



## Current Perspectives on Medicinal and Aromatic Plants



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### Herbal Tea Remedies : Exploring the Ethnobotanical Landscape of Medicinal Plants in Infants and Child Healthcare

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#### Abstract

Herbal medicine occupies a prominent position as one of the most ancient and globally recognized forms of medical treatment. It offers a compelling alternative for achieving healing and recovery without the potential risk of generating new ailments. Despite the advancements made in conventional medicine, the increasing number of medical practitioners, and the establishment of social security systems, many parents have turned to herbal medicine when searching for remedies for their children. The demand for "natural remedies" perceived as being "risk-free" has been steadily rising. Among the accessible methods of harnessing the benefits of herbal medicine, herbal teas have garnered significant popularity. Consequently, our study aims to acquire comprehensive information pertaining to the composition, methods of administration, and diverse plant varieties employed in these herbal teas. Additionally, we seek to ascertain their positive effects and potential toxicity. The current research encompasses an ethnobotanical survey conducted over a period of one month, spanning from January 6, 2021, to February 19, 2021. The survey involved 753 respondents, predominantly consisting of primiparous or multiparous mothers, who actively participated by completing an electronic questionnaire. The findings reveal that a total of 684 mothers utilized herbal teas for their infants, employing 55 herbal remedies to address various indications. The most frequently sought-after effects included carminative properties and relief from colic. Moreover, 9% of the users reported experiencing adverse effects associated with the administration of herbal teas to their infants. In conclusion, the utilization of herbal teas as a natural remedy by Algerian mothers is widely embraced; however, it is crucial to recognize that the "natural" attribute of plants does not automatically guarantee their harmless nature.

**Key Words:** Herbal medicine, Herbal teas, Children, Mothers, Medicinal plants

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## 1. Introduction

Medicinal plants have retained the prestige of the oldest remedies and continue to possess an inexhaustible potential. The plant world offers abundant and diverse raw materials to therapeutics, which are utilized in phytotherapy.

Phytotherapy is one of the oldest forms of medicine in the world. It represents an interesting alternative for treatment and healing without creating new diseases. Despite the phenomenal development of the pharmaceutical and chemical industry, the popular interest in phytotherapy has never

ceased to evolve. Nowadays, these two forms of medication are closely intertwined since the molecular models of most market-available drugs originate from plants (Belkacem S., 2009).

In developing countries, between 70 and 95% of the population resorts to medicinal plants for primary healthcare due to a lack of access to prescribed medications and because plants have demonstrated genuine efficacy. It is estimated that at least 25% of all modern medicines are directly or indirectly derive from plants thanks to the application of modern technologies to traditional knowledge. (Nace International., 2007) Furthermore, the side effects induced by medications concern users, leading them to seek less aggressive treatments.

Despite the progress of medicine, the increase in the number of doctors, and the establishment of social security, many parents turn to phytotherapy for their children. They increasingly seek "natural remedies" believed to be "risk-free." However, the "natural" nature of plants does not guarantee their harmlessness (Rombaux-gilleron P., 2017).

Herbal tea is a highly accessible means of enjoying the benefits of phytotherapy. It involves extracting aromatic compounds from plants through various preparation methods such as maceration, decoction, or infusion of plant material (fresh or dried flowers, stems, roots, leaves), usually in hot water.

However, the administration of herbal teas to an infant can have serious consequences on their health.

## 2. Material and Methods

### 2.1. Objectives of the study

The main objective was to investigate whether women frequently give herbal teas to their children during their first months of

life and obtain detailed information about the composition and mode of administration of these herbal teas.

As secondary objective :

- Study the sociodemographic and epidemiological profile of mothers
- Identify mothers orientation modalities
- Identify the various adverse effects observed in children following the administration of herbal teas

### 2.2. Type of study

This was a descriptive retrospective study conducted over a one-month period (from January 6, 2021, to February 19, 2021), involving both primiparous and multiparous mothers.

### 2.3. Study population

#### 2.3.1. Inclusion criteria

- Algerian mothers.
- Aged over 18 years.
- Primiparous and multiparous.
- Using herbal teas for their children.

#### 2.3.2. Non-inclusion criteria

- Mothers not using herbal teas for their children.

### 2.4. Recruitment of mothers

The recruitment of mothers took place at the offices of specialist pediatric doctors who responded to our questionnaire, which was presented in paper format and through an electronic questionnaire created using Google Forms® on the social media platform Facebook. The questionnaire consisted of three sections:

- Mother's profile
- Data on the consumption of herbal teas in children
- Data on the mothers' opinions on herbal teas

## 2.5. Ethical aspect

The duration of the interview ranged from 10 to 15 minutes. The questionnaire was anonymous, discreet, and unbiased. It was filled out by the mothers alone to ensure their responses were as honest as possible.

## 2.6. Statistical analysis of data

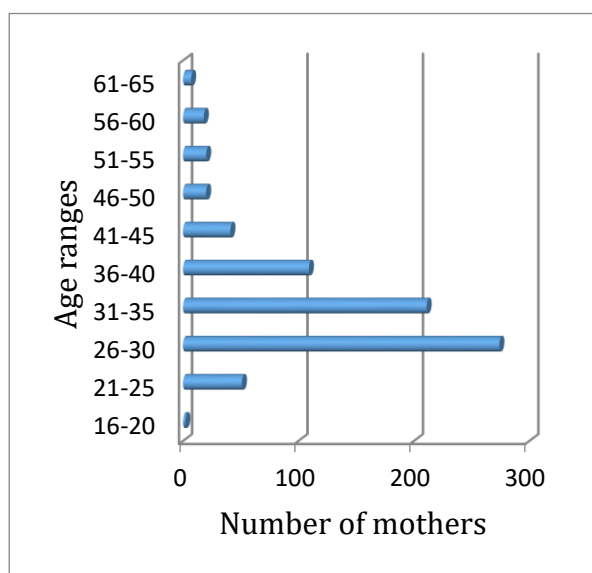
The data was entered into the MS Excel® software. Quantitative variables were expressed in frequencies, while qualitative variables were presented as percentages.

## 3. Results and Discussion

### 3.1. Descriptive parameters of the population (mothers)

#### 3.1.1. Age groups

The age of the mothers ranged from 16 to 65 years, with the highest response rate in the 26-30 age group (36.38%), followed by the 31-35 age group (28.02%) (Figure 1).



