

Prevalence and predictors of using complementary and alternative medicine among diabetic patients in Taif city, Saudi Arabia

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ABSTRACT

Background: Saudi Arabia has the second-highest rate of diabetes in the Middle East. Herbal treatment is the most used complementary and alternative therapy among Saudi diabetic patients. Little is known about the use of complementary and alternative medicine among diabetic patients who reside in Taif city. **Method:** This study evaluated the magnitude and correlates of complementary and alternative medicine (CAM) use among diabetic patients attending diabetic clinics and primary healthcare in two governmental hospitals, namely, Prince Mansour Military Hospital (PMMH) and National Gourd Hospital (NGH) in Taif city. **Results:** CAM prevalence was 33.7%, of whom 87.3% did not consult a doctor before use and 43.2% had more than one source of information while 62.7% used more than one CAM method. Around 49.2% reported that it is very useful, and 72.9% did not notice any side effect from its use. In addition, 47.5% would recommend CAM to other diabetic patients. All (100%) reported using bitter apple, 66.1% reported using cinnamon, 55.1% used ginger, 35.6% took fenugreek, and 21.2% reported using Garlic as an only CAM. Female gender, family history, diabetic complications, and longer duration of diabetes were associated with the increased use of CAM. **Discussion and Conclusion:** CAM use by diabetic patients in Taif is prevalent. Health education and the safe use of CAM is much needed. Appropriate efforts from the government to integrate CAM into conventional diabetes treatment should be considered.

Keywords: Alternative, complementary, diabetic, predictors, prevalence, Saudi Arabia, Taif

Introduction

Diabetes mellitus (DM) was estimated to have affected 451 million people in 2017 worldwide, with a projection of 693 million by 2045.^[1] Diabetes affects over 34% of the Saudi population.^[2]

According to the World Health Organization (WHO), Saudi Arabia has the second-highest rate of diabetes in the

Middle East and the seventh highest in the world with an expected population of 7 million living with diabetes and more than 3 million with prediabetes.^[3,4] This presents an urgent and enormous public health issue.

Complementary medicine practices have numerous definitions. WHO defined the term traditional and complementary medicine (T and CM): “Traditional medicine is the total knowledge of health-related practices and skills based on indigenous beliefs and experiences,” while “complementary medicine is the various health-related practices that are not part of that country’s own tradition or conventional medicine.”^[5]

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Complementary therapies have been defined by the National Center for Complementary and Integrative Health (NCCIH) as “health approaches outside of the mainstream western medicine.” As of lately, the NCCIH classified complementary medicine into three classifications: natural products, mind and body practices, and other complementary health approaches.^[6]

The utilization of T and CM among diabetic patients worldwide has been reported to be between 18% and 72.8%. Most utilized complementary therapies were herbs, dietary supplements, nutritional counseling, spiritual healing, and relaxation techniques.^[7]

There is insufficient data to determine the prevalence of complementary and alternative medicine (CAM) use among Saudi diabetic patients who live in Taif city. Information related to prevalence of CAM utilization, the causes and modes for use, and patient’s disclosure of such use would help protect the health of patients, improve the patient-provider correspondence and coordination, and help incorporate CAM therapies into mainstream medicine.

Our study aimed to evaluate the magnitude and correlates of CAM use among diabetic patients attending diabetic clinics and primary healthcare in two government hospitals in Taif city, Saudi Arabia.

Methodology

This is a descriptive cross-sectional investigation conducted between February and June 2019 on diabetic patients attending primary health clinics of National Guards and Military Hospitals in Taif, Saudi Arabia. Systematic random sampling was used for recruiting adult diabetic patients, waiting for their turn to be seen by their family physician, on randomly selected days.

The survey questionnaire was carefully designed by the research team that included nursing staff, family physician, and diabetologist. The content validity of the questionnaire was confirmed by an expert panel of a physician. The original version of the questionnaire was written in English and subsequently translated to Arabic (since all of the patients spoke Arabic). The translated Arabic version was back-translated by a professional translator to ensure the parallel-form reliability of the questionnaire, to the grantee that all questions were properly translated, and to check the translation quality. The original and back-translated version was reviewed for consistency in meaning by two bilingual experts. A pilot study was conducted with 15 selected diabetic patients to ensure that the target population understood the questions and that the answers yielded the required data. Questionnaires were filled out through a face-to-face interview taking an average of 5–10 min to complete. Weekly meetings of the research team were held to ensure inter-rater reliability and adherence to data collection protocol.

