The use of herbal supplements by individuals with diabetes mellitus

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Abstract

Objective: To analyse the use of herbal supplements by individuals with diabetes mellitus.

Methods: This cross-sectional study was carried out in the endocrinology clinics of two hospitals in Izmir, Turkey, between June and August 2016. The sample consisted of diabetic patients. Data was collected through face-to-face interviews guided by a questionnaire. SPSS 17 was used to analyse the data.

Results: There were 455 subjects with a mean age of 47.02±16.6 years. Of the total, 373(82%) were female, and 352(77.4%) were diagnosed with type-2 diabetes. Overall, 262(57.6%) subjects used herbal supplements like cinnamon, sage, thyme, turmeric and ginseng. Significant differences in the use of herbal supplements were found according to gender, marital status, and duration of diabetes ($p<0.05$ each).

Conclusion: About half of the diabetic patients used herbal supplements.

Keywords: Diabetics, Diabetes mellitus, Herbal supplements. (JPMA 68: 587; 2018)

Introduction

Diabetes mellitus (DM) is the most common endocrine disorder and affects more than 8.5% of the population worldwide.[1] Its prevalence is rapidly increasing all over the world and it is estimated that by 2040, 642 million people in the world will be affected by diabetes.[2] The incidence of diabetes is also increasing in Turkey, and recent literature indicates that the prevalence of diabetes has risen from 7.2% to 13.7%.[3,4]

Diabetes is a chronic disease that reduces the quality of life, increases the risk of mortality and morbidity, and has no cure.[5] Lifestyle changes, oral anti-diabetic drugs, and conventional treatments such as insulin are preferred for managing diabetes.[6] However, many diabetic individuals have substantial difficulty complying with these treatments.[7,8] Many studies have demonstrated that diabetic individuals are unable to adequately comply with the medical treatments prescribed by physicians.[9-11] This problem with treatment noncompliance may be the result of factors such as the lack of a definitive treatment for diabetes, the need for lifelong treatment, the occurrence of acute/chronic complications, and the individual's inability to make behavioural changes based on the healthcare education they receive.[8,12-14]

The side effects of drugs used in current conventional treatment methods and the belief that natural products are always harmless and effective have led to the popularity of complementary and integrative therapies. As in other chronic diseases, patients with diabetes also turn to complementary and integrative therapies in addition to conventional treatments.[8,13,14] Diabetic individuals often prefer herbal supplements as a form of complementary and integrative treatment.[15,16] According to recent studies on diabetic patients, the rate of herbal supplement use is generally between 17% and 71%.[9,17-22] Studies conducted in Turkey show this rate to be 25-85%.[13,16,23]

It has been reported that diabetic individuals use more than 400 plant species and many natural products, vitamins, and minerals to supplement their treatment.[24] Numerous studies have shown that diabetic individuals use various herbal supplements such as cinnamon, nigella, garlic, thyme, sage, stinging nettle, and chamomile.[8,15,16] It was reported that certain herbs, particularly cinnamon, are effective in controlling diabetes.[25-27] In addition to the positive effects, however, there are reports indicating that some of the products used by diabetic individuals may be ineffective or harmful.[28]

In that sense, cultural approaches are very important in the effective management of diabetes.[7] Identifying the plant species used by diabetic patients is important in order to shed light on the studies aimed at evaluating the efficacy of herbal products in controlling diabetes. The current study was planned to analyse the use of herbal supplements by individuals with DM.

Patients and Methods

This cross-sectional study was carried out in the endocrinology clinics of two hospitals in Izmir, Turkey,

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between June and August 2016. Patients who had DM for at least six months, were at least 18 years of age, and agreed to participate in the study were included. Patients who had communications disorders or major depression were excluded.

The study was approved by the Ege University Faculty of Nursing Ethics Committee, and written informed consent was obtained by the subjects.

