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RESEARCH ARTICLE

Investigation of attitude, awareness, belief, and practice of complementary and alternative medicine among type 2 diabetic patients: a cross sectional study

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Abstract

Objective This study aimed to evaluate the awareness, attitude, belief, and practice of complementary and alternative medicine (CAM) among type 2 diabetes patients.

Methods This cross-sectional study was conducted on 1000 type 2 diabetic patients in 2019. The stratified sampling method was used for selecting samples from those who had the inclusion criteria. Data were analyzed using SPSS 24 software.

Results In this study, the mean (standard deviation) of attitude score was 28.21 (3.65) (out of 45), and 64.86 % of patients had a positive attitude towards using CAM. Most of the patients (71.56 %) reported that having very little awareness of CAM modalities. The most commonly used CAM included nutritional therapy (97.1 %), exercise (93.3 %), and vitamin supplements (24.1 %). The most effective CAM modalities from the perspective of patients were nutritional therapy (36.38 %), herbal medicines (35.12), and exercise (21.53), respectively. Results showed that participants getting information about CAM from healthcare providers (58.6 %), internet (55.6 %), friends (36 %), and educational manuals (25.7 %), respectively. The most important reasons for diabetic patients to use the CAM were the treatment of the disease (39.6 %), fear of the side effects of chemical drugs (34.9 %), and increased body energy and ability (9.1 %).

Conclusions The results showed that patients have a positive attitude, and most of them have experience of using CAM. However, most patients report that they have rather little awareness in this field. Thus, healthcare providers must provide patients with the necessary information so that these modalities are used correctly.

Keywords CAM · Type 2 diabetes mellitus · Awareness · Attitude

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Introduction

Complementary and alternative medicine (CAM) is a group of different medical systems and health care, practices, and products that are not currently recognized as part of modern medical practice health [1]. Factors such as little side effects, reduce disease symptoms, low cost, and easy to use has caused that patients tend to use CAM modalities [2, 3]. The most common use of the CAM among people is for chronic pains and illnesses [4] and these modalities are used for people with chronic diseases such as type 2 diabetes [5–7].

There are now about 150 million people around the world with type 2 diabetes, and it is predicted to reach 300 million by 2045 [8]. Patients with diabetes are at higher risk of developing diabetes complications, such as amputation, vision problems, cardiovascular attacks, or renal failure, in comparison to healthy people [9, 10]. Type 2 diabetes is a chronic illness that needs careful monitoring of blood sugar, modern medicine, a

healthy diet, regular exercise, and ideal weight [11–13]. Those with chronic diseases (such as type 2 diabetes) often consult with physicians about CAM or use their awareness of the field for self-treatment and disease management [14].

There are many reasons for patients with type 2 diabetes to use CAM to monitor their blood sugar. Its lower costs, safety, fewer side effects, greater control over the treatment, side effects of chemical drugs in the treatment of chronic diseases, health improvement/well-being, and difficult access to physicians are some of the reasons. As the prevalence of chronic diseases with high disease burden, especially diabetes, is considered to be an important public health issue, the use of CAM modalities is also increasing [15, 16].

The results of an Australian study on diabetic patients showed that 30 % of patients use CAM to treat their disease [15]. Based on the results of the study in 2016, the prevalence of using CAM modalities among diabetic patients was 30.5 % [14]. The results of a study in Iran on type 2 diabetic patients showed that 85.8 % of patients use CAM [17]. The results of an Iranian study of patients with type 2 diabetes showed that 85.8 % of them use CAM [18]. Due to the use of CAM modalities by type 2 diabetic patients to treat or reduce the complications of their disease, it is necessary to investigate the status of their awareness, attitude, and performance about CAM modalities so that CAM modalities are not used in the wrong way and without a doctor's prescription. Therefore, the purpose of this study was to investigate the status of awareness, attitude, belief, and practice of CAM among type 2 diabetes patients.

