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.9

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) |
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 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, rate and nature of diabetes complications and comorbidities, onset age, and family history.

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. In Taif, a similar investigation reported 24.6% prevalence of herbs use among diabetic subjects whereas in Mecca, a rate of 30.1% was uncovered. Similarly, our results agree with the overall (36.95%) prevalence of CAM uptake among Saudi general public.

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

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### 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 | 5 (16) |
| Heart complications | 34 (9.7) |
| Brain complications | 5 (14) |
| Eye complications | 172 (49.1) |

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### 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 103 (87.3) |
| Source of information regarding herbal medicines | Friends, relatives, neighbors 34 (28.8) Internet 3 (2.5) 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) |

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Abdullah, et al.: Prevalence of complementary medicine use in Taif

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 |

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

| Variable                                            | No. (%)     |
|-----------------------------------------------------|-------------|
| Ginger                                              |             |
| No                                                   | 65 (55.1)   |
| Yes                                                  | 53 (44.9)   |
| Black seeds                                         |             |
| Yes                                                  | 26 (22)     |
| No                                                   | 92 (78)     |
| Cinnamon                                            |             |
| Yes                                                  | 40 (33.9)   |
| No                                                   | 58 (49.2)   |
| Fenugreek                                           |             |
| Yes                                                  | 42 (35.6)   |
| No                                                   | 76 (64.4)   |
| Garlic                                              |             |
| Yes                                                  | 25 (21.2)   |
| No                                                   | 93 (78.8)   |
| Myrrh                                               |             |
| Yes                                                  | 19 (6.1)    |
| No                                                   | 99 (83.9)   |
| Aloeos                                              |             |
| Yes                                                  | 4 (3.4)     |
| No                                                   | 114 (96.6)  |
| Neem                                                |             |
| Yes                                                  | 1 (0.8)     |
| No                                                   | 117 (99.2)  |
| Honey                                               |             |
| Yes                                                  | 23 (19.5)   |
| No                                                   | 95 (80.5)   |
| Wormwood                                            |             |
| Yes                                                  | 13 (11)     |
| No                                                   | 105 (89)    |
| Barely                                              |             |
| Yes                                                  | 18 (15.3)   |
| No                                                   | 100 (84.7)  |
| Spiritual (ruqia)                                   |             |
| Yes                                                  | 15 (12.7)   |
| No                                                   | 103 (87.3)  |
| More than one answer                                 |             |
| Yes                                                  | 74 (62.7)   |
| No                                                   | 44 (37.3)   |

India, Malaysia, Bahrain, Oman, and Lebanon. 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 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. 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. 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. 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. Lower education, and female gender 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). Same herbs were found in use in more recent investigations in addition to Neem (Azadirachta indica), abundant in Mecca Province.

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. 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.
Abdullah, et al.: Prevalence of complementary medicine use in Taif

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

| Variable                        | Using CAM No. (%) | Not using CAM No. (%) | Test   | P   |
|---------------------------------|------------------|-----------------------|--------|-----|
| 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. **χ²=Chi-square test. **χ²=Chi-square test.

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

| Variable                        | CAM use | Significance |
|---------------------------------|---------|--------------|
| Gender                          | 0.87    | <0.001       |
| Duration of diabetes            | 0.22    | 0.02         |
| Presence of FH of diabetes      | 0.7     | 0.006        |
| Having at least one diabetic complications | 0.51    | 0.04         |
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