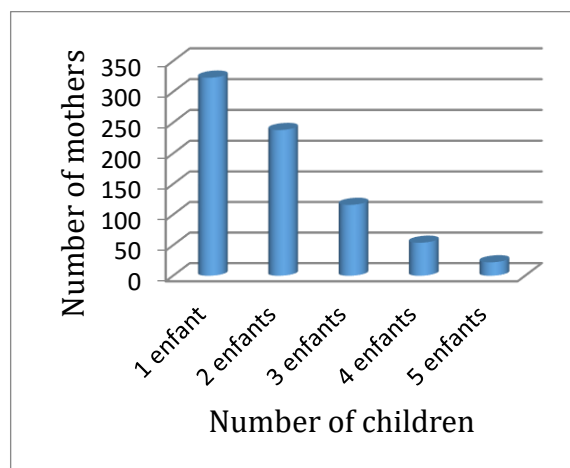
**Figure 1.** Distribution of the population by age groups.

This result aligns with Valérie Huet's study in Reunion Island in 2010, where 79% of the mothers were between 26-35 years old (Huet V., 2010).

#### 3.1.2. The number of childrens

This ethnobotanical survey involved 753 mothers.

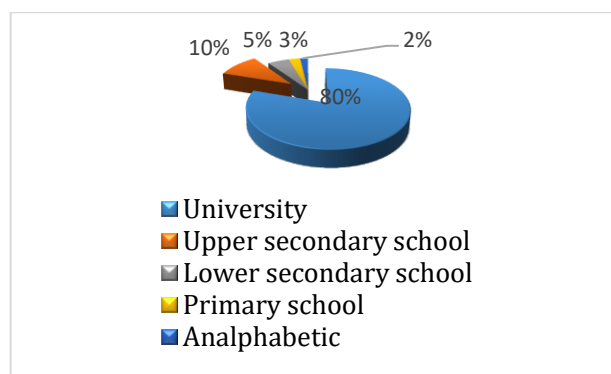
323 mothers (42.9%) are uniparous, followed by 238 mothers (31.6%) are biparous; and 116 mothers (15.4%) have 3 children and the remaining 10.09% have more than 3 children (Figure 2).



**Figure 2.** Distribution of the population by number of children.

#### 3.1.3. Educational level

In terms of education level, among all the herbal tea users, the majority were university-educated, accounting for 80% (Figure 3).



**Figure 3.** Distribution of the population by educational level.

This result is similar to the findings of other researchers who conducted studies in the United States (Ottolini MC et al., 2001),

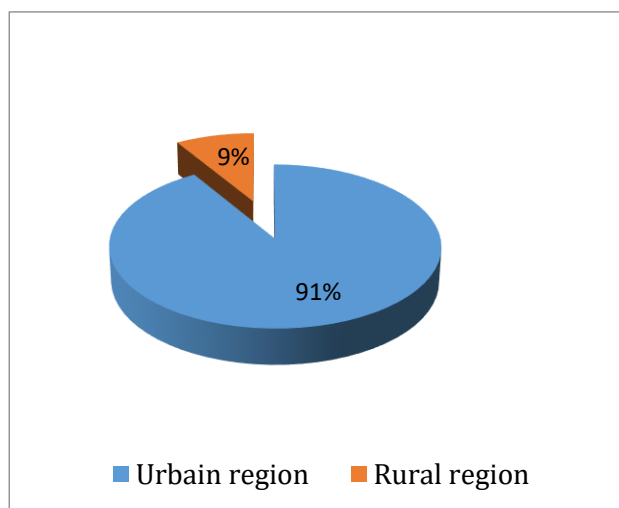
Canada (Spigelblatt Let al., 1994), and Italy (Menniti-Ippolito F et al., 2002).

Comparatively, this result is supported by two studies conducted in Turkey (Ozturk et al., 2008) and Germany (Du Y et al., 2014), which reported that the use of phytotherapy in children is associated with a higher level of education of the mother.

All these previous studies demonstrate that medicinal plants can be dangerous when used unknowingly, particularly among individuals with low levels of education who use medicinal plants irrationally. Illiterate individuals may not fully understand the verbal instructions given by herbalists and healers. However, the rate of illiteracy is significantly lower in our population among users of medicinal plants.

### 3.1.4. Habitat area

The majority of mothers belong to urban areas (91%) (Figure 4).



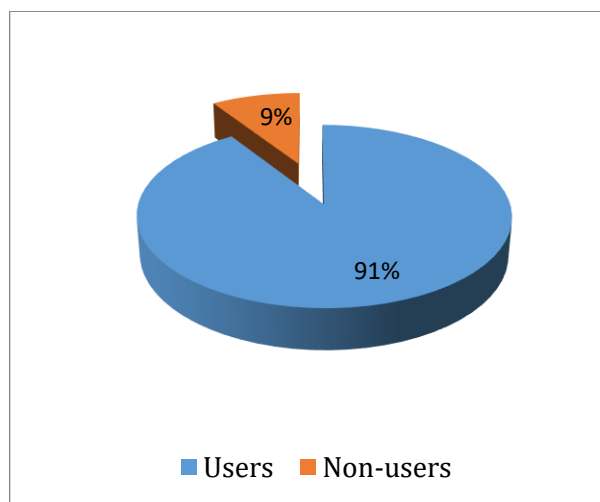
**Figure 4.** Distribution of population by habitat area.

This distribution can be explained by the predominantly urban population that responded to our questionnaire.

## 3.2. Descriptive parameters of herbal tea consumption among children

### 3.2.1. Herbal tea usage by mothers

This ethnobotanical survey involved 753 mothers, 91% of whom used herbal teas for their children (Figure 5).

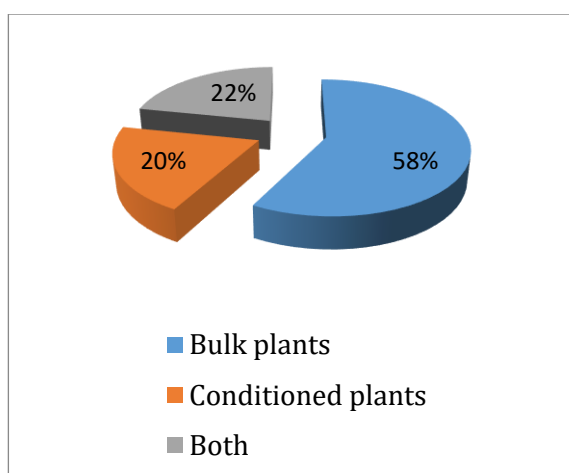


**Figure 5.** Distribution of the population by herbal tea usage.

This result is comparable to Mkedder study conducted in Tlemcen in 2018 on the use of phytotherapy in children, where the usage rate was 68% (Mkedder et al., 2018). Similarly, a study conducted in Reunion Island by Huet in 2010 on the administration of herbal teas to breastfed babies in the Creole society revealed that 79% of the interviewed mothers had given at least one herbal tea to their previous children (Huet V., 2010). High rates of phytotherapy use in children have also been reported in studies conducted in Mali (96.7%) (Chaka O., 2014), Germany (85.5%) (Hümer et al., 2010), and Turkey (76.7%) (Ozturk et al., 2008). However, this rate is much lower in the United States (10%) (Loman, D.G., 2003). This study confirms the widespread use of traditional remedies in children despite the availability and accessibility of modern medicine.

