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Original Research Article

The Burden of Complementary and Alternative Medicine Use among Diabetics Attending a Tertiary Hospital in North Central Nigeria

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Abstract: Diabetes mellitus is a chronic metabolic disorder associated with complications. Its management entails lifestyle modification and drug treatment regimen to control the disease. The use of Complementary and Alternative Medicine (CAM) in addition to orthodox medications is viewed by many patients as the way to achieve glycaemic control. The aim of the study was to determine the burden of complementary and alternative medicine use among diabetics at the Federal Medical Centre, (FMC), Makurdi, North Central Nigeria. The cross sectional study was conducted among 244 patients with type 2 diabetes 18 years and above through systematic random sampling method. The data was collected using a semi- structured interviewer-administered questionnaire and analysed with Statistical Package for Social Sciences (SPSS Version 23). The study found out that the mean age of the participants was 56.97 (± 10.69) years. There were 144 females (59%) and 100 males (41%). Prevalence of the concurrent use of CAM and orthodox medicines among study participants was 40.2%. The study concluded that a significant proportion of patients receiving conventional treatment for diabetes also used CAM therapies. Thus, further research on the potential benefits and otherwise of CAM on treatment of diabetes in this environment is suggested to get a better insight into the role of CAM in diabetes management.

Keywords: Burden, Complementary and Alternative Medicine, Diabetics.

INTRODUCTION

Diabetes Mellitus (DM) is a chronic illness and a major cause of morbidity and mortality worldwide [1, 2]. It is considered as one of the main ten leading cause of death worldwide [3]. It is a non-communicable debilitating illness and a global health challenge that has gained great importance in the sub-Saharan region [4-6]. It requires regular and sustainable health management that involves proper treatment [7]. The burden of diabetes mellitus is enormous and its prevalence keeps increasing [4]. In 2013, World Health Organization gave a prevalence of 347 million people living with diabetes [1]. However, this is expected to double between 2005-2030 with the greater portion of this increase affecting the low to middle income countries [1]. In Nigeria, the prevalence of diabetes is equally increasing due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity [8, 9]. The estimated burden of diabetes in Nigeria is about 1.7 million as at 2016 [10]. Tight blood glucose control has been shown to prevent or delay the

progression of complications in DM patients [8, 11]. These complications usually due to chronic hyperglycaemia are associated with long-term damage, dysfunction and failure of various organs namely the eyes, kidneys, nerves, heart and blood vessels [12, 13].

Good glycaemic control is not an easy task for many patients as the management of diabetes is challenging and it often has an adverse bearing on the quality of life of the patient especially if the blood glucose is uncontrolled and it requires extensive use of health care services which can be physically, emotionally and financially demanding [14]. A study conducted by Okoronkwo *et al*., in South East Nigeria showed that the mean monthly expenditure for the treatment of diabetes was ₦56,245.11 ($356) [15]. This high cost is one of the reasons why diabetics seek to use complementary and alternative medicines.

Complementary medicine is a healthcare approach used in conjunction with conventional medicine [16]. The prevalence of CAM use with orthodox medication is increasing worldwide [17]. As the global use of CAM products continues to increase and many new products are introduced into the market, public health issues, and concerns surrounding their safety are also increasingly recognized [18]. Some CAM products may also be beneficial and safe; but the lack of randomized controlled trials makes their use controversial [19].

Understanding the concerns of a patient seeking care and communicating adequately helps to create an enabling avenue to educate and influence the patient positively [20]. There is dire need for health care practitioners to frequently probe patients for CAM medicine use and the need to know how prevalent it is among patients with chronic disease as this will help practitioners to be aware of their patients' health behaviour and choices, with a view to manage the disease better. The author conducted this research to find out the burden of CAM use among diabetics in Makurdi.

MATERIAL AND METHODS

Study Design, Setting and Population

This was a cross-sectional study carried out at the General Out-Patient Clinic (GOPC) of Federal Medical Centre (FMC) Makurdi, a tertiary hospital in Benue State of Nigeria. The study population was made up of type 2 diabetics aged 18 years and above attending the GOPC who had been on treatment and had been consistent with follow up for at least three consecutive months prior to the time of study.

