

ORIGINAL RESEARCH

Examination of Complementary and Supportive Practices and Self-efficacy Against Foot Ulcers in Diabetic Patients

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ABSTRACT

Context • Medical treatment is critical in the healing of diabetic foot ulcers. Diabetic patients in many countries have recently started using complementary and supportive practices.

Objectives • The study intended to examine the complementary and supportive medical practices and their self-efficacy against foot ulcers that can develop in diabetic patients.

Design • The research team conducted a cross-sectional and descriptive study.

Setting • The study took place at internal-medicine outpatient clinics at a hospital in Turkey.

Participants • Participants were 656 diabetes patients who came to the clinics between March and May 2021.

Outcome Measures • The research team collected data with a structured questionnaire and the Diabetic Foot

Care Self-efficacy Scale (DFCSES).

Results • Significant differences existed in gender, educational status, and average income level as well as between the (CAM) users and non-CAM. A statistically significant difference existed between users and non-users of CAM. Users' diabetes treatment type, going to regular doctor check-ups, having other chronic disease, having a foot problem, regularly doing leg and foot gymnastics, regularly doing foot examination and often doing foot examination.

Conclusions • The most popular products among CAM users were herbal products: Nigella sativa, Nigella sativa oil, cinnamon, and cinnamon oil. The mean scores for non-users of CAM were lower on the DFCSES. (*Altern Ther Health Med.* 2023;29(5):12-16).

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Diabetes is one of the most common chronic diseases in the world, and its rapid progression has propelled it to first rank among health issues that require precautions, earning it the name epidemic.¹ The International Diabetes Federation's (IDF's) current data on the prevalence of diabetes indicates that approximately 7-million people between the ages of 20 and 79 are diabetics in Turkey, accounting for approximately 15% of the total adult population.

Diabetes can cause many negative consequences in individuals, with diabetic foot being one of them.² Although diabetes is a leading cause of morbidity and mortality, it also brings many mental, physical, social, and economic problems to patients.³ Every diabetic patient has a 12-15% risk of developing a diabetic foot ulcer throughout his or her lifetime, and 50-70% of nontraumatic foot amputations are due to diabetes.¹⁻³ Of those amputees, 85% of them have ulcers prior to the amputation.³

The risk of death rises approximately 2.5 times in diabetic patients with fresh ulcers on their feet.⁴ Therefore, it's

critical for diabetics from diagnosis to acquire self-efficacy behaviors, such as adhering to their diets, exercising regularly, taking their medications, performing regular foot care, measuring their blood glucose, and attending health check-ups. Acquiring these behaviors can reduce the formation of diabetic foot ulcers.⁵

Medical treatment is critical in the healing of diabetic foot ulcers. Diabetic patients in many countries have recently started participating in complementary and supportive practices. Most healthcare professionals oppose these methods, but they are on the rise both globally and in Turkey.^{5,6} These methods are referred to as complementary, traditional, or integrative medicine when they cover a wide range of health practices that may or may not be part of the country's own customs and that aren't covered by the existing health system.⁶

An insufficient number of studies has reported on the products that patients have used to prevent or cure diabetic foot ulcers. Inappropriately and overused methods might lead to serious infections and result in foot or limb loss due to malpractice.⁷⁻⁹

The number of studies on the effectiveness of complementary and supportive medical practices that diabetic patients use to prevent foot ulcers is still limited. The current study intended to examine the complementary and supportive medicine practices and their self-efficacy against foot ulcers that may develop in diabetic patients.

METHODS

Participants

The research team conducted a cross-sectional and descriptive study, which took place at internal-medicine outpatient clinics at a hospital in Turkey. Potential participants were diabetic patients who came to the clinics between March and May 2021 and who had the potential to develop diabetic foot ulcers.

Potential participants were included in the study if they were: (1) 18 years old or older, (2) diagnosed with type 2 diabetes at least two years prior to the study's start, (3) volunteered to participate in the study, (4) used complementary and supportive methods as well as medical treatments to prevent the development of foot ulcers, and (5) had no cognitive disorders or hearing, comprehension, or speech impairments.

