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DISTRIBUTION OF TRADITIONAL ECOLOGICAL KNOWLEDGE ABOUT MEDICINAL PLANTS IN AN AMAZONIAN COMMUNITY

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ABSTRACT

The Traditional Ecological Knowledge (TEK) regarding plant resources, especially medicines, is highly dynamic and subject to environmental, socioeconomic, and cultural influences. It also varies according to gender, age, length of residence, income, level of education, and the family roles played by individuals. This article studies different determinants of the distribution of TEK and their possible influences on the cultural transmission process in a traditional community located in a protected area of the Brazilian Amazon basin. Structured socioeconomic interviews and collection of ethnobotanical data by Free List were carried out with 43 residents using the snowball sampling technique in a community located within the Tapajós–Arapiuns Extractivist Reserve in the state of Pará, Brazil. Six socioeconomic factors were evaluated with regard to TEK about medicinal plants: age, gender, professional occupation, education, monthly family income, and length of residence in the community. The study shows that the greater the age and length of residence time in the community, the greater the knowledge regarding medicinal plants. Men and women tend to have similar TEK and those who are farmers have higher TEK than locals who carry out other activities. We also observed that the higher the level of education, the lower the TEK. Monthly family income tends to be inversely proportional to TEK. We conclude that the knowledge of medicinal plants can be influenced by socioeconomic factors, contributing to form different knowledge patterns that affect the cultural transmission of TEK.

KEY WORDS: Brazilian Amazon, ethnobiology, ethnobotany, cultural transmission, intergenerational transmission.

DISTRIBUIÇÃO DO CONHECIMENTO ECOLÓGICO TRADICIONAL SOBRE PLANTAS MEDICINAIS EM UMA COMUNIDADE AMAZÔNICA

RESUMO

O Conhecimento Ecológico Tradicional (CET) sobre recursos vegetais, especialmente medicamentos, é altamente dinâmico e sujeito a influências ambientais, socioeconômicas e culturais. Também varia de acordo com gênero, idade,

tempo de residência, renda, nível de educação e papéis familiares desempenhados pelos indivíduos. Este artigo estuda diferentes determinantes da distribuição do CET e suas possíveis influências sobre o processo de transmissão cultural em uma comunidade tradicional localizada em uma área protegida da bacia amazônica brasileira. Entrevistas socioeconômicas estruturadas e coleta de dados etnobotânicos por lista livre foram realizadas com 43 moradores, utilizando a técnica Bola de Neve, em uma comunidade localizada na Reserva Extrativista Tapajós–Arapiuns, no estado do Pará, Brasil. Seis fatores socioeconômicos foram avaliados em relação ao CET sobre plantas medicinais: idade, gênero, ocupação profissional, educação, renda familiar mensal e tempo de residência na comunidade. O estudo mostrou que quanto maior a idade e o tempo de permanência na comunidade, maior o conhecimento sobre plantas medicinais. Homens e mulheres tendem a ter CET semelhante e aqueles que são agricultores têm CET mais alto do que os locais que desempenham outras atividades. Nós também observamos que quanto maior o nível de escolaridade, menor o CET. A renda familiar mensal tende a ser inversamente proporcional ao CET. Concluímos que o conhecimento de plantas medicinais pode ser influenciado por fatores socioeconômicos, contribuindo para formar diferentes padrões de conhecimento que afetam a transmissão cultural da CET.

PALAVRAS-CHAVE: Amazônia brasileira, etnobiologia, etnobotânica, transmissão cultural, transmissão intergeracional.

INTRODUCTION

The Amazon is the most extensive equatorial forest on the planet, containing the largest reservoir of animal and plant species, nearly a quarter of all species found on Earth (Rodrigues *et al*., 2014). The Brazilian Amazon forest has a high degree of biodiversity, including a great variety of plant species that are widely used in traditional medicine for the treatment of various symptoms and diseases (Valença *et al*., 2015; Odonne *et al*., 2017). In addition to its natural wealth, the Amazon is a complex of cultures, embracing a traditional set of values, attitudes, beliefs, and ways of life that have influenced the social organization and system of knowledge in the region, including practices and uses of natural resources previously characteristic of the indigenous peoples (Albuquerque and Andrade, 2002).

Many communities rely on traditional knowledge as their sole therapeutic and medicinal resource, in which plants and natural medicines can be effective not only as a function of their pharmacological action, but also because of the cultural significance attributed to them. Traditional Ecological Knowledge (TEK) brings together a complex set of interactions between human communities and their natural environment, welcoming a wide spectrum of experience and wisdom, allowing for the appropriation of the natural environment and the survival of populations (Berkes, 2017). This cumulative body of knowledge, practices, and beliefs, involved in adaptive processes, is passed on from generation to generation through cultural transmission (Berkes, 2017).

Cultural transmission is the process of acquiring behaviors, attitudes, or technologies through printing, conditioning, teaching, and active learning or a combination of these (Cavalli-Sforza and Feldman, 1981). In the adaptive processes of traditional communities, the maintenance of knowledge, practices, and beliefs are fundamental to cultural and ecological resilience, through the process of cultural transmission across generations (Cavalli-Sforza and Feldman, 1981; Posey, 1993).

