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A Cross Sectional Study on Utilization of Complementary and Alternative Medicine in Patients with Diabetes Mellitus

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ABSTRACT

The therapies used in combination with conventional medicines are called complementary medicine. Alternative medicine includes therapy that is used in place of conventional medicine. The current study aimed to assess the utilization of complementary and alternative medicine in patients with DM. A cross-sectional study was carried out between 370 patients who visited a private diabetic clinic in Chennai. Data collection employed a structured questionnaire for collecting demographic characteristics, medical history, medication history, social history, types of complementary and alternative medicines used. The mean age of the participants was 56.03 ± 9.26 years. Quite 54.5% of the participants were men. Around 36.5% of diabetic patients have used at least one complementary and alternative treatment among the study population. The most common treatment opted was acupuncture. About 17.3% of the study participants underwent acupuncture treatment. Most of the patients felt satisfied with the usage of complementary and alternative medicines.

KEYWORDS: Complementary medicine, alternative medicine, Diabetes mellitus, acupuncture, cross sectional study, MMAS scale, SF12 form.

INTRODUCTION

Diabetes mellitus (DM) is a critically significant disease and its global prevalence is increasing. Much of this increase in diabetes will occur in Asia, in countries such as India and China. Being an ancient disease, many individuals follow complementary and alternative medicine (CAM) therapies for either the cure or prevention of the diseases. The therapies which could be combined with conventional medicine are termed as Complementary Medicine.Alternative Medicine includes therapies that are used in place of conventional medicine.

Studies report that CAM use is highest among females, nonsmokers, physicallyactive individuals, people with normal body mass index(BMI) and those eating low-fat diets with high fruit and vegetablecontent.Many patients resort to complementary and alternative medicine (CAM) practice at least once during their lifetime [1].

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Overall CAM use was measured by collapsing all reported CAM products into the five domains noted previously:

i. Manipulative and body-based methods, including chiropractic/osteopathic approaches and massage therapy;
ii. Biological treatments, including herbal remedies and specialdiets;
iii. Mind-body interventions, including meditation, hypnosis, prayer and art/musictherapy;
iv. Energy therapies, including bio-fieldand bio electromagnetic-based therapies,and
v. The alternative medical system, including acupuncture, Ayurveda, Homeopathy, and Naturopathy [2].

Physical interventions:

Yoga: It is an old, traditional, Indian psychological, physical, and spiritual exerciseregimen.Yogahasbeenstudiedforseveraldecadesforitsroleinthemanagementofdiabetes, hypertension, asthma obesity, andpsychiatric disorders[3].
Acupuncture: Acupuncture has been shown useful to treat diabetes, chronic pain,etc.Acupuncture also has an anti-obesityeffect[4].

Hydrotherapy: It is found to reduce body weight, mean plasma glucose level and mean glycosylated hemoglobin. Patients should be warned to use water which is not too hot to avoidburning[5].

Massage therapy: It has been recommended for diabetes for nearly 100years. Uncontrolled studies suggest that massage may help normalize blood glucose and symptoms of diabeticneuropathy. Massage at an insulin injection site can increase serum insulin actionsignificantly[6].

Aromatherapy: Essential oils are used to treat severaldiseases.Aromatherapy utilizesmethodssuchasinhalation,local application andbathstopenetratethehuman skin.It canbe employed to get relief from numerous ailments like depression, indigestion, headache, insomnia, muscular pain, respiratory problems, skin ailments, swollen joints, urine associated complications[7].

Biofeedbackis a therapeutic technique involving an instrument that provides information about a psychological activity such as skin temperature or muscle tension, to learn control over maladaptive response tostress[8].

Chromo therapy involves the therapeutic use ofcolors. According to Chromo therapy, lack of color harmony in the human system may cause disease and by the use of color light to the body, the imbalance can beremoved.According to Chromo therapy, diabetes is generally caused by a deficiency of orange and yellow colors in thebody[9].

