



## Use of complementary medicine among people with diabetes in eastern Turkey: A descriptive study

Zeliha Cengiz<sup>a,\*</sup>, Funda Budak<sup>b,2</sup>

<sup>a</sup> Department of Fundamentals of Nursing, Inonu University, Nursing Faculty, Malatya, Turkey

<sup>b</sup> Department of Psychiatric Nursing, Inonu University, Nursing Faculty, Campus 44280, Malatya, Turkey



### ARTICLE INFO

#### Keywords:

Diabetes  
Complementary medicine  
CM use

### ABSTRACT

**Purpose:** To measure the frequency, type, purpose of complementary medicine (CM) use among people with diabetes mellitus.

**Materials and methods:** The population of this descriptive study consisted of the patients hospitalized in the endocrine clinic of a university hospital in Eastern Turkey who were diagnosed with diabetes. Data were collected from 316 patients.

**Results:** 43.0% of the patients were using CM, and 97.0% of those using CM tried herbal methods. The patients who had variable glycosylated haemoglobin values (60.3%) and those who had DM-related complications (60.3%) used CM more.

**Conclusion:** It was determined that CM usage was prevalent among the patients. The most frequently used CM method was herbal therapy. We found that the use of CM was more common in patients with poor metabolic control. Therefore, healthcare professionals must assess use of CM and provide suitable counseling.

### 1. Background

Diabetes is among the chronic diseases that are the most frequently encountered in Turkey and the world and affect quality of life negatively [1]. Some 425 million people worldwide, or 8.8% of adults 20–79 years, are estimated to have diabetes. The number of people with diabetes increases to 451 million if the age is expanded to 18–99 years [2]. This ratio has reached 14.6% in Turkey [3]. The reasons for the prevalence of diabetes in Turkey may include the changing lifestyle brought by rapid population increase and urbanization, obesity, insufficient physical activity and developments in the field of health [4].

While insulin, oral antidiabetic drugs, and with a combination treatment (combination of oral antidiabetic drugs and insulin) seems to be suitable treatments methods in people with diabetes, long treatments affect the daily life activities of patients negatively [5]. This is why it is needed to increase the quality of the lives of people with diabetes, ensure their adaptation to the treatment, change their eating habits and add exercise programs to their daily lives [6]. As diabetes is chronic and its treatment is both physically and emotionally exhausting, patients may resort to practices other than medication [5,6]. The reasons for patients to resort to practices other than treatment may be listed as

dissatisfaction with medication treatment, side effects of drugs and high costs of medication [5,7]. Non-medication practices adopted by patients vary from culture to culture. Complementary medicine (CM) are frequently used among people with diabetes. A study in Taiwan found that the ratio of CM usage for treatment purposes was 67.7% among people with diabetes [8]. Kumar et al. determined the CM usage ratio of people with diabetes as 61.1% [9].

Complementary medicine are treatments that are used to support scientific medical treatments. The most widely used therapies among diabetic populations are nutritional supplements, herbal medicines, nutritional advice, and spiritual healing and relaxation techniques [6]. CM usage is increasingly becoming abundant in several countries in the world [4]. Studies that were carried out in developed countries such as the United State, Australia, the United Kingdom, Taiwan and Singapore reported that most adults used CM [8–10]. As in the case of all diseases, CM usage among diabetes patients is also high. Studies on CM usage by people with diabetes reported the ratio of this as 17–73% [10–12]. Studies conducted in Turkey reported the same ratio to be in the range of 25–85% [13,14]. The most frequently preferred complementary medicine methods in Turkey include praying, getting an amulet, using herbal methods, cupping, leeches, etc. [15].

\* Corresponding author. Inonu University, Nursing Faculty, Campus 44280, Malatya, Turkey.

E-mail addresses: [snmzlh33@hotmail.com](mailto:snmzlh33@hotmail.com) (Z. Cengiz), [funda.budak@inonu.edu.tr](mailto:funda.budak@inonu.edu.tr) (F. Budak).

