List of Medicinal Plants of Interest to SUS (RENISUS)[64], and they are: chamomile, pennyroyal, forskohlii, peppermint, guaco, ginger, high mallow, fennel, espinheira-santa, artichoke, field horsetail, epazote, absinthium, white mulberry, common guava tree, avocado tree, Brazilian berry, devil's claw, greater plantain and cat's claw. The list presents the plants that have potential to generate products of interest to SUS and aims to guide studies and research in order to develop the list of existing phytotherapics for safe and effective

treatment of diseases by the population[64]. Some plants have not been found in the literature or have no therapeutic activity. It is the case of the Brazilian pine knot, which serves as firewood and wood boiler fuel[65], as well as garibola, which had no evidence. This can happen due to respondents answering what they think, and considering that no exsiccatae were made, it is impossible to know what participants intended to answer.

4 FINAL CONSIDERATIONS

It was possible to verify that a great part of interviewees really knew the claim of use of plants, which evidences that popular knowledge transmitted from generation to generation is very important. More research should be done on the subject, so that people may increasingly use the plants knowing their risks and benefits, since many individuals use them without actually knowing the plants and their properties. It is a remarkable fact that most interviewees know that, even being a natural product, plants can be dangerous, and this is important because information is passed from one to the other in small communities.

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