Theinterestin use of complementaryandalternativemedicine(CAM)ishigh among patients with type 2 diabetes due to difficulty in adhering to the therapeutic regimens and lifestyle changes necessary for disease management [10].

Effective and successful glucose control requires appropriate and timely use of medication over the entire period of treatment, which is often lifelong. The clinical impact of drug therapies for diabetes has been limited by poor rates of adherence. Different studies have shown that adherence to diabetes treatment is highly varied and may range from 1.4-88.0%.[11]

CAMuserswerealsofoundtoshowdecreasedadherencetoprescribedmedications.Theybecome both logistically and psychologically burdened and may need to discontinue part or all of their prescribed diabetes medications to be able to continue using CAM. CAM therapies, dependingon the amount or type, can help or harm patients and often cause adverse responses, which indirectly leadtootheirdiseases[12].Diabeticpatientsfrequentlyundergotreatmentforassociateddiseasessuch as hypertension, neuropathy, cardiovascular disease, and so on. According to the world health organization (WHO), patients' adherence to long term therapy for chronic disease was only 50% in developed countries and even lower in developingcountries[13].

With the increasing rates of childhood and adult obesity, the prevalence of T2DM is expected to increase in the future. At the same time, the care of T2DM patients has been influenced by a growinginterestinCAM,whichunfortunatelyislargelyneglectedbyhealthcareproviders[14]. The increase in the number of patients diagnosed with DM and the chronic, progressive nature of the disease means that more patients are seeking out alternative productsin addition to clinical medical therapy. Some studies have suggested that alternative medicine products can decrease the blood sugar level of diabetic patients [15].

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 tradition or conventional medicine [16].

Patients without any co-morbidity were four times more likely to use exclusive CAM compared with patients with co-morbidity indicating that exclusive CAM use was preferred by milder or patients without co-morbidities [17]. The survey consists of face-to-face household interviews to obtain data for each respondent's patients. Excluding solitary prayer, estimates of CAM use by patients with diabetes ranged from 39- 72%. As a result of the chronic course of the disease, the debilitation of complications, and the complexities of treatment plans, many T2DM patients manage their disease through the use of complementary and alternative medicine (CAM) therapies[18].

Lifelong treatment of DM is a challenge for patients. Living with the disease of diabetes, compliance with dietary therapy, performing regular blood glucose tests, and compulsory, regular use of anti-diabetic drugs can be very demanding. Patients often seek a quick cure, leading many to try alternative medicine[19]. More detailed studies should be conducted on the effects and potential role of alternative medicine therapies in the context of diabetes regulation and treatment. The purpose of this study was to survey people with Diabetes

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Mellitus at a diabetic clinic to identify patterns of complementary and alternative medicinal (CAM) use before and after diagnosis, medication adherence, quality of life of the patients who receive complementary and alternative medicine (CAM) with conventionaltreatment[20].

MATERIALS AND METHODS:

2.1.Study design and setting:

A cross-sectional study was conducted enrolling 370 diabetes Mellitus patients who visited the out-patients clinic, Prabanja holistic Health centre, located in Thiruverkadu from the city of Chennai.

2.2. Ethical consideration

We investigated the diabetic patients who received complementary and alternative medicine in the management of DM.The study protocol was approved by the institutional committee with reference number: VISTAS-SPS/IEC/VII/2019/10. Around 370 patients were assessed. The patients were enrolled in the study based on inclusion and exclusion criteria.

2.3. Sampling and sample size:

Convenience sampling was used to select the participants. Therefore on estimate sample size, the subsequent formula was used:

$$N = \frac{Z^2 \times P\,(1-P)}{e^2}$$

Where,n = number to sample

Z^2 = (1.96) FOR 95% confidence P = “best guess” for prevalence

e^2 = maximum tolerable error for the prevalence estimate.

Assuminga40%prevalenceofCAMuseamongDMpatients(P),a95%confidenceinterval(Z= 1.96), and a prevalence estimate inside 5% error margin (e), a sample of370 participants was deemed appropriate for this study supported thisformula.