<sup>1</sup> Home Address: Zaviye Quarter, Street of Malatya, No:12, 44900, Yesilyurt, Malatya, Turkey, Mobile

<sup>2</sup> Home Address: Inonu University, Campus 44280, Malatya, TURKEY Mobile

The purpose of this study is to measure the frequency, type, purpose of CM use in patients with diabetes, to determine the demographic characteristics that make it more likely to use CM, and to find out how such patients perceive the benefits, if any, from the use of CM. The study also aims to identify the source of information recommending the use of a particular CM and a justification explaining the underlying reasons for its use.

**2. Materials and methods**

The population of this descriptive study consisted of patients diagnosed with diabetes who were hospitalized at the endocrine clinic of a university hospital in Eastern Turkey between February 2016 and February 2017.

The method was based on the use of a semi-structured questionnaire trying to fulfill the aims of this study.

**2.1. Research sample**

During the conduct of this study, there were 500 patients in total who assessed for eligibility. The power analysis that was conducted to determine the sample of the study provided the sample size of 218 with a significance level of 0.05, 0.95 confidence interval, 0.6 effect size and 0.95 representation of the population. They were all contacted in the inpatient clinic, and asked for their participation in the study; 316 of them (63.2%) agreed. The patients were selected by simple random sampling. The study included patients who were of age 18 or older, conscious, able to communicate, free of mental issues that may disrupt communication and diagnosed with diabetes for at least 6 months.

**2.2. Data collection tools**

The data were collected by a “Questionnaire” that was prepared by the researchers based on the literature.

**2.3. Questionnaire**

The Questionnaire consisted of a total of 21 questions including those on the patients’ descriptive characteristics (sex, age, education, economic status, employment status), disease-related characteristics (type of diabetes, presence of chronic diseases, state of complications, HbA1c (glycated haemoglobin) values, duration of disease) and states about using Complementary Medicine (CM) (state of using CM, CM methods they use, purpose of using these, source of information about CM, the stage of resorting to CM, state of receiving a result, state of having experienced side effects about the method, cost of the method, state of recommendation, state of leaving medical treatment and herbal products that are used).

The educational levels of the participants were recorded as illiterate, primary school, high school and above. Their working status was noted as working or not-working. The type of diabetes was recorded as Type 1 and Type 2. The other chronic diseases and the most recently measured HbA1c values (obtained by examining the form of laboratory findings) were obtained from each patient’s file. Their duration of illness were marked as the total years after diagnosis with diabetes.

The patients’ use of CM was marked with the question: Have you used any method or substance other than those prescribed by your doctor? People with diabetes who answered “yes” to this question were asked the following further questions:

- What kind of a methods or substances have you used?
- What were your purpose of using such methods or substances?
- Which was the stage of your resorting to this remedy?
- What effect did these remedy have on you?
- Did you get the side effect?
- What was the cost of the method you were using?
- Did you leave your medical treatment?

**2.4. Data collection**

The data were collected between February 2016 and February 2017 by the researcher with the method of face-to-face interviews in the patient rooms at the endocrine clinic of the hospital. Each participant was interviewed only once. Interviews were conducted on different days and times of the week. Application of the data collection form lasted on average about 15–20 min. The questions that were not understood by the patients were explained without interpretation.

**2.5. Data analysis**

The data were analyzed using the “SPSS for Windows 21” package software. The independent variables included demographic characteristics, such as age, gender, educational level, working status, medical conditions (type of DM, another chronic disease, complication related with diabetes, HbA1c values and duration of illness). The grouped data of the people with diabetes are provided as frequency and percentage, while their continuous data are shown as means and standard deviations. The rates of CM use were assessed for the sample as a whole and by social demographic characteristics, medical conditions. A chi-square test was used for comparisons between users and nonusers of CM. The statistical significance level in all tests was taken as 0.05.

**2.6. Ethical consideration**

For the study to be conducted, approval was obtained from the Health Sciences Scientific Research and Publication Ethics Board of Inonu University and legal permission was received from the institution (study protocol number: 2016/12–4). The purpose of the study was explained to the participants, and their questions were answered. Verbal consent was received from each patient before the study. The patients were informed that the information they provide would be kept confidential, it would not be used anywhere else, and they had the right to leave the study whenever they wanted.

**3. Results**

56.3% of the participants were female. The mean age of the participants was 54.82 ± 13.73, while 55.1% were in the age group of 41–60.51.3% were primary school graduates, 69.0% were unemployed (Table 1).

