Survey and Use of Medicinal Plants in an Urban District in the state of Piauí, Northeastern Brazil

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Abstract The use of plants for the treatment and cure of diseases is as old as the human species and is widely used by most of the world population as a therapeutic resource, mostly among rural populations, though less noticeable in the urban sphere. Existing data on the medicinal use of plants for the urban portion of society is still poor, and lack information that can trace a better ethnobotanical profile. Thus, this study aimed to collect data on the knowledge and use of medicinal plants, in the context in which the inhabitants of an urban district are inserted. Data collection was performed using a semi-structured form in 80 homes in the district Alto Santa Maria, in the urban area of the city of Parnaíba, northern Piauí. Twelve species were mentioned to be used by residents, such as boldo, eucalipto, malva, mastruz and erva-cidreira, especially the first one, which is the most used plant by residents in the district. In order to identify therapeutic indications of great importance, we used the Informant Consensus Factor (ICF). The predominant prescription use was indicated as conditions related to diseases of the genitourinary system and kidney stones, skin and nail diseases, dermatitis, and endocrine, metabolic and nutritional disorders, as indicated by ICF. With the development of this research we found that plants with medicinal potential represent a strong resource for the population studied in the treatment of several diseases, and a great degree of use was noticeable.

Keywords Ethnobotany; Folk Medicine; Piauí; Brazil

Introduction The use of medicinal plants often states as the only therapy of many communities and ethnic groups. The use of such plants in the treatment and cure of diseases, which is as old as mankind, has overcome all barriers and obstacles during the evolutionary process and has come to present days, in which it is widely done by most of the world population as a therapeutic resource (Santos, 2008).

In the poorest areas of the country and even in large cities, medicinal plants are sold in grocery stores and street markets, and found in home yards (Maciel et al., 2002). Dorigoni et al. (2001) emphasize that the use of medicinal plants has become so widespread in folk medicine that it has been used not only in rural but also in urban areas as an alternative or complementary treatment to official medical treatments.

Medicinal plants play a key role in helping the treatment of diseases, also contributing to the preservation of the environment, of knowledge and tradition through their popular use. Thus, plants are used as the only therapy by a portion of the population and by more than 2/3 of the world population. The main factors that influence the maintenance of this practice are the low standard of living of the population and the high cost of medicines (Newall et al., 2002).

According to the Ministry of Health (Brasil, 2006), studies of the World Health Organization - WHO show that 80% of the population of developing countries make use of traditional practices in their basic health care, and 85% do so through or from herbal preparations. Therefore, it is observed that even with all the modern medicine, the portion of the population that uses traditional medicine is great.
Note that the use of medicinal plants has an important social and economic impact, since the use of these species, most of the time, is native to an area or they are grown in backyards and can reduce expenses on synthetic drugs. Some Brazilian families, especially those without considerable purchasing power, usually have elderly at home and the appropriation of these synthetic drugs is an item that becomes expensive in the household budget (Reis, 2013).

Badke et al. (2011) state that even with the encouragement of the pharmaceutical industry for the use of manufactured drugs, most of the population still uses complementary practices for health care, such as the use of medicinal plants to relieve or even cure some diseases.

The practices related to the popular use of medicinal plants are the viable alternative that many communities have for the treatment of diseases or health maintenance, as this practice represents a significant part of the culture of a people, spread across generations (Pinto et al., 2006). The collection of information in the communities is of fundamental importance to rescue and enhance their knowledge.

Accordingly, the investigation of the use of these plants may prove to have beneficial results, expanding information and bringing knowledge to the other residents of a particular district, also providing incentive to the applicability of these natural resources.

Hence, the present study aimed to collect data on the knowledge and use of medicinal plants, in the context in which the residents of Alto Santa Maria, Parnaíba, in the north of Piauí, are inserted.