2.4. Study instrument:

This study was designed to investigate the utilization of complementary and alternative medicines by diabetic patients in management of DM. Information like the impact of CAM on the management of DM, medication adherence, and quality of life in patients with DM were the expected outcomes. Patients data such as the demographic details, medical history, medication history, social history, personal history, clinical information like the biochemical investigations, other investigations, surgical history, drug chart, utilization of complementary and alternative systems of medicine, and other information needed for the study

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weredocumentedusingaspeciallydesigned,structuredcasereport form(CRF) along with questionnaires like MMAS and SF12 form. Patient clinical data were collected from patient case reportfiles.One half of the CRF includes questions on the socio-demographic variables like age, sex, marital status, age at diagnosis,casehistoryofDM.Anotherhalf included queriesrelatedtoCAM sortandpattern,which includes knowledge ofCAM,initiationofCAMuse,typeofCAM,sourceoftheirCAMawareness, durationofdisease.

ThethirdhalfgearedtowardsMMASandSF12form.Adherencewasanalyzed by using the eight-item Morisky Medication Adherence Scale (MMAS). The MMAS scale has been used as self-reported measures of adherence to medication for several chronic diseases including diabetes and has shown good responsible and prophetic validity, accessibility,harmlessness, easeofusage,reliefofissues,nointerferencewithdailyactivities, noconcernfor interferingwith alternative therapeutic ways, feeling well after using complementary and alternative medicine. The amount of usage has been measured by yes or no answers.

Thequalityoflifewasassessed bythe12itemsshortform(SF12). Itis a general health questionnaire that was published in 1995 as part of the medical outcomes study (MOS). Two outline scores are reported from the SF 12 - a mental component score (MCS) and a physicalcomponentscore(PCS).Apatient'scasereportformself-explainingtothepatients.Participants should spend around forty five minutes to at least one hour for answering the questionnaire and also the queries asked by the principal investigator regardingDM. This study result can facilitate the clinicians and otherhealthcareemployeestomodifytheirpatient’sspecificapproachesandattainoptimaldiabetes management with good medication adherence and quality oflife.

2.5. Statistical analysis:

Aquestionnairetoidentifycomplementaryandalternativemedicineutilization pattern was developed and validated. The collectedinformationwas enteredina MicrosoftExcel spreadsheet andutilizedforfurther statistical analysis using SPSS software.

2.6. Patients Selection:

Inclusion Criteria

i. Patients with a history of diabetesmellitus.
ii. Patients of eithergender
iii. Patients on oral hypoglycemic or insulin orboth.

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Exclusion Criteria:

i. Patients not willing to give written informed consentforms.

ii. Patients newly diagnosed with diabetes (less than 3months).

2.7. Expected outcome:

1. The system of complementary and alternative medicine utilized by diabetes mellitus patients will beidentified.
2. The impact of complementary and alternative medicine on anti - diabetic medication adherence and blood sugar control in diabetes patients will berevealed.
3. The quality of life in diabetes mellitus patients receiving complementary and alternative will be explored.

3. RESULTS

3.1. Sociodemographic characteristics

Around 370 diabetic patients were enrolled in tostudy based on the inclusion and exclusion criteria. The mean age of the study participants was 56.03 ± 9.26 years (Table 1). Over 54.5%of theparticipantswere men(Table 2).Amajorityofthepatientsweremarried(99.45%). About 93% of the study participants weighed greater than 50kg. Virtually25%oftheparticipantshadotherchronicdiseasesascomorbidconditions(lowbackpain, anemia, high blood pressure, mental disorders, skin diseases, allergies, heart diseases, hypothyroidism, and hyperthyroidism) co-existing with DM. The mean duration of diabetes was 92.5± 37.2 years (Table 3).Most of the patients who participated in the study were married (99%). It was observed that around 96% and 89% of patients had the habit of smoking and alcohol use respectively.

