

Use of herbal products for weight loss in Turkey

Ezgi Bellikci-Koyu¹, Banu Pınar Şarer-Yüreklî², Selda Seçkiner², Nilüfer Özdemir², Zebra Buyuktuncer³

¹Izmir Katip Celebi University, Faculty of Health Sciences Department of Nutrition and Dietetics, Izmir, Turkey - E-mail: ezgi_bellikci@hotmail.com, ²Ege University, Faculty of Medicine, Department of Endocrinology, 35040, Izmir, Turkey; ³Hacettepe University, Faculty of Health Sciences Department of Nutrition and Dietetics, Ankara, Turkey.

Summary. Obesity treatment is a long-term challenge that requires a constant change in lifestyle and behaviors. Therefore, patients are usually interested in methods promising rapid weight loss. In this study, we aimed to determine the frequency of herbal product use by overweight and obese individuals for weight management. A cross-sectional study was conducted on 464 individuals admitted to an endocrinology clinic in a hospital in Turkey. Socio-demographic status, medical history, and information about herbal product usage were recorded by researchers using a data collection form. The percentage of participants using herbal products for weight loss, was determined as 24.1% (n:112). Herbal product users had younger ages and higher body mass index ($p < 0.01$) compared to non-users. Gender and marital status were also related to herbal product use, and it was higher in women and singles ($p < 0.05$, for each). The most preferred products were mixed herbal teas (50.9%), green tea, parsley, and cinnamon. Herbalists (56.3%) and local markets (24.1%) were the most popular places to buy herbal products. A large proportion of patients (88.4%) did not inform health professionals about their herbal usage. Using herbal products for weight management is common among overweight and obese individuals in Turkey. Therefore, it may be suggested that health professionals should monitor the use of these products and patient-physician communication about herbal medicine should be strengthened.

Key words: Obesity, weight loss, herbal medicine

Obesity is a chronic disease which is recognized as a public health problem worldwide. Obesity is defined as the accumulation of excessive fat in the body that may impair health (1). According to the 2016 statistics of the World Health Organization (WHO), 39% of the adult population in the world is overweight, and 13% is obese (1). Treatment of obesity is a long-term challenge which requires a multidisciplinary approach and lifestyle changes (2,3). As the change in lifestyle is relatively hard and requires much effort patients tend to interest in methods and products promising rapid and easier results (4). Herbal products are the popular ones among these methods (5). Also, in the media, herbs or products containing herbal ingredients are marketed with offering quick and easy weight loss.

Additionally, the common belief of the majority of society as 'natural is harmless' increases the demand for these products (6).

Herbs have been used as the most important therapeutic agents for centuries, and they are still one of the main sources for conventional medicine. However, they can seriously damage health when they are not used properly. The herb *Ephedra sinica*, which was a popular herb used for weight loss, was banned in 2004 by Food and Drug Association (FDA) as it has adverse effects on the central nervous system and cardiovascular system (7). Besides, liver toxicity, gastrointestinal and psychiatric diseases may be developed due to the unconscious consumption of herbal products (8-11). Also, the interaction of herbs and medicine should be

taken into consideration for individuals who have a chronic disease and regular use of medicine (12).

Evaluating the use of herbal products and understanding the patient's approach toward these products is vital and necessary to ensure proper use of them and take precautions for their potential risks. Although there are several studies investigating the use of herbal products in patients with diabetes, hypertension, and cardiovascular diseases (13-16), the number of studies evaluating the use of herbal products for weight loss is very limited. This study is carried out to determine the frequency of herbal product use for weight loss and to examine the usage patterns of them in overweight and obese individuals.

Material and Methods

Study Design

This descriptive study was designed to collect information on the use of herbal products among overweight and obese patients. The data was gathered in a regional hospital in the Aegean part of Turkey, Ege University Faculty of Medicine Hospital, outpatient department of Endocrinology between June 2015 and September 2016. Eligible participants were overweight or obese individuals above 18 years old and volunteers to participate in the study. No other inclusion or exclusion criteria were applied.

Data Collection Methods

Anthropometric Data

Body weight was measured by the nearest 0.1 kg using a calibrated electronic scale (TANITA BC 418, Tanita Corp., Tokyo, Japan). Body height was measured using a tape measure while patients standing without shoes, keeping their shoulders in a relaxed position, arms hanging freely and head in Frankfurt horizontal plane. Body weight in kilograms was divided by the square of the height in meters to calculate Body mass index (BMI). For the determination of overweight and obesity, WHO's BMI classification was used. According to this classification, patients with BMI values above 24,99 kg/m² were described as overweight and above 29.99 kg/m² were described as obese (17).