The data were checked for completeness, and responses were coded and entered into the statistical package for the social

sciences (SPSS) software version 25 for windows. Frequencies and percentages were used to assess the qualitative variable (the prevalence, types, mode, and patterns of CAM). Chi-square and Mann-Whitney tests were used to chart comparisons of categorical and continuous variables between users and nonusers of CAM. The binary logistic regression analysis was used to analyze the independent predictors with its odds ratios for our binary outcome. The statistical significance was considered with a *P* value of <0.05.

Ethical approval was granted from the Regional Research and Ethics Committee in Taif and Alhada Armed Hospitals. The approval was granted on February 1st, 2019.

Results

In the present study, 54.6% constituted females. As per Table 1, the mean age of the participants was (60.37 ± 12.25 years), most of them were not educated (37.4%), not working (52.9%), married (98%), and most of them (62%) had an income less than 5000 INR. All the studied patients were of type 2 diabetes.

Moreover, Table 2 demonstrates that the mean age at diagnosis of diabetes among the participants was (45.6 ± 13.3 years), with 56% of the participants had a comorbid chronic disease. Around 39.7% had diabetes for 9 to 12 years, 66.3% had an FH of diabetes, and 40.6% were on both insulin and oral hypoglycemic pills for diabetes control. Of the participants, 58% had at least one diabetic complications (of them, the most common was the eye complications).

As for CAM use, the prevalence was 33.7% with 87.3%, not consulting doctor prior to CAM use. CAM use was mostly

Table 1: Descriptive data of the participants

Variable	No. (%)
Age (Mean±SD)	60.37±12.25
Gender	
Male	159 (45.4)
Female	191 (54.6)
Education	
Not educated	131 (37.4)
Basic (primary and preparatory)	97 (27.7)
Secondary	19 (5.4)
University and higher	103 (29.4)
Occupation	
Not working	185 (52.9)
Military	19 (5.4)
Retired	118 (33.7)
Employee	18 (5.1)
Others	10 (2.9)
Income	
<5000 INR	217 (62)
5000 <10000 INR	98 (25.4)
10000 <15000 INR	32 (9.1)
15000 INR and above	12 (3.4)
Marital status	
Married	343 (98)
Unmarried	7 (2)

Table 2: Clinical character of diabetes among studied patients (No: 350)

Variable	No. (%)
Age at diagnosis (Mean±SD)	45.6±13.36
Presence of another chronic disease	
Yes	196 (56)
No	154 (44)
Duration of diabetes	
less than 3 years	79 (22.6)
3-less than 6	73 (20.9)
6-less than 9	45 (12.9)
9-less than 12	139 (39.7)
12 and more	14 (4)
Presence of FH of diabetes	
Yes	232 (66.3)
No	118 (33.7)
Diabetes medication used	
Insulin	64 (18.3)
Oral hypoglycemic pills	67 (19.1)
Diet and exercise	1 (0.3)
Both insulin and oral hypoglycemic pills	142 (40.6)
Oral hypoglycemic pills, diet, and exercise	76 (21.7)
Having at least one	
Yes	203 (58)
No	147 (42)
Kidney complications	56 (16)
Heart complications	34 (9.7)
Brain complications	5 (1.4)
Eye complications	172 (49.1)

for over 1 year, with 43.2% having more than one source of information regarding herbal medicines. As for the reason for CAM use, 58.5% reported believing in their advantages [Table 3].

The mean cost of the CAM was (44.58 ± 64.25 SAR). Around 25.4% of participants expected lowering blood glucose level but 20.3% reported that they felt no change after their use. However, 49.2% of the sample reported that CAM was very useful, and 72.9% did not notice any side effect from CAM use, 49.2% were willing to reuse the CAM in the future, and 47.5% recommended CAM to fellow diabetic patients [Table 4].

Among patients surveyed, 62.7% used more than one CAM, 100% used bitter apple, 66.1% took cinnamon, 55.1% consumed ginger, 35.6% had fenugreek, and 21.2% reported using garlic as an only CAM. The rest of the CAM was used under 20% of the participants [Table 5].

As for the CAM nonusers, 16.4% reported that their cause was not the prescription by the doctor. Whereas 84.1% of them were not willing to use CAM in the future [Table 6]. Female patients were more likely to use CAM compared to males (41.9% vs. 23.9%) ($P = <0.05$). While the association between CAM use and other sociodemographic characteristics was not significant (age, education, occupation, income, comorbid illness, or marital status) ($P = >0.05$) [Table 7].