86.7% of the patients were being monitored for a diagnosis of Type 2 DM, and 69.6% had another chronic disease. The ratio of the patients who experienced diabetes-related complications was 52.5%. While the HbA1c values constantly change among 44.3% of the patients with DM, the mean duration of disease was 11.25 ± 7.57 years (Table 2).

**Table 1**  
Demographic characteristics of the patients (n = 316).

	n	%	
Age (X ± Sd): 54.82 ± 13.73	18–40	40	12.7
	41–60	174	55.1
	61 and above	102	32.3
Gender	Female	178	56.3
	Male	138	43.7
Level of education	Illiterate	90	28.5
	Primary school	162	51.3
	High school and above	64	20.3
Working status	Working	218	69.0
	Not working	98	31.0
Total	316	100	

**Table 2**  
Medical characteristics of the patients (n = 316).

		n	%
Type of DM	Type 1 <sup>a</sup>	42	13.3
	Type2 <sup>b</sup>	274	86.7
Another Chronic Disease	Yes	220	69.6
	No	96	30.4
Complication	Yes	166	52.5
	No	150	47.5
HbA1c <sup>c</sup> values	Within the person's target range	70	22.2
	Not within person's target range	106	33.5
	Constantly change	140	44.3
Duration of illness (X ± Sd): 11.25 ± 7.57	1–10 year	178	56.3
	11–20 year	104	32.9
	21 year and above	34	10.8
Total		316	100

<sup>a</sup> Type 1 diabetes: the body can no longer produce the insulin it needs.

<sup>b</sup> Type2 diabetes: the body is able to produce insulin but becomes resistant so that the insulin is ineffective.

<sup>c</sup> HbA1c: HbA1c (glycated haemoglobin) reflects average plasma glucose over the previous eight to 12 weeks. HbA1c uses as a diagnostic test for diabetes and as for assessing glycaemic control in people with diabetes.

**Table 3**  
Features associated with complementary medicine use.

		n	%
CM usage	Yes	136	43.0
	No	180	57.0
Methods of CM	Herbal products	132	97.0
	Using Musket	2	1.5
	Hijama	2	1.5
Purpose of use <sup>a</sup>	Trying because of a suggestion	100	73.5
	Reduce illness effects	12	8.8
	Contributing to treatment	80	58.8
	to control blood glucose levels	118	86.8
Applied stage to CM	When diagnosed	18	13.2
	Before treatment	6	4.4
	During treatment	112	82.4
Effect of CM	Get benefit	54	39.7
	not get any benefit	78	57.3
	Uni deaed	4	2.9
Side effect related to CM	Yes	24	17.6
	No	112	82.4
Cost of CM	Cheap	110	80.9
	Expensive	20	14.7
	Free	6	4.4
Leave Medical Treatment	Yes	30	22.1
	No	106	77.9
Used Herbal Products <sup>a</sup>	Cinnamomum Verum <sup>b</sup>	34	25.0
	Olea europaea	30	22.1
	Nigella sativa	21	15.4
	Urtica dioica	19	14.0
	Other	54	39.7

<sup>a</sup> Marked multiple chests.

<sup>b</sup> Cinnamomum Verum: cassia or ceylon cinnamon.

**Table 4**  
Comparison of CM usage according to some characteristics of patients.

		CM usage		X <sup>2</sup>	p
		Yes	No		
		n	%		
Age	18–40	18	(13.2%)	0.082	.960
	41–60	74	(54.4%)		
	61 and above	44	(32.4%)		
		58	(32.2%)		
Gender	Female	74	(54.4%)	0.357	.550
	Male	62	(45.6%)		
Level of education	Illiterate	36	(26.5%)	3.344	.188
	Primary school	66	(48.5%)		
	High school and above	34	(25.0%)		
		30	(16.7%)		
Working status	Yes	94	(69.1%)	0.002	.965
	No	42	(30.9%)		
DM type	Type 1	18	(13.2%)	0.001	.980
	Type 2	118	(86.8%)		
Another Chronic Disease	Yes	98	(72.1%)	0.671	.413
	No	38	(27.9%)		
Complication	Yes	82	(60.3%)	5.769	.016*
	No	54	(39.7%)		
HbA1c values	Within the person's target range	20	(14.7%)	10.124	.006*
	Not within person's target range	56	(41.2%)		
	Constantly change	82	(60.3%)		
		80	(44.4%)		
Duration of illness	1–10 year	70	(51.5%)	2.302	.316
	11–20 year	50	(36.8%)		
	21 year and above	16	(11.8%)		
		18	(10.0%)		

\*p < 0.05.