Questionnaire

A questionnaire including 33 questions was applied to the participants by face to face interview. The questionnaire was comprised of three sections. In the first section, socio-demographic features were collected. In the second section, medical history and health status were assessed according to hospital records. Regular medicine use and dietary status were asked to the patients. In the third section of the questionnaire, herbal product use and opinions about herbal products were evaluated. To determine herbal product use; the following question was asked to the patient: "Have you ever used herbs or herbal products to lose weight?" Patients who reported the use of herbal products for weight management also answered other relevant questions such as name and type of herb, usage frequency, duration of use, the point of purchase, recommender of the product and status of giving information to the health professional about the product.

Statistical Analysis

All statistical analysis was carried out using SPSS (Statistical Package for Social Sciences) version 21 (IBM Corp., Armonk, NY, USA). In the univariate analysis of data, means and standard deviations (SD) were given for continuous variables while proportions for categorical variables. Chi-square test for categorical variables and Student's t-test for continuous variables were used to identify if the factors among individuals who used herbal products were different from those who did not. All of the results have been evaluated in 95% confidence interval and on p<0.05 significance level.

Ethics approval

Informed consent was obtained from all participants at the beginning of the study. Ethical approval was obtained from Hacettepe University local ethical committee, Ankara, Turkey with the approval number GO-15/333.

Results

The study was completed with 464 individual (358 female and 106 male). Information about age, marital status, educational level, medical history and

BMI values of individuals were summarized in Table 1. Average BMI of the participants was 32.9 ± 6.6 kg/m². The total percentage of participants using herbal products to lose weight was 24.1% (n:112). While the proportion of participants using the herbal medicine during research period was determined as 11% (n:51), the proportion of those who used it in the previous periods was 13.1% (n: 61). The average age was lower, but BMI was higher in herbal products users compared to non-users ($p < 0.01$). There was also a significant relationship between gender, marital status, and herbal product use. The tendency to use herbal medicine was higher in females (27.9%) and singles (36.4%) than males and married ($p < 0.05$). Although individuals having eight years or more education were more likely tend to use the herbal products, the relationship between education level and herbal product usage was not found significant ($p = 0.08$) (Table 1). The percentage of herbal product usage was lower in participants who have a chronic disease and use regular medicine

($p < 0.05$) whereas it was higher in those who are on a weight loss diet ($p < 0.01$) (Table 1).

Herbal products that were mostly used by patients were given in Table 2. According to the results, the most preferred product (50.9%) was herbal mixtures. The most preferred herbal mixtures were the tea mixtures of a commercial trademark called five in one (mate, green tea, thyme, rosemary, heather) and nine in one (mate, green tea, thyme, rosemary, heather, English plantain, puncturevine, alder buckthorn, gymnema). Apart from mixed herbs, a total of 22 plants such as green tea, parsley, cinnamon, and lemon were consumed separately for weight management. While, herbs were usually prepared by infusion method (66.1%), decoction, squeezing, mixing with water or mixing with food were also used (Table 2).

The usage patterns of herbal's were given in Table 3. The majority of the participants used herbal products daily (56.3%) or 3-4 times in a week (20.5%). Nearly half of the participants (43.8%) indicated that they

Table 1. General characteristics of participants

	Herbal Product Users		Non-Users		Total		p
	n	%	n	%	n	%	
Number of participants	112	24.1	352	75.9	464	100	-
Age (year)							
±SD	42.7(±12.5)	-	52.7(±13.5)	-	50.3(±14)	-	<0.001*
BMI (Kg/m²)							
±SD	34.6(±7.5)	-	32.4(±6.1)	-	32.9(±6.6)	-	0.002
Gender							
Female	100	27.9	258	72.1	358	77.2	<0.001*
Male	12	11.3	94	88.7	106	22.8	
Marital status							
Married	72	20.3	282	79.7	354	76.3	0.01*
Single	40	36.4	70	63.6	110	23.7	
Education (year)							
≤8	49	20.8	187	79.2	236	50.9	0.08
>8	63	27.6	165	72.4	228	49.1	
Chronic Disease							
Yes	95	22.7	323	77.3	418	90.1	0.03*
No	17	37.0	29	63.0	46	9.9	
Regular Medicine Intake							
Yes							
No	82	21.8	295	78.2	377	81.3	0.01*
	30	34.5	57	65.5	87	18.8	
Following a Diet							
Yes	31	47.7	34	52.3	65	14.0	<0.001*
No	81	20.3	318	79.7	399	86.0	

For age and BMI, student's t-test; for other variables, chi-square test was performed. SD: Standart deviation, * $p < 0.05$