### 3.2.2. Types of herbal teas used

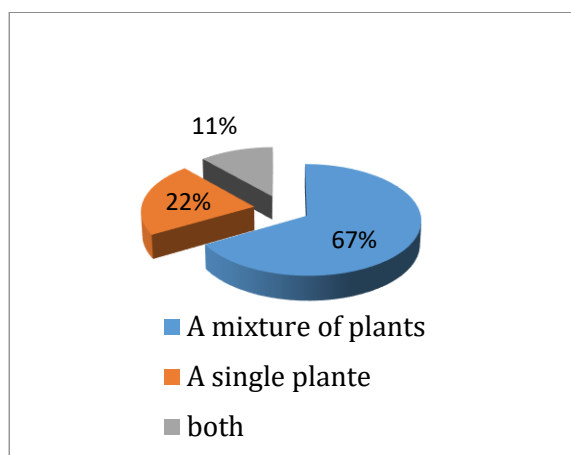
Almost two-thirds of our population (58%) use loose herbs in the preparation of herbal teas for their children and 20% of the population use packaged herbal teas and 22% use both (Figure 6).



**Figure 6.** Distribution of population by the types of herbal teas used.

### 3.2.3. Number of plants used in the herbal teas

The use of medicinal plants for different treatments is not always singular, but mothers often resort to a mixture of several species for a given treatment. Moreover, a single species can be used to treat more than one symptom.



**Figure 7.** Distribution of the population by number of plants used.

In our study, more than half of the population (68%) use a single plant in their herbal teas, while 22% use herbal teas composed of a mixture of plants, and 11% of the population use herbal teas made from a single plant and herbal teas based on a mixture of plants (Figure 7).

This result aligns with Mkedder's study conducted in Tlemcen, which shows that for the majority of preparations (83.8%), plants are used alone (Mkedder et al., 2018). Similar findings were observed in studies conducted in Germany (Du et al., 2014) and Ghana (Asase, A., 2014).

The World Journal of Gastroenterology (WJG) in 2012 has already addressed this type of usage and concluded that herbal treatment for functional gastrointestinal disorders is generally not a single preparation, as an extract from a single herb is claimed to be ineffective. Therefore, many preparations are provided in the form of a combination of drugs. According to traditional Chinese philosophy of maintaining and restoring balance, certain herbs are suggested to treat the main disease, while others are used to enhance the therapeutic effect and reduce the toxicity of the main drugs, and some have a harmonizing effect to guide the drugs to the appropriate organs (Rahimi et al., 2012).

### 3.2.4. The plants used

A total of 55 medicinal plants were identified, distributed among 23 families (Table X).

The most represented families are: Lamiaceae (12 plants), Apiaceae (8 plants), Asteraceae, Rosaceae, Myrtaceae, Rutaceae, and Poaceae (three plants each), Malvaceae, Fabaceae, Lauraceae, and Zingiberaceae (two plants each), Verbena-ceae, Rhamnaceae, Schisandraceae, Caprifoliaceae, Linaceae, Iridaceae, Brassicaceae, Cupressaceae, Punicaceae, and Theaceae (one plant each).

This result is similar to Mkedder's study in the Tlemcen region of Algeria, which identified 51 plant species distributed among 26 botanical families, with the most frequent families being Lamiaceae, Apiaceae, and Fabaceae, mainly used for digestive and respiratory disorders (Mkedder et al., 2018). Comparing these results with various ethnobotanical studies on the use of medicinal plants, we found quite similar results: Lamiaceae and Apiaceae often appear in studies conducted in Tlemcen (Elyebdri et al., 2017), Tiaret (Miara et al., 2013), and Morocco (Hseini et al., 2007).

Out of all the obtained results, we have compiled the most commonly used medicinal plants by the local population. Most of these plants grow spontaneously in the studied region, including *Foeniculum vulgare* Miller, *Cuminum cyminum* L, *Pimpinella anisum* L, *Lippia citriodora* H, B, K, *Mentha viridis* L, *Trigonella foenum graecum* L, *Carum carvi* L, *Anthemis nobilis* L, *Citrus aurantium* L, and *Tilia platyphyllos* Scop.

The most frequently mentioned plant is *Foeniculum vulgare* Miller (65.2%), followed by *Cuminum cyminum* L (56.58%), *Pimpinella anisum* L (47.66%), *Lippia citriodora* H, B, K (28.36%), *Mentha viridis* L (14.18%), *Trigonella foenum graecum* L (12.72%), *Carum carvi* L (11.11%), *Anthemis nobilis* L (9.36%), *Citrus aurantium* L (6.29%), and *Tilia platyphyllos* Scop (4.39%).

The mentioned medicinal plants are distributed among 23 families. The most represented families are Lamiaceae (12 plants) and Apiaceae (8 plants). The used parts of Lamiaceae are represented by leaves, flowers, and flowering tops, while the dried fruits are used for Apiaceae. This difference in the used parts of the plants is justified by the variability in the concentration of active principles in each plant organ or even each species.

The dominance of leaves is justified by the fact that they are the site of the majority of photochemical reactions and reservoirs of derived organic matter (Babba Aissa F., 1999). Leaves provide the majority of alkaloids, glycosides, and essential oils. The importance of fruits is due to the concentration of their bitter, carbohydrate, or aromatic substances associated with certain pigments that give them a characteristic coloration. The use of flowers is due to their richness in essential oils. The same applies to roots and seeds, which are rich in sugars and vitamins (Asase et al., 2014).

The dominance of leaves was confirmed by Mkedder's study, where the majority of preparations mentioned were decoctions or infusions of plants, especially leaves (Mkedder et al., 2018), as well as other studies conducted in children in Ghana (Asase et al., 2014) and Burkina Faso (Zerbo et al., 2008).