CAM use was higher when family history of diabetes was present (38.8% vs. 23.7%) ($P = <0.05$), see [Table 8]. Participants

Table 3: Prevalence of CAM use, consulting a doctor before use, duration of its usage, source of information about herbal medicine, and why using the CAM among the studied CAM users participants (No: 118)

Variable	No. (%)
CAM use	
Yes	118 (33.7)
No	232 (66.3)
Consulted a doctor before using CAM	
Yes	15 (12.7)
No	103 (87.3)
Duration of CAM use	
1-7 days	5 (4.2)
2-4 weeks	11 (9.3)
1-12 months	20 (16.9)
>1 year	(69.5)
Source of information regarding herbal medicines	
Friends, relatives, neighbors	34 (28.8)
Internet	4 (3.4)
Personal choice	5 (4.2)
Media	6 (5.1)
Family believes.	15 (12.7)
Health practitioner	3 (2.5)
More than one answer	51 (43.2)
Why using CAM	
Believe in the advantages of CAM practices	69 (58.5)
Lost hope with conventional therapy	3 (2.5)
looking for another solution	15 (12.7)
CAM is accessible and available	12 (10.2)
More than one answer	19 (16.1)

with longer duration of diabetes, and those with at least one diabetic complication were more likely to use CAM ($P = <0.05$). When adjusting for clinical and sociodemographic factors simultaneously, as per [Table 9] female gender, duration of diabetes, and having at least one diabetic complication were independent predictors for CAM use.

Discussion

In our current study, both sociodemographic and clinical characteristics of participants were comparable to findings from previous regional surveys, particularly in terms of female predominance,^[8] rate and nature of diabetes complications and comorbidities,^[9,10] onset age,^[11] and family history.^[12]

One key finding in our present study is the prevalence of 33.7% of CAM use among diabetes clinics' attendees in Taif city. This is clearly consistent with the rates (32.18%) and (30.5%) of herbal medicines' use reported in Riyadh, Saudi Arabia in 2018 and 2016, respectively.^[6,13] In Taif, a similar investigation reported 24.6% prevalence of herbs use among diabetic subjects^[14] whereas in Mecca, a rate of 30.1% was uncovered.^[15] Similarly, our results agree with the overall (36.95%) prevalence of CAM uptake among Saudi general public.^[16]

However, rates of CAM use in Saudi Arabia, as confirmed by our current results, fall below the rates reported internationally in

Table 4: Experience of CAM use among studied CAM users (No: 118)

Variable	No. (%)
Your expectation when you were using CAM	
Complete cure of disease	3 (2.5)
Lowering blood glucose level	30 (25.4)
Better health status	12 (10.2)
Prevent progression of diabetes	4 (3.4)
Weight loss	1 (0.8)
More than one answer	60 (50.8)
No expectations.	8 (6.8)
Your feeling after CAM use	
A feeling of strengthening of the body	19 (16.1)
A feeling of the disappearance of several symptoms	12 (10.2)
A feeling of being in a good psychological condition	21 (17.8)
Improvement of sexual life	1 (0.8)
A feeling of no change	24 (20.3)
A feeling of being in the bad psychological condition	1 (0.8)
Feeling rise of several symptoms	1 (0.8)
More than one answer	32 (27.1)
Not decided.	7 (5.9)
How you assess the usefulness of CAM	
Very useful	58 (49.2)
Not sure/unable to assess.	19 (16.1)
Of limited usefulness	34 (28.8)
Not useful at all.	7 (5.9)
Noticed any side effect from using CAM	
Yes	11 (9.3)
No	86 (72.9)
Undecided	21 (17.8)
Using CAM again in the future	
Yes	58 (49.2)
No	22 (18.6)
Undecided	38 (32.3)
Recommended CAM to other DM patients	
Yes	56 (47.5)
No	22 (18.6)
Undecided	39 (33.9)
Cost of CAM used (Mean±SD)	44.58±64.25

India,^[17] Malaysia,^[18] Bahrain,^[19] Oman^[19] and Lebanon.^[20] It may be difficult to explain variations in herbal medicine uptake across different countries. Differences in sociocultural perceptions of CAM use, their availability, their accessibility, in addition to differences in study design, and CAM definition could have all contributed to differences in prevalence rates reported in different studies.

The striking results of our survey are the strong belief by people in Taif region that CAM is very advantageous. This belief, in addition to accessibility and lower cost of CAM, may have contributed to the increased rate of CAM use in our study sample.