Table 2. Herbal products used by participants

Latin name	English name	Used parts	Number of Use (n)	Method*
-	Mixed herbs	-	57	I, D, M, C
<i>Camellia sinensis</i> L. (O) KUNTZE	Green Tea	Leaf	29	I
<i>Petroselinum crispum</i> (MILLER) A. W. HILL.	Parsley	Above ground parts	8	I, D, S
<i>Cinnamomum</i> sp. L.	Cinnamon	Bark	6	I, M, Mw
<i>Citrus x limon</i> (L.) Burm.f.	Lemon	Fruit	5	I, Mw
<i>Prunus avium</i> L.	Cherry	Fruit stalk	3	I
<i>Allium cepa</i> L.	Onion	Bulb, Bulb peel	3	I, D, S
<i>Cassia</i> sp. L.	Senna	Leaf	3	I, D
<i>Rosmarinus officinalis</i> L.	Rosemary	Leaf	3	I
<i>Other plants</i>	-	-	19	I

*Preparation methods: C: Capsule, D: Decoction, I: Infusion, M: Mixing with foods, Mw: Mixing with water, S: Squeezing.

started using herbal products due to the recommendation of an acquaintance, whereas the percentage of those using through a doctor (2.7%), dietician (1.8%) or pharmacist's (0.9%) recommendation was very low. The participants mostly preferred to buy the products from herbalist (56.3%) or local markets (24.1%). The percentage of those who made an inquiry on the products was 32.1%. The main source of information for the inquiry was the internet (77.7%) (Table 3).

The percentage of participants who informed their doctors about their herbal product use was 11.6%. The most common reasons for not informing their doctors were declared as, not visiting the doctor, not asked by doctors' and forgot to mention (Table 3). When the participants' perception of risks related to herbals was assessed, the majority stated that herbs might be harmful (52.2%) and interact with their medication (58.0%). Additionally, the majority of the participants (73.5%) were willing to get information from their doctors about the herbals (Table 4).

Table 3. Information related to herbal products

Information	Number (n)	Percentage (%)
Frequency of Use		
Everyday	63	56.3
3-4 times/weekly	23	20.5
1-2 times/weekly	12	10.7
Sometimes/Rarely	13	11.6
As cure	1	0.9
Recommender		
Acquaintance	49	43.8
Newspaper/Television	39	34.8
Internet	13	11.6
Doctor	3	2.7
Dietician	2	1.8
Herbalist	2	1.8
Pharmacist	1	0.9
Distributor	1	0.9
Others	2	1.8
Point of Purchase		
Herbalist	63	56.3
Local markets	27	24.1
Internet	7	6.2
Distributor	7	6.2
Pharmacy	4	3.6
Collecting	3	2.7
Order on TV	1	0.9
Inquiry Status		
Yes	36	32.1
No	76	67.9
Source of inquiry (n=36)		
Internet	28	77.7
Point of purchase	4	11.1
Books	2	5.6
Television	1	2.8
Expert	1	2.8
Status of informing the doctor		
Yes	13	11.6
No	99	88.4
Reasons for not informing doctor (n=99)		
Not visiting doctor	33	33.3
Not asked by doctors	29	29.3
Forgotten	19	19.2
Thinking it's unnecessary	10	10.1
Irregular use	3	3.0
Using for a short period	3	3.0
Shaming/Fearing	2	2.0

Discussion

Although obesity has become a major public health problem over the last years, there is little research in the literature regarding herbal products

Table 4. Participants' opinion related to the herbal medicine

Information	Number (n: 464)	Percentage (%)
Perception of risks		
Herbs might be harmful	242	52.2
Herbs might not be harmful	149	32.1
Had no idea	73	15.7
Opinion about the herb-drug interaction		
Might interact	269	58.0
Might not interact	28	6.0
Had no idea	167	36.0
Willingness to get information from a health professional		
Willing to get information	341	73.5
Not willing to get information	123	26.5

used for weight management. A study carried out by Pillitteri et al. stated that the percentage of dietary supplement (over the counter appetite suppressants, herbal products or weight loss supplements) usage was 33.9% (n=1.444) among the adults who made a serious weight-loss attempt (4). Another study showed that the percentage of dietary supplements used for weight management was 20.4% among 505 subjects older than 15 years (18). Similarly, in this study, it was determined that a total of 24.1% of the subjects used the herbal medicine for weight loss.

A population-based study in the United States (US) revealed that herbal product consumers had a higher BMI than non-consumers (6). Likewise in our study, the average BMI of participants using herbal products was higher than those who do not use.

Previous studies showed that herbal products were mostly preferred by females (19,20). Our study also revealed that the use of herbals was more common among women. When the relationship between herbal product usage and other socio-economic variables were analyzed, the percentage of herbal product use was higher in young adults and singles. Similarly, Pillitteri et al. reported that dietary supplements were mostly preferred by young adults between 25-34 (4).

Our study showed that herbal product use was higher among participants who follow a weight loss diet. This finding is in line with a previous study (4). According to these results, it may be proposed that participants might not consider herbal products as an alternative treatment, but as a complementary treatment to their diet.