43.0% of the patients used CM, and 97.0% these used herbal products. 86.8% of the patients who used CM preferred these methods to control blood glucose levels. It was found that 82.4% of the patients who used CM used them along with their treatment and continued to use them. 57.3% stated that they did not get any benefit from the method they used, and 82.4% said they did not experience complications related to CM. 80.9% of CM users tried inexpensive method. The most frequently used product among herbal products was stick cinnamon (ceylon or cassia cinnamon) by 25.0% (Table 3).

It was found that CM usage was more common among the patients who experienced DM-related complications (60.3%) (p = 0.016). Additionally, while it was found that the patients who had variable HbA1c values used CM more (60.3%), the difference between the groups was statistically significant (p = 0.006) (Table 4).

The differences based on the patients' age, sex, education and employment statuses, economic statuses, DM types, state of having another chronic disease and duration of diabetes were not statistically significant (p > 0.05) (Table 4).

#### 4. Discussion

The findings of the study which was conducted to measure the frequency, type, purpose of complementary medicine use among people with diabetes mellitus are discussed below in the light of the literature.

In many studies conducted in developed countries, the most likely users of CM were affluent, well-educated, middle-age, white females [16,17]. There was no distinct characteristic in overall CM users from Turkey. The CM usage rate of the patients was on a medium level (43.0%). Previous studies report different prevalences of CM usage in people with chronic disease (Usage of CM rates in these studies ranges from 25% to 62%) [4,5,11,18,19]. It is believed that these differences were caused by the cultural characteristics of the geographies and beliefs about CM.

It was found that the patients mostly preferred herbal drugs as a method of CM. Previous studies have indicated that herbal therapies were the most used methods. In their study in Lebanon, Naja et al. found that herbal drugs were the most frequently preferred method among CM methods for people with diabetes [5]. In their study with patients who had hematologic tumors, Assaf et al. found that herbal drugs were used frequently [20]. In their study, Kaynak and Polat found that people with diabetes used herbal drugs the most frequently [6]. These results showed that herbal medicine usage was common among the people with chronic diseases.

Recently there has been a positive tendency concerning the use of the herbal medicine in treating chronic diseases, while this therapeutic approach has been the only choice in the developing countries of the world. A considerable number of patients that are suffering from diabetes turn to self-medication using medicinal plants, preparations, and medicine.

In our study, the increase of internet usage in Turkey, easy access to the CM method, the lack of effective modern medical treatment or the occurrence of side effects may explain the increased utilization rate. In addition, religion, lifestyle, culture and knowledge about local herbs may be a significant factor in CM use of people with diabetes Turkey [21].

The majority of the patients who used CM used these practices for controlling blood glucose levels through their treatment. The studies in the world and Turkey indicate similar results [4,6,13,18,22,23]. The use of more CM by patients who want to controlling blood glucose is due to the effects of glycemic control on the prognosis of the diabetes and the development of complications [2,6]. This also explains our finding that patients with variable HbA1c values have a higher probability of using CM [23,24].

In this study, it was seen that CM usage was more prevalent among patients who experienced DM-related complication [6]. These findings showed that the patients who could not achieve control over their blood glucose levels and those who experienced DM-related complications more were more likely to try different methods.

The majority of the patients in this study stated that they did not reach their goals about use of CM. Some previous studies indicated that the majority of the people with diabetes reach their goals about the CM method they used [4,6,23]. Ceylan et al. on the other hand, reported that people with diabetes who used CM did not reach their goals [15]. It is believed that this difference in study results was caused by the inadequate knowledge of the patients regarding CM and their usage of CM to eliminate complications rather than for treatment.

According to this study, we can say that because of the chronic nature of diabetes, many people in Turkey turn to CM to assist them in coping with complication of disease and controlling the blood glucose.

