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Original article

Sale of medicinal herbs in pharmacies and herbal stores in Hurlingham district, Buenos Aires, Argentina

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In this paper, the sale of medicinal plants was described in the urban city of Buenos Aires, Argentina. Semi-structured interviews were conducted with pharmacists and herb store owners about different characteristics of retail. Likewise, different types of retailers were compared, and the phytomedicine degree of acceptance was consulted. The percentage of customers who buy medicinal plants in herb stores is higher than in pharmacies. The five most demanded species were: “malva” (*Malva* sp.), 18%; “manzanilla” (*Matricaria recutita*), 13%; “tilo” (*Tilia* sp.), 12%; “cuasia” (*Picrasma crenata*), 8%; and “boldo” (*Peumus boldus*), 7%. In like manner, the most demanded mixes of species were those that had slimming properties, 21%; digestive, 17%; sedative and diuretic, 13%. Of the 32 most frequently requested species, only 13 are native. Phytomedicines were widely accepted in the different kinds of retail stores. It was also emphasized that, contrary to the usual assumption, the choice to consume plants is cultural rather than economic. Due to the acceptance observed in the use of phytomedicines, it must be emphasized the potential that Argentina possesses for the development of this industry.

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Introduction

About 80% of the world's population uses Traditional Medicine (TM) to satisfy their needs of primary health care (PHC), according to reports produced by the World Health Organization (WHO, 2002). Such percentage varies depending on the level of development in different countries.

In developed countries, the population does not use the term TM and for this reason the term Complementary and Alternative Medicine (CAM) is applied. As background information, people asked about the use of CAM, admitted to resorting to this type of

medicine at least once, were 70% in Canada, 49% in France, 48% in Australia, 42% in USA, and 31% in Belgium. On the contrary, when people in developing countries were surveyed about their use of TM, the values are closer to the global average. In Africa, figures might vary from 60% (Uganda) to 90% (Ethiopia), and the identical situation is observed in the Asian continent, with values around 70% in India (WHO, 2002).

In Latin America, the situation is similar to what happens with the rest of the developing countries; it has been estimated that only 30% of the population in Brazil uses conventional medicine (Cañigueral et al., 2003). Similarly, in countries such

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as Bolivia, Ecuador, and Colombia, the use of TM is more established due to the generational transmission of practices and ancestral traditions. On the other hand, it has been determined that the use of medicinal plants in the major cities of Argentina involves 70% of the population (Cañigueral et al., 2003), a figure that increases in rural areas due to isolation and social exclusion (Doyle, 1999). In general, the use of medicinal plants tends to cluster in rural areas, contrary to urban areas where it is more rare (Bennett and Prance, 2000). Nonetheless, records show that there has been an increase in the dynamics of use and retailing in recent years, as shown in studies conducted in Bolivia, La Paz (Macia et al., 2005); Brasil, Itaquí-RS (Ethur et al., 2011); as well as in several Municipalities of the Buenos Aires Province in Argentina as: Berisso (Hernández and Arambarri, 2007), Bahía Blanca (Cambi et al., 1999; Cambi and Hermann, 2001), La Plata (Arenas, 2007; Pochettino et al., 2008; Arenas et al., 2011), Tandil (Hilgert et al., 2010), Hurlingham (Bach and Fortunato, 2010), and San Carlos de Bariloche City in the Rio Negro Province (Cuassolo et al., 2009).

The urbanization that includes the Autonomous City of Buenos Aires (CABA) and the conurbation area surrounding the Buenos Aires Province is known as "Gran Buenos Aires". It is the most densely populated area, with about 13 million inhabitants (INDEC, 2010). It is characterized for being a complex zone due to its great cultural diversities. The wave of immigration that happened during the mid and late twentieth century brought new practices and knowledge from immigrants of Latin American countries, such as Bolivia, Colombia, Chile, Paraguay and Peru, which turned this area into a real multicultural framework in the past decades.

So far, there is information regarding the consumption of medicinal plants only in one Municipality of this complex zone (Bach and Fortunato, 2010). Therefore, in this study the use of medicinal plants was analyzed from the point of view of the retailers of this area, bearing in mind the following objectives:

1. To analyze the characteristics of the retail of medicinal plants at Hurlingham district.
2. To compare retail of medicinal plants between pharmacies and herb stores.
3. To compare pharmacies in central and residential areas.