Data was collected using a questionnaire based on a literature review.[16,29-31] The questionnaire form was evaluated for content validity by one doctor and two nurses having experience in the field of internal medicine. The form included questions about socio-demographic (age, gender, educational background, marital status, place of residence, health coverage, income level, and occupational status), characteristics of the individual (7 questions), health/disease status (14 questions) and use of herbal supplements (14 questions). Patients were asked whether they used any herbal supplements after being diagnosed with DM, the type of herbal supplement used, the reasons for using it, and how long the patients used the herbal supplements. Patients who reported using herbal supplements were asked about such as what their expectations were from using the herbal supplement, and whether they had experienced any side effects or toxicity related to the treatment.

Data was collected by interview in the clinics by three researchers. The form was filled-in face-to-face. Filling out the form took 15-20 minutes for each person. Disease-related characteristics of the patients were obtained from patients' files. SPSS 17 was used to analyse the data.

Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to explore the sample profile. Pearson's chi-square test was used for comparisons between users and non-users of herbal supplements. The study participants were categorised as either herbal supplement users or nonusers. Users of herbal supplements were defined as those who reported usage of at least one herbal supplement. The level of statistical significance was accepted as $p<0.05$.

Table-1: Descriptive Characteristics of Diabetic Individuals (n=455).

Characteristics	n (%)
Gender	
Female	373 (82.0)
Male	82 (18.0)
Education level	
Primary school and under	71 (15.6)
High school	113 (24.8)
University	271 (59.6)
Marital status	
Married	358 (78.7)
Single	97 (21.3)
Economic situation	
High	32 (7.0)
Moderate	368 (80.9)
Low	55 (12.1)
Living place	
City	434 (95.3)
Rural area	21 (4.7)
Working status	
Working	302 (66.4)
Not working	153 (33.6)
Access to healthcare	
Hard	21 (4.7)
Easy	434 (95.3)

Table-2: Clinical Characteristics of Diabetic Individuals (n=455).

Characteristics	n (%)
Diabetes type	
Type I	103 (22.6)
Type 2	352 (77.4)
Treatment	
Oral hypoglycaemic agents+diet	234 (51.4)
Insulin+diet	130 (28.6)
Mix+diet	91 (20.0)
Complication of Diabetes	
Yes	182 (40.0)
No	273 (60.0)
Chronic Illness	
Yes	221 (48.6)
No	234 (51.4)
Drug use other than diabetes drugs	
Yes	221 (48.6)
No	234 (51.4)

Results

All 468 patients who met the study criteria were approached. Of them, 455(97.2%) volunteered to participate. The mean age of the sample was 47.02±16.6 years. Of the total, 373(82%) were female, 358(78.7%) were married, and 271(59.6%) were university graduates. Type 2 DM(T2DM) was present in 352(77.4%) patients and the average duration of diabetes was 96.69±84.87 months (range: 6-540 months). All participants had health insurance. Overall, 434(95.3%) subjects were living in the city and 302(66.4%) were actively working. For 368(80.9%) of the individuals, their income and expenses were equal, and 434(95.3%)

Table-3: Diabetics' opinions on herbal products.

Herbal Supplements	n (%)
Herbal supplements use	
User	262 (57.6)
Non-user	193 (42.4)
Finding useful	
Useful	163 (62.2)
Non useful	99 (37.8)
Primary reason*	
Lowering blood sugar	185 (70.6)
Prevent complications	54 (20.6)
To heal	36 (13.7)
Resource on herbal supplement*	
Media (Television)	113 (43.1)
Internet	65 (24.9)
Health professionals	55 (20.9)
Relatives-friend	30 (11.4)
Obtained from*	
Herbs and spice seller	222 (85.0)
Plant collecting	23 (8.8)
Order form internet or by phone	19 (7.2)
Information to health professional	
Yes	63 (24.0)
No	199 (76.0)
Health problem related to the herbal supplement	
Yes	11 (4.2)
No	251 (95.8)

reported having no problems with accessing healthcare services (Table-1).