Inclusion and Exclusion Criteria

Patients with type 2 DM who had been on treatment with oral anti diabetic medication for at least three months prior to this study and had been adherent to medications and had given a written informed consent were recruited to participate in this study while the following categories of patients were excluded: Type 1 diabetic patients, patients with diabetic emergencies, patients less than 18 years, patients who had not fasted up to eight hours overnight before coming to the clinic, pregnant diabetic patients, diabetic patients who are mentally challenged, diabetic patients who were too ill or needed in-patient care, patient who declined informed written consent.

Sample Size and Sampling

The Sample size was calculated using the Leslie and Kish formula for descriptive studies [21].

$$N = \frac{Z^2pq}{d^2}$$

Where

N = Minimum sample size

Z = A constant at 95% confidence level = 1.96

P = Prevalence of CAM use among diabetes mellitus patients in Lagos (46%) [22] =0.46%.

q = I – p (i.e. 1 – 0.46) = 0.54

d = desired precision of 5% = 0.05

$N = (1.96)^2 (0.46 \times 0.54)/ (0.05)^2$

= 382.0

However, the study population for this study was less than 10,000. Hence, the final sample estimate, nf, for proportions with population less than 10,000 was calculated using the formula given below [21].

$$nf = \frac{n}{1 + (n) / (N)}$$

Where,

nf = desired sample size when population is less than 10,000

n = the desired sample size when the population is more than 10,000 = 382

N = the estimate of the study population for the period of study =528 (Number of adult diabetic patients expected to visit within a period of three months).

Hence nf = 382/1+382/528=221.6
This was approximately 222.

A total number of 244 patients were recruited for the study on addition of 10% of the sample size for estimated non-response and missing questionnaire.

A systematic sampling technique was used. A sample frame of 528 diabetics was used with a calculated sample size of 244. The sample interval was 2 this was derived by dividing the sample frame by the sample size. The first adult diabetic patient that was recruited into the study was chosen by simple random sampling using the balloting technique this process was repeated every day until the required sample size is attained.

Data Collection Method

A semi- structured interviewer-administered questionnaire was used to obtain information from the selected patients.

Data Analysis

Data obtained using the questionnaire was analyzed with the Statistical Package for Social Sciences (SPSS Version 23). Results were presented using appropriate charts and frequency tables.

Ethical Considerations

The ethical clearance was obtained from the Federal Medical Centre Makurdi Health and Research Ethics Committee. Written informed consent was obtained from the subjects before recruiting them into the study. Privacy was ensured as a consulting room was used during the interview, and it was conducted on a one-on-one basis.

RESULTS

Sociodemographic Characteristics of the Participants

Table 1: Socio-demographic characteristics of the respondents (N=244)

Socio-demographic characteristics	Frequency	Percent
Age (in years)		
30-40	17	7.0
41-50	58	23.8
51-60	94	38.5
>60	75	30.7
Mean 56.97±10.69		
Gender		
Male	100	41.0
Female	144	59.0
Marital status		
Single	7	2.9
Married	225	92.2
Separated	8	3.3
Divorced	4	1.6
Level of education		
No informal education	52	21.3
Primary	54	22.1
Secondary	52	21.3
Tertiary	86	35.2
Occupation		
Civil servant	64	26.2
Trading/business	39	16.0
Farming	77	31.6
Artisan	8	3.3
Unemployed	14	5.7
Retired	39	16.0
Others*	3	1.2
Ethnic group		
Tiv	181	74.2

Idoma	26	10.7
Igede	5	2.0
Igbo	18	7.4
Others**	14	5.7
Religion		
Christianity	233	95.5
Islam	10	4.1
Others***	1	0.4

*Others include clergy, ** others include Hausa, Etulos, Nupe, Jukun, *** Others include pagan

Table 1 above shows the mean age of respondents to be 56.97 ± 10.69 years, with a higher proportion aged 51-60 years, 94 (38.5%) and closely followed by those >60 year of age, 75 (30.7%). Over half of the respondents144 (59.0%) were females, while 100 (41.0%) were males. A vast majority 225 (92.2%) were married, followed by those that were separated 8 (3.3%) while those divorced had the least frequency 4 (1.6%). A higher proportion of respondents had tertiary education, 86 (35.2%). Majority 77 (31.6%) were farmers and of Tiv ethnic group 181 (74.2%). Christianity was the dominant religion, 233 (95.5%).

