

## Survey on the Practice of Alternative and Complementary Medicine Among Herbalists in Fes

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### Summary

**Background:** The use of plants in therapeutics has been known for a long time. Morocco in particular is characterized by its biogeographic position, by a diversity of flora and a population that has trusted traditional medical practices for centuries. The objective of this work was to highlight the place of herbal medicine in the traditional care system practiced by herbalists in the region of Fez.

**Material and Method:** This is a cross-sectional and descriptive observational study conducted over a period of 7 months from 1 November 2020 to 31 May 2021. The survey was carried out in Fez and conducted among herbalists and their customers, using a questionnaire translated into Arabic dialect in order to have an overview of the local traditional uses and diversity of the pharmacopoeia of this city

**Results:** During the study period, we obtained responses from 20 participants. The average age was 40 years (extremes 20 to 65 years) with a male predominance (95%). The in-depth survey identified forty-four (44) species of plants of which the Lamiaceae is the most cited family before the Apiaceae, the Asteraceae, the Fabaceae and the Verbenaceae. Leaves were the most used plant organs, as for the form of preparation, infusion was the most practiced. The disorders related to the digestive and respiratory systems represented the pathologies object of a frequent phytotherapy.

**Conclusion:** The practice of phytotherapy in Morocco is left to popularization and scientific, legislative and academic oblivion. They must obey strict normative rules that only the specialist in phytotherapy can answer.

**Keywords:** Alternative medicine - Phytotherapy - Medicinal plant - Herbalist - Intoxication

### Introduction

The practice of phytotherapy in Morocco is left to the popularization and scientific, legislative and academic oblivion. Like drugs, medicinal plants must obey strict normative rules that only the specialist in phytotherapy can answer. This inevitably implies the regulation of the profession in our country.

Traditional Moroccan medicine is the fruit of the crossroads of Berber and Arab-Muslim civilization. In some regions of Morocco, it is the main source of care and represents the last resort in case of failure of conventional medicine [1].

Currently, despite the progress of pharmacology, the use of plants in traditional medicine is very present in some countries of the world and especially in developing countries [2]. This can be explained by the following five reasons:

- A historical observation: Traditional medicine is an integral part of the socio-cultural heritage and its usefulness has always been recognized by the populations to solve their health problems;
- An economic observation linked to the poverty of the underprivileged populations, unfortunately they are in the ma-

majority, who are finding it increasingly difficult to afford the cost of chemical (synthetic) medicines;

- The third reason is related to the fact that some patients are disappointed by the results of modern medicine, especially for chronic diseases;
- A belief that everything natural can only be beneficial for health and without undesirable effects;
- A scientific observation: Traditional medicine offers important and enriching research paths, concerning certain therapeutic virtues of medicinal plants.

The objective of this work was to highlight the place of herbal medicine in the traditional care system practiced by herbalists in the region of Fez.

### Materials and Methods

This is a cross-sectional and descriptive observational study conducted over a period of 7 months from 1 November 2020 to 31 May 2021. The survey was carried out in Fez and conducted among herbalists and their customers, using a questionnaire translated into Arabic dialect in order to have an overview of the local traditional uses and diversity of the pharmacopoeia of this city. Herbalists in the city of Fez were included, as well

as patients who received a prescription from the herbalist during the study. Herbalists who refused to join the study were excluded.

All data were collected and analyzed anonymously using a Microsoft Excel® spreadsheet. Quantitative variables are described in numbers and percentages.

**Results**

During the study period, we obtained responses from 20 participants. The average age was 40 years (extremes 20 to 65 years) with a male predominance (95%) (Table 1).

Table 1: Demographic and socio-cultural characteristics of herbalists (N=20).

