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ETHNOPHARMACOLOGICAL INVESTIGATION IN BRAZILIAN PUBLIC HEALTHCARE UNITS

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ABSTRACT: This study was intended to investigate folk medicine-related plants used in Brazilian public healthcare units according to popular knowledge regarding them. Henceforth, a qualitative, cross-sectional, exploratory and descriptive research was conducted, and was based on a structured questionnaire whose application occurred in healthcare units of Mineiros city, Goiás state, Brazil. 200 people were interviewed between March and April 2016, those aged 18 years or over were eligible for the study. Data obtained regarding age, gender, family income, drug use and source of acquired knowledge about folk medicine-related plants was assessed. Results evidenced that the most frequent age regarding herbal use was between 18 and 30 years (35%), followed by 30 to 40 years, 40 to 50 years, over 60 years. Of this total, 66% were female and 34% were male. Concerning the information obtained on medicinal plants use, 61% (n = 122) referred to their ancestors, while the most mentioned plants were: *Peumus boldus*, *Mentha spp.*, *Dysphania ambrosioides*, *Cymbopogon citratus*, *Vernonia polysphaera*, *Zingiber officinale*, *Curcuma longa* and *Mentha pulegium*. This work indicated therefore that the empirical knowledge predominates when herbal use is concerned, and this information is nonetheless passed from generation to generation, henceforth contributing to ameliorate overall patient status, and aid proper healthcare.

KEYWORDS: Ethnopharmacology; Medicinal Plants; Public Health.

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1. INTRODUCTION

Herbal use in folk medicine is a well-known practice whose basic healthcare heavily relies upon. In this context ethnopharmacological studies may provide information concerning traditional uses as well as suggest possible innovative applications for well established folk medicine practices [1-2-3]. A country defined by biodiversity such as Brazil provide a prosperous environment for traditional medicine, however, these practices must be accompanied by proper support from contemporary therapeutic knowledge [3-4-5]. Concerning regulated medicinal practices, the rise in the use of phytotherapies i.e. pharmaceutical preparations of herbal origin, has strengthened regulatory standards, which evidences the importance of studies contemplating herbal use in populations whose governmental healthcare is unable to assess [6-7-8]. In this context, ethnopharmacological assessment is noteworthy to gather information concerning folk medicine-related use of herbal mater, as well as to provide data regarding the vegetal varieties whose use predominates in a determined area or region [9-10-11-12]. Due to the relevance of ethnopharmacological assessment, this work is concerned in investigating the profile of patients making use of traditional medicine, henceforth, basic healthcare units were visited and data regarding the use of folk medicine-related plants was analyzed in order to stablish an overall patient profile, as well as to evidence which herbal variety was the most used.

2. MATERIALS AND METHODS

This work is a cross-sectional exploratory and descriptive study in which the patients of five Brazilian basic healthcare units were surveilled. The basic healthcare units were: Dona Sanica, Dona Florinda; Maria Umbelina; Raul Brandão and Basic Unit Dr. João Batista Paniago Vilela, all located in Mineiros city, Goiás State, Brazil. The information about the ethnopharmacological knowledge was obtained by means of a structured questionnaire. The variables defined included age, sex, family income, way of obtaining the plants, information about their use, as well as their use within the family. The city chosen for the study is located in the micro-region of southwest Goiás, with a territory of approximately 9,060km² and 61,623 inhabitants. Its coordinates are 17 ° 34 '8 "S and 52 ° 33' 3" W, the federal highway passing through the municipality is BR-364 as well as the state highways: GO-194 and GO-306. The predominant vegetation is the cerrado, rainy tropical climate and flat soil surface [13-14]. The study period was between March and April 2016. Based on the mean and dispersion (standard deviation), with a 95% confidence level, and a sample error of 5% of the daily flow of individuals attended at the Units, they were (randomized, without repetitions in the same week), totaling 40 interviews in each unit, with a sample number of 200 interviews at the end of the time established for the study. The data was tabulated and threated in the programs Microsoft Word 2010 and Excel 2010. As a selection criteria, individuals should be 18 years old or older and accept to answer the established questions. To do so, it was confirmed that they signed the Free and Informed Consent Form (FICF), when one way was provided to the participant and another

was filed with the study authors. The project was approved by the Human Research Ethics Committee of the University of Rio Verde - GO, under number 134316. Therefore, its implementation was based on Resolution RDC No. 466, dated December 12, 2012 which provides on guidelines and regulatory norms of research involving human beings [15].