Methods

This cross-sectional analytic study was conducted on 1000 type 2 diabetes mellitus in Iran. Information was collected from April to September 2019.

Sample size and sampling method

According to the previous study [17] and considering the 95 % confidence level, 80 % test power, proportion 0.36, and accuracy 0.03, the required sample size was calculated based on the formula below 1000 subjects.

$$n = \frac{\left(z_1 - \frac{\alpha}{2}\right)^2 p^{(1-p)}}{(d)^2}$$

In this study, participants were selected by stratified sampling method. First, determine the number of health centers and the population of each center, and each health center was considered as a category. Then, a simple random sampling method was used to selected participants from each center based on its population. The researchers referred to health centers to collect information, and after providing complete explanations about the study, the questionnaire was given to them and was completed as a self-report. It should be noted that the questionnaires of those who could not read and write, were completed by the interviewer. Before collecting information, written consent was obtained from all individuals, and they were assured that their information would be kept confidential. Inclusion criteria were the minimum of one year passed since the diagnosis of type 2 diabetes, the satisfaction of participants to enter the study, and signing a written consent, being resident of Sabzevar city. The incompleteness of the questionnaire information was considered as an exclusion criterion in this study.

Instruments

The data collection tool consisted of four sections of demographic, attitude, awareness, and practice.

Demographic section This section included questions such as age, education level, gender, age of onset of diabetes, duration of disease, information resources related to CAM modalities, occupation status, suggesting CAM modalities to others and the most important reasons for using CAM.

Attitude section This section included nine questions that assessed an individual's attitude towards CAM on a 5-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree) (lowest score = 9, highest score = 45). Chang measured the validity and reliability of this questionnaire, and its Cronbach's alpha was obtained as 0.93 [19].

Awareness section This section examined people's awareness of the 15 conventional CAM modalities in Iran (including acupuncture, music therapy, herbal medicines, nutritional therapy, hypnosis, massage therapy, magnetic therapy, meditation, yoga, vitamin supplements, energy therapy, exercise, leech therapy, cupping therapy, hydrotherapy) were assessed on a 5-point Likert scale (poor, moderate, good, very good, no awareness) (lowest score = 15, highest score = 75).

Section of patients' beliefs about CAM effectiveness This section examines patients' beliefs about the effectiveness of the 15 CAM modalities on a 5-point Likert scale (poor, moderate, effective, very effective, ineffective).

Use of CAM section This section examined how many people use the 15 CAM modalities on a daily, weekly, monthly, and that "I have not used so far".

To examine the face validity of the questionnaire, it was given to the expert's group, and the required corrections were made. To examine the reliability of the questionnaire, it was given to 13 target groups, and Cronbach's alpha for attitude

Table 1 Demographic characteristics and their relationship with the rate of use of CAM among type 2 diabetic patients