The TEK regarding plant resources, especially medicines, is highly dynamic and subject to various environmental, socioeconomic, and cultural influences, and can vary according to gender, age, length of residence, income, level of education, and the family roles played by individuals (Almeida *et al*., 2010, 2012; Medeiros *et al*., 2014; Torres-Avilez *et al*., 2014). The knowledge within traditional communities about these plant resources is closely related to the natural resources available to them and their cultural heritage (Silva *et al*., 2014). However, local populations around the world are losing their traditional knowledge (Trosper *et al*., 2012), as well as, changing and adapting knowledge to new contexts,

and this phenomenon principally compromises the youth generations (Voeks and Leony, 2004; Reyes-García *et al*., 2013).

Today, the conservation and protection of natural and cultural wealth is one of the greatest challenges facing the world, particularly in tropical countries that hold a considerable share of the world's biodiversity of plant and animal species (Diegues, 2000). Ethnobiological studies have therefore stood out with regard to the provision of subsidies to analyze the sustainability of natural resources through the investigation of the relationship between people and resources, in order to register and learn the strategies and knowledge of the local people. In this context, this study described patterns of TEK about medicinal plants associated to some socioeconomic factors in a traditional community located in the interior of the Brazilian Amazon region.

METHODS

Study site. The current study was carried out in the traditional community of Vila Franca, located in the municipality of Santarém in the state of Pará, Brazil. The community of Vila Franca is situated at the confluence of the Tapajós and Arapiuns rivers, at coordinates 2º20'43.64"S 55º1'32.64"W, within the Tapajós–Arapiuns Extractivist Reserve. It contains approximately 298 residents who make up 74 families (Projeto Saúde e Alegria, 2012). The region's climate is characterized as megathermic humid equatorial continental of Central Amazonia. The predominant vegetation type is Dense Ombrophylous Forest. Other phyto-physiognomies present in the area are patches of savannah and *igapós* – blackwater-flooded forest –, secondary vegetation and pasture areas used for raising cattle (ICMBio, 2014).

In the community of Vila Franca, indigenous cultural aspects are still persistent and the traditions related to the manufacture of manioc flour, other manioc derivatives – *tarubá*, *caxará*, *manicuéra* –, and crafts, as well as cultural dances remain. The principal economic activity of the community is agro-extractivism. The majority of families in Vila Franca make their living through the production of cassava flour, corn, or tapioca. Agroforestry gardens are present in the region, contributing to the food safety and health of community members with rich medicinal species and the maintenance of traditional knowledge associated with them (Projeto Saúde e Alegria, 2012). Vila Franca has traditional midwives and other women who manufacture natural medicinal products, such as bottles, teas, and the production of soap and intimate soap within the Natural Remedies Project (NRP) (Projeto Saúde e Alegria, 2012).

Data collection. Non-probabilistic intentional sampling was used for data collection, in which the informants were chosen by means of the snowball sampling technique (Bailey, 1994). The first key informant was appointed by the local leader, among the residents of the community recognized as having knowledge about medicinal plants. Each interviewee indicated the next informant to be consulted. Structured interviews (Albuquerque *et al*., 2010) were conducted between May and November 2018 with those selected and also with those who live in the same house as the chosen informants, if over 18 years of age and present at the time of the home visits. Surveys containing socioeconomic questions were applied followed by collection of data regarding ethnobotanical knowledge using the Free List technique (Albuquerque *et al*., 2010). Field notes were also taken about the coexistence in the community by Participant Observation (Queiroz *et al*., 2017). At this stage, the researcher stayed in the community for about 28 days – four consecutive days each month –, when he conducted interviews and followed the local daily life.

For the purposes of analysis, the following TEK variables about medicinal plants were quantified, based on the ethnobotanical data collected: 1 – Medicinal Plant Indication (hereinafter, *Medicinal plant*), for citations of plants known and used by the informants and, from each plant listed: 2 – Medicinal Use Indication (*Medicinal Use*), for diseases treated with these plants; 3 – Part Use Indication (*Part of the Plant*), for the part of the plant used in treatment (leaf, stem, root, etc.); 4 – Therapeutic Preparation Indication (*Therapeutic Preparation*), for the form in which the medicine was administered (tea,

syrup, bath, etc.). In addition, three age categories were distinguished: youth (18 to 29 years), adult (30 to 59 years), and elderly (≥ 60 years). The data were organized in an electronic spreadsheet and analyzed as follows.

Data analysis. To understand how socioeconomic factors relate to the transmission and possible loss of TEK regarding medicinal plants in the community, data from the socioeconomic and ethnobotanical survey forms and participant observations were used. The relationship between age, gender, professional occupation, education, monthly family income, length of residence, and the quantitative TEK variables: *Medicinal plant*, *Medicinal Use*, *Part of the Plant*, and *Therapeutic Preparation*. The homogeneity of the data was tested using the Levene test.

Using the Student t-test for independent samples, differences between the factors of gender, occupation, education, and TEK variables (*Medicinal plant*, *Medicinal Use*, *Part of the Plant*, and *Therapeutic Preparation*) were assessed. Professional occupations were analyzed by grouping them as either Farmers (also includes retired interviewees who used to work as farmers) or Others (all other occupations mentioned: housewife, student, teacher, fisherman, shipowner, administrative assistant) for proportionality in the statistical analysis.