Material and methods

Collection

Hurlingham district is part of the Gran Buenos Aires metropolitan area. It is located 25 km west of CABA (34° 36' S, 58° 38' O), (Fig. 1). This Municipality has an approximate population of 176,000 inhabitants (INDEC, 2010).

The research was carried out throughout 2010 in 42 pharmacies (100%) and ten herb stores (under this designation, stores called "herboristerías", "dietéticas", or "todo suelto"), are included in Hurlingham district. Central pharmacies are those located in the commercial area of the district, while residential areas are those located among family houses and neighborhood shops. It must be noted that from fifteen registered herb stores, five did not accept to cooperate. The surveys were administered depending on their preferences.

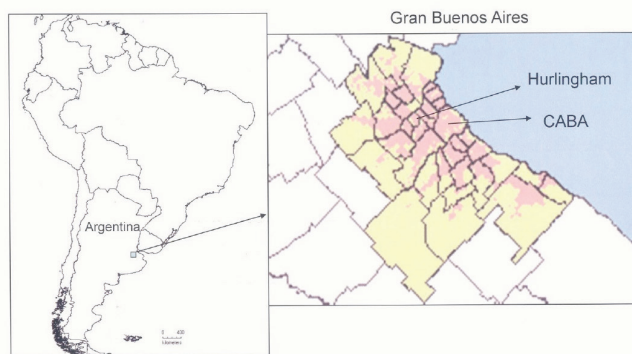


Figure 1 - Location of Hurlingham district and Autonomous city of Buenos Aires (CABA) in Argentina.

One way was self-administration (the questionnaires were given and they were answered at the moment or for the following day), and a second way was through an interview.

The semi-structured interviews (see Appendix) can be found in the archives of the Biological Resources Institute. The obtained data was processed in Excel spreadsheets, using *Infostat* (an open statistics software designed by researchers from Córdoba University, Argentina) for statistical analysis. Results are given as a mean \pm S.D. The results were analyzed by Student's *t*-test and *p* values < 0.05 were considered statistically significant. Medicinal plants are commercialized by their common names. Samples were acquired, three different commercial brands of the most utilized medicinal plants, and mixtures of two or more species for botanical corroboration. Voucher specimens are stored in the herbarium of the Biological Resources Institute (BAB). Only the genus name was indicated in Table 1, (i.e. *Baccharis* sp.; *Eucalyptus* sp.; *Malva* sp.; *Mentha* sp. y *Tilia* sp.). When the specific name in the labels did not coincide with the content, their determination was performed at genus level.

Results and discussion

The results obtained showed that from the 42 pharmacies in Hurlingham only one of them does not offer medicinal plants (MP), whereas in the others, MP are sold in any of their presentation forms: mono herbs (packed or in bulk), mixes or packaged to make infusions. The percentage of MP buyers that come to purchase at pharmacies from central area was around 5%, while in residential areas the percentage increases up to 15%, and this difference was significant ($p < 0.05$). In herb stores, the percentage of customers that buy MP is around 60%, statistically higher ($p < 0.05$), compared to pharmacies from the central area or residential area (Fig. 2). According to Cambi and Hermann (2001), in Bahía Blanca (Buenos Aires Province) the percentage of MP consumers is between 10% and 30%. These authors do not make any distinction regarding place of purchase, if it is done in either pharmacies or herb stores. Therefore, if the percentage is undifferentiated, 25% of the customers use MP in Hurlingham district; and the results would be showing similarity with the previously reported in Bahía Blanca (Cambi and Hermann, 2001).

Table 1

List of most in demand species in Hurlingham.