Demographic characteristic		Data (n = 1000)		Attitude	P-value	Awareness	P-value	Use of CAM n(%)		P-value
		n	%	Mean(SD)		Mean(SD)		Yes	No	
Gender	Female	492	49.2	28.27(369)	0.637*	25.19(2.32)	0.178*	462(93.9)	30(6.10	0.527#
	Male	508	50.8	28.16(3.67)		25.39(2.42)		471(92.7)	37(7.3)	
Education level	Elementary	136	13.6	27.85(3.400	0.036**	25.48(2.28)	0.558*	125(91.9)	11(8.1)	0.280#
	Diploma	642	64.2	28.11(3.75)		25.24(2.40)		605(94.2)	37(5.8)	
	Academic	222	22.2	28.75(3.44)		25.32(2.37)		203(91.4)	19(8.6)	
Occupation	Housewife	391	39.1	28.00(3.690	0.321**	25.41(2.44)	0.309**	380(97.2)	11(2.8)	0.035#
	Employed	149	14.9	28.39(3.420		25.37(2.29)		140(94)	9(6)	
	Self-employed	460	46	28.34(3.68)		25.17(2.34)		451(98)	9(2)	
The age of diabetes begins	≤40	506	50.6	28.60(3.610	0.001*	25.26(2.40)	0.694*	489(96.6)	17(3.4)	0.453#
	>40	494	49.4	27.82(3.650		25.32(2.35)		482(97.6)	12(2.4)	
Diabetes duration (mean years)	≤ 5	390	39	28.33(3.57)	0.516**	25.21(2.33)	0.060**	376(96.4)	14(3.6)	0.099#
	6-10	423	42.3	28.06(3.63)		25.49(2.43)		409(96.7)	14(3.3)	
	>10	187	18.7	28.32(3.83)		25.03(2.32)		186(99.5)	1(0.5)	
Recommend CAM modalities to others or your friends	Yes	820	82	28.14(3.560	0.199*	25.34(2.37)	0.149*	799(97.40	21(2.6)	0.215#
	No	180	18	28.56(4.01)		25.06(2.39)		172(95.6)	8(4.4)	
If using CAM modalities, whose advice has been most effective?	Family	160	16	27.94(3.88)	0.061**	25.26(2.27)	0.197**	157(98.1)	3(1.9)	0.057#
	Friends	228	22.8	28.78(3.650		25.28(2.18)		220(96.5)	8(3.5)	
	Health personnel or physician	225	22.5	28.17(3.340		25.03(2.38)		221(98.2)	4(1.8)	
	Your own opinion	383	38.3	28.00(3.66)		25.48(2.51)		370(96.6)	13(3.4)	
	Media (TV, Radio, Internet, etc.)	4	0.4	30.25(5.90)		24.25(2.21)		3(75)	1(25)	
See diabetic foot ulcers in others	Yes	522	52.2	28.33(3.600	0.309*	25.34(2.46)	0.515*	503(94.40	19(3.60	0.187#
	No	478	47.8	28.09(3.70)		25.24(2.28)		468(97.90	10(2.1)	
Having diabetes complications	Yes	528	52.8	28.10(3.72)	0.318*	25.28(2.38)	0.887*	512(97)	16(3)	0.852#
	No	472	47.2	28.34(3.57)		25.30(2.37)		459(97.20	13(2.8)	

* Independent Samples t- test, ** One-way ANOVA, # Chi-Square

and awareness sections was obtained as 0.79 and 0.90, respectively. Data analysis was performed using SPSS software version 24 and inferential statistics (Independent-samples t-test, One-way ANOVA, and Chi-square) at a significance level of less than 0.05.

Results

This study was conducted on 1000 type 2 diabetic patients. The mean (standard deviation) age of participants was 49.07 (8.03). Participants in this study included of 49.2 % female (n = 492) and 50.8 % male (n = 508). All the participants were married. Most of them (n = 642, 64.2 %) had a diploma degree. Also, most of the participants were self-employed (n = 460, 46 %) and housewives (n = 391, 39.1 %). About 51 % (n = 506) of participants reported that their diabetes disease started begins at the age of less than 40 years old and 42.3 % (n = 423) stated having diabetes disease for 6 to 10 years. In this study, 82 % (n = 820) of participants stated that they had suggested CAM modalities to other people or friends, and 38.3 % of them (n = 383) used CAM based on their personal opinion (Table 1).

The mean (standard deviation) attitude score was 28.21 (3.65) (points from 45) and 64.86 % of patients had a positive attitude towards using CAM. Based on the results of Tables 2 and 96.4 % (n = 964) of participants believed that the doctor or health care staff opposes with use of CAM, and 95.8 % (n = 958) of them believed that health care professionals should talk to their patients about CAM, Also, 93.3 % (n = 933) of patients believed that using CAM makes them feel better (Table 2).