As medical treatment, 234(51.4%) of the diabetic patients used oral anti-diabetic drugs and diet, 130(28.6%) used insulin and diet, and 91(20%) used oral anti-diabetics, insulin, and diet. Besides 273(60%) individuals had no diabetes-related complications and 182(40%) had at least one chronic disease besides DM. In addition to diabetes treatment, 221(48.6%) individuals used medicines other than diabetic drugs (Table-2).

Over half 262(57.6%) of the diabetic individuals used herbal supplements and all of them reported that they started using herbal supplements after being diagnosed with diabetes (Table-3). Statistically significant differences were observed in the use of herbal supplements based on gender, marital status, and diabetes duration ($p<0.05$). Herbal supplement use did not differ significantly according to educational status, type of diabetes, or type of treatment ($p>0.05$) (Table-4).

Individuals using herbal supplements often preferred cinnamon 110(41.8%), sage 74(28.3%), thyme 50(24.8%), turmeric 56(21.4%), and ginseng 51(19.4%) (Table-5). Among the individuals who used herbal supplements, 163(62.2%) reported benefiting from herbal

Table-4: Use of herbal products according to some characteristics of diabetic individuals.

Characteristics	User n (%)	Nonuser n (%)	Total n (%)	χ^2	P
Gender					
Women	225 (60.3)	148 (39.7)	373 (100)	6.358	0.012*
Men	37 (45.1)	45 (54.9)	82 (100)		
Marital status					
Married	215 (60.1)	143 (39.9)	358 (100)		
Single	47 (48.5)	50 (51.5)	97 (100)	4.206	0.040*
Education level					
Primary school and under	38 (57.6)	28 (42.4)	66 (100)		
High school	62 (54.9)	51 (45.1)	113 (100)	3.387	0.824
University	158 (58.3)	113 (41.7)	271 (100)		
Diabetes type					
Type I	53 (52.0)	49 (48.0)	102 (100)	1.645	0.2
Type 2	208 (59.1)	144 (40.9)	352 (100)		
Treatment					
Oral hypoglycaemic agents+diet	146 (62.4)	88 (37.6)	234 (100)	4.947	0.084
Insulin+diet	66 (50.8)	64 (49.2)	130 (100)		
Mix+diet	50 (54.9)	41 (45.1)	91 (100)		
Duration of having diabetes					
1-5 year	51 (45.1)	62 (54.9)	113 (100)		
6-10 year	143 (54.7)	118 (45.3)	261 (100)	3.311	0.024*
11 year and over	44 (54.3)	37 (45.7)	81 (100)		

* $p<0.05$.

Table-5: Distribution of herbal supplements (n=262).

Turkish Name	English Name	n* (%)
Tarcin	Cinnamon	110 (41.8)
Adacayi	Sage	74 (28.3)
Defne yapragi	Bay leaf	65 (15.2)
Zerdecal	Turmeric	56 (21.4)
Ginseng	Ginseng	51 (19.4)
Kekik	Thyme	50 (24.8)
Keten tohumu	Flaxseed	50 (18.9)
Isirgan	Stinging nettle	40 (15.2)
Papatya	Chamomile	35 (13.4)
Kudret nari	Bitter melon	35 (13.3)
Sogan	Onion	32 (12.2)
Yaban mersini	Blueberry	32 (12.2)
Sakiz bitkisi	Gum plant	32 (12.2)
Kereviz	Celery	25 (9.5)
Ebegümeci	Hibiscus	25 (9.5)
Meyan kökü	Licorice root	22 (8.4)
Ceviz yapragi	Walnut leaf	22 (8.4)
Cemen	Fenugreek	22 (8.4)
Aloevera	Aloe vera	22 (8.4)
Sirmakök	Rye root	20 (7.6)
Ardic	Juniper	20 (7.6)
Sarimsak	Garlic	20 (7.6)
Sari cicek/Solmaz cicek	Helichrysum	20 (7.6)
Aci kavun	Ecballium (squirting cucumber)	16 (6.1)
Karniyarik otu	Psyllium	16 (6.1)
Zeytin yapragi	Olive leaf	15 (5.7)

*The number of n has changed since there is more than one herbal product use.

supplements; 185(70.6%) reported using herbal supplements to reduce blood glucose levels, 54(20.6%) to prevent complications, and 36(13.7%) used them as treatment. Besides, 222(85%) of these individuals obtained their herbal supplements from herbs and spice sellers. They received information about herbal supplements through television 113(43.1%), the internet 65(24.9%), healthcare professionals 55(20.9%) and relatives-friends (11.4%) (Figure).