Common Name	Scientific Name	Family	Retail Store	Citation Numbers
Ambay*	<i>Cecropia pachystachya</i> Treul (BAB 92445)	Cecropiaceae	Pharmacy Herb Store	4 2
Anacahuita*	<i>Blepharocalyx salicifolius</i> (Kunth) O. Berg (BAB 92468)	Mirtaceae	Herb Store	1
Anis estrellado	<i>Illicium verum</i> Hook. f. (BAB 92448)	Illiciaceae	Pharmacy Herb Store	1 1
Arenaria	<i>Spergularia rubra</i> (L.) C. Presl. (BAB 92460)	Caryophylliaceae	Pharmacy Herb Store	1 1
Boldo	<i>Peumus boldus</i> Molina (BAB 92455)	Monimiaceae	Pharmacy Herb Store	13 1
Burro*	<i>Aloysia polystachya</i> (Gris.) Mold. (BAB 92461)	Verbenaceae	Herb Store	2
Carqueja*	<i>Baccharis</i> sp. (BAB 92427)	Asteraceae	Pharmacy Herb Store	4 2
Cascara sagrada	<i>Rhamnus purshiana</i> DC. (BAB 92464)	Ramnaceae	Herb Store	1
Cedrón*	<i>Aloysia citriodora</i> Palau (BAB92446)	Verbenaceae	Pharmacy Herb Store	4 2
Cola de caballo*	<i>Equisetum giganteum</i> L. (BAB 92467)	Equisetaceae	Pharmacy Herb Store	8 5
Congorosa*	<i>Maytenus ilicifolia</i> Mart. Ex Reissek (BAB 92465)	Celastraceae	Herb Store	1
Guasia	<i>Picrasma crenata</i> (Vell.) Engl. (BAB 92425)	Simarubaceae	Pharmacy Herb Store	15 1
Eucaliptus	<i>Eucaliptus</i> sp (BAB 92444)	Myrtaceae	Pharmacy	1
Fucus	<i>Fucus vesiculosus</i> L. (BAB 92463)	Fucaceae	Herb Store	1
Hisopo	<i>Hyssopus officinalis</i> L. (BAB 92462)	Lamiaceae	Herb Store	1
Malva	<i>Malva</i> sp. L. (BAB 92424)	Malvaceae	Pharmacy Herb Store	27 9
Manzanilla	<i>Matricaria recutita</i> L. (BAB 92456)	Asteraceae	Pharmacy Herb Store	20 6
Maíz	<i>Zea maiz</i> L. (BAB 92447)	Poaceae	Herb Store	6
Melisa	<i>Melissa officinalis</i> L. (BAB 92451)	Lamiaceae	Herb Store	2
Menta	<i>Mentha</i> sp. (BAB 92472)	Lamiaceae	Herb Store	2
Mil hombres*	<i>Aristolochia</i> sp. (BAB 92470)	Aristolochiaceae	Herb Store	1
Paico*	<i>Chenopodium ambrosioides</i> L. (BAB 92466)	Chenopodiaceae	Herb Store	2
Pasionaria*	<i>Passiflora caerulea</i> L. (BAB 92449)	Passifloraceae	Herb Store	2
Peperina*	<i>Minthostachys verticilata</i> (Griseb.) Epling. (BAB 92454)	Lamiaceae	Herb Store	1
Pezuña de vaca*	<i>Bauhinia forficata</i> Link. subsp. <i>pruinosa</i> (Vogel) Fortunato et Wunderlin (BAB 92453)	Leguminosae	Herb Store	1
Pulmonaria	<i>Pulmonaria officinalis</i> L. (BAB 92459)	Borraginaceae	Herb Store	1
Sen	<i>Senna alexandrina</i> Mill. (BAB 92426)	Fabaceae	Pharmacy Herb Store	10 3
Té verde	<i>Thea sinensis</i> L. (BAB 92452)	Theaceae	Herb Store	1
Tilo	<i>Tilia</i> sp. (BAB 92457)	Tiliaceae	Pharmacy Herb Store	22 2
Uña de gato	<i>Uncaria tomentosa</i> (Willd) DC. (BAB 92471)	Rubiaceae	Herb Store	1
Valeriana	<i>Valeriana officinalis</i> L. (BAB 92469)	Valerianaceae	Pharmacy Herb Store	7 3
Yerba del pollo*	<i>Alternanthera pungens</i> Kunth (BAB 92450)	Amaranthaceae	Herb Store	2

*Native Plants.

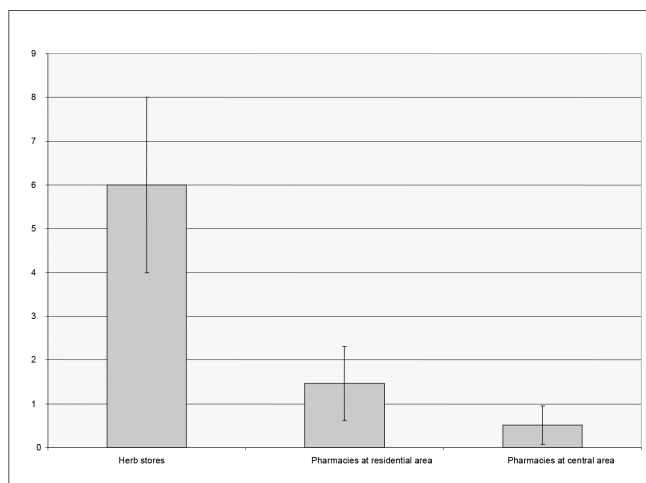


Figure 2 - Percentage of medicinal plant sales in pharmacies and herb stores in Hurlingham district.