Based on the results of Table 3, the mean (standard deviation) awareness score was 25.29 (2.37) (points from 75) and most of the patients (71.56 %) reported that having very little awareness of CAM modalities. Also, the results of Table 3 showed that the most effective CAM modalities from the patients' perspective were nutritional therapy (36.38 %), herbal medicines (35.12 %), and exercise (21.53 %). The most commonly used CAM modalities were nutritional therapy (97.1 %), exercise therapy (93.3 %), vitamin supplements (24.1 %), and herbal medicine (21.9 %). Also, the least used CAM modalities were leech treatment (3.1 %), hydrotherapy (3.1 %), and cupping therapy (5.4 %), respectively (Fig. 1). In this study, 87.9 % (n = 879) daily, 7.6 % (n = 76) weekly, and 1.6 % (n = 16) monthly were using nutritional therapy. Vitamin supplements were used by 2.7 % (n = 27) in a daily, 4.5 % (n = 45) weekly, and 16.9 % (n = 169) monthly. Also, exercise therapy was

Table 2 Attitude of diabetic type 2 diabetic patients towards CAM

Items	Level of attitude n (%)					Mean (SD)	Range of score
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree		
1. I think using complementary medicine makes me feel better	21(2.1)	34(3.4)	12(1.2)	322(32.2)	611(61.1)	28.21 (3.65)	9–45
2. I think using complementary medicine can improve some of my symptoms	185(18.5)	162(16.2)	50(5)	236(23.6)	367(36.7)		
3. I think using complementary medicine can easily control my diabetes	523(52.3)	370(37)	0	55(5.5)	52(5.2)		
4. Using complementary medicine can prevent the complications of diabetes in me	141(14.1)	102(10.2)	13(1.3)	300(30)	444(44.)		
5. In my opinion, the use of complementary medicine along with chemical drugs are dangerous for the body	477(47.7)	338(33.8)	22(2.2)	64(6.4)	99(9.9)		
6. I think that using complementary medicine can hurt my body.	207(20.7)	153(15.3)	43(4.3)	241(24.1)	356(35.6)		
7. The doctor or health care staff opposes my use of complementary medicine	9(0.9)	14(1.4)	13(1.3)	484(48.4)	480(48)		
8. In my opinion, I do not have enough knowledge to choose the correct complementary medicine	107(10.7)	91(9.1)	27(2.7)	375(37.5)	400(40)		
9. Health care professionals should talk to their patients about complementary medicine	7(0.7)	11(1.1)	24(2.4)	487(48.7)	471(47.1)		

Table 3 Diabetic patients' Awareness and beliefs about the effectiveness of CAM modalities