In order to compare the age, monthly family income, and residence time categories with the *Medicinal plant*, *Medicinal Use*, *Part of the Plant*, and *Therapeutic Preparation* variables, the One-Way Analysis of Variance (ANOVA) was used, per the adjustment of the data to a normal distribution, established by the Levene homogeneity test. To compare the means of the variables, the post-hoc Tukey test was used. The education factor was grouped into Group 1 (illiterate, literate, incomplete elementary school) and Group 2 (complete elementary school, complete and incomplete high school, complete and incomplete university) for proportionality in the statistical analysis.

Values of $p < 0.05$ were considered statistically significant. All analyses were performed in the R program (R Core Team, 2018), using the Vegan package (Oksanen *et al*., 2018).

Ethics approval and consent to participate. This research was authorized by the Research Ethics Committee of the Pará State University, *Campus* XII–Tapajós [CEP–UEPA, Brazil (CAAE # 86066918.2.0000.5168)]. The community and each participant also authorized the study through the Free and Informed Consent form. The access to the Tapajós–Arapiuns Extractivist Reserve for scientific purposes was authorized by the Chico Mendes Institute for Biodiversity Conservation [ICMBio, Brazil (# 62993-1)]. The research was also registered in the National System of Genetic Resource Management and Associated Traditional Knowledge [SisGen, Brazil (# AC3A561)].

RESULTS

A total of 43 people were interviewed, representing 14.4% of the population of the community. The interviewees were mostly women (58.1%), with men making up the remaining 41.9%. The age of the interviewees ranged from 18 to 80, with 25.6% being youth, 34.9% adults, and the majority of respondents elderly (39.5%). The interviewees had higher TEK regarding medicinal plants than for *Medicinal Use* (12.51 ± 7.72), followed by *Therapeutic Preparation* (11.00 ± 8.17), *Part of the Plant* (8.60 ± 3.98), and a more specific knowledge of *Medicinal plant* (7.95 ± 3.48).

Relationship between socioeconomic factors and TEK regarding medicinal plants. There were significant differences in the four TEK indicators for medicinal plants between youth and elderly interviewees. However, there was no significant difference between the knowledge of these groups and the adult interviewees (*Medicinal plant*: $F = 5.937$, $p = 0.005$, *Medicinal Use*: $F = 3.293$, $p = 0.047$, *Part of the Plant*: $F = 4.866$, $p = 0.013$, *Therapeutic Preparation*: $F = 3.863$, $p = 0.029$) (Figure 1). The elderly interviewees listed the greatest number of indications, an average of 9.71 ± 3.39 indications for *Medicinal plant*, 10.41 ± 3.55 for *Part of the Plant*, and 14.53 ± 10.19 for *Therapeutic Preparation*. However, the highest TEK

observed in this group was with regard to medicinal uses, specifically diseases treated with botanical resources (14.53 ± 10.19) (Figure 1). The number of plants and their known uses varied among interviewees in the three age groups. Although adult informants had a higher frequency of indications than youth subjects, this knowledge was not significantly different (Figure 1). Regarding the number of indications analyzed in each age group, an increasing pattern was observed, with youth interviewees knowing a smaller variety of indications, adults with an intermediate number of indications, and the elderly with the greatest knowledge both of plant species and of their different uses.

When the influence of gender on the process of knowledge transmission and learning about medicinal plants was analyzed, significant differences were observed only for *Medicinal plant* (t = 2.039, p = 0.048), with women having greater knowledge, on average 8.84 ± 2.97 citations, while men reported an average of 6.72 ± 3.85 plants (Figure 2). Significant differences were not observed for the other variables (*Medicinal Use*: t = 1.555, p = 0.128, *Part of the Plant*: t = 1.828, p = 0.075, *Therapeutic Preparation*: t = 1.620, p = 0.113). Therefore, TEK was found to be more homogeneous between genders.

Regarding the professional occupation factor, it was verified that people who work or have worked as farmers had higher mean indications values for all knowledge variables analyzed (*Medicinal plant*: 8.69 ± 3.58, *Medicinal Use*: 13.66 ± 8.08; *Part of the Plant*: 9.45 ± 4.02, *Therapeutic Preparation*: 12.31 ± 8.91) (Figure 3), with significant differences for *Medicinal plant* (t = 2.039, p = 0.048), having a mean citation of 8.69 ± 3.58, and for the parts of the plant used in the treatment of diseases (*Part of the Plant*: t = 2.080, p = 0.044), having 9.45 ± 4.02 indications.