TABLE 1: AGE DISTRIBUTION

Age (Year)	Frequency N=370	Percentage %
18-27	1	0.2702
28-37	6	1.6216
38-47	68	18.3783
48-57	159	42.9729

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58-67	122	32.9729
68-77	13	3.5135
78-87	1	0.2702

TABLE 2: GENDER DISTRIBUTION

Gender	**Frequency N=370**	**Percentage %**
Male	200	54.0540
Female	170	45.9459

TABLE 3: DURATION OF DIABETES DISTRIBUTION

Duration of diabetes	**N=370**	**%**
≤4 years	122	32.9729
5-9 years	105	28.3783
10-15 years	105	28.3783
≥16 years	38	10.2702

3.2. Findings

Intotal,36.5%(n=370)oftheparticipantsusedaminimumofonecomplementaryand alternative medicine within the past year. Of these who had used complementary and alternative medicines, 23.78% (n=88) used acupuncture, 12.43% (n=46) used Ayurveda, 1.08% (n=4) used yoga and meditation, 0.27% (n=1) used physiotherapy. Whereas, none of the participants reported that they used hydrotherapy or homeopathy. Also, the participants had used massage for alternative reasons except for DM. About 9.61% of the study participants used only acupuncture and 8.65% used Ayurveda only for reducing their blood sugar level. Nearly 3.84%

Used yoga and meditation only for reducing their blood sugar level. Only 0.9% used physiotherapy just for reducing their blood sugar level. The use of type of

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CAM is shown in figure 1 and 2.

The most common Ayurveda medicine that was used by the study participants is Nishamalakitablet, Nisakathakadikashayam, Madhumeharichurna, Chandraprabha Vati tablet, Siva qulika tablet, Dhanwantharam tablet, Dhanwantharamghrutham, Mahatiktakashayam (Table 4).

TABLE 4: AYURVEDA AND ITS USES

AYURVEDIC MEDICINE	**USES**
Nisakathakadikashayam	• Maintain normal blood sugar levels in pre-diabetes,diabetes. • Treat complications of diabetes such as neuritis
Nishamalaki tablet	• Maintain blood sugarlevel • Helps to relieveurticarial • Anti-allergic
Madhumeharichurna	• Relive frequenturination • Numbness • Excessive thirst associated with increased bloodsugar • Fatigue • Dryness ofmouth
ChandraprabhaVati tablet	• Treat urinary tract infection, difficulty in urination, urinarycalculi • Relive constipation,bloating • Helps to relieve indigestion, eyeinfections • Treat eczema, allergic skinconditions • Used to treat semen defects and gynecologicalproblems

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Siva qulika tablet	• Treatment of liver and spleendisorders • Ascites • Anemia • Goutarthritis • Skindiseases
Dhanwantharam tablet	• Reduce gastrouble • Hiccup • Chestpain • Aggravated kappa complaints • Bronchialcomplaints
Dhanwantharamghrutham	• Treatment ofedema • Diabetes • Diabeticcarbuncle • Spleen relateddiseases • Skin and psychoticdiseases
Mahatiktakashayam	• Treatment of skin diseases of Pitta origin • Reduce the inflammation around the wound • It is used in burning sensation in wounds • Effective in psychiatric conditions and eye diseases • Used to heal fistula wounds, menorrhagia

3.3. Blood sugar wise distribution

The mean fasting blood glucose and postprandial blood sugar of the study participants were observed to be 207.34 and 312.97 mg/dl before taking CAM and after utilizing CAM 184 and 274 (Table 6). As assessed from the collected data of the study participants, there was a significant decrease in the mean

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fasting and postprandial blood glucose of the study population after taking CAM. We couldnot findtheHbA1Cdataforallthepatientsandthestudyislimitedtocommentontheoverall diabetes control in patients takingCAM. Table 5 illustrates the percentage of study participants on antidiabetic medication and table 6 explains the distribution of study participants based on their blood sugar.