The research team adhered to both scientific and universal principles while conducting the study. Accordingly, the study took into account the principles of informed consent, autonomy, confidentiality, protection of confidentiality, equity, nonmaleficence, and kindness. The team obtained written consent from the participants and received the necessary permits for the usage of the scales in the study. Also, the team obtained approval from the Non-Invasive Research Ethics Committee of the Faculty of Health Sciences, Kafkas University (31.01.2021/81829502.903/9), and additionally, the necessary formal authorization from the hospital.

Procedures

Participants. The research team accepted all individuals who agreed to participate in the study, and therefore, used no sampling method.

Groups. The research team divided participants into two groups, CAM users and CAM non-users.

Data collection. The research team informed the accepted participants about the study during the data collection. The researchers gathered the data through face-to-face interviews, with the data being collected by having literate patients read and fill out the forms themselves or by the researchers reading the forms to illiterate patients. It took an average of 30-35 minutes to complete the forms.

Outcome measures. The research team collected data with a structured questionnaire and the Diabetic Foot Care Self-efficacy Scale (DFCSES).

Outcome Measures

Structured questionnaire. The structured questionnaire was prepared based on the research team's knowledge of the literature.²⁻⁹ The form consisted of questions on participants' sociodemographic characteristics, such as their ages, genders, places of residence, and educational levels; health conditions; and use of complementary and supportive treatments.

DFCSES. In 2005, Quarles developed this scale to determine to assess diabetic patients' self-efficacy, the self-perception of their own strengths in

carrying out diabetic-foot-care activities.¹⁰ The scale is of the Likert type and consists of nine items. The nine statements that comprise the scale are evaluated on an 11-digit visual scale, with 0 = I'm not sure at all and 10 = I'm very sure. The scores range from 0 to 10, with the lowest and highest scores of the scale being 0 and 100, respectively. Bicer and Enc adapted the scale into Turkish.¹¹ Cronbach's α value was 0.83 in the present study.

Statistical Analysis

Following data collection, the research team entered the data into the Statistical Package for the Social Science (SPSS) software version 22 for Windows ((SPSS, Version 22, IBM, USA). The team: (1) summarized the demographic and clinical data about the sample through descriptive statistical procedures; (2) made comparisons between the CAM users and non-users on each variable, using inferential statistics; (3) used definitive statistical methods—rate, mean, standard deviation, and frequency values—to evaluate the data; (4) used the independent sample t-test and the Mann-Whitney U tests to evaluate the quantitative data; and (5) used the chi-square test in the analyses of qualitative data. Significance was accepted at $P < .05$.

RESULTS

Participants

Table 1 shows that participants' mean age was 67.49 ± 11.22 . Significant differences existed in gender and work

Table 1. Demographic Characteristics of Participants Using CAM

Characteristics	CAM Use			χ^2/t	P Value
	Yes n = 465 n (%)	No n = 191 n (%)	Total n = 656 n (%)		
Gender					
Male	230 (49.46)	85 (44.50)	315 (48.02)	$t = 1.255$	$<.021^a$
Female	235 (50.54)	106 (55.50)	341 (51.98)		
Marital Status					
Married	240 (51.61)	75 (39.26)	315 (48.01)	$t = 1.075$	$>.147$
Single	225 (48.39)	116 (60.74)	341 (51.99)		
Educational Status					
Illiterate or primary school	31 (6.66)	15 (7.86)	46 (7.01)	$\chi^2 = 1.159$	$>.243$
Literate	83 (17.84)	66 (34.55)	149 (22.71)		
High school and higher	351 (75.50)	110 (57.59)	461 (70.72)		
Income Level					
Income is less than expenses	280 (60.21)	70 (36.64)	350 (53.35)	$\chi^2 = 1.220$	$>.236$
Income equals expenses	179 (38.49)	60 (31.41)	239 (36.43)		
Income is more than expenses	6 (1.30)	61 (31.95)	67 (10.22)		
Work Status					
Employed	245 (52.68)	81 (42.40)	326 (49.69)	$t = 2.399$	$<.017^a$
Unemployed	220 (47.32)	110 (57.60)	330 (50.31)		
Age					
Mean \pm SD	67.49 ± 11.22				
Min, Max	45, 105				

^a $P < .05$, indicating that significantly CAM users scored significantly gender and work status on the characteristics than the CAM non-users did

Abbreviations: CAM, complementary and alternative medicine.