Of the herbal supplement users, 251(95.8%) had no health problems related to the herbal supplement while 11(4.2%) experienced problems such as mild nausea and diarrhoea. Furthermore, 199(76%) of the diabetic individuals did not discuss their herbal supplement usage with their healthcare providers.

Discussion

Because of the nature of diabetes and its potential threat to quality of life, many diabetic individuals use herbal supplements in order to better cope with and control the disease.[13,16,20,23,31,32] The present study showed that approximately 60% of diabetic patients had used a herbal supplement at least once since their diagnosis. Herbal supplement usage among diabetic patients varies between 17.3% and 80%.[16,23,30,32-37] While the herbal supplement usage rates in our study are similar to those in the literature, these ratios vary by country. This variation may be the result of different populations' values, beliefs, and cultural attitudes regarding the use of supplementary and integrative therapies. The use of herbal supplements is also affected by inadequate operation of or access to healthcare services, plants being more readily accessible than drugs, positive feedback from other herbal supplement users, and the societal influence of traditional healers.[38]

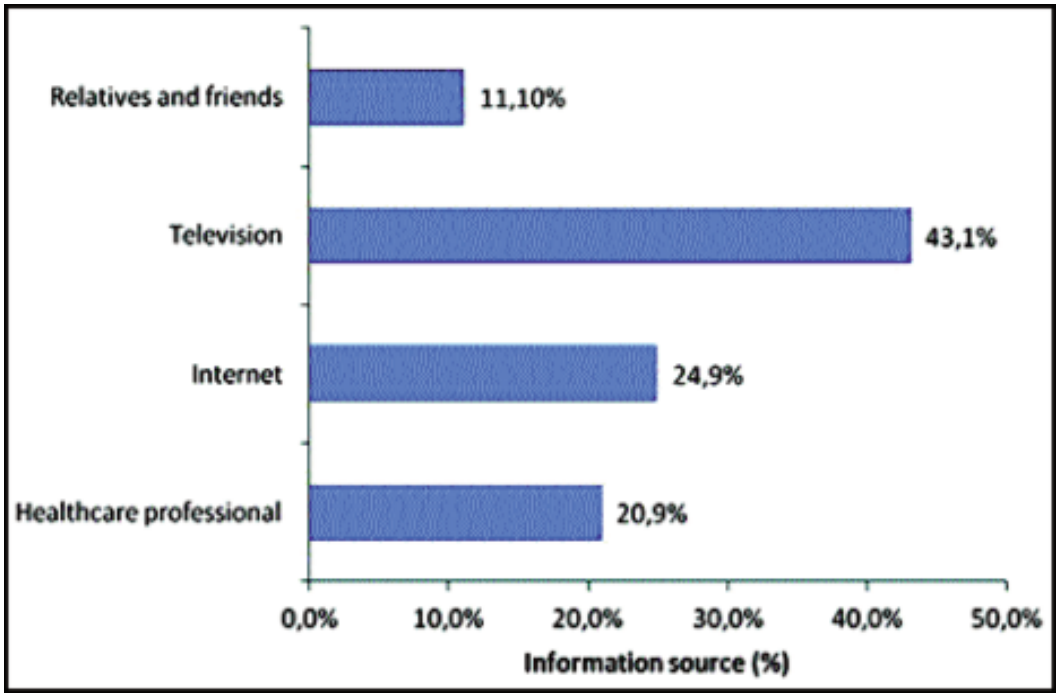

Figure: Statements of patients about how they receive information on herbal supplements.