Characteristics	
Age (year) <sup>1</sup>	Number (Percentage)
< 20	1 (5%)
20-30, n (%)	5 (25%)
30- 40, n (%)	2 (10 %)
40- 50, n (%)	4 (20%)
≥ 50, n (%)	8 (40%)
<b>Sexe<sup>1</sup></b>	
Male	19 (95%)
Female	01 (5%)
<b>Education Level<sup>1</sup></b>	
Illiterate	5 (25 %)
Primary	4 (2%)
Secondary	8 (40%)
University	3 (15%)
<b>Duration of experience (year)<sup>1</sup></b>	
<1	1 (5 %)
[1-5]	5 (25 %)
[5-10]	2 (10 %)
[10-20]	2 (10 %)
[20-30]	4 (20 %)
[30-40]	2 (10 %)
[40-50]	3 (15 %)
>50	1 (5 %)

<sup>1</sup>expressed as a number (percentage)

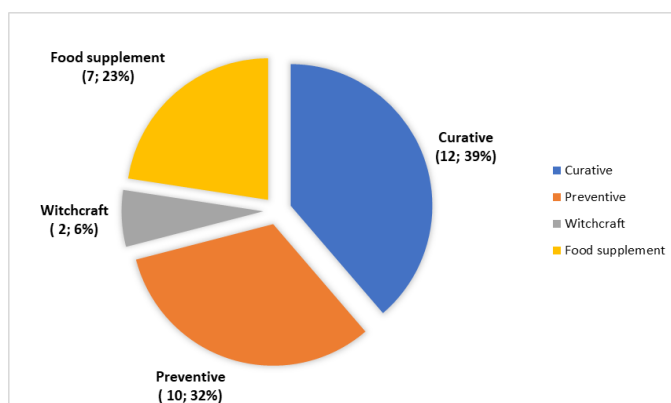


Figure 1: Customer purchase objective according to our population.

70% of the herbalists surveyed had never attended any training or study in this field.

The survey revealed that most of the individuals using medicinal plants were women with a percentage of 70%. The age group between 30 and 40 years old represents the highest percentage (40%).

The main source of information regarding the therapeutic use of medicinal plants showed that 45% of our respondents refer to the experience of relatives, 40% solicit herbalists based on

radio/television broadcasts (media).

The study population prefers to use herbal medicine to cure various diseases (39%), for disease prevention (32%), as a food supplement in 23% of cases and then for witchcraft (6%) (Figure 1).

The vast majority of the population uses medicinal plants as traditional remedies. For these people, the use of traditional medicine is more effective than drug treatment (45%), 30% say that this medication has an average effect and only relieves their ailments.

Table 2 shows the distribution of the medicinal plants identified according to their therapeutic indications. The number of plants identified was 44 of which 12 are the most sold: Thymus vulgaris (16%), Origanum vulgare (15%), Lavandula dentata (14%), Rosmarinus officinalis (9%), Mentha pulegium (8%), Verbena officinalis (8%), Cuminum cyminum (7%), Matricaria chamomilla (6%), Trigonella foenum-graecum (5%), Eucalyptus globulus (5%), Foeniculum vulgare (5%), Pimpinella anisum (2%).

The taxonomic identification of the prescribed plants identified the most represented families: Lamiaceae, Apiaceae, Asteraaceae, Fabaceae and Verbanaceae.

The people surveyed most often use the leaves of plants, in the form of infusion, followed by decoction.

Regarding the knowledge of the herbalist on the adverse effects of herbal medicine, the survey reveals that 75% of respondents know the adverse effects of medicinal plants, the most reported are disorders of the digestive tract with a percentage of 56%, followed by allergy (17%), high blood pressure (13%) and the rest mentioned nephrotoxicity and hepatotoxicity.

While the rest of the population (25%) declared their lack of knowledge of the dangers they can cause to health. More than half of the sample of herbalists studied (60%) knew the circuit of notification of adverse effects, the rest (40%) did not. However, all the herbalists have never used this system.

**Aromatherapy and Apitherapy:**

The survey showed that Lavandula dentata EO (Lavender) and Eugenia caryophyllata EO (Clove tree) were the most sold at 25% and 19% respectively, followed by Eucalyptus globulus EO (Eucalyptus)26%, and Melaleuca alternifolia (Tea tree) 12%, Rosmarinus officinalis (Rosemary) 10%, Mentha piperita (Peppermint) 10%. Citrus limon (Lemon), Salvia officinalis (Sage), Citrus aurantium (Orange blossom) show a low rate of 8% (Figure 2).