#### 4.1. Limitation of the study

A number of shortcomings in this study are worth mentioning. First, and most importantly, it was conducted with a small sample and at only one hospital. It may be recommended to conduct the study with larger samples. Second, it is acknowledged that a comparison of rates of CM use among people with diabetes across different studies is limited due to the differences in the definitions and inclusions/exclusions of CM therapies in each study. However, these will not affect our findings. Third, recall bias might have been experienced by some patients especially that many of them were asked about their recent and life

time use of CM therapies. Finally, although data collection involved well-trained interviewers, it cannot be assured that patients were able to comprehend all the questions in the survey instrument.

## 5. Conclusion

As a result of the study, it was determined that CM usage was prevalent among the patients. The most frequently used CM method was herbal therapy. The majority of patients lacked an appropriate awareness of potential risks of herbs. There is a need for greater information to be made available about possible adverse effects. We found that the people with diabetes tried CM because of a suggestion. And also we found that the use of CM was more common in patients with poor metabolic control. Therefore, healthcare professionals must assess use of CM and provide suitable counseling. Further analysis and in vivo studies may help in discovering of herbal therapy as a source of an effective or dangerous CM. The findings in this study can be used to improve healthcare professional awareness, patient assessment, healthcare professional and patient education, and clinical research.

### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ctcp.2019.06.007>.

### Conflicts of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Source of funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

### References

- [1] J.E. Shaw, R.A. Sicree, P.Z. Zimmet, Global estimates of the prevalence of diabetes for 2010 and 2030, *Diabetes Res. Clin. Pract.* 87 (2010) 4–14, <https://doi.org/10.1016/j.diabres.2009.10.007>.
- [2] L. Club, IDF and Lions Club International: Working Together to Tackle Diabetes, (2018), p. 65.
- [3] B. Kara, Self-rated health and associated factors in older Turkish adults with type 2 diabetes: a pilot study, *J. Transcult. Nurs.* 28 (2017) 40–47, <https://doi.org/10.1177/1043659615601484>.
- [4] Ö. Küçüküçüclü, S. Kızılcı, H. Mert, Ö. Uğur, D.B. Besen, E. Ünsal, Complementary and alternative medicine use among people with diabetes in Turkey, *west, J. Nurs. Res.* 34 (2012) 902–916, <https://doi.org/10.1177/0193945910387165>.
- [5] F. Naja, B. Anouti, H. Shatila, R. Akel, Y. Haibe, A. Tfyali, Prevalence and correlates of complementary and alternative medicine use among patients with lung cancer: a cross-sectional study in beirut, Lebanon, evidence-based complement, *Altern. Med.* (2017) 1–11, <https://doi.org/10.1155/2017/8434697> 2017.
- [6] İ. Kaynak, Ü. Polat, The use of complementary and alternative therapies of patients with diabetes mellitus and their relationship with diabetes attitudes, *J. Gene Med.* 27 (2) (2017) 56–64.
- [7] M.J. Verhoef, L.G. Balneaves, H.S. Boon, A. Vroegindewey, Reasons for and characteristics associated with complementary and alternative medicine use among adult cancer patients: a systematic review, *Integr. Cancer Ther.* 4 (2005) 274–286, <https://doi.org/10.1177/1534735405282361>.
- [8] H.Y.A. Chang, M. Wallis, E. Tiralongo, Use of complementary and alternative medicine among people with type 2 diabetes in taiwan: a cross-sectional survey, evidence-based complement, *Altern. Med.* 2011 (2011), <https://doi.org/10.1155/2011/983792>.
- [9] D. Kumar, S. Bajaj, R. Mehrotra, Knowledge, attitude and practice of complementary and alternative medicines for diabetes, *Publ. Health* 120 (2006) 705–711, <https://doi.org/10.1016/j.puhe.2006.04.010>.
- [10] M. Wazaify, I. Alawwa, N. Yasein, A. Al-Saleh, F.U. Afifi, Complementary and alternative medicine (CAM) use among Jordanian patients with chronic diseases, *Complement. Ther. Clin. Pract.* 19 (2013) 153–157, <https://doi.org/10.1016/j.ctcp.2013.03.001>.
- [11] N.D.U. Saxenai Nidhi, K.S. Raj, Arvind Kumar, Chhavi Saxena, C.R. Saxena, Mona Saxena, The use of complementary and alternative medicine therapies in type 2 diabetic patients in Mexico, *Diabetes Care* 26 (2003) 2470.