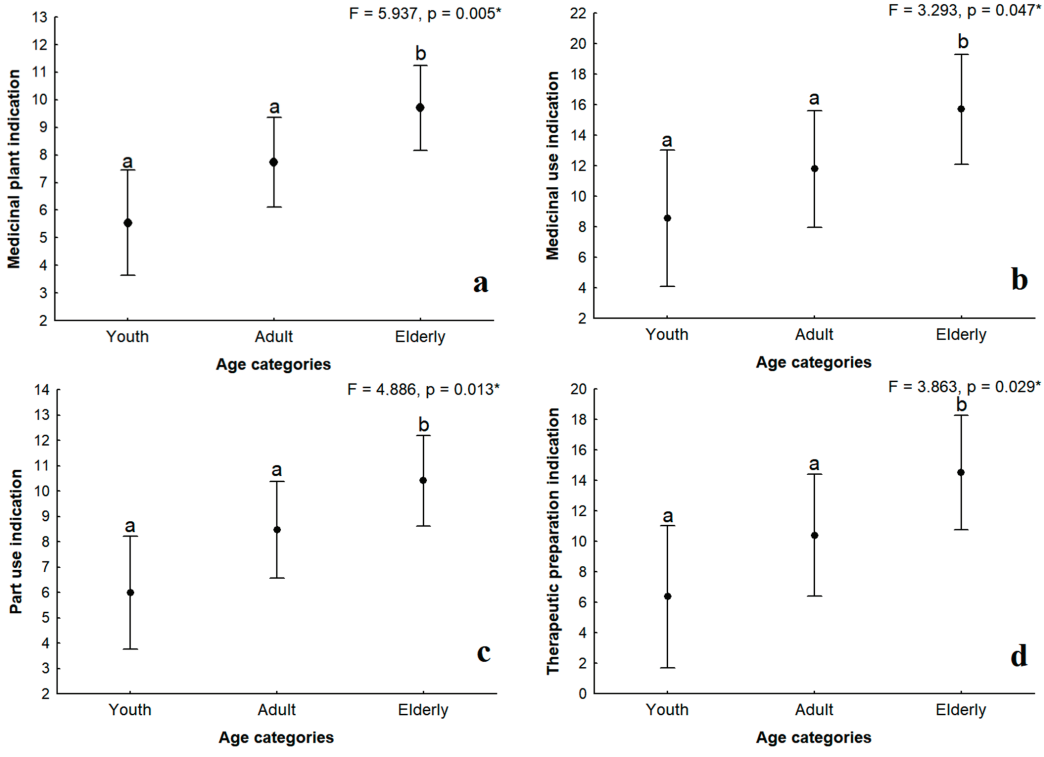

Figure 1. Distribution of TEK about medicinal plants by age category for the following variables: a) Medicinal plant indication, b) Medicinal use indication, c) Part use indication, d) Therapeutic preparation indication. F = One-Way Analysis of Variance (ANOVA). Tukey comparison test: different letters indicate significant differences. Values expressed as mean and standard deviation. * statistically significant result (p <0.05).

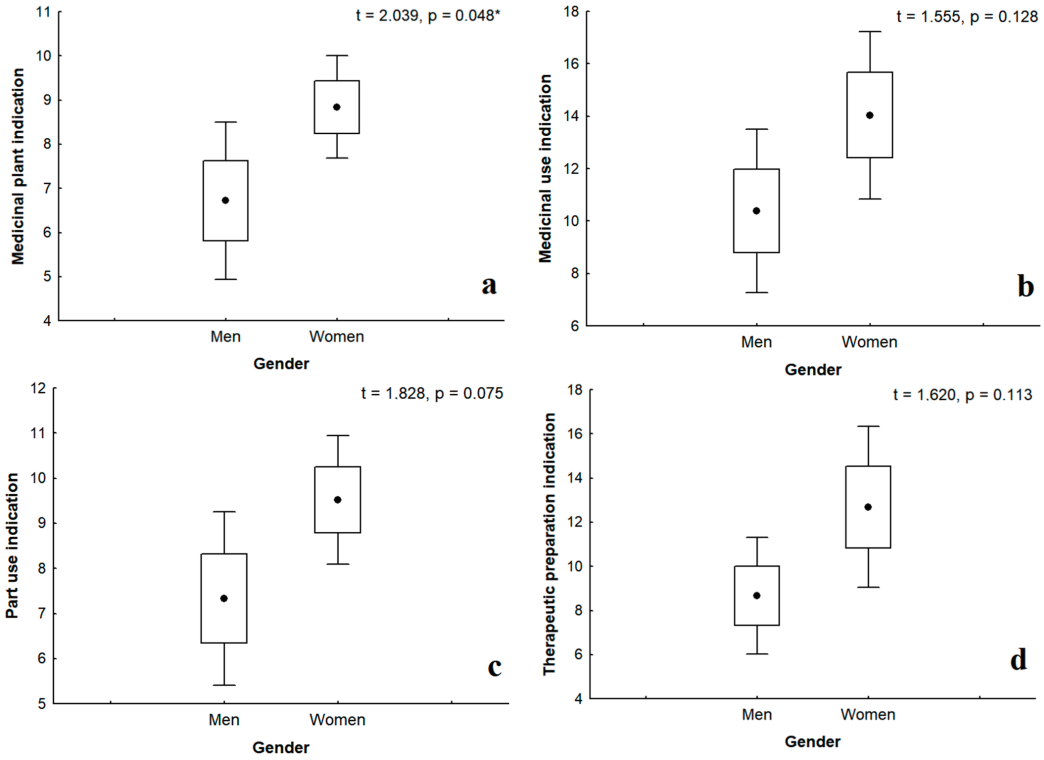

Figure 2. Distribution of TEK about medicinal plants by gender for the following variables: a) Medicinal plant indication, b) Medicinal use indication, c) Part use indication, d) Therapeutic preparation indication. t = Student's t-test for independent samples. Values expressed as mean and standard deviation. * statistically significant result (p <0.05).