3. RESULTS AND DISCUSSION

After the application of the questionnaires, a total of 200 participants were obtained, with the female audience predominating on 66% (n = 132) while 34% (n = 68) were male. Of this group, 35% had the age range between 18 and 30 years (n = 70), representing the most prevalent of the interviewed. The majority reported an income between two and three minimum wages (54%) and a minimum wage (34%). About 82% of the public surveyed reported using medicinal plants, and the knowledge about the use and clinical indication was passed on through generations, by parents, grandparents, uncles, therefore representing 61% of the interviewees. As well as the predominance of the cultivation of these medicinal plants at home, as reported by 36% (n = 72) of the users. Results are depicted in Table 1.

Table 1: Profile of users interviewed regarding gender, age, family income, origin of the knowledge acquired and ways of obtaining medicinal plants for daily use.

	n	Frequency (%)
Sex		
Female	132	66
Male	68	34
Age		
18 to 30	70	35
30 to 40	58	29
40 to 50	32	16
50 to 60	15	7
Above 60	25	13
Family income		
Up to 1 minimum wage	68	34
From 2 to 3 minimum wages	108	54
From 4 to 5 minimum wages	20	10
Above 6 minimum wages	4	2
Origin of acquired knowledge		
Family	122	61
Healthcare professionals	12	6
Neighbors	20	10
Others	10	5

Do not use medicinal plants 36 18

Way of obtainment

Cultivated at home	72	36
Family/friends	63	31,5
Folk medicine doctors	24	12
Pharmacies	11	5,5
Others	30	15

The use of tea is the most used form (58.5%), for that the most cited part of the plant was referred to leaves and later to roots. Based on the knowledge reported by basic healthcare unit users in Mineiros, Table 2 shows the information provided by the interviewees, such as the popular nomenclature, used part, popular therapeutic indication and number of references for the medicinal plants mentioned by the participants.

Table 2: Medicinal plants used daily by users of the basic healthcare units of Mineiros

Popular name	Scientific name	Used part	Main use	Source	Citing
Açafrão	<i>Curcuma longa</i> L.	Root	Respiratory system	16-17-18	13
Alcachofra	<i>Cynara scolymus</i> L.	Flower	Weight loss	18	1
Alcaçuz	<i>Glycyrrhiza glabra</i> L.	Root	Respiratory system	16-17	1
Alecrim	<i>Rosmarinus officinalis</i> L.	Leaves	Digestive system	17-18	10
Alfavaca	<i>Ocimum gratissimum</i> L.	Leaves	Respiratory system	17-18	8
Alho	<i>Allium sativa</i> L.	Root and leaves	Respiratory system	16-18	4
Algodãozinho	<i>Gossypium barbadense</i> var. <i>brasiliense</i> L.	All parts	Anti-inflammatory	18	18
Amora	<i>Rubus</i> L.	Leaves	Weight loss	18-19	5
Angélica	<i>Angelica razulii</i> Gouan	Flowe	Anti-infective	0	0
Angico	<i>Anadenanthera peregrina</i> (L.) Speg.	Bark	Wound healing	17-18	1
Assa-peixe	<i>Vernonanthura ferruginea</i> (Less.) H.Rob.	All parts	Respiratory system	17	16
Arnica	<i>Baccharis lychnophora</i> Gardner.	All parts	Circulatory system	16	4

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Babosa	<i>Aloe vera</i> (L.) Burm.f.	Leaves	Digestive system	16-18-20	8
	<i>Stryphnodendron</i>				
Barbatimão	<i>adstringens</i> (Mart.) Coville	Bark	Anti-infective	17-18	5
Beterraba	<i>Beta vulgaris</i> L.	Root	Anemia	0	0
Boldo	<i>Plectranthus barbatus</i> Andrews	Leaves	Digestive system	17-18	43
Buchinha	<i>Luffa cylindrica</i> M.Roem.	Leaves	Anti-inflammatory	18	1
Caferana	<i>Vernonia condensata</i> Baker	Leaves	Digestive system	18	6
Camomila	<i>Matricaria chamomilla</i> L.	Flower	Nervous system	16-18-20	17
Canela	(<i>Cinnamomum sp.</i>)	Bark	Weight loss	21	1
Capim	<i>Cymbopogon citratus</i>	Leaves	Nervous system	16-18	7
Cidreira	(DC) Stapf				
Carqueja	<i>Baccharis aethiopicum</i> L.	Leaves	Digestive system	16-18-20	6
	<i>Rhamnus sphaerosperma</i>				
Cascara sagrada	<i>pubescens</i> (Reissek) M.C.Johnst.	Bark	Urinary system	0	0
Cavalinha	<i>Equisetum hiemale</i> L.	Leaves	Digestive system	16-18-20	4
	<i>Camellia sinensis</i> (L.) Kuntze	Leaves	Urinary system	22	1
Coco	<i>Cocos nucifera</i> L.	Fruits	Digestive system	0	0
Coentro	<i>Coriandrum sativum</i> L.	Seeds	Painkiller	18	5
	<i>Copaifera oblongifolia</i>				
Copaíba	Mart.	Oil	Wound healing	18-23	1
Couve	<i>Brassica oleracea</i> L.	Flower	Digestive system	0	0
Dedaleira	<i>Digitalis purpurea</i> L.	Leaves	Wound healing	24	1
Erva-cidreira	<i>Lippia alba</i>	Leaves and roots	Respiratory system	18	19
	<i>Pimpinella anisum</i> L.	Flower and leaves	Respiratory and digestive system	18	5
	<i>Chenopodium ambrosioides</i> L.	Flower	Circulatory system	18	29
Espinheira-	<i>Maytenus ilicifolia</i> Mart.	Leaves	Digestive system	16-18-23	1