1 Material and Methods

1.1 Studied Community

The city of Parnaíba has an area of 436 square kilometers of extension and a population of more than 148,832 inhabitants; its demographic density is 341.3 inhabitants/km², and it is the second most populous city in the state of Piauí (Ibge, 2010).

This study was developed in the district Alto Santa Maria, located in the urban area of the north of Parnaíba, in the state of Piauí. The district, according to “Atenção Básica” from Municipal Secretary of Health in Parnaíba, has about 3,127 inhabitants in 812 homes (Secretaria de Saúde de Parnaíba, 2013).

1.2 Data collection and analysis

Interviews were carried out in the first half of 2014. The survey included 80 homes, and a resident was interviewed in each household, which corresponds to about 10% of the total households. Participants were interviewed directly in their homes, signing the Informed Consent form in order to authorize the research. We applied a semi-structured form to collect data containing 19 questions (10 closed and 9 open questions), such as education level, gender, age, income, number of persons per household, among others.

The application of the forms was carried out through weekly periodic visits and, before implementation, participants were informed that all the information provided by them would serve only as a basis for further academic study, and their data would be kept confidential.

Medicinal plants cited by respondents were grouped according to the World Health Organization-WHO (Brasil, 2006) whose categories are determined according to the functionality in the treatment of diseases that affect a specific corporal system of the living organism.

The body systems and disease categories with the highest relative importance site were determined by the Informant Consensus Factor (ICF) from Trotter and Logan (1986), with ICF-Nur formula = Nt/Nur-1, where Nur is the number of use quotes in each category and Nt is the number of species used. The ICF has a maximum value of 1, when there is complete consensus among informants and the use of the species (Oliveira et al., 2010), and the higher the value obtained, the greater the representativeness of the consensus of informants.

Categories following Sampieri (2013) were used to analyze the open-ended questions.

2 Results and Discussion

Regarding the age of the sampled residents, it was found that they were between 26 and slightly over 50 years old. Regarding gender, a high number of respondents were females (94%). Out of the total of respondents, 30% had graduated from secondary school, 26.25% finished primary school, 22.5% were enrolled in elementary school, 12.5% had not finished
elementary school, 5% had higher education and 3.75% were still attending high school.

As for the occupation of the informants, it was found that 57.5% of them were engaged in provision of services, 15% were domestic cleaning workers, 12% were dedicated to housework, 6.25% were retired and 6.25% did not have any income.

The 80 households of the respondents have an average monthly income ranging from less than one up to four Brazilian minimum wages. It is observed that most of the interviewed population has a relatively low family income and medicinal plants were used by them as an alternative source in the treatment of diseases, probably due to the high cost of synthetic drugs.

The results showed that 99% of the interviewees use of medicinal plants for healing their diseases or to alleviate undesired symptoms of any type. Several studies have reported similar data to this study, i.e., a high percentage of the population use plants for medicinal purposes (Lima and Silva, 2002; Viganó et al., 2007; Silva et al., 2009; Carvalho et al., 2013).

In the urban community analyzed in this study, 87% of residents made use of plants because they are cheaper and 13% reported such practice because plants do not harm their health. According to Barros, (2006), the demand for plants to cure certain diseases is given by a difficult access to physicians or perhaps the low income factor of the community. Also, a predominant use of plants due to the fact that they do not harm their health was registered in the village of Manajo, in Lima Duarte, Minas Gerais, studied by Oliveira & Menini Neto (2012), in which residents reported that they used plants whenever they needed.

As a way to obtain information about the medicinal plants in our sample, most of the residents (94%) reported that it was done through the family, whereas 6% of respondents reported that they do it through education (school, magazines, books). Obtaining information through the family was also cited in the works of Dorigoni et al. (2001), Pereira (2011), and Viganó et al. (2013).

The transmission of information between generations that each individual reported is part of the knowledge acquired over time. As it is highlighted by Castellucci et al. (2000), the use of natural resources by local communities is guided by a set of accumulated knowledge, resulting from the selection of its members with the environment, motivated by a way of life that still holds strong independence of nearby nature.