TABLE 5: PRESCRIBED DIABETIC MEDICATION DISTRIBUTION

VARIABLES	N=370	%
No drug	84	22.7027
Diabetic tablets	286	77.2973

TABLE 6: BLOOD SUGAR WISE DISTRIBUTION

BLOOD SUGAR LEVEL	BEFORE CAM	AFTER CAM	P-VALUE
FBS (Mean± SD) mg/dl	207.34± 28.85	184.13± 42.74	<0.01
PPBS (Mean± SD) mg/dl	312.97± 61.54	274.42±48.65	<0.01

3.4. MMAS

Medication adherence of the study participants to their regular anti-diabetic medications was studied using the MMAS questionnaire. To our surprise, none of the patients reported that they forget to take their medication sometime. Even when asked about missing the medications for reasonsotherthanforgetting,noneofthemmissed takingthemedicationoverthepasttwoweeks. Whenaskedabout the withdrawalofantidiabeticmedicationswithouttheclinician'sadvicewhenthey felt worse while taking the medication, only one participant agreed that they have stopped taking the medication without the physician's knowledge. While participants traveled or left home, only 2 patientsforgotto bringtheirmedication(1.9%)andallothershavetakenit regularly. Whenasked whether they took their medication for the previous day, the entire patients(100%) reported that they have taken the medication. Around 11.5% of the study participants reported that they stop taking their medications when they feel like the symptoms are under control. Taking medication every day is a real inconvenience; we were astonished with the response recorded when

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enquired aboutwhethertheyfelthassledaboutstickingtotheirtreatmentplan.Only2.8%ofthestudy participantsfeltthatitwasinconvenienttosticktothetreatmentregimeneveryday.Wheninquired about how often they have difficulty in remembering to take all their medications, a majority of thestudyparticipantrespondedneverorrarely(95.19%)followedbysometimes(2.38%),once in a while (1.92%) and none of them recorded either usually or all the time Figure(3). Though approximately 35% of the study participants used CAM, overall medication adherence to their regularanti-diabeticmedicationswasobservedtobe excellentamongthestudyparticipants(Table 7 and figure 3).

3.4. SF12

The quality of life of the study participants when taking CAM was assessed using the SF12 questionnaire. All the patients responded to every question of the questionnaire. When inquired about their general health, about 90.38% of the study participants reported excellent and 9.61% responded as very good. A majority (80.76%) of the patients responded that their moderate activities like moving a table, pushing a vacuum cleaner, are not limited at all followed by limited a little in15.38% and limited a lot in 3.84% of the participants. Climbing several flights of stairs was not limited at all in 70% of the participants followed by limited a little and limited a lot in 14.42% and 18.26% respectively. The impact of CAM on the physical health of the participants was assessed by the $4^{th}$and 5^{th}questions of the SF12 questionnaire. To the question "whether they accomplished less than they would like" and "were limited in kind of work", while using CAM, alltheparticipants(100%)responded"NO".

The6^{th} and7^{th} questionanalyzedwhether"whileusing complementary and alternative medicines, were patients limited in the kind of work they do or other regular activities as a result of any emotional problems (such as feeling depressedoranxious)".Whenaskedabouttheyaccomplishedlessanddidn't dowork ascarefully, asusual,only1.92%and2.88%ofparticipantsreportedthattheyaccomplished lessanddidn'twork carefully, respectively. While using complementary and alternative medicines, none of them reported that pain interfered with their normal work while taking CAM. About all the patients (99.03%)respondedthattheyfeltcalmandpeacefulallofthetime.Amajorityofthepatientshave responded that they had a lot of energy all of the time (83.65%), followed by most of the time (8.65%) and some of the time (5.76%). None of them felt downhearted and blue while taking CAM.Mostofthepatientsrespondednoneofthetime(92.30%)whenaskedforhowm

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uchofthe time their physical health or emotional problems had interfered with their social activities (like visiting with friends, relatives, etc.) while taking CAM. The responses to SF12 questionnaire by the study participants are shown in table(8).