This would show a similarity with the results in Bahía Blanca. It is important to determine the type of business since differences between retailers cannot be appreciated in the general average.

Regarding preferences in the use of individual herbs or mixes, the results were: in pharmacies 69% of customers purchased individual herbs, 25% mixes, and the others had no preference; in herb stores, 50% purchased individual herbs and 50% does not state a preference between mixes or individual herbs. It should be noted that MPs are used according to the therapeutic need of each individual, regardless of their presentation.

The five most demanded species were: “malva” (*Malva* sp.) 18%, “manzanilla” (*Matricaria recutita*) 13%, “tilo” (*Tilia* sp.) 12%, “cuasia” (*Picrasma crenata*) 8%, and “boldo” (*Peumus boldus*) 7%, the total number of cited species was 32 (Table 1 and Fig. 3).

No differences were found between pharmacies in the central and the residential area when questioned about which were the most frequently requested species. On the contrary, a divergence was observed in herb stores where “malva” (*Malva* sp.), “manzanilla” (*Matricaria recutita*), “Cola de caballo” (*Equisetum giganteum*), “Sen” (*Senna alexandrina*), and “Valeriana” (*Valeriana officinalis*) are the most cited species in herb stores. Global relative occurrence was consistent among herb stores for “malva” and “manzanilla”, while for the rest of MP there are differences in the magnitude of frequencies. It could be said that “sen” takes the 4th position in herb stores (6th in pharmacies) thanks to the high number of over-the-counter products with laxative properties. It is noteworthy that “boldo” and “cuasia” just received one citation from herb stores.

When the data obtained is compared to the study of Cambi and Hermann (2001), the information is similar; the most requested species in Bahía Blanca are: “tilo” (*Tilia* sp.), “manzanilla” (*Matricaria recutita*), “sen” (*Senna alexandrina*), “boldo” (*Peumus boldus*) and “cuasia” (*Picrasma crenata*); but it differs from that registered by Cuassolo et al. (2009) for the city of Bariloche, since the most requested species in this area were: “manzanilla” (*Matricaria recutita*), “malva” (*Malva parviflora* and *M. sylvestris*), “eucalipto” (*Eucalyptus* sp.) and “palo amargo” or

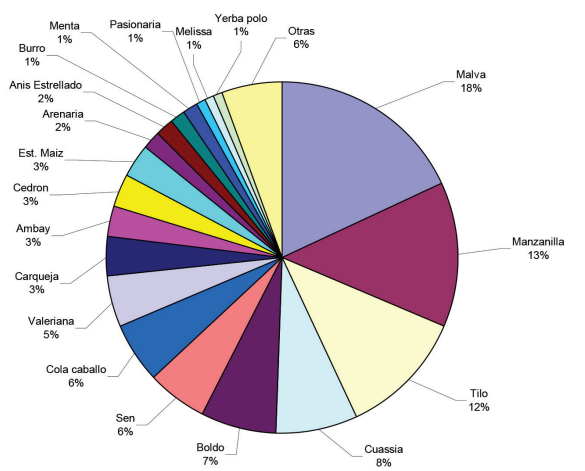


Figure 3 - Relative frequency of the most requested herbs in pharmacies and herb stores in Hurlingham.

“cuasia” (*Picrasma crenata*). Hilgert et al. (2010) indicate as the most demanded species in the Municipality of Tandil, “tilo” (*Tilia* sp.), “malva” (*Malva sylvestris*), and “manzanilla” (*Matricaria recutita*). These three species coincide with the present study, and then among the five first species “ambay” (*Cecropia pachystachya*) and “ginkgo” (*Ginkgo biloba*) are found. It should be noted that frequency is not indicated. As a consequence, “tilo” is taken as the species with the highest demand, followed by all the others in decreasing order. The tendency towards the use of exotic species could be observed in the four urban sites (Hurlingham, Tandil, Bahía Blanca and Bariloche). Therefore, it should be important to find substitutes in the native plants to promote the an Argentinian plant pharmacopeia.