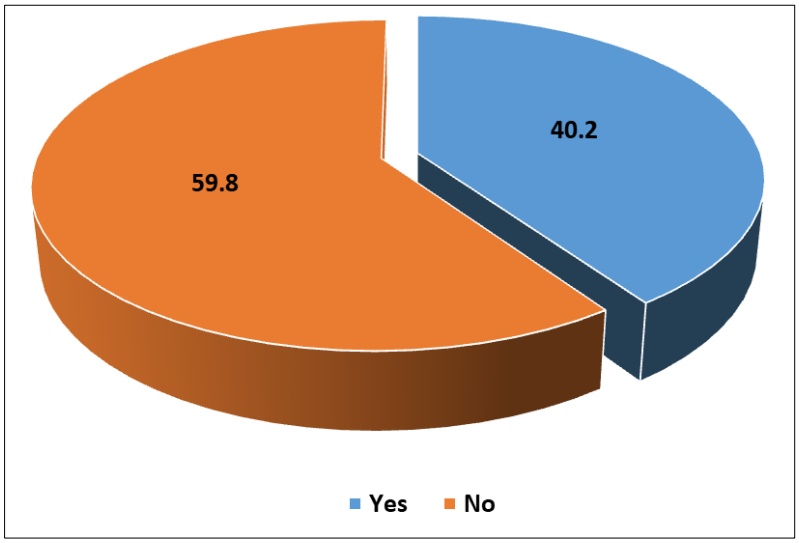

Figure 1: Prevalence of CAM use among participants

The prevalence of CAM use was 40.2%. Diabetics who did not use CAM had a prevalence of 59.8% (see figure1 below).

History of CAM Use among Participants

Table 2: Relevant history of CAM use among diabetic respondents

Variables	Frequency	Percent
Frequency of CAM use (N=98)		
Daily	51	52.0
Weekly	31	31.6
Monthly	16	16.4
Duration of CAM use (in months)		
<12	23	23.5
12-24	54	55.1
25-48	11	11.2
>48	10	10.2
Mean=25.03±13.50		
Cost of CAM (in naira)		
No cost	52	53.1
<1000	14	14.3
1000-2000	13	13.3
2001-3000	2	2.0
3001-4000	4	4.1

>4000	13	13.2
Reason(s) for CAM use (Multiple response)		
Readily available	58	46.4
Counteract western medicine	8	6.4
Complement each other	41	32.8
Disappointment with conventional health care	5	4.0
Others	13	10.4
Source of knowledge of CAM (Multiple response)		
Family and friends	72	60
Media/advertisement	12	10.0
Pharmacist	1	0.8
Doctors	1	0.8
CHEWS	5	4.2
Pastors/religious leaders	22	18.3
Others	7	5.8
Disclosure to physician		
Yes	24	24.5
No	74	75.5
Reason (s) for non-disclosure (Multiple response)		
Doctor did not ask	62	73.8
Did not think the doctor needed to know	11	13.1
Believed that the doctor had less knowledge about CAM	1	1.2
No time to discuss CAM use with the doctor	2	2.4
Afraid of negative reaction from doctor	5	6.0
Worried that doctor will discourage CAM	3	3.6

Table 2 shows the age group with the lowest use of CAM were those in age ranges between 30-40 years. Over half of the respondents 144 (59.0%) were females and 40.3% of them used CAM (see Table 2). Majority of the respondents 53.1% got their CAM therapy at no cost while 14.3% spent <1000 naira monthly on CAM. Of the respondents who used CAM, 58 (46.4%) indicated that they used CAM because it is readily available; 41 (32.8%) indicated that CAM use and oral hypoglycaemic agents complement each other, while 8 (6.4%) indicated that they used CAM to counteract the side effect of western medicine. On their knowledge of CAM, 72 (60%) indicated that they got to know through their family and friends; while 22 (18.3%) indicated that they knew about CAM through their pastors/religious leaders. Majority of respondents 74 (75.5%) did not disclose CAM use to doctors, while 24 (24.5%) indicated that they disclosed their CAM use to their doctors. (See Table2 above).