According to completely different aspects of satisfaction, most of the participants were glad about easy use, the safety of complementary and alternative medicines, they believed that victimization of complementary and alternative medicine failed to interfere with their daily activities, the impact of complementary and alternative medicines on the reduction of glucose, failed to have any concern on the interaction between complementary and alternative medicines and other therapies, had a good feeling after use of complementary and alternativeMedicinesandrecommendedcomplementaryandalternativemedicinest oothers.Themajorityof the CAM users reported that their selection of the CAM medical care was influenced by their friends.

TABLE 7: DISTRIBUTION BASED ON MMAS SCALE

QUESTIONS AND RESPONSES	N=370	%
Q1		
• No	370	100
• Yes	0	0
Q2		
• No	370	100
• Yes	0	0
Q3		
• No	368	99.454
• Yes	1	0.2702
Q4		
• No	367	99.189
• Yes	3	0.8108
Q5		
• No	0	0
• Yes	370	100

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Q6 • No • Yes	310 60	90.386 9.9615
Q7 • No • Yes	366 4	98.911 1.0810

TABLE 8: DISTRIBUTION BASED ON SF12 FORM

QUESTIONS AND RESPONSES	**N=370**	**%**
SF1 Excellent (1) Very Good (2) Good (3) Fair (4) Poor (5)	 360 10 0 0 0	 90.3846 9.6153 0 0 0
SF2 Yes, Limited A Lot (1) Yes, Limited A Little (2) No, Not Limited At All (3)	 4 16 360	 1.08101 4.3243 94.5949
SF3 Yes, Limited A Lot (1) Yes, Limited A Little (2) No, Not Limited At All (3)	 19 15 346	 5.1351 4.0540 93.5135 1
SF4 Yes(1) No(2)	 0 370	 0 100

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SF5 Yes (1) No (2)	0 370	0 100
SF6 Yes (1) No (2)	2 368	0.5405 99.4594
SF7 Yes (1) No (2)	367 3	99.1899 0.8108
SF8 Not At All (1) A Little Bit (2) Moderately (3) Quite A Bit(4) Extremely(5)	370 0 0 0 0	100 0 0 0 0
SF9 All of the Time (1) Most of the Time(2) A Good Bit of the Time (3) Some of the Time(4) A Little of the Time (5) None of the above	369 1 0 0 0 0	99.7297 0.2702 0 0 0 0

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SF10		
All of the Time (1)	344	92.979
Most of the Time(2)	15	4.054
A Good Bit of the Time(3)	2	0.5405
Some of the Time(4)	7	1.8918
A Little of the Time (5)	2	0.5405
None of the Time (6)	0	0
SF11		
All of the Time (1)	0	0
Most of the Time(2)	0	0
A Good Bit of the Time (3)	0	0
Some of the Time(4)	0	0
A Little of the Time (5)	0	0
None of the Time (6)	370	100
SF12		
All of the Time (1)	0	0
Most of the Time(2)	0	0
A Good Bit of the Time (3)	0	0
Some of the Time(4)	3	0.8108
A Little of the Time (5)	5	1.3513
None of the Time (6)	362	97.8378

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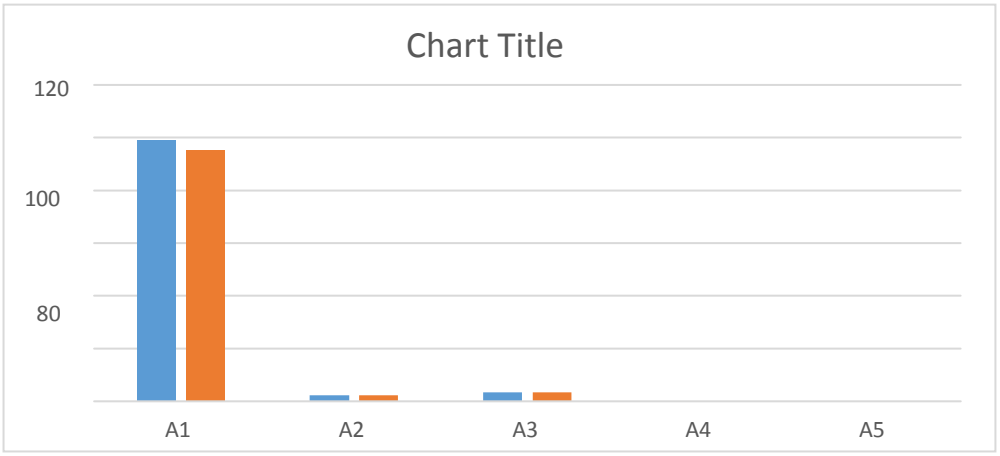