A greater diversity of species is requested in herb stores than in pharmacies. From the 32 species registered with higher frequency, 57.5% were only mentioned in herb stores (Table 1). From these 32 species, only one of them is not a vascular plant, but rather it is an algae (*Fucus vesiculosus*). From the vascular plants, one species belongs to the Lycopodiophyta division (*Equisetum giganteum*), and the others to the Spermatophyta division, Magnoliophyta subdivision. On the other hand, from the 32 most requested species, only thirteen are native, which represents 40% of total species consumed; this percentage is also registered in Bahía Blanca as shown by Cambi and Hermann (2001). Thus, these results show that there is a tendency of using exotic plants more frequently in urban areas. According to the results obtained in the surveys, more than half of the native species registered, 61%, were only mentioned by herb-storeowners. This would show that the retail of native species is more important in herb stores than in pharmacies in the Hurlingham district. For future studies, the repetition of this tendency in other cities should be verified.

In regard to medicinal plants mixes more frequently sold, slimming tea (22.2%) is the most requested, followed by digestive (16.6%), sedative (12.7%), diuretic (12.7%), hypoglycemic (10.3%) and hypocholesterolemic (9.5%) mixes.

It could be observed, that other mixes (to treat hypertension, expectorant, antiparasitic) of medicinal plants that are sold

with more frequency do not exceed 5% (Fig. 4). Aligned with these data, in the Municipality of Itaqui, Rio Grande do Sul (Brazil), Ethur et al. (2011) report that the most sold plants are for slimming and as digestive, without making a distinction between individual herbs or mixes.

The pharmacists answered that 75% of the patients requested herbs for a particular ailment. Likewise, herb store owners had a similar answer, given that 80% of their customers requested medicinal plants in the same way. The situation is

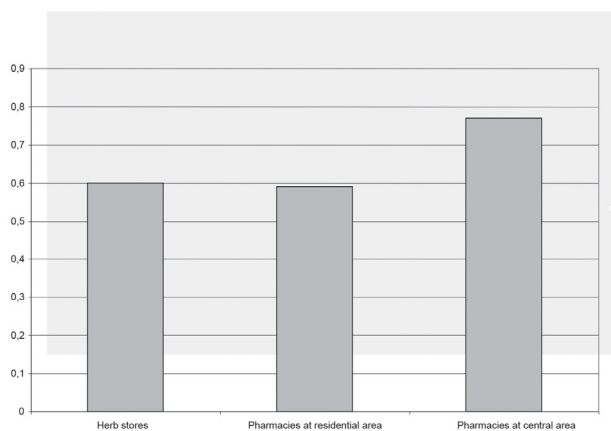


Figure 4 - Relative frequency of most requested mixes by consumers, by main action in pharmacies and herb stores in Hurlingham.

different when customers request for ailments or pathologies in pharmacist and herb stores: the list is headed by nervous disorders (17.6%), hyperglycemic (14.1%), hypercholesterolemic (9.4%), overweight (8.2%), digestive disorder (8.2%), urinary retention (8.2%), and rheumatic pain (7.0%), constipation (4.7%), hemorrhoids (4.7%), hypertension (3.5%), head lice (2.3%), and prostatic disorder (2.3%), and lastly, MP to treat anxiety (1.2%), inflammatory processes (1.2%), cough (1.2%), menstrual disorder (1.2%), vaginal inflammation (1.2%), asthma (1.2%), allergy (1.2%), and circulatory disorder (1.2%).

Another point taken into account was whether physicians prescribed medicinal plants. When pharmacists were asked about the percentage of people who bought medicinal herbs with a prescription, the answer was around 1%. On the contrary, nine of the ten surveyed herb stores stated that about 10% of the people who buy medicinal plants have prescription. The 90% of herb store owners informed that customers ask for advice regarding the use and dosage, while

this percentage decreases up to 61% in pharmacies. According to this information taken from customers the herb store owner would be considered more able and reliable than professional pharmacies.

When asked about the reasons people turn to medicinal plants for health care in the Hurlingham district, it was shown that the efficacy of the medicinal herb and the economic factor are not determinant for their consumption. Instead, there is a higher consensus among professionals and herb store owners to state that consumers of medicinal plants do so, due to the culture of use, and above all, for the "natural" condition that these medicines possess (Table 2). In the Municipality of Bahía Blanca, Cambi and Hermann (2001) show that the reasons for the use of medicinal plants, according to retailers, are due mainly to economic reasons and the return to natural by consumers.

