

## Research Article

# Experience of Diabetic Patients for the Usage of Complementary and Alternative Medicine Therapy

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### ARTICLE

#### INFO

Received: 14/03/2023

Revised: 03/04/2023

Accepted: 08/05/2023

#### Keywords:

Diabetic patients,  
alternative medicine,  
herbal therapies,  
homeopathy,  
yoga.

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### ABSTRACT

**Background:** Diabetes is common in every community, but its management always seems to be challenging. The alternative medicine (AM) therapies in multiple ways have been widely accepted by individuals suffering from various diseases. This study was undertaken to evaluate the knowledge and experience of diabetic patients towards the implication of multiple AM therapies.

**Methods:** This study aimed to investigate the knowledge and experiences of diabetic patients regarding the use of various alternative medicine therapies. Data were collected through a self-administered questionnaire, and statistical software SPSS was employed for data analysis.

**Results:** Out of 469 diabetic patients, 123 were diagnosed with type 1 diabetes, 333 had type 2 diabetes, and the remaining patients had gestational diabetes. A majority of the diabetic patients (61.3%) reported that combining alternative medicine (AM) with allopathic diabetic medicines effectively controlled their blood sugar levels. Interestingly, 64.7% of patients received recommendations from diabetologists to incorporate AM therapies into their treatment plans. Among all diabetic patients, 85.3% believed that AM therapies had no side effects. Herbal medicines/herbs were favored by 28.7% of diabetic patients, while 15.4% and 14.5% reported experiencing the effectiveness of homeopathy and yoga, respectively, for diabetic therapy.

**Conclusion:** This comprehensive study reveals the potential of alternative medicine therapies in managing diabetes. However, it emphasizes the importance of exercising caution when relying solely on specific complementary and alternative medicine approaches during the follow-up process.

## 1. INTRODUCTION

The International Diabetes Federation (IDF) estimated that 9.3% of the global population were diabetic in 2019, and this is expected to increase to 10.2% in 2030 (International Diabetes Federation 2022). There are three main types of diabetes mellitus: type 1 diabetes mellitus, type 2 diabetes mellitus (responsible for more than 90% of all cases), and gestational diabetes mellitus (Auvinet *et al.*, 2020). The estimated universal prevalence of diabetes has increased to almost 1.5-fold in the last three decades. The prevalence in the Middle East is greater than the global average as per the World Health Organization report in 2022 (World Health Organization

2022). The main reason for the onset of diabetes is assumed to be higher consumption of fat and carbohydrates, with lower consumption of vegetables and protein attributed to higher rates than the global rates (Rice Bradley *et al.*, 2018). The practice of alternative medicine (AM) has been used for the treatment/controlling of diabetes in many populations and communities, including the Middle East and North Africa (MENA) region (El-Kebbi *et al.*, 2021; International Diabetes Federation 2022 (IDF) Diabetes Atlas 10th Edition 2021). Patients from several disorders have reported several types of AM practices, including prayer, faith healing, unusual diets, herbal treatments, pearl therapy and many others (Langhorst *et al.*, 2015; Rasheed *et al.*, 2016; Rasheed *et al.*, 2019; Rasheed *et al.*, 2010; Shukla *et al.*, 2008). In fact, diabetic patients are twice as likely to use AM as people without diabetes, and the most frequently used are nutritional and dietary advice such as homoeopathic diets and orthomolecular therapies such as magnesium, mega doses of vitamins, or melatonin, spiritual healing, herbal remedies, massage, and meditation (Medagama *et al.*, 2014; Bell *et al.*, 2006; Manya *et al.*, 2012). Im-