Regarding education (Figure 4), Group 1 people (illiterate, literate, incomplete elementary school) had higher TEK about medicinal plants than those with a higher education level, included in Group 2 (complete elementary, complete and incomplete high school, complete and incomplete university). Significant differences were observed for *Medicinal plant* (t = 2.349, p = 0.024), *Part of the Plant* (t = 2.553, p = 0.014) and *Therapeutic Preparation* (t = 2.041, p = 0.048).

Regarding the influence of monthly family income on TEK about medicinal plants (Figure 5), an inversely proportional trend was observed beginning from the R$ 401–800 income range. The higher the income, the lower the number of indications. Significant differences were found between the income ranges of R$ 401–800 and above R$ 1,000 for all variables (*Medicinal plant*: F = 4.127, p = 0.012, *Medicinal Use*: F = 4.766, p = 0.006, *Part of the Plant*: F = 4.198, p = 0.011, *Therapeutic Preparation*: F = 4.975, p = 0.005). For *Therapeutic Preparation* there was also a significant difference between the R$ 0–400 and R$ 401-800 ranges.

Regarding the residence time (Figure 6), it was found that elderly residents (> 60 years) had knowledge about medicinal plants that was significantly higher than those who had lived in the community for 20 years (*Medicinal plant*: F = 3.174, p = 0.035, *Part of the Plant*: F = 3.200, p = 0.034). A patter of TEK proportional to the length of time lived in the community was observed. The longer the residence time, the higher the TEK about plants indicated and their uses. People with more than 60 years of residence had a mean *Medicinal plant* of 10.00 ± 2.93, *Medicinal Use* of 15.38 ± 5.85, *Part of the Plant* of 11.00 ± 2.93, and IPT of 13.50 ± 4.66, while those who were in the community for at least 20 years had a mean *Medicinal plant* of 5.92 ± 3.63, *Medicinal Use* of 8.42 ± 5.45, *Part of the Plant* of 6.33 ± 4.10, and *Therapeutic Preparation* of 6.50 ± 4.25. People in groups with intermediate residence time (21-40 and 41-60) did not have significant differences from other groups.

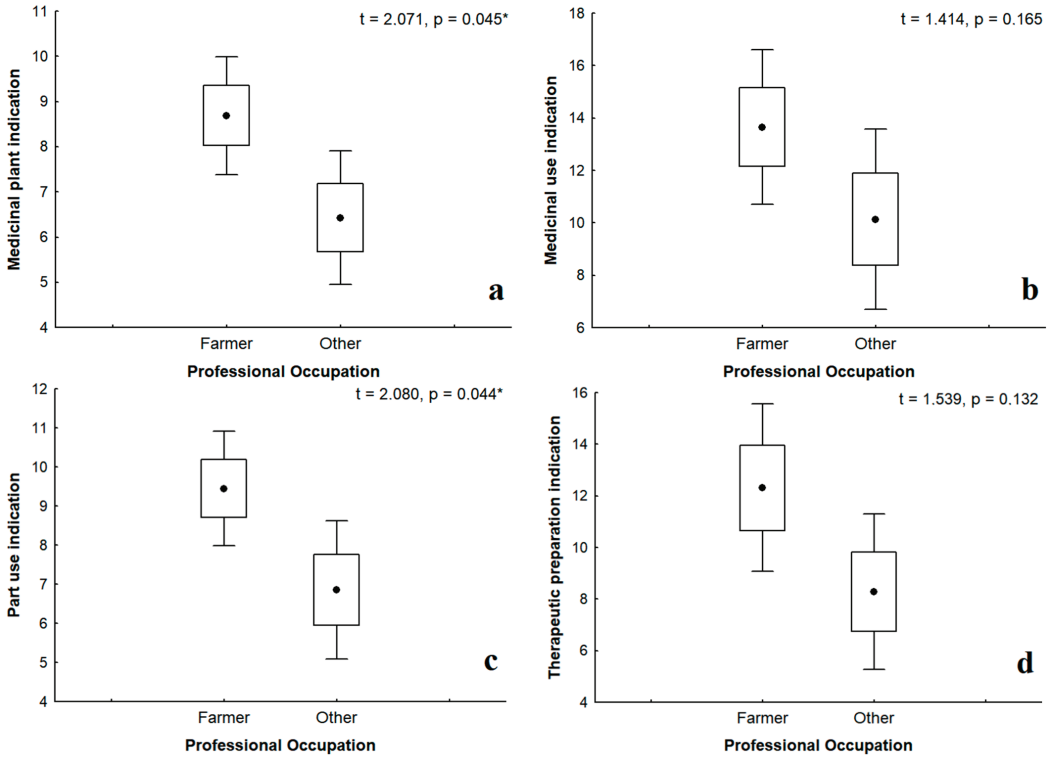

Figure 3. Distribution of TEK about medicinal plants according to professional occupation for the following variables: a) Medicinal plant indication, b) Medicinal use indication, c) Part use indication, d) Therapeutic preparation indication. t = Student's t-test for independent samples. Values expressed as mean and standard deviation. * statistically significant result (p <0.05).