CAM modalities	Awareness						Patients' beliefs about the effectiveness of CAM modalities				
	No awareness	Poor	Moderate	Good	Very good	Mean (SD)	Ineffective	Poor	Moderate	Effective	Very effective
	n(%)	n(%)	n(%)	n(%)	n(%)		n(%)	n(%)	n(%)	n(%)	n(%)
1. Acupuncture	752 (75.2)	143 (14.3)	93 (9.3)	12 (1.2)	0	25.29 (2.37)	125 (12.5)	505 (50.5)	237 (12.7)	78 (7.8)	55 (5.5)
2. Music therapy	908 (90.8)	92 (9.2)	0	0	0		878 (87.8)	69 (6.9)	22 (2.2)	20 (2)	11 (1.1)
3. Herbal medicine	0	0	155 (15.5)	343 (34.3)	502 (50.2)		0	14 (1.4)	36 (3.6)	87 (8.7)	863 (86.3)
4. Nutritional therapy	0	0	126 (12.6)	383 (38.3)	491 (49.1)		0	2 (0.2)	16 (1.6)	88 (8.8)	894 (89.4)
5. Hypnosis	880 (88)	109 (10.9)	11(1.1)	0	0		827 (82.7)	83 (8.3)	33 (3.3)	33 (3.3)	24 (2.4)
6. Massage therapy	883 (88.3)	96 (9.6)	21 (2.1)	0	0		828 (82.8)	72 (7.2)	50 (5)	33 (3.3)	17 (1.7)
7. Magnetic therapy	950 (95)	42 (4.2)	8 (0.8)	0	0		936 (93.6)	60 (6)	4 (0.4)	0	0
8. Meditation/Relaxation	946 (94.6)	47 (4.7)	7 (0.7)	0	0		910 (91)	78 (7.8)	12 (1.2)	0	0
9. Yoga	913 (91.3)	80 (8)	7 (0.7)	0	0		929 (92.9)	60 (6)	7 (0.7)	4 (0.4)	0
10. Vitamin supplements	865 (86.5)	68 (6.8)	67 (6.7)	0	0		91 (9.1)	237 (23.7)	529 (52.9)	108 (10.8)	35 (3.5)
11. Energy therapy	936 (93.6)	56 (5.6)	8 (0.8)	0	0		913 (91.3)	68 (6.8)	19 (1.9)	0	0
12. Exercise	404 (40.4)	251 (25.1)	230 (23)	74 (7.4)	41 (4.1)		58 (5.8)	15 (1.5)	114 (11.4)	284 (28.4)	529 (52.9)
13. Leech therapy	789 (78.9)	107 (10.7)	77 (7.7)	27 (2.7)	0		894 (89.4)	73 (7.3)	29 (2.9)	4 (0.4)	0
14. Cupping therapy	711 (71.1)	64 (6.4)	99 (9.9)	126 (12.6)	0		887 (88.7)	98 (9.8)	15 (1.5)	0	0
15. Hydrotherapy	798 (79.8)	110 (11)	92 (9.2)	0	0		443 (44.3)	300 (30)	185 (18.5)	43 (4.3)	29 (2.9)

used by 75.3 % (n = 753) daily, 13.3 % (n = 133) weekly, and 4.7 % (n = 47) monthly.

The results of Fig. 2 show that patients getting information about CAM modalities from healthcare providers (58.6 %), internet (55.6 %), friends (36 %), and educational manuals (booklets, pamphlets, brochures) (25.7 %). Results of Table 4 showed that the most important reasons for diabetic patients to used CAM modalities were disease treatment (39.6 %), fear of side effects of chemical drugs (34.9 %), and increased body energy and ability (9.1 %), respectively (Table 4).

Discussion

The purpose of this study was to evaluate the status of awareness, attitude, belief, and performance of type 2 diabetic patients toward CAM modalities. Based on the results of this study, most patients with type 2 diabetes usually use CAM. Also, most patients had a positive attitude towards using these modalities, but their awareness was very limited in this field.

Based on the results of this study, most of the patients used CAM modalities. The most commonly used modalities were nutritional therapy, exercise therapy, vitamin supplements, and herbal medicine, respectively. The least used modalities were leech therapy, hydrotherapy, and cupping therapy, respectively. In 2011, the results of a study on type 2 diabetes patients in Taiwan showed that 22.7 % of patients used CAM before diagnosis, and 61 % of patients used CAM after diagnosis and the most commonly used modalities after the diagnosis of the disease were nutrition supplements, herbal medicines and nutritional therapy [2]. The results of a similar study showed that 58 % of type 2 diabetic patients in Pakistan used the CAM and the most commonly used modalities by them were herbal medicine, nutritional therapy, and cupping [3]. In a study by Sheikhrabori, 88 % of patients reported that they've used at least one of the CAM modalities during the last year and the most commonly used modalities by them were herbal medicine and cupping therapy [20]. In a study by Mohamed in Qatar, 53 % of diabetic patients used the CAM modalities, and the most commonly used modalities were herbal powder, bitter gourd, and fenugreek [21]. Manya's study also found that 46 % of diabetic patients in Sydney have used CAM and that cinnamon has been used more commonly than other modalities [15]. Differences in the use of CAM modalities can be due to different attitudes and levels of awareness of people in different studies. On the other hand, the high use of some CAM modalities in other studies may be due to different cultural-religious beliefs of individuals and also their place of residence.