- [12] M.S. Ali-Shtayeh, R.M. Jamous, R.M. Jamous, Complementary and alternative medicine use amongst Palestinian diabetic patients, *Complement. Ther. Clin. Pract.* 18 (2012) 16–21, <https://doi.org/10.1016/j.ctcp.2011.09.001>.
- [13] M. Tan, O. Uzun, F. Akçay, Trends in complementary and alternative medicine in eastern Turkey, *J. Altern. Complement. Med.* 10 (2004) 861–865, <https://doi.org/10.1089/acm.2004.10.861>.
- [14] N. Inanç, B. Çiçek, H. Sahin, M. Bayat, S. Tasci, Use of herbs by the patients with diabetes in Kayseri, Turkey, Pakistan, *J. Nutr.* 6 (2007) 310–312, <https://doi.org/10.3923/pjn.2007.310.312>.
- [15] S. Ceylan, Ö. Azal, A. Taşlipinar, T. Türker, C.H. Açikel, M. Gulec, Complementary and alternative medicine use among Turkish diabetes patients, *Complement, Ther. Med.* 17 (2009) 78–83, <https://doi.org/10.1016/j.ctim.2008.07.003>.
- [16] F.V. O'Callaghan, N. Jordan, Postmodern values, attitudes and the use of complementary medicine, *Complement, Ther. Med.* 11 (2003) 28–32, [https://doi.org/10.1016/S0965-2299\(02\)00109-7](https://doi.org/10.1016/S0965-2299(02)00109-7).
- [17] E. Ernst, Prevalence of use of complementary/alternative medicine: a systematic review, *Bull. World Health Organ.* 78 (2000) 258–266, <https://doi.org/10.1590/S0042-96862000000200015>.
- [18] Ş.F.N. Oksel Esra, COMPLEMENTARY and alternative therapy method that patients' use IN diabetes mellitus, *ege üniversitesi hem? Irelik Yüksek Okulu Derg.* 25 (2009) 27–36.
- [19] E.A. Ryan, M.E. Pick, C. Marceau, Use of alternative medicines in diabetes mellitus, *Diabet. Med.* 18 (2001) 242–245, <https://doi.org/10.1046/j.1464-5491.2001.00450.x>.
- [20] A.M. Assaf, R.N. Haddadin, N.A. Aldouri, R. Alabbassi, S. Mashallah, M. Mohammad, Y. Bustanji, Anti-cancer, anti-inflammatory and anti-microbial activities of plant extracts used against hematological tumors in traditional medicine of Jordan, *J. Ethnopharmacol.* 145 (2013) 728–736, <https://doi.org/10.1016/j.jep.2012.11.039>.
- [21] G. Özçelik, D. Toprak, Bitkisel tedavi neden tercih ediliyor? Why is phytotherapy preferred? *Ankara Med J, Cilt.* 15 (2015) 48–58, <https://doi.org/10.17098/amj.05190>.
- [22] S.M. Ching, Z.A. Zakaria, F. Paimin, M. Jalalian, Complementary alternative medicine use among patients with type 2 diabetes mellitus in the primary care setting: a cross-sectional study in Malaysia, *BMC Complement Altern. Med.* 13 (2013), <https://doi.org/10.1186/1472-6882-13-148>.
- [23] H.Z. Huri, G.T.P. Lian, S. Hussain, R. Pendek, R.T. Widodo, A survey amongst Complementary Alternative Medicine (CAM) users with type 2 diabetes, *Int. J. Diabetes Metabol.* 17 (2009) 9–15.
- [24] S.S. Hasan, W.C. Loon, K. Ahmadi, S.I. Ahmed, N.I. Bukhari, Reasons, perceived efficacy and factors associated with complementary and alternative medicine use among Malaysian patients with diabetes mellitus, *Br. J. Diabetes Vasc. Dis.* 11 (2011) 92–98, <https://doi.org/10.1177/1474651410398367>.