Doi: <https://doi.org/10.54940/ms22157243>

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portantly, various AMs, including homeopathic medicines, have been recommended by diabetes educators and physicians (To *et al.*, 2017). There are many reasons for using alternative modalities for the treatment of human disorders, including ease of availability and no prescription needed, fear about medication side effects, dissatisfaction with medical institutions and high price of modern/conventional medicine interventions (Mora *et al.*, 2022; Ho *et al.*, 2019). In Saudi Arabia, the usage of AM therapies is very popular and widely used in the treatment of several disorders such as traditional herbs remedies, including black cumin (*Nigella sativa*), kowshair, aloe Vera, honey, dates and fenugreek (Rasheed *et al.*, 2010; Abuelgasim *et al.*, 2018). Because of these, this study hypothesized that diabetic patients in Qassim are using AM therapies to control their blood sugar levels. To test this hypothesis, all major types of diabetic patients at the hospitals of Qassim were asked to fill out a well-designed, validated questionnaire. This questionnaire was designed in a manner to know the experience of diabetic patients towards the usage of complementary and alternative medicine.

## 2. METHODS

### 2.1. Study type and design

This retrospective cohort study was performed on diabetes patients from the Qassim region of Saudi Arabia. The study was designed to investigate the experience of patients with type 1 diabetes, type 2 and gestational diabetes patients towards the acceptance of complementary and alternative medicine.

### 2.2. Sample size calculation

The sample size in this study was calculated using the Raosoft online sample size calculator ([http://www.raosoft.com/sample\\_size.html](http://www.raosoft.com/sample_size.html)) with a confidence level of 95% and a margin of error of 5%. The distribution of responses used was 50%. According to the calculations, the minimum recommended size for this survey was determined to be 323.

### 2.3. Diabetes patients, ethical approval and data collection

The diabetes patients were identified from their laboratory investigation reports as described previously (Ito *et al.*, 1983). The selected patients were informed about this study, and their informed consent was taken as per the ethical guidelines described previously (Basuet *et al.*, 2018; Degeling *et al.*, 2021). The ethical approval of this study was taken from the Regional Research Ethics Committee, which was registered with the National Committee of Bio & Med. Ethics (NCBE), Registration # H-04-Q-001, Ministry of Health General Directorate of Health Affairs, Ai-Qassim region, KSA. The ethical approval number of this study was 44/607/10428. The diabetes patients were selected from outpatient clinics of the University Medical City, and the data were collected using a self-administered questionnaire, which was previously validated on other types of patients (Rasheed *et al.*, 2023). The questionnaire has three sections: the first section was all about the demographic and clinical de-

tails of the patients, the second section was comprised of questions based on the knowledge and awareness towards complementary and alternative medicines therapies, and the third section was about the questions related to their experience and attitude of patients for the usage of alternative medicine in the treatment or control of diabetes. The inclusion criteria of the patients were all three types of diabetes: type 1, type 2 and gestational diabetes. However, diabetic patients with secondary complications, such as retinopathy, cardiopathy, and nephropathy, were excluded from the study.

### 2.4. Statistical analysis

The statistical software SPSS (IBM, USA) was used to calculate the frequencies of distributed proportions. The chi-square test was applied, and the obtained data were revalidated by Origin statistical software (Origin Lab Corporation, MA, USA).

## 3. RESULTS

### 3.1. Demographic information of diabetic patients

In this study, 469 diabetic patients were recruited. Out of them, 268 patients were males and 201 were females. Among them, 247 patients were 25-50 years old, and the rest were greater than 50 years. A majority of selected patients were married and non-smokers. The study also measured the sedentary activities of the studied diabetic patients in terms of measuring physical activity and the employment-based lifestyle. Our data analysis showed that 193 patients were not doing any of the physical activities, whereas 223 patients were irregular in their physical activities. However, 22 patients reported that they performed daily exercise, and the remaining 31 patients were doing exercise five times a week. The data also point out that 234 patients earned an average income between 4000-16000 SAR, whereas 114 patients received a good income of above 16000 SAR, and the rest 121 patients earned less than 4000 SAR. These data in per cent prevalence have been summarized in Table 1.

