Original Research

A Questionnaire-Based Study on Medicinal Plant Use in Patients with a Chronic Disease Diagnosis

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Abstract

Chronic diseases are the most common non-communicable diseases worldwide. Today, with the increase in the elderly population, the burden of the disease is gradually increasing, and alternative treatment methods for these diseases are gaining importance. Potential adverse reactions, contraindications, and interactions with prescription drugs and herbals are important to evaluate. Therefore, the use of plants by chronic patients should be under supervision of health professionals. In this study, we aimed to obtain comprehensive data by questioning the plants used by patients using drugs for chronic disease, their usage patterns, and changes seen as a result of plant use. For this purpose, 60 people over the age of 18 (47% female, 53% male) participated in the survey study, and 53.3% of the patients stated that they used plants in the treatment. Twenty-one plants have been identified. Linden and mint-lemon mixture are the most commonly used plants, accounting for 62% and 15% of the total, respectively. The most commonly used preparation method is decoction (60%). 62.5% of the users obtain the plants from herbalists' stores; 59.37% of the patients learned the use of plants through advice (friend, neighbor, relative); 96.87% of the patients stated that they benefited from the use of plants. According to these results, the patients need to be informed about the use of plants as a complementary treatment. Thus, further efforts should be made to raise awareness of the use of herbal medicine and possibility of herb-drug interactions among physicians and other health professionals.

Keywords: Chronic diseases; Medicinal plant; Complementary medicine; Herbal product

Introduction

Chronic is derived from the Greek word "Chronos", which means time. Chronic diseases are defined as long-term diseases. These diseases, which require continuous medical care and treatment, are health problems associated with symptoms that cause slow and progressive, irreversible changes in normal physiological functions [1]. Non-communicable diseases are collectively responsible for nearly 70% of all deaths worldwide, and chronic diseases are the most common non-communicable diseases [2]. The main chronic diseases are cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes [2].

Chronic diseases have also been the leading causes of morbidity and mortality in Turkey, accounting for approximately 71% of all deaths. The basic approach to preventing chronic diseases is to reduce exposure to risk factors [3].

Plants have been used as a source of medicines since ancient times. Medicinal plants have been used directly as medicine or starting materials for the synthesis of drugs or as models for synthetic drugs [4]. Today, with the increase in the elderly population, the burden of the disease is gradually increasing, and alternative treatment methods for these diseases are gaining importance. Worldwide, there has been renewed atten-

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tion to the use of traditional medicine over the last decade [5]. According to the data of the World Health Organization, approximately 4 billion people in the world try to solve their health problems with herbal drugs in the first place [2].

Today, Complementary and alternative medicine (CAM) are preferred as supportive care in order to minimize the side effects of the drugs used to treat chronic diseases and interactions that may occur in the use of multiple drugs. In Europe, between 20-65% of the general population uses some form of CAM, and herbal products are one of the most preferred CAM practices by patients with chronic diseases [6,7]. While patients regularly use prescribed medications for chronic diseases, herbal medicine/herb-drug interactions are a point to be noted. Awareness of health professionals about the use of herbal medicine by patients is important [8, 9]. While use of these products is believed to be increasing, there are few studies on the use of herbal medicines among patients in Turkey. Özçelik and Toprak (2015) investigated the reasons why patients preferred herbal treatments, as well as the sociodemographic characteristics of users in İstanbul (Turkey). All participants in the study stated that they used one of the CAM methods in addition to modern medical treatment. Among CAM methods, 97.9% of them prefer only herbal treatment. Since 58.9% of the patients could not get adequate response from the drugs, 24.7% chose it because they believed in the benefits of herbs. According to their results, patients frequently preferred herbal treatment to lose weight, and it was also used for sexual problems, as well as skin and gastrointestinal disorders. As the education level and income level increased, the use of CAM also increased [10]. In another study, herbal medicine's uses were assessed in a population of Turkish hospital patients in 2013. Herbal medicines were utilized by 48.8% of the participants. The majority of the patients used herbal medicines for maintaining health. Other common reasons for using herbs include fatigue, weight loss, musculoskeletal pain, cough and cold symptoms. 25.4% of participants chose herbal medicine instead of a prescribed medicine because they believed it is not harmful due to its natural origin [11]. There are studies conducted on different patient groups, such as the elderly group, cancer sufferers, diabetics, asthmatics, and pediatric patients [12,13,14,15,16].

The aim of this study is to determine the medicinal plants use in patients with a diagnosis of chronic disease, including detailed usage, plant supply, source of usage information, sociodemographic features, and notifying the doctor about herbal uses. In summary, it will contribute to increasing the awareness of health professionals by making determinations about the use of herbal products in patients who use reported drugs for their chronic diseases.