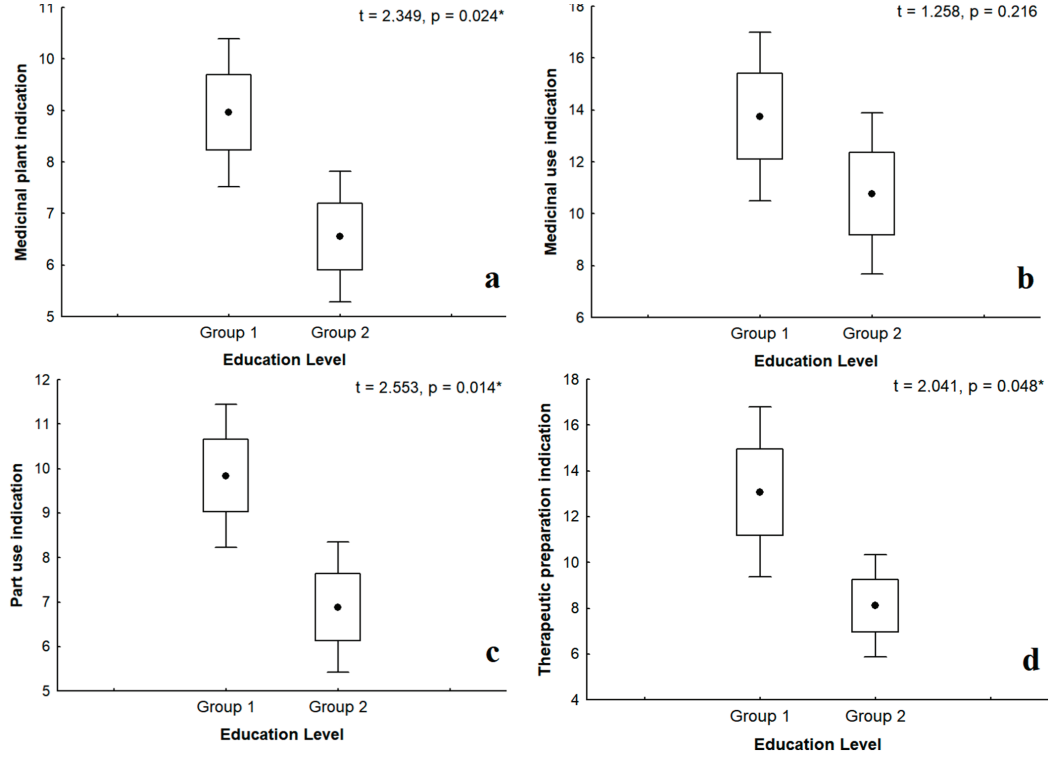

Figure 4. Distribution of TEK about medicinal plants according to education level for the following variables: a) Medicinal plant indication, b) Medicinal use indication, c) Part use indication, d) Therapeutic preparation indication. **Group 1** = illiterate, literate, incomplete elementary school. **Group 2** = complete elementary, complete and incomplete high school, complete and incomplete university. t = Student's t-test for independent samples. Values expressed as mean and standard deviation. * statistically significant result (p <0.05).