**Table 1. Demographic details of the diabetes patients**

Parameters	Number of diabetes patients (n = 469)	Prevalence (%)
<b>Gender</b>		
Male	268	57.1
Female	201	42.8
<b>Age (years)</b>		
25-50	247	52.8
>50	222	47.4
<b>Marital status</b>		
Single	79	16.8
Married	390	83.1
<b>Smoking history</b>		
Smokers	72	15.3
Non-smokers	397	84.6
<b>Physical Activity</b>		
Daily Exercise	22	4.6
Five times a week	31	6.6

<b>Irregular</b>	223	47.5
<b>No Exercise</b>	193	41.1
<b>Employment-based Sedentary</b>		
<b>Lifestyle (SAR)</b>	121	25.8
<b>Poor: &gt; 4000</b>	234	49.9
<b>Average: 4000-16000 Good: &lt;16000</b>	114	24.3

**3.2. Clinical parameters of diabetic patients**

HbA1c has mainly analysed the diabetic index of the studied patients, and the plasma level of HbA1c was higher than 7% in all studied patients. This study also analyzed that out of 469 diabetic patients, 333 patients (71%) were type 2 diabetic, whereas 123 patients (26.2%) were type 1 diabetic, and the rest 13 patients (2.8%) were demonstrated as gestational. The data also analyzed the patient's history of diabetes, which has been summarized in Table 2.

**Table 2. Clinical parameters of diabetes patients (n = 469)**

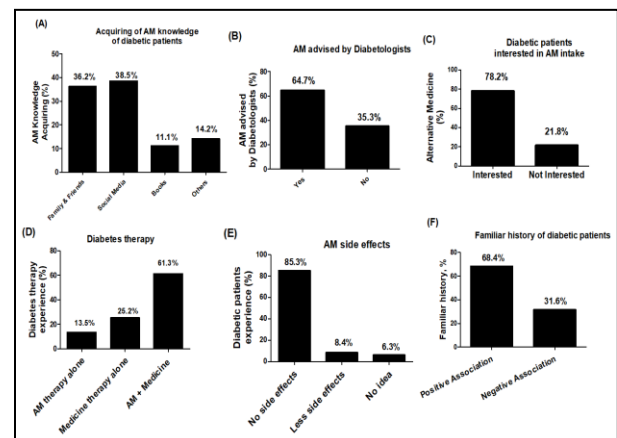
Clinical parameters	Patients studied (n)	Involvement (%)
<b>Glycated haemoglobin (HbA1c)</b>	469	7.2
<b>Diabetes types</b>		
Type 1 diabetes	123	26.2
Type 2 diabetes	333	71.0
Gestational diabetes	13	02.8
<b>History of diabetes, years</b>		
0-1 years	101	21.5
2-5 years	171	36.5
6-10 years	163	34.7
10> years	34	07.2

**3.3. Acceptance of alternative medicine therapies by diabetic patients**

To prove the central hypothesis of this article, the experience, knowledge and awareness of diabetic patients towards the usage of AM was analyzed by asking multiple questions on AM therapies. The questioning started from the basic one, from where they acquired knowledge of AM therapies. 38.5% of patients answered that they acquired acknowledgement from social media, whereas 36.2% of diabetic patients acquired knowledge from their friends. Only 11.1% suggested that they acquired knowledge from books (Fig. 1A). Importantly, 64.7% of diabetic patients have been advised by their consultant diabetologists to use the AM for their treatment (Fig. 1B). Responding to the question on the interest in AM therapies for their treatment, 78.2% patients showed their interest. However, the rest 21.8% patients were not at all interested in AM therapies (Fig. 1C). A majority of patients (61.3%) experienced that AM therapies with the conventional allopathic of diabetes were highly useful for their treatment. However, 13.5% and 25.2% of patients believed that AM therapy alone

and Allopathy treatment alone were useful, respectively (Fig. 1D). As far as the side effects of AM are concerned, 85.3% of patients experienced that AM therapies have no side effects (Fig. 1E).