Furthermore, we found that spiritual healing was used by a significant proportion of T2DM patients (12.7%). A previous cross-sectional study in Riyadh city found that 10.8% of diabetic participants were using spiritual healing (ruqia).^[13]

CAM has wide acceptance in the Saudi population. This might be explained by strong religious views that many of the patients base

Table 5: Detailed distribution of the CAM used among studied patients (No: 118)

Variable	No. (%)	Variable	No. (%)
Ginger		Clove	
Yes	65 (55.1)	Yes	14 (15.9)
No	53 (44.9)	No	104 (88.1)
Black seeds		White lupin	
Yes	26 (22)	Yes	1 (0.8)
No	92 (78)	No	117 (99.2)
Cinnamon		Vitamins and minerals	
Yes	78 (66.1)	Yes	10 (8.5)
No	40 (33.9)	No	108 (91.5)
Fenugreek		Rosemary	
Yes	42 (35.6)	Yes	4 (3.4)
No	76 (64.4)	No	114 (96.6)
Garlic		Pomegranate	
Yes	25 (21.2)	Yes	5 (4.2)
No	93 (78.8)	No	113 (95.8)
Myrrh		Olive leaves.	
Yes	19 (6.1)	Yes	5 (4.2)
No	99 (83.9)	No	113 (95.8)
Aloes		Bitter apple	
Yes	4 (3.4)	Yes	118 (100)
No	114 (96.6)	No	0 (0.0)
Neem		Radish	
Yes	1 (0.8)	Yes	3 (2.5)
No	117 (99.2)	No	115 (97.5)
Honey		Garden cress.	
Yes	23 (19.5)	Yes	17 (14.4)
No	95 (80.5)	No	101 (85.6)
Wormwood		Arabic gum.	
Yes	13 (11)	Yes	6 (5.1)
No	105 (89)	No	112 (94.9)
Barely		Helteet	
Yes	18 (15.3)	Yes	4 (3.4)
No	100 (84.7)	No	114 (96.6)
Spiritual (ruqia)			
Yes	15 (12.7)		
No	103 (87.3)		
More than one answer			
Yes		74 (62.7)	
No		44 (37.3)	

their CAM use on, and possibly lack of awareness regarding the potential for serious side effects and complications. People also are unaware of the poor evidence that supports CAM use. Being illiterate and born in a village were found to bear a significant association with CAM use in Saudi Arabia.^[21]

In agreement with previous studies, we found only a worrying minority of 12.7% who consulted a doctor before using CAM.^[15,22,23] This result reinforces how inadequate doctor-patient (and pharmacist-patient) relationship leads to concealment of CAM use. In Taif, CAM is often recommended by friends and peers who provide information regarding the benefit of CAM use in exclusion of physicians and pharmacists.^[14] Routine inquiry about CAM use should be adopted in clinical encounters, given the popularity of this practice.

Indicative of a high level of satisfaction with CAM use, 47.5% of our sample would recommend their use. Such a trend was established across international studies.^[16,17] Some 58.5% of our participants believed in a positive effect for CAM, with only 9.3% attributed any adverse effect to CAM. This is also a consistent finding in many global surveys of CAM-related behaviors and attitudes.^[24,25] Qualitative studies with comprehensive thematic analysis are required to further understand the underpinning concepts of such beliefs.

Female patients and those with a positive family history of complications of diabetes, in the sample we surveyed, were more likely to use CAM, as established in many other studies.^[26,27] Clearly, the use of CAM by a family member or

perception of conventionally untreated complication could pressurize patients in seeking help from CAM. Affordability of CAM was also established to motivate their use.^[28] T2DM,^[29] lower education,^[24] and female gender^[30] were established factors associated with CAM use. The findings from our investigation certainly confirm such an association in Saudi society.

Bitter apple, cinnamon, and ginger were the most used CAM methods among our participants. In his earlier survey, Al-Rowais found patients using mainly myrrh (*Commiphora molmol*), black seeds (*Nigella sativa*), fenugreek (*Trigonella foenum-graecum*), helteet (*Ferula assa-foetida*), and aloes (*Aloe vera*).^[22] Same herbs were found in use in more recent investigations in addition to Neem (*Azadirachta indica*), abundant in Mecca Province.^[15,31,32]

Family physicians often encounter patients who declare usage of complementary medicinal herbs. It is established that primary care physicians hold fluid and variable views towards alternative medicines use.^[33] The need for information about the scale of the issue of CAM use is pressing indeed.