FIGUFIGURE 1: DISTRIBUTION BASED ON CAM USERS

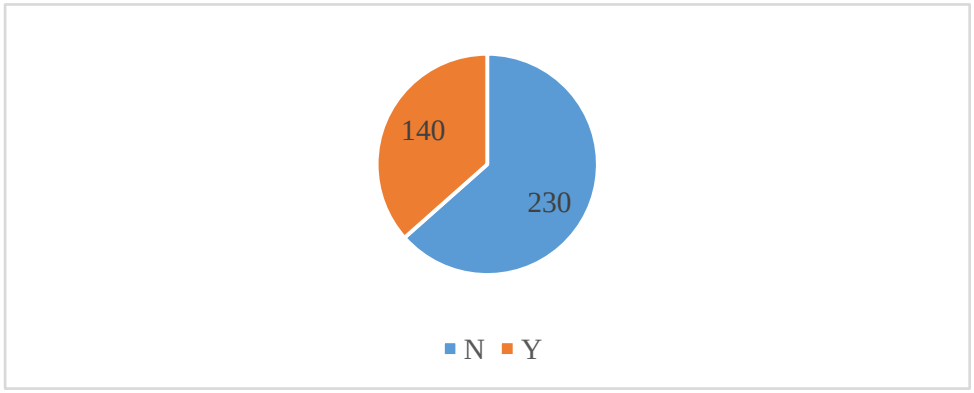

FIGURE 2: DISTRIBUTION BASED ON CAM HISTORY

NOTE:**A**-Ayurveda, **AP**-Acupuncture, **Y**-Yoga, **PT**-Physiotherapy, **N**-No

4

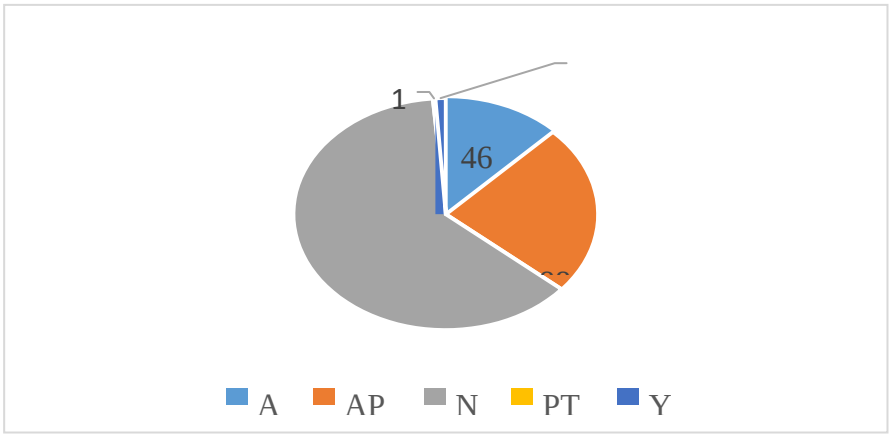

FIGURE 3: DISTRIBUTION BASED ON MMAS SCALE

NOTE:A1- Never/rarely A2- Once in a while A3- SometimesA4- UsuallyA5- All the time

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4. DISCUSSION

In the present study, the application of complementary and alternative medicines in diabetic patients is investigated. Complementary and alternative medicine was utilized during this study, 36.5% of DM patients have used a minimum of one in all the complementary and alternative treatments throughoutrecent years. ComplementaryandpracticeofmedicineuseprevalencewithintheUSA ranged from 31% to 57% among diabetic patients, 63% in Bahrain, 62% in Mexico, 17% in the UK, and 25% in Canada. In India, reported the state of Uttar Pradesh reported a prevalence of 68%, 63.2% in Maharashtra the patients use CAM for diabetic Mellitus [17].