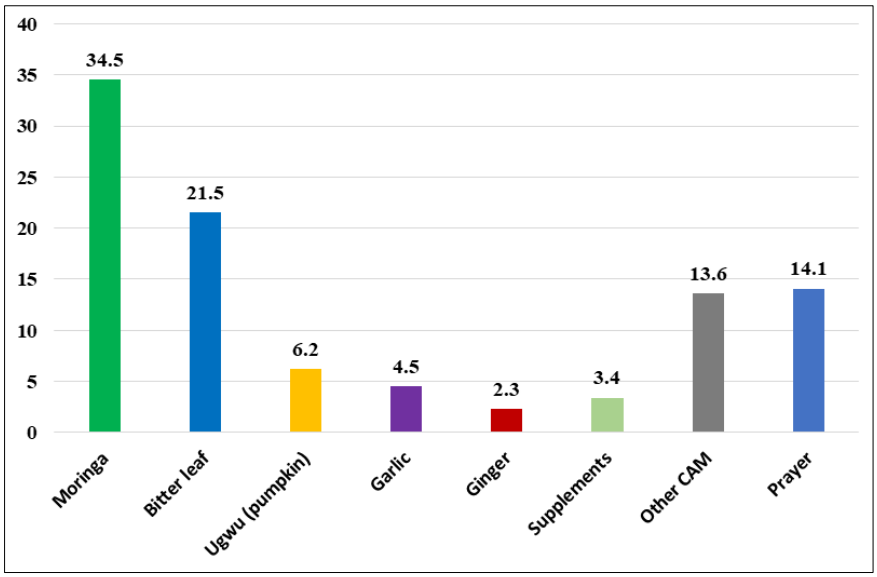

Figure 2: Bar chart showing types of CAM used by respondents

Majority (72.4%) of the respondents used biological based therapy, 14.1% used mind and body medicine while 13.6% used other forms of CAM. Moringa (34.4% n=61) and bitter leaf (21.5% n=38) were the most common types of

biological products used. Others were ugwu (pumpkin), garlic, ginger and supplements. All the respondents (14.1%) who utilized mind body therapy, used prayers (See figure 2 below)

DISCUSSION

The mean age of respondents was 56.97 ± 10.69 years. Over half of the respondents 59% were females while 41% were males. Majority of the participants (92%) were married while those who were divorced were the least in number (1.6%). Majority of the participants were farmers (31.6%) and this was closely followed by the civil servants (26.2%). The Tivs were the predominant ethnic group in this study with a prevalence of 74.2%. Majority of the participants were Christians (95.5%). The mean age of the respondents (56.97 ± 10.69 years) was similar to findings from a multicenter cross-sectional study conducted among diabetes across seven tertiary health centers in Nigeria's six geopolitical areas, conducted by Chinenye and colleagues [10]. The similarities could be attributed to the fact that both studies were hospital based and that the mean age of the respondents may be related to the fact that diabetes is more frequently diagnosed in middle-aged and older people. This study was also similar to the studies reported in Saudi Arabia by Bahrain and Taiwan, where majority of the respondents were between ages 40-64 years and CAM use among the respondents was 73%, 66% and 31.6% respectively [23, 24].