This study also determined the familiar history of the studied diabetic patients; 68.4% of patients were found to have a familiar association with diabetes (Fig. 1F). Figure 2 summarizes the main outcomes of the central hypothesis of this article as it shows the detailed description of knowledge, attitude and experience of diabetic patients for the usage of specific AM therapies. Out of 469 patients, 28.7% experienced that the herbal medicines and herbs were effective for their treatment in controlling blood sugar levels whereas 15.4% patients experienced that the homeopathic medicines were also effective. The data also revealed that 14.5% of the surveyed diabetic patients reported receiving suggestions for yoga as an alternative medicine therapy. Additionally, 10.2% of diabetic patients were advised to consider camel milk. Interestingly, most patients (26.4%) reported experiencing high effectiveness when combining multiple alternative medicine therapies for their treatment. The details of other AM therapies such as acupuncture, honey, and hajama have been given in Figure 2. By knowing the facts that the studied diabetic patients mostly liked herbs or herbal medicine, the questions on specific herbs/herbal medicine were asked to the patients in separate parts of the questionnaire. Most of the diabetic patients experienced that green tea (30.1%) and black seeds (23.1%) were effective for their treatment. Interestingly, 16.1% of patients experienced that ginger was good in controlling blood sugar levels. The questions on fennel, turmeric, capsicum, plantain and bran were also asked and the detailed descriptions of their results were given in Figure 3. The complete descriptions of the outcomes of the study's central hypothesis are summarized in Figure 4. In short, most diabetic patients experienced that green tea, black seeds and ginger were effective for controlling their blood sugar level.



**Figure 1. Knowledge and awareness of diabetic patients (n=469) for alternative medicines (AM) therapies. (A) Sources of AM therapies (B) AM therapies advised by the diabetologists (C) Interest of diabetic patients towards AM therapies (D) Experience of diabetic patients for the usage of AM therapies alone or in combination with allopathic medicines (E) Experience of diabetic patients towards the side-effects of AM therapies (F) Familiar history of diabetic patients.**

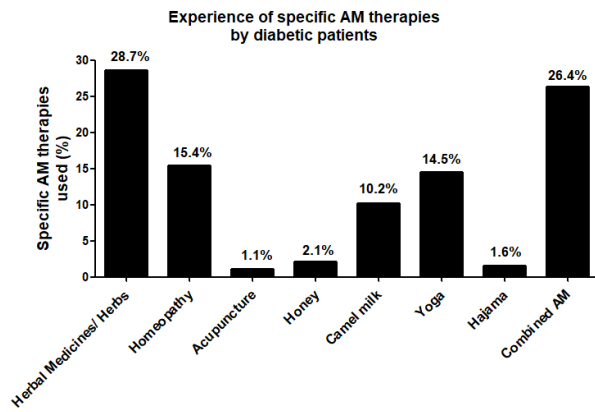


Figure 2. Experience of specific alternative medicines therapies by diabetic patients. The bar for combined AM therapies represents those diabetic patients who were taking more than one AM therapy.

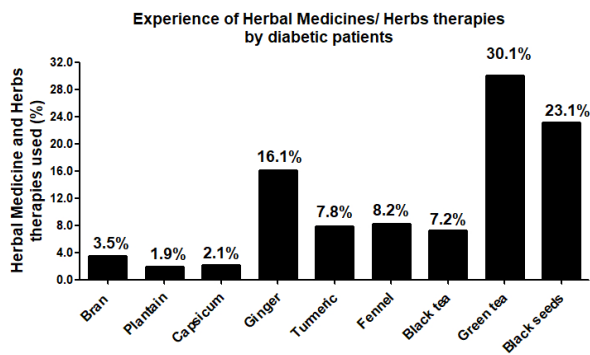


Figure 3. Experiences of diabetic patients with specific herbal medicines and herb therapies.