### 3.2.5. Indications cited

The ethnobotanical analysis allowed for the identification of several diseases treated with medicinal plants. In general, the obtained results show that the most sought-after indications for treatment are gas and bloating with a rate of 47.51%, followed by colic (34.8%) (Table 1). This result is consistent with the results of surveys conducted in Tiaret (Miara et al., 2013), Tlemcen (Elyebdri et al., 2017) and Morocco (Hseini et al., 2007) and also the study by (Huet V., 2010), where herbal teas were frequently indicated to relieve colic in infants, In contrast to Turkish and American parents where half of the parents reported using herbal medicines to relieve respiratory problems in their children (Ozturk et al., 2008) (Pitetti et al., 2001).

**Table 1.** Indication cited and their repetitions frequencies

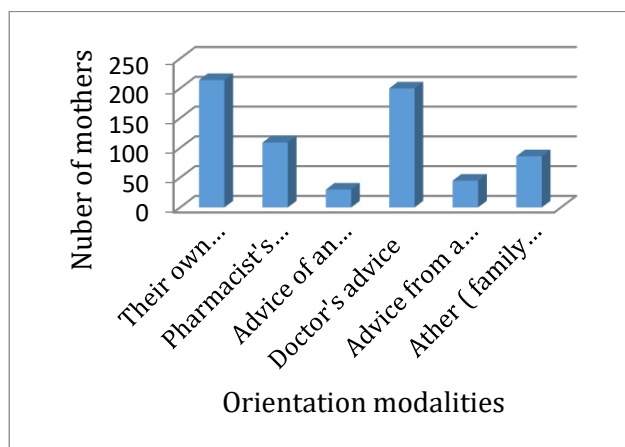
Indications	Occurrences	Repetition frequencies%
Gas	325	47,51
Colic	238	34,8
Carminative	129	18,85
Sedative	104	15,2
Abdominal pains	89	13,01
Flu	47	6,87
Constipation	46	6,73
Diarrhea	24	3,51
Cold	17	2,49
Bloating	16	2,34
Vomiting	16	2,33
Fever	15	2,19
Appetite stimulant	15	2,19
Toothache	11	1,6
Facilitate digestion	10	1,46
Coughs	11	1,61
Respiratory illness	4	0,58
Weight gain	4	0,58
Anti-spasmodic	3	0,43
Soothe the baby	2	0,29
Sweet taste appreciated by baby	2	0,29
Allergy	2	0,29
Well being	2	0,29
Gastric problems	2	0,43
Hydration	2	0,29
Anthelmintic	1	0,15
Nausea	2	0,30
Jaundice	1	0,15
Nasopharyngitis	1	0,15
Digestive problems	1	0,15
Infection	1	0,15
Tonsillitis	1	0,15
Nasal discharge	1	0,15
Flatulence	1	0,15
Immunized	1	0,15
Suckling	1	0,15
Sputum	1	0,15
Intoxication	1	0,15

The majority of the indications cited for plants frequently used in the region are consistent with the literature. This is valid for almost all the species cited for certain pathologies, in particular digestive pathologies, the indications most cited by this population of mothers were the subject of a bibliographical search which made it possible to identify the following points: According to Commission E (scientific advisory board of the German Food and Drug Administration), aniseed in monotherapy or in combination has the following indications: dyspeptic disorders and bloating and the following properties are recognised: spasmolytic and antibacterial (Babulka P., 2004). A clinical herbal medicine article indicated that the treatment of irritable bowel is based on a 15-minute infusion of anise seeds (*Pimpinella anisum*), fennel seeds (*Foeniculum vulgare*), and hawthorn fruits (*Crataegus monogyna*) at 10 g (Goetz P., 2014). For caraway, several studies have been done to evaluate their effects: one demonstrated the antioxidant activity of *Cuminum cyminum*, and antimicrobial activity against most of the strains tested (Athamena et al., 2009). The accepted medical indications for caraway: digestive disorders such as gastrointestinal dyspepsia, flatulence, eructation, epigastric bloating, moderate spasms of the intestinal tract, colon infection (adjunctive treatment), irritable bowel and spastic colopathy (Ghédira et al., 2016). For the treatment of insomnia *Carum carvi* and *Cuminum cyminum* are wrongly used, *Pimpinella anisum* which is mostly used has a hypnotic and central nervous system depressant effect at high doses.

### 3.2.6. Use of herbal teas according to the orientation modalities

In our study, 28.42% of mothers use herbal teas based on their own initiative, 26.56% use them based on their doctor's advice, 14.48% use them after consulting a

pharmacist, and finally, 3.98% of mothers use them following advice from an herbalist ( Figure 8).

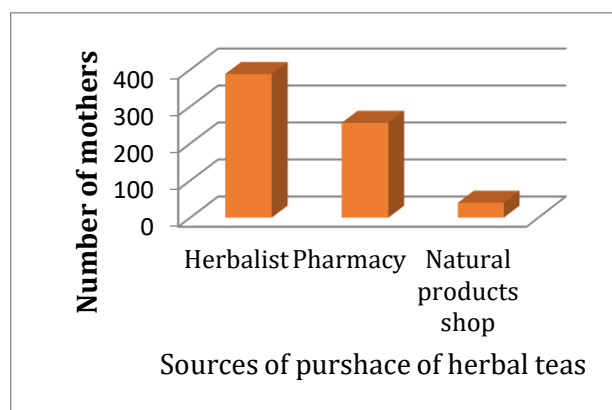


**Figure 8.** Distribution of population according to their orientation modalities.

In contrast, Mkedder's study conducted in Tlemcen showed that in 84.3% of cases, the origin of the information was based on the experience of others, and the use of herbalists remained minimal in the region (2.4%) (Mkedder et al., 2018). This origin is also predominant in studies conducted in Turkey (Ozturk, et al. (2008), Germany (Weissenstein, A., et al., (2013), England (Ernst, E., et al 2002), and Morocco (Bouayyadi, L., et al 2015). In contrast, Valérie HUET's study in Reunion Island showed that 89.47% of mothers did not seek advice from a healthcare professional (Huet V., 2010). Therefore, knowledge of medicinal plant usage is generally acquired through accumulated experience passed down from one generation to another. The transmission of this knowledge is currently at risk because it is not always guaranteed (Anyinam C., 1995).