Of the 20 herbalists surveyed, only 9 sell bee products. Our survey counted a percentage of 30% for propolis, 26% for royal jelly, 22% honey, 18% pollen and a low percentage of 4% for beeswax.

**Discussion**

The present study included herbalists from the region of Fez. Many herbalists refused to participate in our study. This can be explained by the fear that these herbalists have towards the goals of our study or by the refusal to disclose certain recipes to limit the competition.

The small number of participants did not allow for further

Table 2: Therapeutic effects of the most sold medicinal plants according to our survey.

Species	Therapeutic effects reported by herbalists
<i>Lavandula dentata</i>	Chills, Genital Infections, Hair Care
<i>Thymus vulgaris</i>	Colic, Diarrhea, Digestive disorders, Flatulence, Chills, Bronchitis, Flu, Cough, Toothache, Painful menstruation, Anemia, Infections
<i>Origanum vulgare</i>	Antispasmodic, Hypoglycemic, Against bronchitis and cold, Gastrointestinal disorders
<i>Rosmarinus officinalis</i>	Colic, Flatulence, Digestive disorders, Liver disorders, Nervousness, Depression, Cold, Bronchitis, Flu, Asthma, Dental pain, Immunity failure, Anemia
<i>Matricaria chamomilla</i>	Colic, Diarrhea, Nervousness, Depression, Angina, Canker sores, Painful menstruation, Fever, Abscess, Infections
<i>Eucalyptus globulus</i>	Antiseptic, Febrifuge, Stomach ache
<i>Foeniculum vulgare</i>	Antispasmodic, Digestive disorders, Against bronchitis
<i>Verbena officinalis</i>	Carminative, Sedative
<i>Calamintha officinalis</i>	Refreshing, Antipyretic, Stomach ache
<i>Eugenia caryophyllata</i>	Antipyretic, Dental pain, Hair care

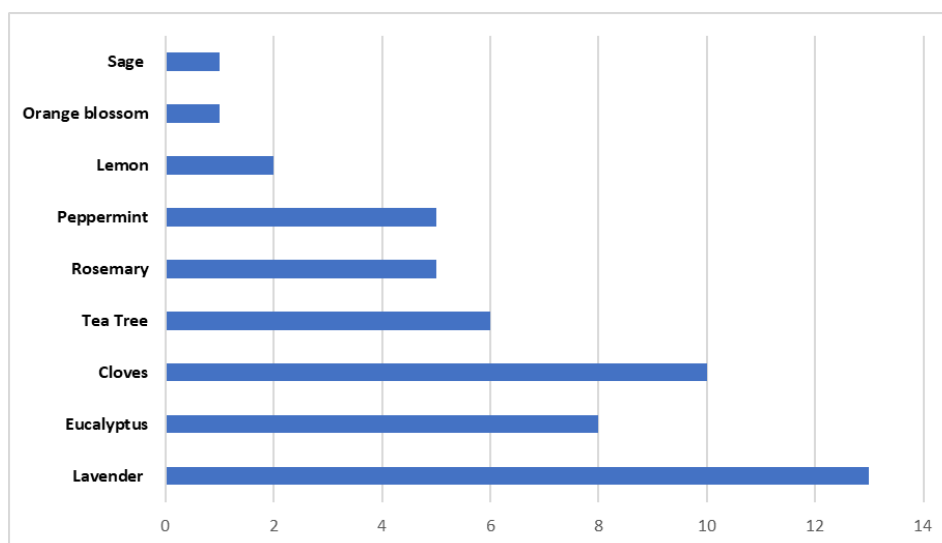


Figure 2: Distribution of the most sold essential oils in herbalist shops.

statistical analysis, which is the main limitation of our work. However, some interesting and practical information can be drawn from this study.