The present study found that women, married people, and

those suffering from diabetes for 6 years or more had higher rates of herbal supplement use. It has been previously reported that women are more likely to use herbal supplements because they look more favourably on traditional medicine and use healthcare services more frequently.[20] Furthermore, women are generally more involved in self-care and treatment, which are primary factors involved in the use of herbal supplement.[39] While some studies have demonstrated that women use herbal supplements more than men do,[40,41] others have revealed no significant correlation between gender and herbal supplement usage.[16,17,30,31] In the current study, there was a significant correlation between diabetes duration and herbal supplement usage, with a higher rate of herbal supplement usage among individuals suffering from diabetes for 6-10 years. This supports previous studies reporting that the use of alternative products increases with diabetes duration, particularly at durations over 5 years.[23,33] It is believed that diabetic individuals turn to supplementary and integrative products more as the diabetes duration increases, the disease becomes harder to control, and the risk of complications grows. Although the present study has not revealed any significant differences in herbal supplement usage based on educational status, type of diabetes, or type of treatment, a study conducted in Iraq showed increased herbal supplement usage with higher education level and a significant correlation between type of treatment and herbal supplement usage.[32] This difference may be related to factors such as cultural and ethnic values and beliefs.

The individuals in the present study reported using 26 different types of herbs. The herbal supplements most commonly used by diabetic individuals are cinnamon, sage, thyme, and ginseng, similar to the results of other studies in Turkey[16,23,33] and in other countries.[17,20,32,37,41,42] Cinnamon has been proven to be effective by means of procyanidin type A polymers, which facilitate insulin receptor autophosphorylation and result in increased sensitivity to insulin.[43-45] Numerous studies have demonstrated that cinnamon is effective in the treatment and prevention of insulin resistance, metabolic syndrome, and T2DM. Cinnamon in particular has two mechanisms of action, one which increases insulin sensitivity, and one that regulates insulin resistance by way of peroxisome active-proliferator receptors.[25] Sage and thyme are two medical herbs which are endemic to Turkey. Sage is used by patients because its leaf extracts have antihyperglycaemic properties.[46] Ginseng is used by diabetic patients and healthy individuals due to its ability to reduce fasting blood glucose and glycated haemoglobin (HbA1c) amount.[47]

Herbal combinations are an important part of traditional Turkish medicine, and the public commonly believes that herbal supplements are natural and harmless and that herbal medicine is more natural than modern treatment. In recent years, increased advertising of herbal supplements has also led to patients' uninformed use of these products. Especially in the last decade, herbal medicines for the prevention and treatment of diabetes complications have attracted patients' attention because they have multiple targets and are believed to have less harmful side effects.[48] However, the World Health Organisation [WHO] reported that some herbal supplements are powerful and not as reliable as people believe them to be. It was also strongly emphasised that herbal supplements can be dangerous when taken in combination with modern medicines.[49] For all of these reasons, nurses should be informed about the possible side effects of herbal treatments, and should warn their patients accordingly and act as a consultant.

In this study, the most common primary reason for herbal supplement use was to lower blood glucose, followed by preventing complications and treating diabetes. It has been reported that diabetic patients use herbal supplements for similar reasons.[13,16,23] Other reasons for the widespread use of herbal supplements are that the herbs are more easily accessible than drugs, they are more affordable, and are perceived to be beneficial.[13,17,38,42,50] In our study, 62.2% of the diabetic individuals using herbal supplements find these supplements useful. In most studies, the patients consider these herbal supplements to be beneficial.[13,16,20,23,31,32,37,51] However, there are also studies in which the participants were not sure about the benefit of these products or did not find them beneficial.[51] The results of clinical studies also reveal that cinnamon and ginseng, often preferred by diabetic individuals, can be used to supplement diabetes treatment.[24] However, since there are differing opinions about the use of herbal supplements, duration of use, dosage, and method of preparation, there are few clinical studies evaluating these positive effects.