The relationship between the level of education and herbal product consumption was complicated. Although in a study it was revealed that there was a negative correlation between the level of education and consumption of the herbal products (4), other studies pointed out that use of herbal products was more common among subjects with higher education (21,22). According to our results, the tendency to use herbal products increased with level of education. Although it is expected that people with a high level of education may realize the potential risks of these products and use with utmost care, the tendency to use more natural and non-synthetic products may also increase.

In this study, herbal mixtures were found as the most preferred products. Blank et al., also reported that most of the dietary supplements contain more than one plant or active agents (6). Apart from herbal mixtures, green tea, parsley, and cinnamon were preferred frequently for weight loss. In a Cochrane review, the impact of green tea on weight loss was analyzed, and it was concluded that green tea has a small, statistically and clinically non-significant impact on weight loss in overweight or obese adults (23). On the other hand, studies with cinnamon were mostly focused on glucose metabolism, and it was reported that cinnamon might show a positive impact on diabetes and insulin resistance (24). However, there's no study in the literature showing cinnamon's effectiveness on obesity treatment. Similarly, the diuretic effect of parsley and cherry stalk (25,26) and laxative effect of senna (27) were reported, but there is no clinical study showing their impact on fat loss. Although there is some finding revealing that rosemary might have a positive effect on obesity treatment, data is very limited and conducted in an animal model data is very limited and conducted in an animal model (28). Further researches are needed to determine the efficacy of these plants in obesity treatment.

One of the critical points related to herbal medicine usage is the need to pay attention to the interaction between medicines and herbs. Tulunay et al. found out that the percentage of herbal product consumption in patients with a chronic disease is 29% (29). Our study revealed that patients who took regular medicine used herbal products less for weight management. However, one-quarter of regular medicine user was also

herbal medicine user. Among the most reported herbs by the patients in our study, green tea had the risk of interacting with analgesics, antiandrogens, antiarthritics, anticoagulants and antidepressants and cinnamon with anticoagulants, antidiabetics, and antifungals (30). Also, both herbs may interact with the agents metabolized through cytochrome P450 enzymes (30). Thus, it is important to question and monitor the use of herbal product in patients using medicine regularly.

In our study, participants mostly started using herbal products due to their neighbors' or a friend's recommendation. This was followed by recommendations through newspaper or television, but the percentage of health professionals' was very low. Also, the percentage of herbal users acknowledged their doctor about the issue was very low (only 11.6%). Similar findings were also recorded in other studies which evaluated the use of herbal medicine in various diseases (31-33). Using herbal products without consulting to health professionals may lead to the misuse of these products and may cause health risks. Therefore, it is necessary to encourage health professional to check and monitor their patients for herbal medicine use.

Another important issue associated with herbals is the point of purchase. The whole process from harvesting to storage should be well-planned, managed and controlled to obtain a good quality product. Poor manufacturing and storage conditions might result in contamination with insects, parasites, fungi, pesticide and metal residues (34). Imitation and adulteration are other issues related to the safety of these products. Products especially used for weight management might be adulterated with synthetic drugs like sibutramine. In some herbal products, Ministry of Health-Turkey had identified sibutramine adulteration, which was banned by FDA and European Medicines Agency due to its high cardiovascular risks. There are case reports in the literature reporting sibutramine intoxication after the use of herbal weight loss products (35,36). For this reason; it is crucial to control the contents of herbal products and the places where they are sold. Although pharmacies are the most reliable points in Turkey to buy these products, the percentage of purchase of herbals from the pharmacy was found as only 3.6% in our study. Most of the consumers prefer to buy from herbalists, local bazaars and internet. When we

consider that less controlled products can be marketed through the internet much more easily, it is necessary to inspect the sales strictly and raise the awareness of the public about this issue.

More than half of the participants stated that they want to consult their doctors about herbals and think that herbs might be harmful and interact with the medicines. This finding suggests that health professionals should be trained and communicate with their patients about herbal products. Studies carried out with doctors and students of faculty of medicine showed that the majority of the practitioners were willing to have information on alternative and complementary treatment methods and implement these in their practice (37-39).

The generalizability of our study results may be limited by the single-center setting and limited sample size. Despite the limitations, the study center is the biggest university hospital in Aegean Region and may reflect the attitude of consumers in this region. Also, our study is one of the very few studies investigating herbal products and their consumption methods for weight management. Further studies are needed to reflect the opinion of all population on this issue.

Conclusion

In conclusion, our study suggests herbal product usage is common among overweight and obese people. It is highly advisable that health professionals should communicate with their patients about herbal products during clinical practice. This study also implies that health professionals in Turkey should be encouraged to be trained about herbal medicines.

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Correspondence:

Ezgi Bellikci Koy

Izmir Katip Çelebi University, Faculty of Health Sciences Department of Nutrition and Dietetics, 35620, Izmir, Turkey

Phone: +90530 500 85 24

E-mail: ezgi_bellikci@hotmail.com