Materials and Methods

Ethical considerations

Patients attending the pharmacy were informed about the study. Only those who agreed to participate and signed a consent form were included.

Informed consent was obtained from all patients. All principles of the Helsinki declaration were followed throughout the study. The study was considered ethically appropriate by the Istanbul University Istanbul Faculty of Medicine Clinical Research Ethics Committee (11.12.2019/1500).

Study design and sampling

This research is based on a survey conducted between December 2019 and March 2020 with 60 participants who consented to participate in the study. The patients who visited the Hasırcılar Pharmacy in İstanbul were asked to answer a face to face questionnaire. Patients (over 18 years of age) diagnosed with chronic diseases were included in this study. This study was planned and permissions were obtained prior to the start of the COVID-19 pandemic, so it was carried out until March 2020. As a result of pandemic restrictions, the number of participants was limited to 60.

Questionnaire

The questionnaire form was designed specifically for this study, and it included four main parts; socio-demographic characteristics (age, gender, education), medical data (type of chronic disease, duration of disease), details about the use of medicinal plants (name of plants, parts of plants, methods of use, dosage, how long it is used, where it is obtained, who recommended it, benefit or adverse effect), and interaction between patients and healthcare professionals about use of medicinal plants (informing physician about the use of plants, physician's approach to patient about plant usage). While survey design, the studies in the literature were examined, and questions about chronic diseases were designed for this study [11,13,15].

Data analysis

The obtained data were analyzed using SPSS (Statistical Package for the Social Sciences) version 21.0 software. Both chi-square analysis and Fisher's exact test was used to determine the statistical significance of differences between groups. Chi-square test was used for comparison of non-numerical data. Fisher's exact test was used due to smaller sample sizes. A p value less than 0.05 were taken to indicate statistical significance.

Results

Sixty patients aged between 21 and 80 years (average age 60.51) participated in the study. Thirty-two of

which were male and 28 were female. Twenty-eight patients (46.66%) had completed primary school, five (8.33%) had completed intermediate school, seventeen (28.33%) had completed high school, three (5%) had completed university, and seven (11.66%) had not had education (Table 1). While 45% of the participants have one diagnosis of chronic disease, 55% of them have more than one diagnosis of chronic diseases. The diagnoses of chronic diseases are hypertension (73.3%), diabetes (43.3%), hypercholesterolemia (25%), heart disease (18.3%), chronic obstructive pulmonary disease (COPD) (11.66%), and others (20%). Others are multiple sclerosis, rheumatism, osteoporosis, and peptic ulcer.

All participants were regularly using prescribed medications for these chronic diseases. The duration of the diagnosis of chronic disease was 0-3 years in 15%, 4-10 years in 53.3%, 11-20 years in 25% and more than 20 years in 6.6%.

Of the 60 patients surveyed, 53.3% of them stated that they used plants and 46.6% did not use plants. The male/female ratio of the plant users was 15/17. A total of 32 participants used plants. 28.12% of them used plants for the treatment of their chronic diseases. Others used plants as a sedative, as well as for common colds, flu, and constipation. In terms of gender, age, and education level, there is no significant difference between plant users and non-users (p > 0.05). In some studies, it has been shown that the use of plants increases in women and those with higher education levels [11]. Furthermore, some studies have shown that there is no link between them and plant use, as in our study [14,16].

As a result, the use of twenty-one plants is documented. The plants are cinnamon, lemon balm, chamomile, olive leaves, linden, walnut fruit, sage, thyme, mint-lemon mixture, hibiscus, fenugreek, hawthorn, green tea, rosehip, black cumin, ginger, turmeric, passiflora, apricot and eucalyptus (Table 2).

Table 1. Sociodemographic characteristics of the participants

Variable	Frequency (%)	Plants User	
		Yes (%)	No (%)
Gender (p > 0.05)			
female	28 (46.6%)	17 (60.7%)	11 (39.3%)
male	32 (53.3%)	15 (46.9%)	17 (53.1%)
Age (p > 0.05)			
<40	5 (8.3%)	4 (80%)	1 (20%)
40-50	6 (10%)	3 (50%)	3 (50%)
50-60	21 (35%)	14 (66.6%)	7 (33.3%)
>60	28 (46.7%)	11 (39.3%)	17 (60.7%)
Education (p > 0.05)			
no education	7 (11.6%)	3 (42.9%)	4 (57.1%)
primary school	28 (46.6%)	15 (53.6%)	13 (46.4%)
intermediary school	5 (8.3%)	2 (40%)	3 (60%)
high school	17 (28.3%)	9 (52.9%)	8 (47.1%)
university	3 (5%)	3 (100%)	–

Plant samples which are used by the patients have not been provided; therefore, the scientific (botanical) name of the plants specified by the patients could not be exactly determined. With 62% and 15%, respectively, the most commonly used plants are linden and mint-lemon mixture. Both of them are used for common cold and flu.