### 3.2.7. Places of purchase of herbal teas

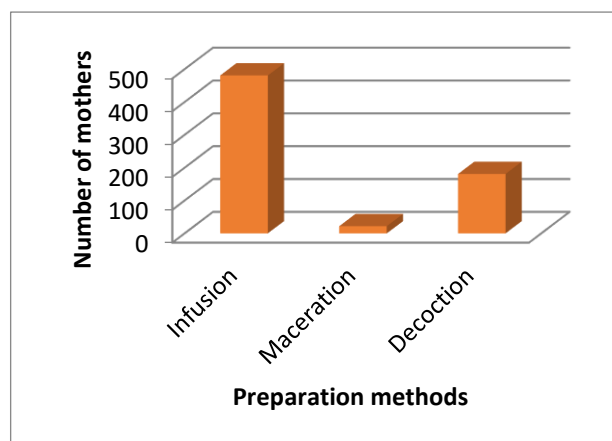
Nearly half, 388 (43.29%) of our population, purchase their herbal teas or their constituents from an herbalist, followed by 256 (33.99%) who buy them from a pharmacy, and 40 (5.31%) who buy them from a natural products store (Figure 9).



**Figure 9.** Distribution of the population according to different sources of herbal tea purchase.

### 3.2.8. Methods of preparation of herbal Teas

The most applied method for preparing herbal teas by our population is infusion (63.87%), followed by decoction (24.03%), with maceration accounting for 2.92% (Figure 10).



**Figure 10.** Distribution of the population according to their methods of preparing herbal teas.

According to (Salhi et al, 2010) , users always seek the simplest method to prepare herbal medicines, confirming the dominance of the "infusion" method in our case (Diatta et al., 2013).

The best use of a plant is that which preserves all its properties while allowing the

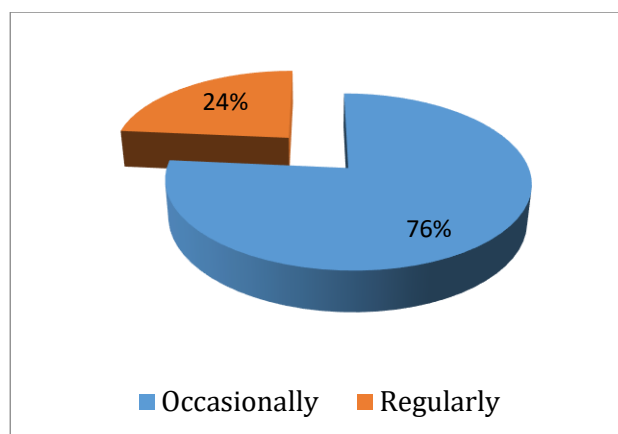


extraction and assimilation of the active principles (Dextreit, R., 1984). In addition to being the preparation method that preserves the active principles of the plant (El Hafian et al., 2014), the decoction warms the body and disinfects the plant to neutralize the toxic effect of certain recipes, but it can destroy certain active principles of the species used.

All the prepared recipes are administered orally (herbal teas) because it represents the simplest, most effective, and quickest route of administration. Similar results were observed in a study by El Hafian et al. (2014), which found that oral administration, including various preparation methods (infusion, maceration, decoction, herbal tea, internal powder), is the most recommended method, as well as another study in Ghana (Asase et al., 2014).

### 3.2.9. Frequency of use of herbal teas

76% of the mothers use herbal teas regularly for their children (Figure 11).



**Figure 11.** Distribution of the population according to their frequency of herbal tea use.

### 3.2.10. Ages of children at the time of the first administration of herbal tea

In our survey, the majority of mothers have given herbal teas to their infants since birth,

which is consistent with Huet's study (Huet V., 2010) (Table 2).

**Table 2.** Ages of children at the time of the first administration of herbal tea.

Age of the infant at the time of the first intake	Occurrences	Repetition frequencies %
From birth	58	8,48
Threedays	1	0,15
Ten days	6	0,88
A few days	2	0,29
After 40 days	1	0,15
One week	40	5,85
Two weeks	11	1,61
Three weeks	5	0,73
One month	170	24,85
Two months	50	7,3
Three months	61	8,91
Four months	11	1,61
Five months	4	0,58
Six months	39	5,7
Ten months	2	0,29
Eighteen months	2	0,29
One year	15	2,19
Two years	4	0,58
Three years	3	0,44
Four years	1	0,15
Five years	2	0,29
Did not respond	196	28,65

### 3.2.11. Duration of use

The duration of treatment varied, with the most frequent duration being indefinite (no age limitation) at 18.86%, followed by 6.87% for a duration of three months, 6.58% for one month, 4.97% for 12 months, 3.5% for two months, 2.77% for a few months, and finally 2.04% for a few days (Table 3).

**Table 3.** Duration of use of herbal teas for children .

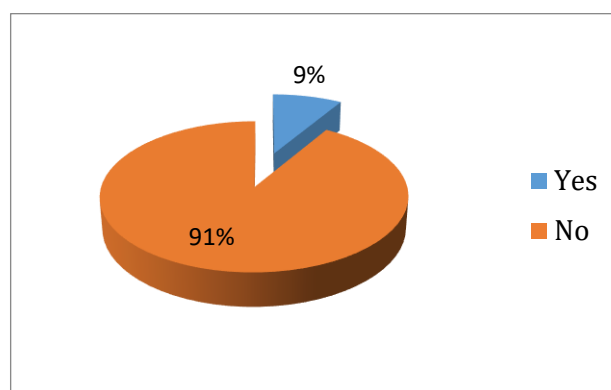
Duration of use	Occurrences	Repetition frequencies %
Two days	10	1,46
Four days	14	2,04
Ten days	4	0,58
Twenty days	1	0,15
A few days	18	2,63
One week	8	1,16
Two weeks	3	0,44
A few weeks	1	0,15
One month	45	6,58
Two months	24	3,5
Three months	47	6,87
Four months	19	2,78
Five months	7	1,02
Six months	31	4,53
Seven months	3	0,43
Ten months	7	1,02
Twelve months	34	4,97
Eighteen months	6	0,87
A few months	14	2,04
The first months	19	2,77
two years	14	2,05
Three years	6	0,88
Five years	1	0,15
Six years	2	0,29
Seven years	2	0,29
Nine years	1	0,15
Indefinite duration ( no age limit )	129	18,86
Did not respond	214	0,31

This result is consistent with Mkedder's study, where long-term use accounted for 13.70% and 16.40% until recovery (Mkedder et al., 2018). It is also in line with studies conducted in Germany (Du et al., 2014) and Huet's study, where the majority of mothers administered herbal teas for a short period of time (Huet V., 2010).

#### 4. Descriptive parameters of mothers' opinions on herbal teas

##### 4.1. Observation of adverse effects in children following the administration of herbal teas

91% of the population did not notice any adverse effects following the use of herbal teas for their infants and children (Figure 12).