**The socio-cultural profile of herbalists**

A survey done in the West Bank of Palestine in 2016, showed that male herbalists dominate with a percentage of 71%, the average age of the herbalists was 55 years old, with a qualifying high school education at 30%. Regarding training and knowledge acquisition, 77% of the participants acquired their knowledge through observation of family members, 21% through courses and apprenticeships, and the remaining 2% claimed that they had a divine gift for healing certain diseases [3].

At the national level a study done in Marrakech in 2014 showed that herbalists were predominantly male (82%), with an average age of 53 years. 63.6% of herbalists acquire their skills through the experiences of former practitioners of the trade. [80] In the region of Fez, where our survey was conducted, it was found that most herbalists are male (95%), which is probably due to the cultural characteristics of the region of Fez, they are over 50 years old (40%), consistent with the data in the literature.

Many herbalists have never been trained in the field, they enrich their knowledge through personal experiences and those of others on the one hand, and books of alternative medicine on the other hand, consistent with national and international data.

**Socio-cultural profile of clients:**

The majority of clients using medicinal plants were women (70%) with a dominant age range between 30 and 40 years. One third of the clients were illiterate. A large proportion of the respondents confirmed the use of herbal medicine after a recommendation from relatives (45%) and the media (40%). This use was mainly for curative purposes. This is consistent with the results of several studies conducted in many regions of Morocco and can be explained by the relative frequency of illiteracy among women in our society, their economic concern for the balance of the disease as well as for its cost, their attachment to the traditional and cultural aspect and the ease of transmission of this information among them.

Phytotherapy is frequently practiced by the Moroccan population. Indeed, studies have shown that the majority of individuals use plants to treat digestive disorders, respiratory diseases, immune diseases, urinary diseases as well as chronic diseases such as diabetes. According to our study, the families of plants most represented in traditional medicine are Lamiaceae, Apiaceae and Astraceae. All the plants we counted are universally known for their phytochemical and pharmacological properties and are included in the Moroccan pharmacopoeia [4].

Many therapeutic properties are, in fact, attributed to Lamiaceae, in particular, anti-inflammatory, antibacterial, antiviral, antioxidant and antiallergic properties [5]. These different properties are due to their chemical constituents of pharmacological

interest. These are coumarins, tannins, mucilages, flavonoids and phenolic acids such as rosmarinic acid from oregano or thyme [6]. In addition, this family is characterized by the presence of essential oils that occupy an important place in therapeutics thanks to their broad spectrum of biological activities [7] [8]. Linalool, for example, a compound naturally present in lavender alleviates stress and joint pain. It is particularly effective on oral infections. Rosemary EO activates liver function and biliary excretion [9].

### Medicinal plants and toxicity

Moroccan medicinal plants occupy an important place in our society. The intoxications by plants in Morocco represent 5.1% of all intoxications apart from scorpionic stings and envenomations. The first 3 plants sources of intoxication are *Atractylis gummifera* 10.1% (glue thistle), *Cannabis sativa* 4.6% (*Cannabis*) and *Peganum harmala* 3.6% (Harmel) [10] Our survey revealed that 75% of the herbalists affirm that they have knowledge on the undesirable effects of plants.

Indeed, surveys of Moroccan herbalists have shown that some sellers amplify the therapeutic indications of medicinal plants, do not indicate the precautions for use, do not know the undesirable effects and toxicity of plants. In addition, the posologies are not provided to the customers in a precise and correct way, and they are different from one herbalist to another; we speak about pinch or handful which can vary from one individual to another, the duration of use of the plants is random. Finally, the medicinal plants used are generally poorly preserved and of poor quality [11].

## Aromatherapy and Apitherapy

### 1. Essential oils (EO)

Among the important figures to be retained from this study, we note that 85% of herbalists sell and advise on essential oils. According to the SUMMAC study, 65.6% of patients use aromatherapy as a complementary therapy. The most commonly used oils are Eucalyptus and Tea Tree (13%), Ravintsara (11%), Lemon, Thyme and Lavender (9%). Note that 2% of patients use Cinnamon [12].