Nine patients mentioned that they used plants for chronic diseases. These plants and diseases are: sage and eucalyptus for COPD; walnut fruit for hypercholesterolemia; hawthorn for heart disease; black cumin, turmeric, cinnamon, green tea, fenugreek, and olive leaves for diabetes. While the preparation method of sage leaves, eucalyptus leaves, hawthorn leaves, cortex cinnamon, and walnut fruit was decoction, the preparation method of green tea leaves, olive leaves, and turmeric was infusion. In addition, black cumin was used in capsule form.

Twenty-three patients use the plants for common colds, flu, constipation, and as a sedative.

Decoction of sage leaves, thyme leaves, chamomile flower, hibiscus, ginger, mint leaves-lemon mixture, rosehip fruit, and infusion of linden leaves were used for common cold and flu. As sedative, infusion of lemon balm leaves and the capsule form of passiflora were used. Apricot leaves were prepared as an infu-

Table 2. List of the plants and their uses

Plant name	Latin name of plant	Uses for chronic disease	Other uses	Used part	Preparation method
Apricot	*Prunus armeniaca* L.		Constipation	Leaves	Infusion
Black cumin	*Nigella sativa* L.	Diabetes		Capsule form	Capsule form
Chamomile	*Matricaria* sp.		Common cold, Flu	Flowers	Decoction
Cinnamon	*Cinnamomum* sp.	Diabetes		Bark	Decoction
Eucalyptus	*Eucalyptus* sp.	COPD		Leaves	Decoction
Fenugreek	*Trigonella foenum-grae-cum* L.	Diabetes		Seed	Decoction
Ginger	*Zingiber officinale* Ros-coe		Common cold, Flu	Rhizoma	Decoction
Green tea	*Camellia sinensis* (L.) Kuntze	Diabetes		Leaves	Infusion
Hawthorn	*Crataegus* sp.	Heart disease		Leaves	Decoction
Hibiscus	*Hibiscus* sp.		Common cold, Flu	Flowers	Decoction
Lemon balm	*Melissa officinalis* L.		As sedative	Leaves	Infusion
Linden	*Tilia* sp.		Common cold, flu	Leaves	Infusion
Mint-lemon mixture	*Mentha* sp.- *Citrus limon* (L.) Osbeck		Common cold, flu	Leaves - Juice	Decoction
Olive	*Olea europaea* L.	Diabetes			Infusion
Passiflora	*Passiflora incarnata* L.		As sedative	Capsule form	Capsule form
Rosehip	*Rosa canina* L.		Common cold, flu	Fruit	Decoction
Sage	*Salvia* sp.	COPD	Common cold, flu	Leaves	Decoction
Thyme	*Thymus* sp. / *Origanum* sp.		Common cold, flu	Leaves	Decoction
Turmeric	*Curcuma longa* L.	Diabetes		Rhizome	Infusion
Walnut	*Juglans regia* L.	Hypercholester-olemia		Fruit	Decoction

sion and used for constipation.

Main preparation methods are decoction (60%) and infusion (30%) (Figure 1). The frequency of use was once daily in 71.87%, twice daily in 12.5%, three times a day in 9.37%, and once a week in 3.12% (Figure 2). When asked about the duration of plant use, the majority of patients (65.62%) have used plants when they were sick. The answer to the question 'Where do you obtain plants?' was from herbal shops (62.5%), nature/own garden (28.12%), market/bazaar (6.25%), and pharmacy (3.12%) (Figure 3).

The main source of information about medicinal plant use was from family/friends (59.37%), followed by the media (television, internet) (25%), pharmacist/doctor (12.5%), and herbalists (3.12%) (Figure 4).

When asked about effectiveness, a large majority of participants (96.87%) indicated that it was beneficial. None of the patients claim to experience any side effects. Most of the patients (71.87%) recommended the plants to other people, and nine patients did not recommend them.

Most patients (62.5%) who use plants have not consulted their doctor. Besides that, twelve patients have informed their doctors. When asked about the doctor's approach to plant usage, six patients declared that the doctor left it to the choice of the patient; five patients stated that the doctor informed them; one patient reported that the doctor opposed it (Table 3).