The prevalence of the concurrent use of CAM and orthodox medications among diabetics in this study was 40.2%. This high prevalence may be attributed to the fact that most of the respondents who used CAM (46.4%, n=58) utilized it because it was readily available and most of them (30.4%) got CAM at less than one thousand naira in a month. The prevalence of CAM utilization in this study may also be attributed to strong family ties that exists in this part of the world as about two-thirds (60%) of respondents in this study said they got to know about CAM from family members and friends. The high prevalence could also be attributed to the access of social media as majority of respondents had tertiary education. This prevalence is similar to the prevalence of CAM use obtained from other studies among the general population [25-27]. One of such reported prevalence (irrespective of disease entity) was 38% in the study in the USA [28]. The World Health Organization Traditional Medicine Strategy reported a CAM use prevalence of 49% in France, 48% in Australia and 40% in China [29]. A study of CAM use in Southeast Asian Nations reported a prevalence of 42.7% in Singapore [30]. Though the findings from these studies are similar but the methodology used differed from one another. This study was a cross sectional study where systematic random sampling technique was used however the studies conducted in Singapore and USA were systematic reviews. Prevalence of CAM use from China, France and Australia were obtained from global review from various government and non-government reports. The health care services/delivery in these countries also differ from that in Nigeria.

Specifically amongst diabetic cohorts, a prevalence of 46% was obtained in the study in Lagos Nigeria which was similar to the prevalence of this index study of 40.2% [22]. The reason for the similarity may be due to the fact that the study was also carried out in similar settings (hospital- based). Close prevalence were also reported in Lebanon, United Arab Emirates and Egypt 38% 39.3% and 41.7% and respectively [31- 33]. The reported prevalence of CAM use in this study was also much lower than what was obtained in Malawi (54 %) [34], California (Vietnamese Americans 57%), Iran(88.4%), Srilanka (76%), Tanzania (77%) and Morocco (75%) [24-28]. A systematic review on prevalence of Cam use among diabetics in Africa reported a prevalence ranging from 12.4% to 77.1%, with a median prevalence of 50% [35].

Even though the reported prevalence in our study may not be directly comparable with these studies due to the differences in the study location, period and duration of CAM use, the age differences in the study population may also have accounted for the difference. The difference may also be due to variation in acceptance of CAM therapy in different socio-cultural settings of the world. For instance, Chinese Herbal Medicine (CHM) is one of the most important components of traditional Chinese medicine (TCM) widely used in East Asia and this is well accepted resulting in a very high proportion of patients using CAM therapies in Asia [36]. Furthermore, CAM use was assessed in only patients older than 65 years of age in the US study [24].

The prevalence of CAM use among diabetics in this study was higher than the prevalence of 17.1% obtained in the study at Uyo, South-South, Nigeria [37]. The lower prevalence of CAM use in Uyo may be attributed to the study population. The study population in this study was only among diabetics while that conducted in Uyo was conducted among patients with different chronic illnesses which diabetes was inclusive. It was higher than that obtained among African Americans (17%) in a systemic review reported by Gardiner P and colleagues on prevalence of herb use among Racial/Ethnic minorities in the United States [38]. A lower prevalence of CAM use of 29% compared to this study was also reported by Nguyen and colleagues in Southern Carlifornia [39]. The prevalence of CAM use in this study was also higher than that reported by Manya K *et al.,* in a multicenter cross-sectional study of diabetics who attended a Public hospital and specialist endocrinology clinic in Sydney where a prevalence of 28.9% was reported [40].

In this study, biological based method of CAM was used by majority of the respondents (72.4%). This may be as a result of the availability of these products as majority of the respondents (46.4%) who used CAM said they utilized it

because it was readily available. Another reason may be due to cost as more than half of the respondents (53.1%) said they got their CAM at no cost. This was followed by 14.3% of the respondents who spent less than ₦1000 on CAM monthly. This study is in keeping with studies done in Sydney, California, Iran and India where biological based methods were the commonest forms of CAM used [39- 42]. In sub-Sahara Africa, Peter Bai and colleagues also found that biological based therapies were the prevalent forms of CAM used [43]. In Tanzania, Rose Kassole and colleagues reported biological based method of CAM was the most common form of CAM used [44]. In Nigeria, Ogbera and colleagues and Amaeze *et al.,* also reported herbal remedies as the most prevalent form of CAM being utilized [22-45]. These studies however differed from that reported by Tor-anyiin *et al.,* in Benue state where mind-body medicine (spiritual) form was the commonest CAM used [46]. The difference in commonest type of CAM used by respondents reported by Tor-anyiin *et al.,* and that reported in this study can be attributed to the study population although both studies were conducted in Benue State. While Tor-anyiin *et al.,* conducted the study among health workers, this study was conducted among the general population.