Another factor influencing the use of herbal supplements is the ease of access to the product. Herb and spice sellers are common, making herbs readily available, and the most common method of obtaining herbs is visiting one of these shops. Consistent with the literature,[20,23] the current study also found that most (85%) of the individuals who used herbal supplements obtained these

products from herb and spice sellers. In another study, more than half of the participants stated that they obtained the herbs by picking them directly from the wild.[37] Although herb sellers provide easier access, urbanisation is making it more difficult to acquire herbs from nature.

In the present study, the main sources of information about the use of herbal supplements were television and the internet, indicating that most patients obtain information about this topic through the media. In similar studies it has been reported that media is the most influential source in the use of herbal supplements.[38,41,50] Unfortunately, only 20.9% of the diabetic individuals had asked a physician and/or nurse for information. This finding is not surprising in the light of a report from the WHO stating that healthcare professionals are usually interested in contemporary therapies, and do not ask their patients about their use of alternative products or are not informed about the alternative treatments being used.[49] Furthermore, the limited recommendation of herbal supplements by healthcare professionals may be due to a lack of belief in their usefulness. Similarly, most of the participants in this study (76%) using herbal supplements did not tend to discuss their use of herbal supplements with their doctor, nurses, or nutritionist. The situation is similar in many different countries, and it is quite striking that healthcare professionals are not aware of patients' use of herbal supplements.[16,19,20,30-32] It has been reported in various studies that diabetic patients avoid giving information to healthcare professionals because they believe that they will receive a negative response.[20,31] It is thought that by not reporting their herbal supplement usage to their healthcare professionals, patients create the risk of unwanted effects. Using natural products with hypoglycaemic effects in combination with conventional medical treatments may reduce blood glucose levels, and these products may also have interactions with other drugs and food; therefore, it is important that healthcare professionals be informed about the products their patients use so that they can adjust the dose of the prescribed drugs accordingly.[24] This also indicates that including healthcare professionals in this area may provide optimum benefits through the more conscious use of herbal treatment methods in combination with modern therapies. It is also believed that healthcare professionals should be aware of diabetic patients' attitudes towards and opinions about herbal supplements.

In our study, only 4.2% of the participants stated that they had health problems such as mild nausea and diarrhoea when using herbal supplements, but this may be an underestimation. In a study, 91.7% of the diabetic individuals reported no side effects.[20] The most common side effect experienced by diabetic individuals as a result of herbal supplements is hypoglycemia.[52] In a study conducted in Africa, it was reported that drug interactions are a potential risk for patients and that negative glycaemic control and side effects are important because they may be fatal.[53] In a study in Cyprus, it was found that 80% of the participants did not know that herbal supplements may have interactions with drugs.[37] Doctors and nurses should keep in mind that many herbal supplements are not licenced products, are not approved by the US Food and Drug Administration, and may cause toxicity or interactions with many conventional drugs.[54] There is a need for more information about the reliable use of herbal supplements and for more randomised controlled studies in this field.

Important advantages of this study are that it was conducted in multiple institutions, and the research data was collected by three experienced researchers by way of face-to-face interviews. On the other hand, the study has some limitations. The study had a cross-sectional design and was carried out in one province of Turkey. Therefore, the conclusions drawn from the study cannot suggest causation. The questionnaire did not include information about the dose and frequency of supplements. Additionally, a blood glucose level that may affect herbal supplement use was not checked. Thus, the results of this study might not represent herbal supplement usage in diabetic patients. In order to have a better understanding of herbal supplement use by diabetic patients, the study should be repeated with more patients in different regions.

Conclusion

Diabetic individuals used several culture-specific herbal supplements to support their disease management. When providing holistic care for diabetic individuals, healthcare professionals should obtain information about the individuals' healthcare behaviours by observing their cultural traits. Health professionals caring for diabetic patients should ask about the supplementary and integrative treatment, particularly the use of herbal supplements, while taking patients' medical and nutritional history. In addition, the possible side effects of these products should also be kept in mind.

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