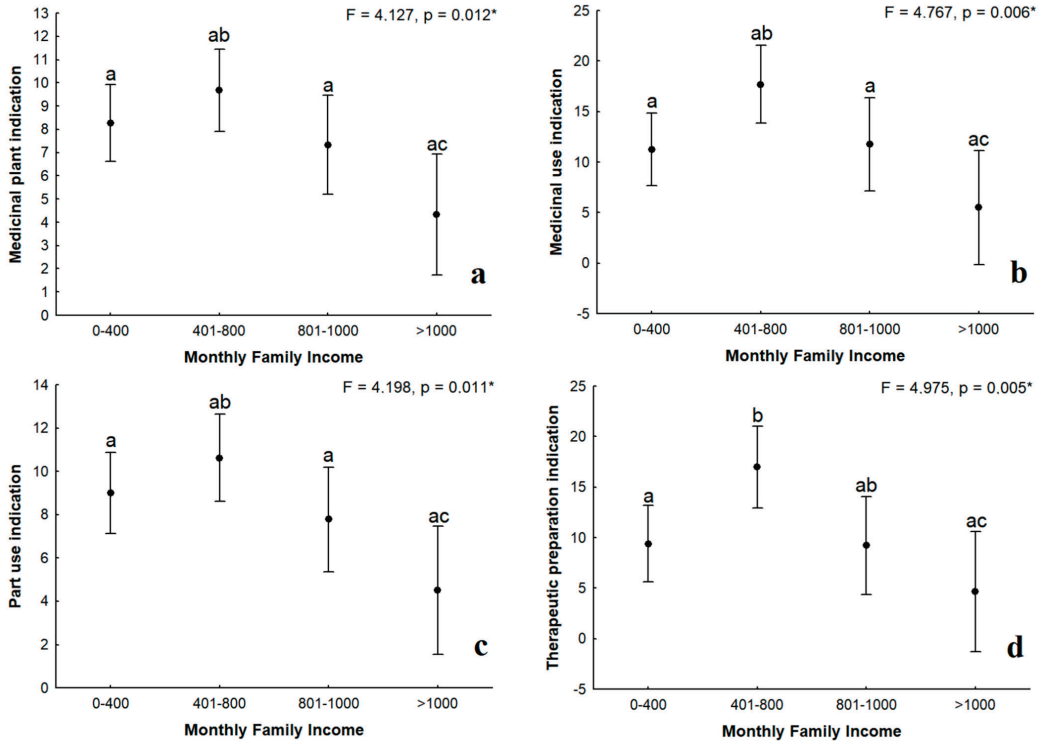

Figure 5. Distribution of TEK about medicinal plants by monthly family income category for the following variables: a) Medicinal plant indication, b) Medicinal use indication, c) Part use indication, d) Therapeutic preparation indication. F = One-Way Analysis of Variance (ANOVA). Tukey comparison test: different letters indicate significant differences. Values expressed as mean and standard deviation. * statistically significant result (p <0.05).

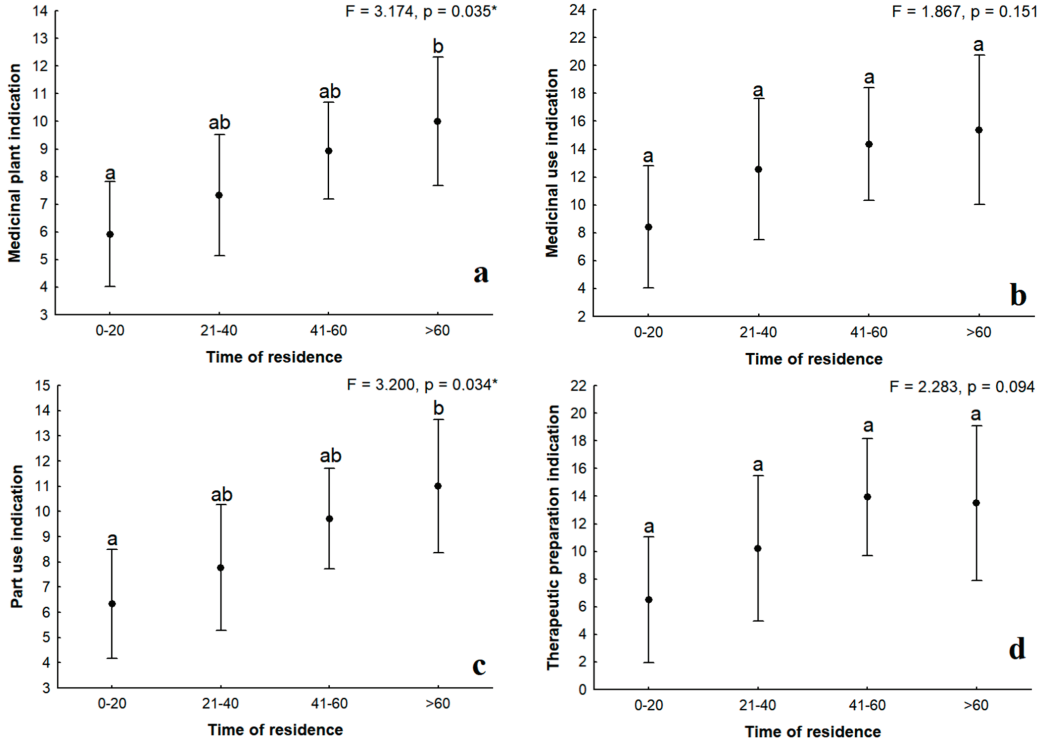

Figure 6. Distribution of TEK about medicinal plants by time of residence in the community for the following variables: a) Medicinal plant indication, b) Medicinal use indication, c) Part use indication, d) Therapeutic preparation indication. F = One-Way Analysis of Variance (ANOVA). Tukey comparison test: different letters indicate significant differences. Values expressed as mean and standard deviation. * statistically significant result (p <0.05).

DISCUSSION

TEK regarding medicinal plants is distributed in different ways across the community of Vila Franca, influencing the process through which this cultural knowledge is transmitted. A positive relationship was found between a person's age and their level of knowledge. Several studies suggest a positive relationship between the number of resources known (species richness, for example) and the age of those who know them (Torres-Avilez *et al*., 2014). However, this is not a hard standard, as there is evidence that people above a certain age (60 years) may have reduced knowledge of species, perhaps as a consequence of memory loss with advancing age (Almeida *et al*., 2012).

The smaller number of indications reported by the youth participants in this study may reflect the limited experience and reduced contact between the youth and those who have this traditional knowledge and with the plant resources found in the region, representing a reduced flow of knowledge transmission. Several authors suggest that the lower level of knowledge observed in this generation may be explained because they are still in the learning process (Albuquerque, 2006; Silva *et al*., 2011; Mathez-Stiefe and Vandebroek, 2012), even though they may have other interests. Therefore, the relationship between age and the number of plants known does not, by itself, suggest that knowledge is being lost in a community, but may indicate that TEK tends to be transmitted and accumulated gradually (Brito *et al*., 2017).