In the present study, most patients had a positive attitude toward using CAM. The results of a similar study on diabetic patients indicated that they have a positive attitude toward using CAM modalities for their disease [14]. The results of a study on type 2 diabetic patients showed that they had a positive attitude towards using CAM modalities and this positive attitude increased their use of CAM modalities [14]. A study conducted by Ching on Malaysian patients showed that patients had a positive attitude towards CAM and believed that using these modalities can help them better control the disease [22]. Considering that most of the people in the present study had used CAM, it seems that their positive attitude has made them more inclined to use CAM modalities.

The results of this study showed that most patients with type 2 diabetes reported that they had no awareness of CAM modalities and had only a little awareness in this field. A similar study of patients with type 2 diabetes in Taiwan showed that 63 % of patients had not enough information about the CAM modalities [2]. Most diabetic patients reported that they had heard something about CAM modalities [3]. A study conducted by Al-Eidi in 2016 showed that the awareness of most patients about CAM modalities is suitable [14]. Based on the results obtained in the present study,

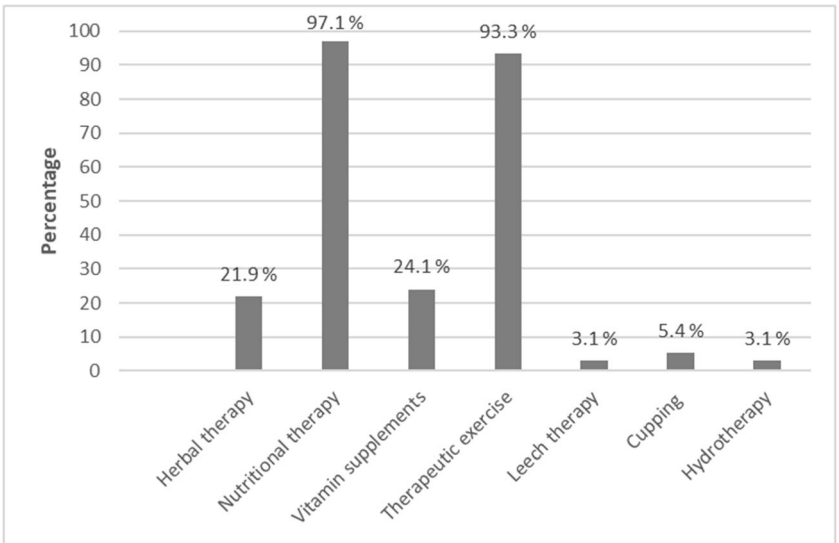

Fig. 1 Use of CAM modalities among type 2 diabetic patients

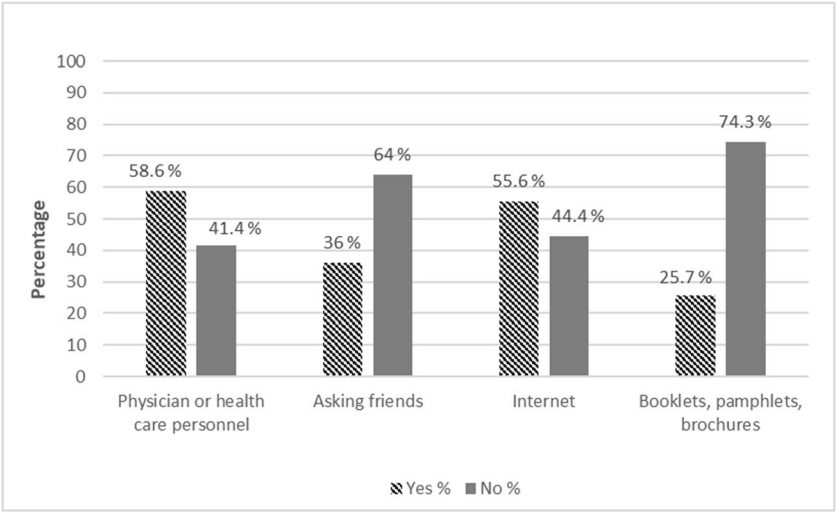

Fig. 2 The information resources about CAM modalities

most patients had a positive attitude towards CAM modalities and most of them used these modalities. However, they have insufficient awareness of these modalities, and arbitrary use of these modalities may endanger their health or interfere with the conventional medical treatments they receive, so it is necessary to provide them with training courses on CAM modalities.

In this study based on the patient's point of view, the most effective CAM modalities are nutritional therapy, herbal medicine, and exercise. In a study, 43 % of patients believed that the CAM modalities were useful for their disease [3]. In a similar study, diabetic patients reported that they used cupping therapy and acupuncture modalities to reduced blood sugar levels, and were effective [20]. In the Kumar study, about 50 % of patients reported that the use of CAM modalities was satisfactory for them [23].

In this study, most patients reported that getting information about the CAM modalities from healthcare providers, the internet, friends, and educational manuals, respectively. In a study in Taiwan, patients with diabetes reported that they had obtained information about the CAM modalities from family members, friends, and the media, respectively [2]. Based on the results of Mohamed's study, most patients reported that they obtained information about the CAM modalities from family, friends, and the media [21]. Also, Eidi's study showed that most diabetic patients for the getting of information on CAM modalities referred to friends, family, and the media, respectively [14].