Table 2. The Relationship Between Participants’ Clinical Characteristics and CAM Use

Characteristics	CAM Use			χ^2 / t	P Value
	Yes n = 465 n (%)	No n = 191 n (%)	Total n = 656 n (%)		
Diagnosis Duration					
1-5 years	138 (29.67)	50 (26.18)	188 (28.65)	$\chi^2 = 2.484$	>.289
6-10 years	158 (33.97)	94 (49.21)	252 (38.41)		
>11 years	169 (36.36)	47 (24.61)	216 (35.94)		
Diabetes Treatment Type					
OAD	149 (32.04)	32 (16.75)	181 (27.59)	$\chi^2 = 21.370$	<.000 ^a
Insulin	221 (47.53)	128 (67.02)	349 (53.20)		
OAD + insulin	95 (20.43)	31 (19.23)	126 (19.21)		
Do you regularly go to your doctor for check-ups?					
Yes	306 (65.80)	112 (58.63)	418 (63.71)	$t = 1.736$	<.083
No	159 (34.20)	79 (41.37)	238 (36.29)		
Have you ever been hospitalized for diabetes?					
Yes	345 (71.19)	142 (74.34)	487 (74.23)	$t = 0.040$	>.968
No	120 (28.81)	49 (25.66)	169 (25.77)		
Do you have any other chronic disease?					
Yes	156 (33.54)	93 (48.69)	249 (37.95)	$t = 3.662$	<.000 ^a
No	309 (66.46)	98 (51.31)	407 (62.05)		
Have you received training in foot care?					
Yes	236 (50.75)	146 (76.43)	382 (58.23)	$t = 1.102$	>.271
No	229 (49.25)	45 (23.57)	274 (41.77)		
If you had foot-care training, from whom?					
Doctor	239 (51.39)	85 (44.50)	324 (49.39)	$t = 1.259$	>.263
Nurse/midwife	226 (48.61)	106 (55.50)	332 (50.61)		
What do you do when you have a foot problem?					
I try to fix the problem with my own means	447 (96.12)	74 (38.74)	521 (79.42)	$\chi^2 = 5.172$	<.065
I immediately refer to a health care	8 (1.72)	65 (34.03)	73 (11.12)		
I do not care	10 (2.16)	52 (27.23)	62 (9.46)		
Do you do leg and foot gymnastics?					
Yes	365 (78.49)	69 (36.12)	434 (66.15)	$\chi^2 = 20.205$	<.000 ^a
No	100 (21.51)	122 (63.88)	232 (33.85)		
Do you regularly examine your feet?					
Yes	355 (76.30)	81 (42.40)	436 (66.46)	$t = 2.537$	<.011 ^a
No	110 (23.70)	110 (57.60)	220 (33.54)		
How often do you do your foot examination?					
Everyday	108 (23.24)	66 (34.55)	174 (26.5)	$\chi^2 = 11.187$	<.025 ^a
Once a week	147 (31.82)	50 (26.18)	197 (30.0)		
Once a month	146 (31.56)	58 (30.37)	204 (31.1)		
I don't do	64 (13.98)	17 (8.90)	81 (12.4)		

^a $P < .05$, indicating that CAM users scored significantly higher on the characteristics than the CAM non-users did

Abbreviations: CAM, complementary and alternative medicine; OAD, oral antidiabetes drugs.

status between the two groups ($P < .05$). No statistically significant difference existed between the groups regarding marital status, educational status, or income level ($P > .05$).

Clinical Characteristics and CAM Use

Table 2 shows that a statistically significant difference existed between the groups regarding diabetes treatment type ($P < .000$), presence of other chronic diseases ($P < .000$), regularity of performance of leg and foot gymnastics ($P < .000$), regularity of performance of foot examinations ($P < .011$), and frequency of foot examinations ($P < .025$).