#### 4. DISCUSSION

This is the first report from the Qassim region of Saudi Arabia to provide comprehensive experience of diabetic patients using complementary and alternative medicine. Diabetes in Saudi Arabia and all over the globe has now become the most prevalent human disorder. Its prevalence rate is continuously on the rise now, its management has become a major challenge for the health sector all over the world, including Saudi Arabia (Robert *et al.*, 2017). Several investigations from different communities reported that the onset of diabetes occurs due to the adaptation of an easy lifestyle and lack of physical activities (Hamilton *et al.*, 2014; Li *et al.*, 2022). In Saudi Arabia, a large volume of studies has been conducted on the epidemiology of diabetes (Al Dawishet *et al.*, 2016; Naeem *et al.*, 2015; Alotaibi *et al.*, 2017). These reports point out that the prevalence of diabetes in Saudi Arabia has markedly increased in the last decades, and still its occurrence is on the rise. The Ministry of Health of Saudi Arabia took several steps to manage diabetes, which are useful. However, the rate of its onset is still uncontrollable. The global reports on diabetes reported that diabetes is not only a highly prevalent disorder but it has an association with several other human disorders such as cardiomyopathy, retinopathy, nephropathy and so on (Harding *et al.*, 2019; Deshpande *et al.*, 2008). Therefore its management is extremely important to

prevent the onset of other chronic disorders. Despite the availability of high-quality of medicines and high molecular approaches, the treatment of diabetic patients seems to be difficult, and the available drug for its treatment are only helpful in controlling the blood sugar, but now of them have been reported to completely reverse the disorder, however, these drugs were reported to have multiple side effects.

In the last three decades, the uses of complementary and alternative medicines (AM) for the treatment of several human disorders as an alternative therapy have gained attention in every community in all over the world (Tabish *et al.*, 2008; Rasheed *et al.*, 2017; Rasheed *et al.*, 2016; Rasheed *et al.*, 2009; Rasheed *et al.*, 2016). People all over the globe believe that AM therapies have no side effects whereas the reports showed that the allopathic medicines have side effects. Sometimes these side effects cause serious effects, which might be responsible for the disease-related death (Chaudhury *et al.*, 2017). Interestingly, the AM therapies at molecular levels have also been reported to have numerous health benefits against the onset and progression of chronic diseases (Rasheed *et al.*, 2016; Rasheed *et al.*, 2019; 38, Rasheed *et al.*, 2016). Because of these, this study hypothesized that AM therapies are useful for diabetic patients as an alternative therapy. To prove this hypothesis, the experience of diabetic patients with the usage of AM therapies was gathered. The gathered information was analyzed to find the best alternative therapies for diabetic patients. The 469 diabetic patients were recruited in this study. Out of them, 57.1% of patients were males, and 42.8% were females. The study determined the sedentary activities of the studied diabetic patients in terms of measuring physical activity and the employment-based lifestyle. Our data showed that 41.1% of patients were not doing any physical activities, whereas 47.5% were irregular in their physical activities. However, 4.6% of patients reported that they performed daily exercise, and the remaining 6.6% of patients were doing exercise five times a week. The data also point out that 49.9% of patients earned an average income between 4000-16000 SAR, whereas 24.3% of patients received a good payment above 16000 SAR, and the remaining 25.8% of patients earned less than 4000 SAR. HbA1c mainly analyzed the diabetic index of the patients analysed as described previously (Sherwani *et al.*, 2016). The plasma level of HbA1c was higher than 7% in all studied patients. This study also analysed the types of diabetic patients. A majority of studied patients were type 2 diabetic, whereas 26.2% were type 1 diabetic, and the remaining 2.8% patients were gestational. Similar patterns for the prevalence of these three types of diabetes have also been common in other communities of the world (Lawrence *et al.*, 2021). To validate the central hypothesis of this study, the evaluation of the experience of diabetic patients for the usage of complementary and alternative medicines. The data showed that 28.7% of patients experienced that the herbal medicines and herbs were adequate for their treatment in controlling blood sugar levels, whereas 15.4% of patients experienced that the homeopathic medicines were also effective. The data also showed that yoga as one of the AM therapies



was also suggested by 14.5% of studied diabetic patients. 10.2% of diabetic patients suggested camel milk.