In this study, the most important reasons for diabetic patients to use the CAM modalities were the treatment of the disease, fear of the side effects of chemical drugs, and increase the body's energy and ability, respectively. The results of another study showed that the most important reasons for patients use the CAM modalities were to reduce disease symptoms, maintain physical health, improve physical strength, directly control diabetes and treat diabetes complications [2]. In a study conducted in Pakistan in 2019, the most important reasons for patients to use CAM modalities were little side effects, helping control blood sugar, delaying physician visits, the cost of chemical drugs, poor patient-physician communication, and lack trust on modern chemical drugs [3]. Based on the results of Sheikhrabori's study, the most important reason for patients to use CAM modalities was to lower their blood sugar [20]. In a study conducted by Manya on Sydney patients, it was reported that the most important reason for patients to use the CAM modalities was the treatment of the disease [15]. Also, in the Al-Eidi study, diabetic patients pointed out that the most important reason for using the CAM modalities were fewer side effects, good control of diabetes, ease of use, and low cost [14]. Due to the sociocultural differences of each region, and different CAM modalities used in this study with other studies, one of the limitations of this study is to generalize the results to other regions and studies. Another limitation of the study was that the information was collected in a self-report and there may be some errors.

Table 4 Diabetic patients' reasons for the use of CAM

Items	n=1000	
	n	%
Treatment of the disease	396	39.6
Fear of the side effects of chemical drugs	349	34.9
Distrust of chemical drugs	20	2
Strengthen the immune system	12	1.2
No side effects	82	8.2
It's cheap and availability	50	5
Increased energy and ability of the body	91	9.1

Conclusions

Based on the results obtained, patients had a positive attitude toward using CAM, and most of them had the experience of

using one or more CAM modalities. However, most patients in this study reported that they had little awareness of CAM modalities. Therefore, due to the positive attitude of patients and their use of CAM modalities and their poor awareness in this field, it is necessary to provide the necessary information to the patients by health-care providers to prevent self-prescribing of these modalities. Also, it is necessary to use CAM in patients prescribed and supervised by health-care providers to prevent possible problems in patients.

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Compliance with ethical standards

Ethical consideration This study is based on a research project approved by the research council of Mashhad University of Medical Sciences with the code of ethics IR.MUMS.REC.1398.114. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Conflict of interest The authors declare that they have no conflicts of interest.

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