The local population has a Municipal Health Center that covers the most urgent medical needs of the district. Although this treatment option is available, most residents usually seek information about the use of plants for therapeutic purposes from their elders.

One of the factors that drew our attention to the community during this study was the importance of family in the use of medicinal plants. Most respondents (69%) attributed the acquisition of knowledge for the use of medicinal plants mainly to family members, then 25% to grandparents and 6% to neighbors. Similar data were also checked by Viganó et al. (2007) and Petry & Junior (2012), who found that the habit of the use of medicinal plants is a family inheritance.

The plants that were more frequently reported as being the ones most medicinally used by the community of this study were boldo (Plectranthus barbatus Andrews), mentioned as the most used one, accounting to 23.02% of the citations; followed by eucalipto (Eucalyptus citriodora Hook.), 15.8%; malva (Plectranthus amboinicus (Lour.) Spreng.), 13.6%; erva cidreira (Lippia alba (Mill.) N.E.Br.), 10%; hortelã (Mentha × villosa Huds.), 8.6%; algodão (Gossypium hirsutum L.), 7.9%; capim limão (Cymbopogon citratus (DC.) Stapf.), 7.1%; aroeira (Myracrodruon urundeuva Allemão), 5%; maracujá (Passiflora edulis Sims), 3.5%; laranja (Citrus × aurantium L.), 2.8%; melão de São Caetano (Momordica charantia L.), 1.4%; and finally, ameixa (Ximenia americana L.), accounting to 0.71% of the citations. Similar results were found by Viganó et al. (2007) and Albertasse et al. (2010) in the community of Barra do Jucu, Vila Velha, Espírito Santo, in which boldo had the highest citation by respondents.

As for the method of use or application in the community analyzed in this study, the informants reported oral use (86%), topical use (11%), inhalation (3%), whereas tea preparation was the most widely used form of oral intake. Similar
results were found by Franco & Barros (2006); Lucena et al. (2013) and Lima et al. (2014) which mentioned tea as the main form of use of medicinal plants.

The categories with the greatest local relative importance were: genitourinary tract diseases, skin and nail diseases, dermatitis, and endocrine, metabolic and nutritional disorders (Table 1).

Table 1 Distribution by disease categories of medicinal plants used in the district Alto Santa Maria, city of Parnaíba, state of Piauí.

<table>
<thead>
<tr>
<th>Body System or disease category</th>
<th>Number of uses cited</th>
<th>Number of used species</th>
<th>CFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD (K00-K93) Digestive diseases, liver diseases</td>
<td>45</td>
<td>9</td>
<td>0.81</td>
</tr>
<tr>
<td>ICD (J00 – J99) Respiratory diseases, flu, asthma</td>
<td>39</td>
<td>10</td>
<td>0.76</td>
</tr>
<tr>
<td>ICD (N00-N99) Apparatus Diseases genitourinary</td>
<td>14</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ICD (F00-F99) Mental and behavioral disorders</td>
<td>8</td>
<td>5</td>
<td>0.75</td>
</tr>
<tr>
<td>ICD (L00-L99) Diseases of the skin and nail, dermatitis,</td>
<td>7</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ICD (I00-I99) Diseases of the circulatory system</td>
<td>5</td>
<td>2</td>
<td>0.75</td>
</tr>
<tr>
<td>ICD (E00-E99) Endocrine, nutritional and metabolic diseases</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Source: Direct Research (2014)

In addition, Meireles (2012) and Freitas & Fernandes (2006), found that the medicinal use of plants is not limited to the treatment of ordinary diseases and easy to cure, but ranges from the simplest diseases to more complex diseases such as those related to the endocrine system.