Discussion

The use of herbal medicines, phytonutrients, or medicinal plants is becoming increasingly popular among many people around the world. These herbal remedies are sold and available not only in pharmacies, but now also in herbal shops and supermarkets. In most cases, these herbal products are continuously made available to consumers without a prescription, and potential adverse reactions, contraindications, and interactions with prescription drugs and foods are hardly recognized [8]. Studies on the use of herbal products are important in terms of revealing the situation and raising awareness among health professionals and patients.
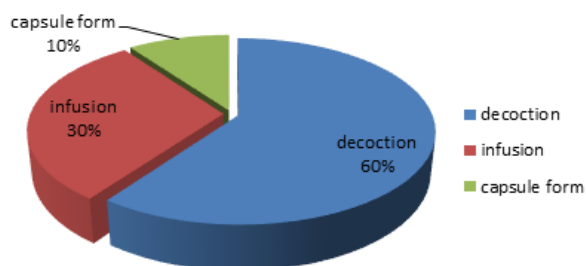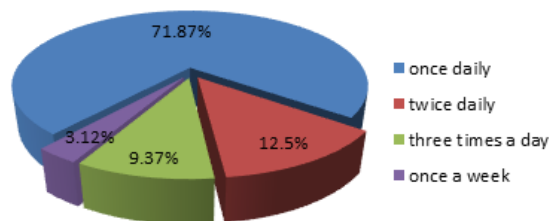
Figure 1. Preparation methods of plants used

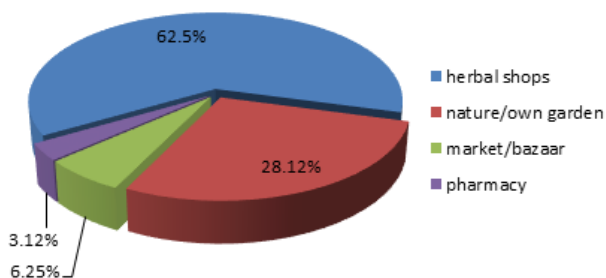
Figure 2. The frequency of plant uses

Figure 3. The way of obtaining plants

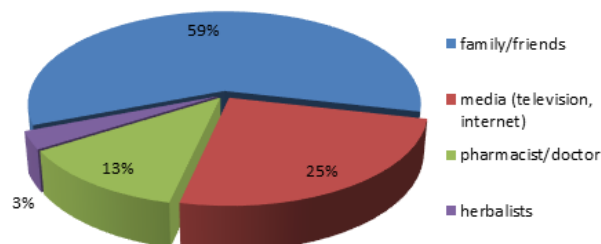**Figure 4.** The main source of information about medicinal plant use

Table 3. Doctor's approach to plant usage

Variable		n (%)
Informing to doctors	Yes	12 (37.5%)
	No	20 (62.5%)
Doctor's approach about plant usage	Opposed	1 (8.33%)
	Avoided commenting	6 (50%)
	Informed and motivated the utilization	5 (41.66%)

Varlı et al. evaluated the use of nonprescription medications in older individuals with 79.12% having at least one chronic disease. Herbal products comprised the majority (74.21%) of non-prescription drugs [17]. In our study, all participants had at least one chronic disease, and 53.3% of them used plants. The nine plants in their study were also recorded in our study. In another study, the use of traditional complementary and alternative medicine (TCAM) methods in asthmatic patients has been investigated [16]. 35.2% of the participants said they used one of the TCAM methods. The most used method was herbal medicine (54.2%). Tuncay et al. determined medicinal plant usage among cancer patients. There were 17 plants and one mushroom found to be used by 24% of the patients. The most commonly used plants were *Curcuma longa* L., *Urtica dioica* L., and *Camellia sinensis* (L.) Kuntze. According to their findings, patients were hesitant to report the herbs they used to doctors [15]. Taşkın Şayir et al. evaluated polypharmacy and use of complementary therapies in elder patients

(≥ 65 years). The most common chronic diseases in the study group were hypertension, hyperlipidemia, and diabetes. Plants were used by 59% of the patients and the most commonly used plants were determined as linden, green tea, and mint-lemon [14]. In our study, linden and a mint-lemon mixture were also determined as the most commonly used plants. Soner et al. evaluated the use of herbal medicine among Turkish hospital patients. Herbal medicine was used by 48.8% of the study population. As in our study, common colds and diabetes were mentioned as reasons for using herbal medicine. The primary sources of information about using herbal medicine in this study and our study overlap significantly and are arranged in the same order as family/friends, the media, pharmacist/doctor, and herbalists [11]. Erarslan et al. investigated the use of medicinal plants for respiratory diseases. Mint-lemon, licorice, linden, and rosehip were the most commonly used plants. Except for licorice, the other three plants are also used in our study for the common cold. Only 40% of participants

informed healthcare professionals about the use of plants [18]. In our study, this rate was 37.5%. Öztürk et al. investigated the use of herbal products in diabetic patients. According to their results, 52.1% of patients used herbal products and 82.3% of patients did not notify their doctor. Plants used for diabetes were thyme, nettle, parsley, cinnamon, and olive leaves [13]. The last two plants were also used for diabetes in our study.