Table 3. Characteristics of CAM Users (N = 465)

Variable	n (%)
Using CAM?	
Yes	465 (70.80)
No	191 (29.20)
How long have you used CAM?	
1-5 years	269 (57.84)
6-10 years	115 (24.73)
≥11 years	81 (17.43)
Why do you prefer CAM?	
CAM is useful	205 (44.08)
I don't believe to useful drugs	90 (19.35)
Advice from other patients	76 (16.34)
For support drug treatment	94 (20.23)
Where do you get the CAM?	
Pharmacists	65 (13.97)
Traditional healer	337 (72.47)
Family/friends	63 (13.56)
How often do you use CAM?	
Every day	179 (38.49)
Once a week	232 (49.89)
Once a month	54 (11.62)
Who advised you to use CAM?	
Social media/internet	68 (14.62)
Traditional healer	71 (15.26)
Friends	85 (18.27)
Herbalist	57 (12.25)
Diabetes patients with foot ulcers	184 (39.60)
Can help diabetes control with the CAM?	
Yes	375 (80.64)
No	90 (19.36)
Total	465 (100.00)

Abbreviations: CAM, complementary and alternative medicine.

No statistically significant differences existed between the groups regarding the diagnosis duration, regularity of checkups with the doctor, hospitalizations for diabetes, receipt of training in foot care, the source of that training if received it, and practices when have foot problems ($P > .05$).

Characteristics of CAM Users

Of the 656 participants, 465 (70.80%) used CAM and used 269 (57.84%) 1-5 years. CAM, 205 (44.08%) indicated that CAM was useful, 337 (72.47%) received CAM from a traditional healer, 232 (49.89%) used CAM once a week, 184

Table 4. CAM Herbal Products Used (N = 465). Participants gave multiple answers.

CAM Herbal Products	n (%)
Nigelle sativa	350 (53.3)
Ginger	130 (19.8)
Nigelle sativa oil	335 (51.0)
Tumeric	240 (36.5)
Garlic	265 (40.3)
Eucalyptus	210 (32.0)
Rosemary	135 (20.5)
Glass turpentine	157 (23.9)
Cinnamon	305 (46.4)
Juniper oil	254 (38.7)
Wild jasmine	209 (31.8)
Liquorice	144 (21.9)
Pomegranate flower	265 (40.3)
Cinnamon oil	295 (44.9)

Abbreviations: CAM, complementary and alternative medicine.

Table 5. Comparison of the Self-efficacy for Participants With Diabetes

	CAM Non-users n = 191 Mean ± SD	CAM Users n = 465 Mean ± SD	Total N = 656 Mean ± SD	t	P value
DFCSES	46.18 ± 12.01	58.67 ± 14.65	52.24 ± 13.33	2.578	P < .000 ^a

^aP < .000, indicating that CAM users scored significantly higher on the DFCSES than the CAM non-users did

Abbreviations: CAM, complementary and alternative medicine; DFCSES, Diabetic Foot Care Self-efficacy Scale.

(39.60%) received the advice to use CAM from diabetes patients with foot ulcers, and 375 (80.64 %) found that CAM helped control the diabetes (Table 3).

Herbal Products

Table 4 shows that the most popular products were herbal products. Of the 465 participants, 350 used Nigella sativa (53.30%), 335 Nigella sativa oil (51.0%), 305 cinnamon (46.40%), and cinnamon oil 295 (44.90%).

DFCSES

Table 5 shows that the overall mean score on the DFCSES was 46.18 ± 12.01. The mean score of CAM users was 58.67 ± 14.65, which was significantly higher than that of non-users at 52.24 ± 13.33 (P < .000).

DISCUSSION

When the research team compared participants' demographic characteristics and CAM, a statistically significant difference existed in those receiving complementary and supportive treatment based on gender and employment status (P < .005). This means that females and the unemployed were the predominant users of CAM.

When the studies were examined, use of CAM was reported to be widespread among female and unemployed patients.^{12,13} The study by Yildırım et al in 2018 indicated that the majority of diabetic patients using CAM were female.⁹ Ozcelik et al., found in their study that use of CAM was higher in women.¹⁴ Findings of the present study are similar to those of other studies.