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Eucalipto	<i>Eucaliptus globulus</i> Labill	Leaves	Anti-inflammatory	17-18	1
Favaquinha	<i>Ocimum carnosum</i> Link & Otto	Leaves	Respiratory system	18	1
Fedegoso	<i>Senna obtusifolia</i> L.	Leaves	Digestive system	26	3
Gengibre	<i>Zingiber officinale</i> Roscoe	Root	Respiratory system	16-17-18	15
Ginkgo	<i>Ginkgo biloba</i> L.	Leaves	Circulatory system	16-18	2
Goiabeira	<i>Psidium guajava</i> L.	All parts	Digestive system	18	3
Guaco	<i>Mikania officinalis</i> Mart.	Leaves	Respiratory system	18-23	5
Hibiscus	<i>Hibiscus sabdariffa</i> L.	Flower	Weight loss	18	1
Hortelã	<i>Mentha pulegium</i>	Leaves	Respiratory and digestive system	16-18	38
Laranjeira	<i>Citrus aurantium</i> L.	Leaves	Respiratory system	18	1
Limoeiro	<i>Citrus limon</i> L.	Leaves and Flower	Respiratory system	18	3
Losna	<i>Artemisia alba</i> Turra	Leaves	Digestive system	16-18	5
Maracujazeiro	<i>Passiflora edulis</i>	Leaves	Digestive system	26	1
Macela	<i>Achyrocline satureioides</i>	Leaves and Flowers	Digestive system	16-18	5
Maria Mole	<i>Peperomia pelúcida</i> L.	All parts	Anti-infective	0	0
Mama-cadela	<i>Brosimum gaudichaudii</i>	Fruits and roots	Digestive system	0	0
Mamão	<i>Carica papaya</i> L.	Seeds	Digestive system	18-23	2
Melão de São Caetano	<i>Momordica charantia</i> L.	Leaves	Respiratory system	16	6
Mentrassto	<i>Ageratum conyzoides</i> L.	Leaves	Respiratory system	17-18	2
Neem	<i>Azadirachta indica</i>	Leaves	Digestive system	18	1
Noni	<i>Morinda citrifolia</i>	Fruits	Digestive system	19	2
Noz moscada	<i>Myristica surinamensis</i>	Seeds	Digestive system	0	0
Orégano	<i>Origanum vulgare</i> L.	Leaves and flower	Urinary system	18	3
Pata-de-vaca	<i>Bauhinia forficata</i>	Leaves	Weight loss	16-18	5
Perdiz	<i>Simarouba amara</i> Aubl.	Roots	Urinary system	0	0
Picão	<i>Bidens pilosa</i> L.	Leaves	Respiratory system	16-18	2

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Poejo	<i>Mentha pulegium</i> L.	All parts	Respiratory system	16-18	13
Quebra-pedra	<i>Phyllanthus niruri</i> L.	Leaves	Urinary system	16-18	2
Quina	<i>Quassia amara</i> L.	All parts	Digestive system	17-18	3
Romã	<i>Punica granatum</i> L.	Fruits	Respiratory system	18	9
Ruibarbo	<i>Rheum rhaponticum</i> L.	Barks	Anemia	27	1
Salsinha	<i>Petroselinum crispum</i> (Mill.) Fuss	Leaves	Urinary system	18	1
Sangra d'água	<i>Croton urucurana</i> Baill.	Barks	Anti-inflammatory	17-18	5
Sucupira	<i>Pteerodon pubescens</i> (Benth.) Benth.	Seeds	Anti-inflammatory	17	10
Tanchagem	<i>Plantago major</i> L.	Leaves	Anti-infective	17-18	4
Vick	<i>Mentha arvensis</i> L.	Leaves	Respiratory system	17-18	4