The observations made of TEK with regard to age in the study community show that the process of intergenerational transmission of knowledge has a greater flow from life experiences, from interpersonal relationships where knowledge and experience are exchanged from those with the longest life. TEK indicates a continuous increase in the number of species mentioned and their different uses, as age increases.

Regarding the influence of gender on TEK, women have been described as having greater knowledge than men with regard to some natural resources, such as in the case of medicinal plants and food (Torres-Avilez *et al*., 2014). Almeida *et al*. (2012), when evaluating the intracultural knowledge of the use of medicinal plants, verified the effect of gender on the number of plants known, observing that women had more knowledge regarding the number of medicinal species. However, our results showed that men and women tend to have similar levels of knowledge. The environment offered possibilities for learning and accumulation of TEK common to both men and women. There was no significant difference between genders with regard to occupation in the community, with both men and women principally engaged in agricultural activities. Therefore, the transmission of knowledge tended to show little difference between them. It is most commonly found in the literature that women have a greater knowledge of medicinal plants and foods than men, however, some studies also show a homogeneous distribution of knowledge between genders (Hanazaki *et al*., 2000; Monteiro *et al*., 2006).

Farmers in the community know about more medicinal plants and their uses than people who practice other professional activities. Therefore, they can be good transmitters of TEK in the community, while those with different occupations tend to accumulate less knowledge of medicinal plants, contributing less to the cultural transmission of this knowledge in the community. The larger TEK on the part of farmers is directly related to the fact that they tend to have greater contact with different species of plants than other occupations (housewife, student, teacher, fisherman, shipowner, administrative assistant) because they are responsible for management of agroforestry farms, pastures, and the collection of resources from the forest, among other attributions. This result may also be associated with the educational level of these individuals. Schooling can interfere directly with an individual's professional occupation, which, in turn, interferes with their knowledge and use of natural resources. For example, in rural and urban-rural areas, people with higher education would tend to have jobs that are not linked to agricultural and forestry activities. People working in the field, in turn, would have greater familiarity with natural resources, which would explain their greater knowledge and/or use

(Silva *et al*., 2011; Medeiros *et al*., 2014). A person's lack of contact with plant resources can affect the transmission of plant knowledge, since individuals tend to disconnect intellectually and spiritually from these resources (Voeks and Leony, 2004). It was verified in this study that people involved in other activities have less contact with plant resources and risk losing this type of knowledge. They also tend to lose familiarity with traditional medicinal practices, reducing the perpetuation of this knowledge to future generations.

Regarding education level, Reyes-García *et al*. (2010) found that the substitution of traditional education for formal education has diminished traditional knowledge. The results of this study showed that formal education is negatively correlated with TEK in the community, where transmission through family, neighbors, friends, and the elderly is essential to maintain knowledge and use of these resources. Formal education, if not associated with traditional education, can reduce the maintenance of TEK. From the field observations performed in this study, people with lower levels of education tend to make greater use of natural remedies, both for economic reasons and for cultural tradition, as well as for greater contact with these resources due to the influence of schooling on the nature of professional occupation.

Income is one of the socioeconomic variables that has the greatest explanatory power over knowledge and the use of natural resources. As observed in the results of this study, lower income residents tend to have greater knowledge. This may be because interviewees with lower income are more dependent on these plant resources in situations of illness and this therefore leads to greater knowledge regarding them and their uses. This factor ends up being significant to the process of TEK transmission, as it influences the acquisition of this knowledge in the community. However, income is not always inversely related to knowledge and/or use of medicinal plants. A study developed by Almeida *et al*. (2010), for example, observed that the number of plants known to residents of two communities in the Brazilian Northeastern semi-arid region increased as a function of income. However, income can, as observed in this study, influence the distribution and acquisition of knowledge.

This study also showed that elderly residents have greater knowledge about medicinal plants. This result may be related to the interactions that occur day-to-day between people and the natural resources present, thereby increasing this knowledge with the passage of time. As a result, residents with a longer residence time accumulate higher TEK regarding local biodiversity, while new residents may still be building their local knowledge. People with longer residence time tend to have higher TEK on medicinal plants, significantly influencing the transmission of this knowledge to future generations, in a relationship directly proportional to age. Gandolfo and Hanazaki (2014) also showed that residents living in a coastal area of the island of Florianópolis, Santa Catarina, Brazil, for more than 30 years, know a greater number of native plants than those living in the same area who are mostly from urban areas.

CONCLUSIONS

Knowledge regarding medicinal plants can be influenced by socioeconomic factors that contribute to the formation of different knowledge patterns among the interviewees and that affect the maintenance and cultural transmission of TEK. It is important to note that, even when a social factor is important, such as length of residence time, this does not necessarily mean that this knowledge can be generalized, because different communities have different socioecological systems. It is necessary, when studying this type of knowledge, to investigate the peculiarities of each social group. Therefore, ethnobiological studies of knowledge regarding medicinal plants are important for projects that promote the sustainable use of natural resources and the conservation of cultural aspects, especially in areas where a large number of traditional populations are concentrated, such in as the Amazon.

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