The commonest form of biological based therapy used in this study was moringa seeds (34.4%). This study is in keeping with a cross sectional study carried out among diabetics in Tanzania where moringa was the commonest traditional medicine used in the management of diabetes [44]. Amaeze and colleagues in a cross sectional study in Lagos also reported that Moringa and bitterleaf were the commonest herbs used in the management of diabetes [45]. Before the advent of orthodox medicine in Nigeria, herbal products such as moringa seeds had been the mainstay of treatment for various ailments and were dispensed by traditional herbalists involved in their cultivation and preparation [47]. The observed high use of moringa seeds in this study may be linked to this cultural background and history. Moringa is an important food source in some parts of the world including Makurdi, North Central Nigeria. This is because it can be grown cheaply and easily and many of the participants in this study said it was obtained from their farms and backyard gardens although a few patients reported purchasing these readily available products from places such as the market, herbal centers and pharmacies. The leaves of this plant has been reported to possess antioxidant and medicinal properties that may be helpful in the treatment and management of diabetes and its associated complications [48]. Moringa has also been reported to be useful in the management of hypertension [49].

In this study a higher number of respondents who did not use CAM 58.2% had hypertension while a lower number of hypertension 41% was reported in those who used CAM. This may be attributed to the antihypertensive properties of moringa as it was the commonest form of CAM used in this study. The perception that moringa is less toxic, with relatively little or no side effects may also have accounted for the frequent use among the study participants [50]. Olufunsho and colleagues reported that moringa is safe when administered orally [51].

Another common form of CAM used in this study was bitter leaf (21.5%). This is in keeping with the study carried out in Lagos where bitter leaf was the main form of CAM used by diabetics [22]. Also in Kaduna, bitter leaf was the commonest form of CAM used [52]. Prayer was also another highly utilized form of CAM used in this study (14.1%). Prayer and spiritual healing were also common and consistent with findings in a similar study in Sydney, Australia [40]. Tor-anyii and colleagues in a cross-sectional studies, also reported that spiritual therapy (prayers) was the commonest form of CAM used by participants in a cross sectional study conducted in Benue state [46]. The popularity of this mode of treatment may be explained by the fact that religion is an acknowledged source of coping technique when dealing with difficult life situations [53].

Ugwu (pumpkin), ginger, supplements, aloe-vera and massage were other forms of CAM utilized by participants in this study. The use of the other types of CAM such as alternative medicine, manipulative and body medicine was not so common in this study unlike the study in Bahrain where alternative medicine, manipulative and body medicine in addition to biological products were commonly used [24]. This difference could be because those other forms are less well known in this environment and even if they were available, may not be affordable by the patient.

CONCLUSION

The use of CAM therapies among diabetics attending FMC, Makurdi is common. It is important that physicians managing diabetics should inquire about the use of CAM in the management of their illness to enable appropriate evaluation of all factors responsible for their glycaemic control. Further research on the potential benefits and otherwise of CAM on treatment of diabetes in this environment is suggested to get a better insight into the role of CAM in diabetes management.

Limitation

The limitation of this study was that, firstly, a cross-sectional study design, hence exposures and outcome were measured at the same time. This study may not have ascertained temporal relationships which makes any inference from the observed association be made with care. Secondly, the interviewer administered questionnaire study relied on the honesty of those being interviewed and may not adequately reflect the actual use of CAM therapies by respondents.

DECLARATIONS

Ethical Approval and Consent to Participate: Ethical clearance was obtained from the Federal Medical Centre Makurdi Health Research Ethics Committee with reference number FMH/FMC/MED108/VOL1/X. Written informed consent was obtained from the subjects before recruiting them into the study.

Competing Interest: There were no conflicts of interest in this study.

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