Other studies have reported a varying range of complementary and alternative medicine use rates among T2DM patients depending on the country or geographic area. Different percentages are often affected by methodology. In some studies, sampling was random, and in others, it was not random. Also, concerning disagreements in the definition of complementary and alternative medicines in several studies, it is expected that no similar treatment is used in all studies leading to the variable prevalence of complementary and alternative medicine use in several studies [21]. Herbal medicines use is becoming a standard practice both in developed and developing countries.

Ourstudyfindingsrevealedthatmostofthepatientswho receivedCAMdid notstoptakingtheir medication after their symptoms were under control. Despite the participants did not have any healthinsuranceandcamefromloweconomicstatus,theirmedicationadherencewas good.Those patients may have been encouraged to use CAM due to the low cost of such therapies compared to conventional therapies. And the study revealed only one participant stopped to takemedication without their physician's knowledge; because most of the health practitioners do not refer to use CAM. Other studies reported a higher percentage, 6.9% informed to their physicians of such use, even though patients were recruited from physician's clinics [8]. Other studies revealed the same or even lower pattern of reporting. [22].

Our study revealed the SF12 form gives a valid outcome for assessing and monitoring the patient's health status. It is helpful to know the presence and seriousness of physical and mental changes, self-reported changes from health. Most of the patient's physical health is excellent because they regularly received CAM therapies. The majority of the patients has a lot of energy and felt calm because they alternatively doing yoga and meditation. The questions related to face validity so easilyunderstandthephysicalandmentalofthepatients.Theultimate intention of

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using CAMtherapieslike acupuncture and herbal medicines by the diabetic patients was to reduce blood glucose level.After using CAM their blood glucose level wascontrollable.

Nevertheless ,in the presentstudy,acupuncturehadthehighestamongpatients;physiotherapyhadthe lowest prevalence among patients with diabetes. The diabetic patients are considerably increasing the use of complementary and alternative medicine because of the low cost of such therapies as compared to traditional ones, side effects of medications, and the ineffectiveness of medications in some conditions and traditional medicines match with beliefs and values of people better than modern treatment. As a result, most of the diabetic patients like better to use complementary and alternative medicines associate degreed different medicines an adjunct for diabetes treatment.[23] Also, complementary and alternative medicine is employed as a means to scale back the usage of commonmedicationsbecauseoftheircomplications,lessprice,andthattheyaregoin gtobebought without a prescription[24].

5. CONCLUSION

A Cross-sectional study was carried out to investigate the utilization of complementary and alternative medicines by the patients with diabetes mellitus. Among 370 diabetic patients enrolled,about 37% of patients had used CAM concomitantly to manage their diabetes. The lower costs, availability, without prescription, fewer side effects, and recommendations by friends were the common reasons reported by the study participants for having used CAM. There was a significant difference between the mean blood sugars of the study participants before and after using CAM. The patients have reported improved quality of life when they used CAM in addition to their regular medicines in managingdiabetes.The useofCAMdidnotaffectmedicationadherencetoregularanti-diabeticmedications among the study population. A randomized trial with similar objectives when conducted prospectively will give us a better understanding of the role of CAM in managing patients with diabetesmellitus.

6. LIMITATIONS

ThestudycompletelydependeduponpatientsreporteddataanddatafrompatientsOP records.Data to assess the impact of CAM use on blood sugars were inadequate as HbA1C was notrecorded.

CONFLICT OF INTEREST

There are no conflicts of interest

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