**Figure 12.** Distribution of the population according to their observations of adverse effects.

This is in line with the Tlemcen study, where few mothers reported the appearance of adverse effects following the use of herbs for their children (Mkedder et al., 2018).

##### 4.2. Cited adverse effects

For the 9% who noticed adverse effects following the use of herbal teas, the frequency of recurrence of the adverse effect diarrhea was the highest at 25.42%, followed by 8.47% for weight loss and satiety, 6.78% for deep sleep, vomiting, disruption of breastfeeding and stool discoloration and many other lesser cited adverse effects (Table 4).

This result was demonstrated by Benkhniue's 2011 study which found that 8% of people believe that herbal treatment causes side effects, toxicity and even worsening of disease (Benkhniue O., 2011).

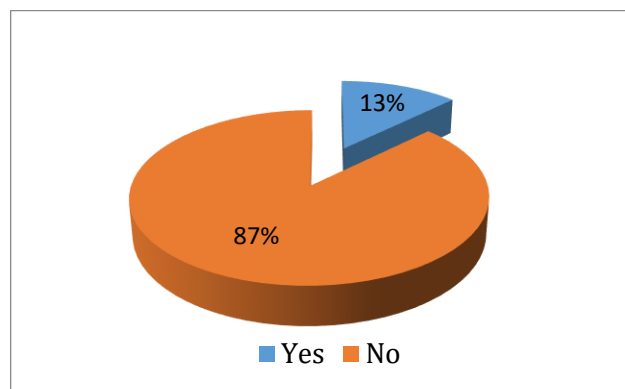
**Table 4.** Adverse effects noticed by mothers in their children

Cited side effects	Occurrences	Repetition frequencies %
Diarrhoea	15	25,42
Weight loss	5	8,47
Satiation	5	8,47
Green stool coloration	4	6,78
Vomiting	4	6,78
Disruption of breastfeeding due to reduced feeding frequency	4	6,78
Long sleep	4	6,78
Lack of gas	3	5,08
Colic	2	3,39
Constipation	2	3,39
Digestive discomfort	1	1,69
Kidney problems	1	1,69
Anemia	1	1,69
Feeling of hunger	1	1,69
Drowsiness	1	1,69
Expectorant	1	1,69
Regurgitation	1	1,69
Agitation	1	1,69
Abdominal pain	1	1,69
Shortness of breath	1	1,69
Digestive system disorder	1	1,69

Studies on the adverse effects of herbal medicine show that most adverse effects of medicinal plants are reported not from the plant itself, but from misidentification, unintentional contamination (by another plant, by heavy metals, by pathogenic micro-organisms or by agrochemical residues), failure to take the correct dose or interaction with drugs. Thus all plants should be considered a priori dangerous, even those that seem particularly well tamed by humans should still be viewed with suspicion (Delaveau P., 1977).

### 4.3. Reports of health problems related to the administration of herbal teas by mothers

87% of our population have heard of health problems related to the administration of herbal tea to infants and children (Figure 13).



**Figure 13.** Distribution of the population according to their reports of health problems related to the administration of herbal teas.

The same applies to the feedback from mothers on health problems related to the use of herbal teas

### 4.4. Health problems reported

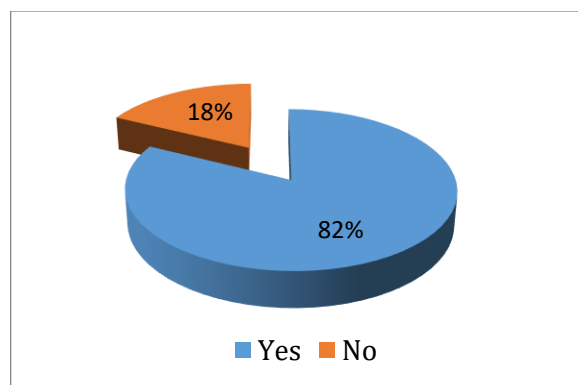
For those who have heard of health problems related to the administration of herbal teas, the frequency of recurrence of kidney problems was the highest at 29.88% (Table 5). This result was demonstrated by Chebat in 2014 on Risk assessment of adverse events related to the use of herbal medicines in children with haematological and cancerous diseases showed that among the patients surveyed, using herbal medicines, it was noted that 9.4% had experienced adverse events. Analysis of the results showed that tubulointerstitial nephritis was the most frequent adverse effect (3.2%), followed by cough and cold (0.5%), diarrhoea (0.2%) and vomiting (0.2%) (Chebat et al., 2014).

**Table 5 .** Reported health problems

Health problems	Occurrences	Repetition frequencies %
Kidney problems	26	29,88
Diarrhea	12	13,79
Intestinal problems	9	10,34
Digestive problems	9	10,34
Gastric problems	8	9,2
Vomiting	6	6,9
Intoxication due to overdose	5	5,75
Satiation (refusal to breastfeed)	9	10,35
Allergy	4	4,6
Nervous system disorders	4	4,6
Early weaning from breastfeeding	4	4,6
Destruction of intestinal flora	3	3,45
Weight loss	3	3,45
Weakness	3	3,45
Insomnia	2	2,3
Anemia	2	2,3
Relaxation of stomach muscles	2	2,3
Intoxication due to toxic plants	2	2,3
Liver problems	2	2,3
Renal colic	2	2,3
Jaundice	1	1,15
Intelligence disorders	1	1,15
Abdominal cramps	1	1,15
Convulsion	1	1,15
Sleep disturbance	1	1,15
Malnourishment	1	1,15
Stomach stuffing	1	1,15
Anesthetic effect	1	1,15
Sedative effect	1	1,15
Intussusception	1	1,15
Colopathy	1	1,15
Bloody stools	1	1,15
Intestinal inflammation	1	1,15
Hemorrhage	1	1,15
Drowsiness	1	1,15
Swallowing problem	1	1,15
Body disorder	1	1,15
Vertigo	1	1,15

#### 4.5. Trust in terms of quality attributed to herbal teas

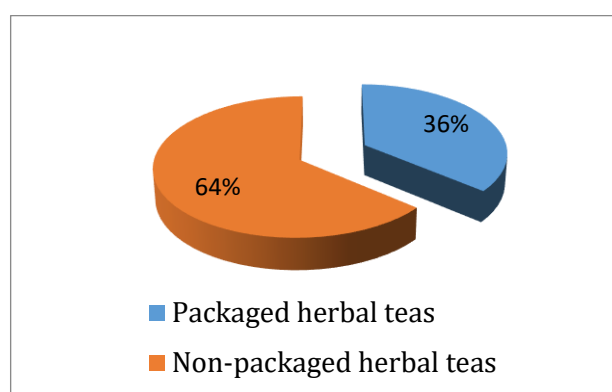
82% of our population trust herbal teas in terms of quality (Figure 14).