For those categories obtained, contrary data are presented in studies conducted by Silva (2010) and Alves & Povh (2013), in which diseases of the genitourinary system (0.66) did not obtain the maximum value for the CFI. Oliveira et al. (2010a) obtained approximate values for endocrine disorders (0.9), unlike what happened in Ribeiro et al. (2014) and Oliveira et al. (2010b), whose values were respectively 0.5 and 0.3. According to Chaves & Barros (2012), skin diseases have little representation.

The vast majority of respondents in the community of this study (92%) reported that they always notice satisfactory results in the treatment with medicinal plants, while 8% reported that they only notice it sometimes. High satisfaction rates regarding the use of medicinal plants were also reported in studies of Arnous et al. (2005) and Carvalho et al. (2013).

Regarding the frequency of use of medicinal plants, most of the respondents (92%) in the community of this study reported that they always use medicinal plants to immediately relieve some unpleasant symptoms, while some said that they sometimes (8%) use these plants. Also with respect to the frequency of use, others studies in urban communities found relatively high percentages, such as Brasileiro et al. (2008) who found that 36.5% of respondents always use medicinal plants as an alternative therapy for different health problems in their daily lives, followed by 55.5% who rarely use and only 0.8% who have never used. According to Cruz-Silva, Pelinson and Campelo. (2009), the frequency is related mostly to the fact that some unpleasant symptoms, such as headaches, are alleviated immediately. It was felt that this habit is also transmitted from one generation to another.

Although all parts of the plants were mentioned by respondents for medical use, the most cited ones were the leaves (86%), followed by the bark (13%) and the root (1%). These results coincide with those found by Marodin & Baptista (2001), Medeiros et al. (2004), Chaves (2005), Fuck et al. (2005) and Franco & Barros (2006). Castellucci et al. (2000) suggest that the higher frequency of use of leaves may lie in the fact that they are easier to collect, in addition to being present in the plant most of the year. Marodin & Baptista (2001) point out that the use of leaves is also a conservation character for the plant because its removal, provided it is not excessively, would not jeopardize the plant.

The medicinal plants used by the respondents in the study area are mainly obtained in their own backyard (46%), in the backyard of their neighbors or relatives (25%), in the vegetation next to their homes (16%)
and bought in the grocery store or the street market (13%). According to Castellucci et al. (2000), the need for a non-existing plant in the backyard of a resident can be supplied by the neighbors who cultivates it in their own backyard, revealing the exchange of information between residents, which also contributes to the knowledge of medicinally used plants.

Finally, when the population studied was asked about the preference of the use of plants for medicinal purposes, it was noticed that most of the residents consider the use of plants for this purpose a very important practice, citing different reasons, as it is shown in Table 2.

Table 2 Responses mentioned more frequently by residents of the district Alto Santa Maria, city of Parnaíba, state of Piauí

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>NUMBER OF CITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to find</td>
<td>22</td>
</tr>
<tr>
<td>Quick result</td>
<td>26</td>
</tr>
<tr>
<td>Satisfaction or feeling fine</td>
<td>22</td>
</tr>
<tr>
<td>Home remedy</td>
<td>6</td>
</tr>
<tr>
<td>Divine</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: Source: Direct Research (2014)

With these results, it was found that the residents of the district Alto Santa Maria have very significant knowledge about medicinal plants, and use them in a representative manner. Such data should be kept for future generations because it is part of folk medicine, and aims at preserving the knowledge of plants and their importance for healing different diseases.

3 Conclusions

In this research, it could be seen that in the urban community studied most of the participants have knowledge on medicinal plants, which is shared through the family, and the information is passed on from one generation to another. Those plants are used for the treatment of several diseases, as they are less expensive than manufactured drugs.

Due to the fact that the place studied is an urban area, a great level of knowledge on medicinal plants was shared among the residents, thus making this research of great importance and preciousness, because it helped to bring out the community addressed to the research setting, and the transmission of knowledge regarding the use of these plants as a cheaper method of acquiring medicine.

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