When some characteristics of the patients who participated in the study and their use of CAM were compared, a statistically significant difference was found between people who administer insulin, attend regular medical checks, have another chronic condition, try to solve their foot problems on their own, do leg and foot exercise, and inspect regularly their feet once a week (P < .05). Radvan

et al underlined in their study that type 2 diabetes patients who used CAM attend medical checks regularly.¹⁵ In studies conducted in Saudi Arabia, Pakistan and Indonesia it was determined that CAM practitioners administered insulin and consisted of diabetic patients who had other chronic diseases.¹⁶⁻¹⁸ Vishnu et al stated in their study that CAM practitioners attended regular medical checks and exercised on a regular basis.¹⁹ The results of this study are similar to those found in the literature.

In this study, it was determined that most of the patients (70.80 %) used CAM, and newly diagnosed patients preferred CAM more since they believed that CAM method was beneficial and helped to manage diabetes. When the studies in Turkey were evaluated, it was found that the rate of using CAM ranged from 25 to 85%.²⁰ The studies conducted in Taiwan and China reported that approximately 61% of patients with T2DM used CAM after their initial diagnosis.²¹ It was found that the use of CAM among diabetic patients in the United States ranged from 31% to 57%, with 63 % in Bahrain, 62 % in Mexico, and 63.2 % in Maharashtra.²²⁻²⁴ Sari et al stated in their study that patients believe that CAM methods were easily accessible, inexpensive, and safe, and they could help to control diabetes and preserve physical health.¹⁸ Similar to the literature, the present study revealed that the patients used CAM methods alongside current medications and they preferred the methods as they believed they were useful.

This study revealed that most of diabetic patients procured the CAM method from traditional healers, they practiced it at least once a week, and they began the CAM method upon the advice of diabetic patients with foot ulcers, and most of them were satisfied with the method. In their study, Martin et al stated that patients used the methods upon the advice of other patients.²⁵ Alireza et al reported in their study that diabetic patients used CAM method at least twice a week and procured it through healers.²⁶ The study by Sari et al indicated that the CAM used by diabetic patients dropped their blood glucose

levels, reduced complications, and accordingly, the patients were satisfied.¹⁸ The results of this study are similar to those found in the literature. It was determined in this study that diabetic patients used medicinal herbs as a CAM method. People in Turkey have easy access to health care and pay no fees for medical expenses. Nevertheless, it is believed that complementary and supportive have been maintained to the present day due to the abundant plant diversity.

In this study, it was found that the majority of patients used nigella sativa, nigella sativa oil and cinnamon oil to eliminate foot ulcers. Similarly, Yıldırım et al determined in their study on patients with Type 2 diabetes that the most commonly used CAM methods in Turkey were nigella sativa, nigella sativa and cinnamon.¹⁸

When the literature is reviewed, they discovered that nigella sativa promoted weight loss and lowered HbA_{1c} levels as a result of its use in metabolic disorders, such as obesity, diabetes, and dyslipidemia.²⁷⁻³⁰ Similarly, cinnamon was reported to inhibit rapid spike of blood glucose and lower HbA_{1c} levels in diabetic patients.³¹ In another study, cinnamon was reported to boost metabolism, lower blood glucose levels, and improve metabolic parameters.³²⁻³⁵ In their study, Radwan et al reported that cinnamon and nigella sativa were among the herbal methods most commonly utilized by diabetic patients to lower their blood glucose levels.¹⁵ CAM is a frequently used method in studies on different chronic diseases in Turkey.^{36,37} The results of this study are similar to those found in the literature.

When the mean scores of the Diabetic Foot Care Self-Efficacy Scale were compared in this study, it was observed that the patients who did not use CAM method had higher mean scores. According to this result, it was found that patients who used CAM method had insufficient self-care when exercising diabetic foot care activities. When the literature was reviewed, it was observed that the majority of patients who used CAM method resorted to traditional methods when they have foot problems and they solved the problems themselves.³⁶ It is believed that patients who used CAM do not prioritize their self-care because they believe that the methods they use will not produce ulcers, make them feel good physically and spiritually, or heal their disease.

CONCLUSIONS

CAM use and reasons may differ according to the expectations and choices of the patients, the patient's sociocultural backgrounds and religious properties. In this study, the Self Efficacy for Patients with Diabetes who used CAM was lower than that in those that did not. In this study determined that CAM and supportive practices is quite common among diabetic patients. Although the CAM method is very common worldwide, more studies are needed.

AUTHORS' DISCLOSURE STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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