Renda et al. investigated healthcare professionals' perspectives on the use of herbal products [19]. The survey was conducted with 113 doctors and 129 community pharmacists. 50.4% of the doctors and 94.6% of the pharmacists said they had prior knowledge about herbal medicines. 70.2% of participants believe they are unable to provide adequate service regarding the use of herbal products. In our survey, 62.5% of patients did not consult doctors about plant usage. When the doctor was consulted, most of the doctors either informed the patient or left it to the patient's decision. Only one objected to the plant's usage.

As a result of our study, the usage of ten plants was determined for different diseases. In the literature, there are biological activities or clinical studies supporting the use of plants. In our survey, lemon balm and passiflora were indicated as sedatives. Sedative effects of both plants are mentioned in the ESCOP monograph [20]. Participants indicated apricot for constipation in our study. Yilmaz and Asiret conducted a descriptive study with patients aged 65 and above, aiming to identify the constipation levels of the patients and their interventions for recovery [21]. One of the answers for recovery was to eat apricots. In another study, CAMs were evaluated in chemotherapy-induced constipation [22]. According to their results, the main method was phytotherapy, and the most commonly used plant was apricot (39.4%), followed by olive oil (28.8%). In animal model studies, it was shown that apricot fiber significantly increased fecal output [23].

Some patients stated that they used plants for their chronic diseases. It is very important to report such uses to doctors and to evaluate the effectiveness of the plant and drug interactions well. Hawthorn was mentioned for heart disease in our survey. Flavonoids are pharmacologically active substances and *Crataegus* preparations have potential in the treatment of cardio vascular diseases [24,25,26]. There have been no reports of drug interactions involving hawthorn extracts [27,28].

The patients mentioned that they used walnut fruit for hypercholesterolemia. Shimoda et al. evaluated the hypolipidemic effect of walnut (*Juglans regia*) in high-fat diet fed mice, and it was found to have hypotriglyceridemic activity by increasing peroxisomal fatty acid-oxidation in the liver [29]. It has been reported that juglone, which is found in walnuts, can cause irritant reactions [30].

Wang et al. investigated the protective effect of eucalyptus essential oil (EO) on COPD in rats [31]. Their findings indicate that EO could exert a protective effect against COPD via inhibition of pro-inflammatory cytokine production and improvement of antioxidant status. Wei studied the effects of *Salvia miltiorrhiza* Bunge on patients with chronic asthmatic bronchitis [32]. The results showed it could ameliorate the symptoms, improve the pulmonary function. According to some reports, *Salvia miltiorrhiza* can increase the effects of warfarin [28]. Sage and eucalyptus were stated for COPD in our survey.

There are many activity studies on the use of medicinal plants in diabetes. *Camellia sinensis* has a high *in vitro* α-glucosidase inhibition [33]. Cinnamon has antidiabetic activity. Different mechanisms were shown that included regulation of glucose levels, lipid metabolism, repair of pancreatic beta cells in STZ-induced high- fat diabetic mice and inhibition of iNOS, and NF-κB activation [34]. Ahmad et al. showed that turmeric has been improved the levels of serum glucose, serum transaminases in alloxanized rabbits [35]. Wainstein et al. conducted a randomized clinical trial in adults with type 2 diabetes to examine the efficacy of olive leaf extract. Olive leaf extract exhibited significantly lower HbA1c and fasting plasma insulin levels [36].

This survey provides information on the plant's use in patients with chronic disease diagnoses. There are several limitations to this survey. The sample reflects only a small population of patients in one pharmacy in İstanbul. The study is not necessarily generalizable. Because of the COVID-19 outbreak, the survey was conducted until March 2020. Otherwise, more participants could have participated in the survey.

Further study on chronic patients is clearly required. Studies should also include physicians' perspectives on herbal product usages. In terms of pharmaceutical care and rational drug use, it is crucial to evaluate prescription medicines and herbal products together.

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Conflict of Interest
The authors have no conflict of interest to declare.

Acknowledgments

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