Due to the remarkable increase in the current offer of phytotherapeutics, we decided to investigate the degree of acceptance that these medicines have, compared to medicinal herbs. Pharmacists from non-centric pharmacies and herb store owners answered 58.6% and 60% respectively in favor of phytotherapeutics over medicinal herbs, showing no significant differences ($p < 0.05$). On the other hand, there was a 77% preference of the surveyed in favor of phytotherapeutics in center area pharmacies, these differences are significant when compared to the residential area pharmacies or herb stores ($p < 0.05$) (Fig. 5).

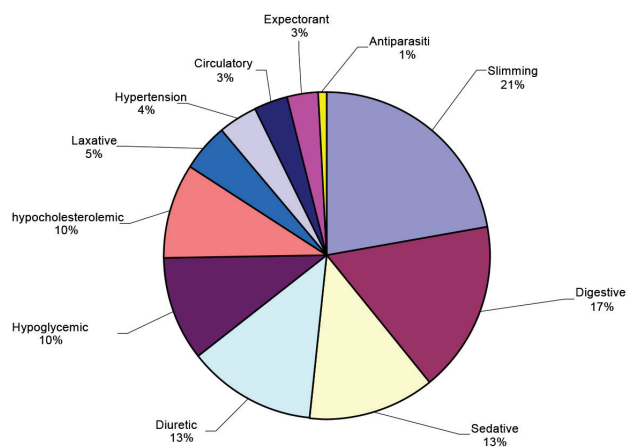


Figure 5 - Phytotherapeutic acceptances in Herb stores, Pharmacies in residential areas and Pharmacies in center areas.

Table 2

Reasons for election of medicinal plants for health care in Hurlingham district.

Consumption reason	Center area Pharmacies	Residential area Pharmacies	Herb Stores
Due to being natural	37.5%	25%	34%
Due to cultural use	33.5%	32%	26%
Due to being more economical	29%	25%	26%
Due to higher efficacy	--	2%	13%

Chart 1

Reasons of higher acceptance of phytomedicines and medicinal herbs in pharmacies and herbal stores the Hurlingham district.

Phytomedicines	Medicinal Herbs
Due to the nature of phytotherapeutics.	There is no knowledge of phytomedicines by physicians and patients.
Constancy and uniformity in the intake.	People look for herbs and do not want to take pills because it is not natural.
Because they directly calm ailments.	Economic problems.
More effective.	
There is more trust in the laboratory medicine and distrust in the effectiveness of medicinal herbs.	
The customer requests them.	
The physician can prescribe them with more security.	
It depends on the economic level.	
They believe they are medicines.	

Among the answers in favor of phytotherapeutics, 50% answered that practicality (for example: pill intake) is determinant for their choice, whereas the other half mentioned different reasons (Chart 1). It should be noted that herb store owners in favor of phytotherapeutics also said it was a fact that they are more practical. Likewise, within the ones in favor of medicinal herbs, 53% answered that they prefer them because they are "natural", while the other 47% stated that phytomedicines would not have a greater acceptance than herbs due to their higher cost or lack of knowledge etc. (Chart 1).

Conclusion

This research was carried out with the purpose of collecting the opinion of pharmaceutical and herbal dispensers in an urban area. There are few records addressing this type of evaluation in urban areas, and the questionnaires provide important data on the demand of medicinal plants. Likewise, the goal of the questionnaire was to give information to the community who work with health issues. It is also important to know and compare the different types of shops and their dynamics, which can be different, according to the treated subject as shown by the results. Furthermore, we conclude that further research regarding quality control to ensure the safety, quality and efficacy of herbal medicines are needed.

Authors' contributions

HB (PhD student) contributed to the fieldwork (visits to professional pharmacists and herb-storeowners) to complete surveys, as well as the taxonomical identification of samples and adaptation for their incorporation to the BAB herbarium. MLW contributed in the writing and critical editing of the

manuscript. RAR contributed to the statistical treatment of data, and the writing as well. RHF contributed to the writing and critical correction of the manuscript. All the authors have read the final manuscript and approved the submission.

Conflicts of interest

The authors declare no conflicts of interest.

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