**Figure 14.** Distribution of the population according to their trust in herbal teas in terms of quality.

#### 4.6. Type of herbal teas they trust more

More than half (64%) of our population trust non-packaged herbal teas (prepared from loose herbs) more (Figure 15).

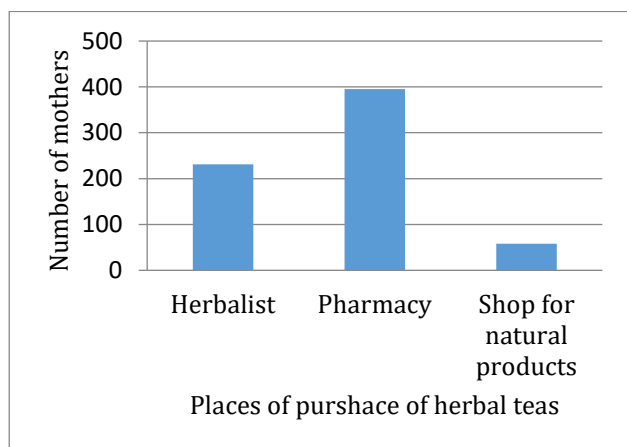


**Figure 15.** Distribution of the population according to the type of herbal teas they trust more.

#### 4.7. Preferences for places to purchase herbal teas in terms of quality

More than half of our population, 395 (52.46%), trust herbal teas purchased at pharmacies, while 231 (30.68%) trust herbal

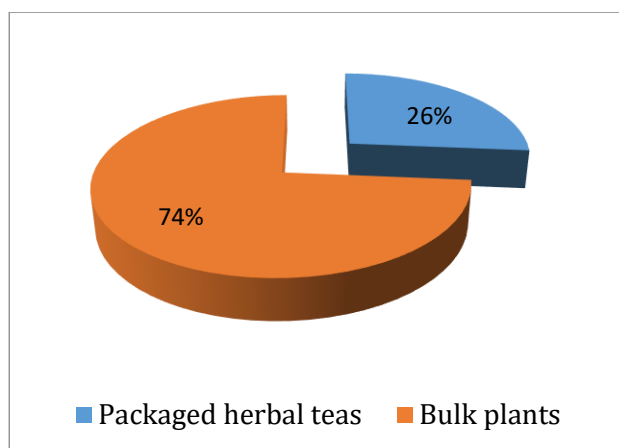
teas purchased from herbalists, and 58 (7.70%) trust herbal teas purchased from natural product stores (Figure 16).



**Figure 16.** Distribution of the population according to their preferences for places to purchase herbal teas in terms of quality.

#### 4.8. Preferred types of herbal teas in terms of price

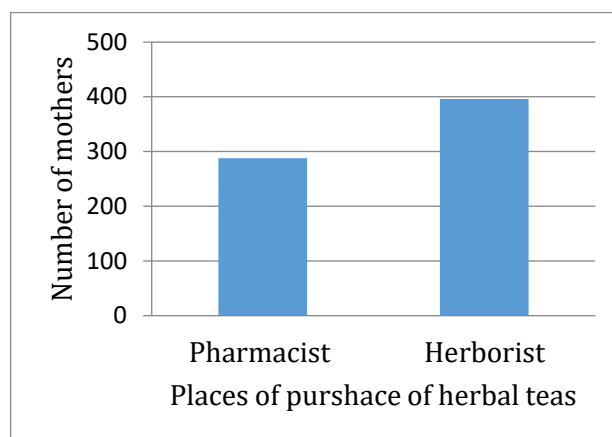
It is observed that 74% of our population prefer non-packaged herbal teas prepared at home from loose herbs in terms of price (Figure 17).



**Figure 17.** Distribution of the population according to their preferences in terms of price.

#### 4.9. Preferences for places to purchase herbal teas in terms of price

386 of our population (58%) prefer herbal teas purchased from herbalists in terms of price (Figure 18).



**Figure 18.** Distribution of the population according to their preferences for places to purchase herbal teas in terms of price.

This result coincides with results obtained by Hmamouchi in 2012 in Morocco, which showed that 62% of people saw that traditional medicine was more effective against pain. 21% of other respondents prefer traditional treatment because of its easy acquisition, 15.67% prefer it because it is economical. While 8.33% of people find medication to be ineffective and more harmful than helpful. (Hmamouchi I., 2012)

This can be explained by the fact that the choice of herbal medicine by the local population is most often related to the isolation of rural areas, non-existence or rudimentary state of health infrastructure, high cost of pharmaceutical products and low income (Guedje N.M., 2011)

**Table X.** The mentioned indications and their repetition frequencies

Plants	Scientific names	Arabic names	Families	Parts used	Counts	Repetition frequencies %
Green anise	<i>Pimpinella anisum</i> L	حبة الحلاوة	APIACEAE	Dried fruit	326	47,66
Fennel	<i>Foeniculum vulgare</i> Miller	بسياس , الشمر , النافع	APIACEAE	Dried fruit	446	65,2
Cumin	<i>Cuminum cyminum</i> L	كمون	APIACEAE	Dried fruit	387	56,58
Roman chamomile	<i>Anthemis nobilis</i> L	بابونج	ASTERACEAE	Flower head	64	9,36
Lemon Verbena	<i>Lippia citriodora</i> H,B et K	اللوزية , الطرنجية	VERBENACEAE	Leaves	194	28,36
Linden	<i>Tilia platyphyllos</i> Scop	زيزفون	MALVACEAE	Inflorescence and bract	30	4,39
Orange-tree	<i>Citrus aurantium</i> L	شجر البرتقال	RUTACEAE	Barks, Leaves, Flowers	43	6,29
Spearmint	<i>Mentha viridis</i> L	نعناع	LAMIACEAE	Leaves, Flowering tops	97	14,18
Medlar	<i>Eriobotrya japonica</i> (Thunb)Lindl	بوعضية , الزعرور	ROSACEAE	Leaves	2	0,29
Peach-tree	<i>Prunus persica</i> (L)Batsch	الخوخ	ROSACEAE	Leaves	1	0,15
Common thyme	<i>Thymus vulgaris</i> L	زعيرة	LAMIACEAE	Leaves, Flowering tops	48	7,02
White wormwood	<i>Artemisia herba alba</i> Asso	الشيح	ASTERACEAE	Aerial part	11	1,61
Fenugreek	<i>Trigonella foenum graecum</i> L	حلبة	FABACEAE	Seeds	87	12,72
Licorice root	<i>Glycyrrhiza glabra</i> L	عرق السوس	FABACEAE	Rhizomes, root	22	3,22
Caraway	<i>Carum carvi</i> L	الكروية	APIACEAE	Dried fruit	76	11,11
Curry Tree	<i>Murraya koenigii</i> (L) Spreng	الكاري	RUTACEAE	Roots, Barks, Leaves	1	0,15
Lemon balm	<i>Melissa officinalis</i> L	ترنجاني , نعناع الترنج	LAMIACEAE	Leaves, Stems, Flowers	4	0,58
Mushrooms				Dried mushrooms	1	0,15
Celery	<i>Apium graveolens</i> L	كرفس	APIACEAE	stems, seeds	6	0,88
Alaternus	<i>Rhamnus alaternus</i> L	مليس	RHAMNACEAE	Leaves	2	0,29
Hawthorn	<i>Crataegus oxyacantha</i> L	بابا عجينة, بوخورو	ROSACEAE	Flowering tops	1	0,15