In the region of Fez where our survey was conducted, the EO of *Lavandula dentata* (Lavender) and the EO of *Eugenia caryophyllata* (Clove) were the most sold at respective rates of 25% and 19%, followed by the EO *Eucalyptus globulus* (Eucalyptus) 26%.

The qualitative analysis of the 3 essential oils cited in majority by the herbalists of Fez has been described in several studies:

- Lavender EO (*Lavandula officinalis*) contains linalyl acetate, linalool, 1,8-cineole and  $\gamma$ -terpinene. It is indicated in the relief of mild symptoms of mental stress and exhaustion, as well as in cases of sleep disorders and in many skin conditions for its anti-inflammatory and healing effects. In addition to the antispasmodic and analgesic effects [12].
- The EO of clove (*Eugenia caryophyllus*) is composed of a phenol, eugenol, and eugenyl acetate, with anti-infectious and bactericidal properties in vitro but at the origin of a hepatotoxicity and dermo causticity [14].
- The EO of Eucalyptus (*Eucalyptus globulus*) is essentially composed of 1,8-cineole (eucalyptol),  $\alpha$ -pinene, globulol,  $t$   $\alpha$ -terpineol, these are terpene oxides. This oil is a powerful expectorant with decongestant and mucolytic properties in vitro, it is also an antiseptic for the urinary tract, antirheumatic, stimulant and tonic. In addition, it is an excellent natural antibiotic [15].

### 2. The products of the hive:

The products of the hive are complements to conventional treatments thanks to their numerous active constituents, they have very interesting properties and are able to counteract pathological processes such as infection, oxidation and inflammation.

On the other hand, some have the ability to strengthen regenerative phenomena such as immunity and healing, or to improve physiological performance leading to general well-being. However, despite all the therapeutic benefits that the bee can bring, it also has its risks. Its venom, responsible for potentially morbid envenomations and allergic manifestations, has therefore a special place in apitherapy [16].

In our study, only 45% of the herbalists surveyed put the products of the hive on sale. Propolis and royal jelly are the products most requested by the customers for their virtues on health, they have great dietetic and therapeutic qualities.

Bee medicine has been the subject of several studies, but they are still too few or incomplete. Indeed, scientists wanted to know more about these noble products of the hive, paying more attention to their compositions and its therapeutic effects.

### Recommendations

The present study, relating to the study of the practice of alternative and complementary medicine among herbalists in the region of Fez, allowed us to note that:

- The use of phytotherapy is frequent in Fez hence the need to further develop the phytovigilance system in Morocco. The main goal of this system is to ensure a safe use of medicinal plants while informing the public and also health professionals about the expected adverse effects of random use of plants especially in combination, and by developing a comprehensive database on medicinal plants in our country. However, it should be noted that this system of phytovigilance encounters several problems, first of all the cultural constraints and the absence of a legislation that regulates the sale of medicinal plants.
- The lack of information among herbalists concerning the undesirable effects and potential toxicity of plants, hence the interest in developing an educational sheet aimed at making herbalists aware of the risks but also of the benefits of using phytotherapy.
- The sale of these plants is not regulated, hence the need to take into account the use of these plants, whose effect may potentiate or conversely reduce the effectiveness of conventional treatment.
- Identify herbalists and perhaps provide specialized training to draw attention to the danger of certain plants or uses.
- The interest of doing clinical trials in order to clinically prove the indications, to define the therapeutic and toxic margin of the plants most often used in our context.

### Conclusion

Traditional herbal medicine is still widely used in Morocco. Its development comes from the strong popular demand for this type of care. And with the development of the means of communication, there has been an exchange with the traditional medicines of other regions of the world, which allows its continuous enrichment.

Many pathologies are targeted by phytotherapy, but the most common are digestive disorders, respiratory system disorders,



infectious diseases, anxiety and insomnia.

The frequency of intoxications has been increasing over the last few years as plants exist in the wild, as well as being available over the counter and at low prices from herbalists, fresh seasonally or dried throughout the year. It is for these reasons that the population has recourse to them in various contexts.

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