The use of medicinal plants or even phytotherapy is motivated by several factors, amongst them are: increasing therapeutic resources, preserving biodiversity, rescuing popular knowledge, promoting environmental and popular education, agroecology in addition to social development [28]. Its consumption has increased rapidly in many countries, mainly in Brazil, hence its vast biodiversity [29]. The rich Brazilian biological heterogeneity is accompanied by long acceptance of medicinal plants tied to the traditional knowledge of its population. In this context, the National Agency for Sanitary Surveillance (ANVISA) itself recognizes that traditional herbal products can prove their safety and efficacy through tradition of use or after their simplified registration [30]. It should be noted that in the present study it was observed that the age group of the participants resembled data found in the literature, in which the authors affirm that this occurrence is very common [31-32-33]. Another study reports that there was a greater participation of women in relation to men, which resembles what was found in this study [34]. This conception can be justified by the fact that the majority of females find themselves at home in traditional family structure, thus coming into contact with household herbal use. However, this variable is homogeneous for both sexes in terms of the intensity of plant consumption, since both admit the applicability of this therapy [34]. On the other hand, another study that verified the age group with the greatest participation of those surveyed in this type of study was between 64 and 87 years old, representing half of the citations for the research, thus confirming the presence of the older population, that is, the largest holders of agglomerated knowledge from generation to generation on the subject [35]. Still about the age, individuals up to 40 years old have stated that they have acquired learning about treatment through plants through their relatives and / or neighbors. It is worth noting that most of this information is acquired through people considered elderly [35]. Regarding the data on the participants' financial situation, it was

observed that the family income was similar to that observed in previously published studies, which corroborates to the data herein obtained [32-36]. Another important fact worth discussing is the way to obtain knowledge about plant therapy, most of which are reported to be through their ascendants, which is commonly found in other studies [4-37]. Nevertheless, in another study carried out with public health officials in the cities of Cascavel and Foz do Iguaçu located in the western part of the state of Paraná, the population's understanding of the use of medicinal plants was provided through their relatives [38]. Regarding the way of obtaining the plant phylogenetics, the home culture stood out to the others, as reported in the literature [39]. For the most part, according to the individuals interviewed, this occurs in the backyard of their homes. Regarding the most used form of preparation, according to the participants of the research, the tea stood out in front of the others, fact that follows in analogy with several researches [33-40-41]. However, there was disagreement with that identified by another author who reported being the most cited syrup followed by tea, with 30 and 27%, respectively [36]. Regarding the most used part, the leaves stood out, and a similar situation was observed in the surveys, since the leaves represented 56% of the choices due to the easy and quick handling, taking advantage of the totality of their benefits [42]. Following this same reasoning, previous data show the most frequent bramble (45%), while the leaves obtained second place, rebutting the results obtained here [44]. It was observed that the most cited plants were: *Peumus boldus*, *Mentha spp.*, *Dysphania ambrosioides*, *Cymbopogon citratus*, *Vernonia polysphaera*, *Zingiber officinale*, *Curcuma longa* and *Mentha pulegium*, with respective number of citations of: 43, 38, 29, 19, 16, 16, 15, 13 and 13. In a similar way to the data presented during the research in the rural communities, in the cities of Miranda and Aquidauana, located in the state of Mato Grosso do Sul, Brazil, the authors related *Peumus boldus*, *Mentha spp.* and *Dysphania ambrosioides* as the main ones by folk practitioners [44]. Another discovery mentions *Mentha ssp.* with 36 indications, *Peumus boldus* with 35, chamomile with 29, and *Mentha pulegium* with 10 [39]. Of those mentioned in the city of São João da Ponte, located in the state of Minas Gerais, Brazil, the lemon *Dysphania ambrosioides*, *Mentha spp.* and *Mentha pulegium* stood out the others according to the interviewees [31-45]. Another reported association made reference to *Peumus boldus*, henceforth corroborating to the results obtained [46-47]. Henceforth, this work evidenced the use of medicinal plants in Brazilian healthcare, and considering that many native vegetal varieties may have yet unknown applications whose therapeutic potential and applicability in life is being progressively investigated [48-49-50-51], the results herein reported may shed more light in the use of traditional knowledge.

4. CONCLUSION

This work evidenced that the empirical knowledge predominates when the use of folk medicine-related herbs is concerned. Many of the popular therapeutic indications are in accordance to literature. Nevertheless, it is of great importance the conscious use of medicinal plants, since they are also prone to abuse. Henceforth, the presence and aid of trained pharmaceutical professionals is

advised in order to enforce patient safety.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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