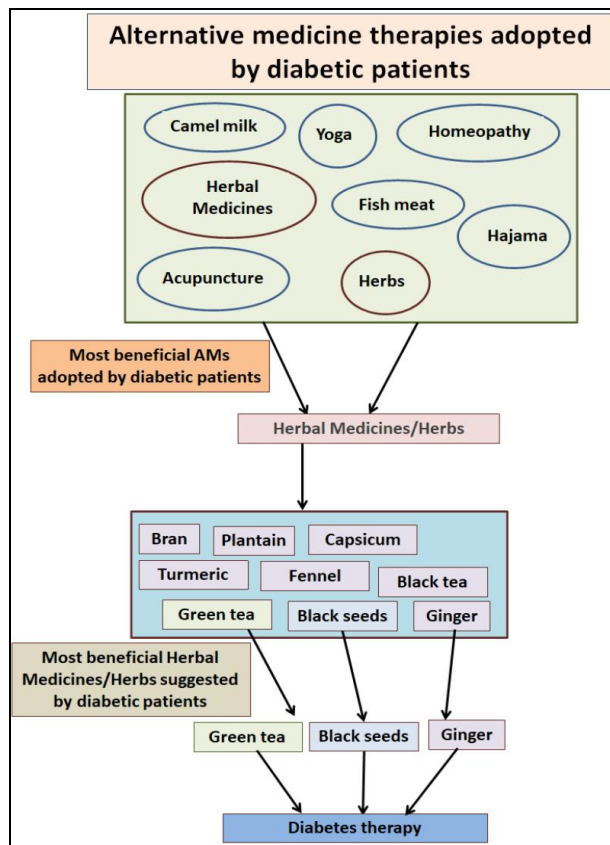


Figure 4. The systematic diagram explains the flow of alternative and medicine therapies used by diabetic patients

Interestingly, most patients experienced that combined AM therapies were highly effective for their treatment. To investigate in depth the experience of using herbs or herbal medicine, the questions on specific herbs/herbal medicine were asked to the patients in separate parts of the questionnaire. Most of the diabetic patients experienced that green tea, black seeds and ginger were effective for their treatment. Other patients have also suggested that the fennel, turmeric, capsicum, plantain and bran were also effective in controlling the level of blood sugar. Interestingly, the overall response of all types of diabetic patients, such as the response of patients with type 1 diabetes, type 2 diabetes and gestational diabetes, was found to be almost the same towards the usage of alternative and complementary medicines, indicating that the thinking of all types of diabetic patients was similar, they just wanted to avoid the use of allopathic medicine for controlling their blood glucose levels by the complementary and alternative medicines (Setiyoriniet al., 2022; Pandey et al., 2011; Girgis et al., 2022). Most importantly, about half of diabetic patients informed that their consultant diabetologists had advised them to use the AM for their treatment. Most patients experienced that AM therapies with the conventional allopathic of diabetes were highly useful for their treatment. A majority of studied patients experienced that AM therapies have no side effects. These data have also been well supported by other studies (Chaudhury et al., 2017). Despite including several AM therapies for diabetic patients in this study, the study still has a few

limitations. The first limitation of the study was that the selection of diabetic patients was confined to only one hospital. In addition, diabetic patients with secondary complications were not included, and the most obvious limitation of the study was that opinion of diabetic patients was taken only at one time; it is always important that attention must be paid to reliance on AM therapies during the follow-up.

## 5. CONCLUSION AND RECOMMENDATION

This is the first comprehensive study from the central region of Saudi Arabia to evaluate the experience of diabetic patients towards the applicability of complementary and alternative medicine as one of the alternative ways of their treatment. The novel findings point out that most diabetic patients believed that the **experiences** of complementary and alternative medicines with allopathic medicines were highly effective and suitable for maintaining blood sugar levels. Still, attention must be paid to reliance on specific complementary and alternative medicine during the follow-up.

## AUTHOR CONTRIBUTION

It is a single-author study

## SOURCE OF FUNDING

None

## CONFLICT OF INTEREST

There are no conflicts of interest to declare in this study.

## ACKNOWLEDGEMENTS

None

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