Chinese star anise	<i>Illicium verum</i> Hook. Fil	نجم الأرض, جانبة , باديان	SCHISANDRACEAE	Dried fruit	4	0,58
Common laurel	<i>Laurus nobilis</i> L	الورد	LAURACEAE	Leavers	9	1,32
Valerian	<i>Valeriana officinalis</i> L	ناردين طبي	CAPRIFOLIACEAE	Rhizomes	1	0,15
Coriander	<i>Coriandrum sativum</i> L	فصير	APIACEAE	Dried fruit	5	0,73
Flax seed	<i>Linum usitatissimum</i> L	زريعة الكتان	LINACEAE	Seeds	6	0,88
Cloves	<i>Eugenia caryophyllata</i> Thunb	القرنفل	MYRTACEAE	Flower buds	6	0,88
Ginger	<i>Zingiber officinale</i> Roscoe	الزنجبيل	ZINGIBERACEAE	Rhizomes	6	0,88
Rye	<i>Secale cereale</i> L	الشليم	POACEAE	Dried fruit	2	0,29
Lemongrass	<i>Cymbopogon citratus</i> (DC)Stapt	حشيشة الليمون	POACEAE	Leavers	2	0,29
Rosemary	<i>Rosmarinus officinalis</i> L	اكليل الجبل , أزيز	LAMIACEAE	Leaves, Flowering tops	4	0,58
Basil	<i>Ocimum basilicum</i> L	حبق	LAMIACEAE	Leavers	2	0,29
Common sage	<i>Salvia officinalis</i> L	سالمة	LAMIACEAE	Leavers	1	0,15
Origan marjoram	<i>Origanum majorana</i> L	الزعرور	LAMIACEAE	Leavers	2	0,29
Saffron	<i>Crocus sativus</i> L	زعفران	IRIDACEAE	Styles and stigmas	1	0,15
Wheat	<i>Triticum aestivum</i> L	القمح	POACEAE	Wheat germ	1	0,15
Watercress radish	<i>Raphanus sativus</i> L	الفجل	BRASSICACEAE		1	0,15
Curcuma	<i>Curcuma longa</i> L	الكرم	ZINGIBERACEAE	Rhizomes	2	0,29
Fragrant mint	<i>Mentha suaveolens</i> Ehrh	دومران	LAMIACEAE	Leaves, Flowering tops	14	2,05
Amoide verticillata	<i>Ptychotis verticillata</i> Duby	النوخة	APIACEAE	Flowering tops	18	2,63
Nigella	<i>Nigella damascena</i> L	السانوج , الحبة السوداء	RANUNCULACEAE	Seeds	7	1,02
Chalep Street	<i>Ruta chalepensis</i> L	الفجلة	RUTACEAE	Aerial part	3	0,44
White Marrubus	<i>Marrubium vulgare</i> L	مريوت , مريوة , مروث	LAMIACEAE	Leaves, Flowering tops	2	0,29
Lavender	<i>Lavandula angustifolia</i> Miller	خزامى	LAMIACEAE	Leaves, Flowering tops	2	0,29
Ayapana	<i>Ayapana triplinervis</i> Spach		ASTERACEAE	Leaves	1	0,15
Cinnamon	<i>Cinnamomum sp</i>	القرفة	LAURACEAE	Barks	4	0,58
Poulliot mint	<i>Mentha pulegium</i> L	فليبو	LAMIACEAE	Leaves, Flowering tops	12	1,75
Oxycedral juniper	<i>Juniperus oxycedrus</i> L	عرعار كاري , شربين	CUPRESSACEAE	Cade oil, Leaves	2	0,29

Green tea	<i>Camellia sinensis</i> L	الشاي الأخضر	THEACEAE	Young leaves and buds	4	0,58
Myrtle	<i>Myrtus communis</i> L	ريحان	MYRTACEAE	Leaves	3	0,44
Mallow	<i>Malva sylvestris</i> L	الخبيزة	MALVACEAE	Flower	3	0,44
Parsley	<i>Petroselinum sativum</i> Hofm	معدنوس	APIACEAE	Dried fruit	1	0,15
Pepper mint	<i>Mentha piperata</i> L	نعناع الفطور	LAMIACEAE	Leaves	4	0,58
Eucalyptus	<i>Eucalyptus globulus</i> Labill	كاليتوس	MYRTACEAE	Aged leaves	1	0,15
Grenadier	<i>Punica granatum</i> L	رمان	PUNICACEAE	Fruit peels	3	0,44
Packaged herbal teas					33	4,82
Did not respond					6	0,88

#### 4. Conclusion

At the end of this study, we were able to identify the different plants used and obtain detailed information on the composition and mode of administration of the herbal teas. Although our survey is only half virtual, our survey opens the door to further research in the future, and the perspectives of this study are as follows

- To deepen the analysis of the therapeutic efficacy of medicinal plants, especially in terms of toxicology.
- To carry out more in-depth studies on all the medicinal plants reported in order to isolate and identify the active principles using more precise methods such as: HPLC and NMR.

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#### Author Contribution

The study and design were conceptualized and designed by ML and HA. The first draft of the manuscript was written collaboratively by ML, HA, and DHMK. The work was revised

critically by HA. All authors read and approved the final manuscript.

#### Conflicts of Interest

The authors declared no conflict of interest.

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