The current study adds to the present evidence regarding the prevalent use of CAM among diabetic patients. It has many strengths including large sample size and use of a comprehensive questionnaire. However, one limitation should be allowed before generalizing its results. Social desirability and recall bias may have underestimated the overall CAM prevalence, and future research may have to be community-based rather than hospital-based.

Table 6: Attitude of CAM nonuser participants towards CAM use (No: 232)

Variable	No. (%)
Reasons for not using CAM	
The doctor did not prescribe it	38 (16.4)
Afraid of the side effects	20 (8.6)
Mainstream medicine is the best	5 (2.2)
Additional expenses and useless	1 (0.4)
Do not believe it	11 (4.7)
Do not need it	10 (4.3)
Never heard of it	8 (3.4)
Not interested	9 (3.9)
No one advised its use	6 (2.6)
More than one answer	122 (53)
Considering using CAM in the future	
Yes	37 (15.9)
No	195 (84.1)

Table 7: Relationship between CAM use and sociodemographic characters of studied participants (No.:118)

Variable	Using CAM No. (%)	Not using CAM No. (%)	Test	P
Age (Mean±SD)	59.8±12.19	60.66±12.29	1.01*	0.31
Gender				
Male	38 (23.9)	121 (78.1)	12.55**	<0.001
Female	80 (41.9)	111 (58.1)		
Education				
Not educated	51 (58.9)	80 (61.1)	5.53**	0.14
Basic (primary and preparatory)	24 (24.7)	73 (75.3)		
Secondary	6 (31.6)	13 (68.4)		
University and higher	37 (35.9)	66 (64.1)		
Occupation				
Not working	75 (40.5)	110 (59.5)	9.19**	0.05
Military	5 (26.3)	14 (73.7)		
Retired	29 (24.6)	89 (75.4)		
Employee	5 (27.8)	13 (72.2)		
Others	4 (40)	6 (60)		
Income				
<5000 INR	77 (35.5)	140 (64.5)	2	0.57
5000 <10000 INR	29 (32.6)	60 (67.4)		
10000 <15000 INR	10 (31.3)	22 (68.8)		
15000 INR and above	2 (16.7)	10 (83.3)		
Marital status				
Married	114 (33.2)	229 (66.8)	1.75**	0.18
Unmarried	4 (57.1)	3 (42.9)		

*U=Mann-Whitney test. ** χ^2 =Chi-square test

Table 8: Relationship between CAM use and clinical character of diabetes among studied participants (No: 118)

Variable	Using CAM	Not using CAM	Test	P
	No. (%)	No. (%)		
Age at diagnosis (Mean±SD)	43.6±14.68	46.61±12.55	1.62*	0.1
Presence of another chronic disease				
Yes	67 (34.2)	129 (65.8)	0.04**	0.83
No	51 (33.1)	103 (66.9)		
Duration of diabetes				
less than 3 years	22 (27.8)	57 (72.2)	18.29**	0.001
3-less than 6	17 (23.3)	56 (76.7)		
6-less than 9	16 (35.6)	29 (64.4)		
9-less than 12	52 (37.4)	87 (62.6)		
12 and more	11 (78.6)	3 (21.4)		
Presence of FH of diabetes				
Yes	90 (38.8)	142 (61.2)	7.94**	0.005
No	28 (23.7)	90 (76.3)		
Having at least one diabetic complications				
Yes	82 (40.4)	121 (59.6)	9.65**	0.002
No	36 (24.5)	111 (75.5)		

*U=Mann-Whitney test. ** χ^2 =Chi-square test. ** χ^2 =Chi-square test

Table 9: Binary logistic regression analysis regarding the risk factors for CAM use among studied participants

Variable	CAM use			Significance
	Beta	Wald	Odds Ratio	
Gender	0.87	12.75	0.41	<0.001
Duration of diabetes	0.22	5.15	0.8	0.02
Presence of FH of diabetes	0.7	7.44	2.06	0.006
Having at least one diabetic complications	0.51	4.03	1.67	0.04

Conclusion

The use of CAM therapies among T2DM patients in Taif is prevalent. Hence, decision-makers should consider the potential risks and benefits of CAM therapies. A concerted effort by the government, orders and syndicates, medical, nursing and health schools, and educational institutions is required to enhance education about the safe use of CAM and sharing their use with their family physician should be encouraged with all diabetic patients. Future studies should be large-scale, community-based to validate the findings of this current investigation.

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Conflicts of interest

There are no conflicts of interest.

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