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KNOWLEDGE, ATTITUDE AND PRACTICES STUDY AMONG COMPLEMENTARY AND ADVANCE MEDICINES USED IN TYPE-II DIABETIC PATIENTS

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ABSTRACT

Objective: Complementary and Alternative Medicine (CAM) has become the treatment options for the person diagnosed with diabetes mellitus. This survey centered on assessing the Knowledge, Attitude, and Practices (KAP) of CAM among type 2 diabetes mellitus patients in Multan, Pakistan. Methods: An observational, prospective, cross-sectional study was conducted Nishtar Medical College and university, Multan from 1st October 2022 to 31st January 2023. All patients of type 2 diabetes mellitus who intended to have routine visits during the study tenure were interviewed. Their demographic characteristics, clinical data, and attitude towards use of CAM products were assessed. Data were managed using SPSS. Results: The study includes 223 patients with type 2 diabetes. Almost all patients had heard of alternative medicine and being used by 58% of the individuals. Herbs (80.3%), specific diets (64.6%), and cupping (45.0%) were the most readily utilized CAM practices. CAM practices were proved relevant to diabetes-related complications [(p < 0.000); OR 2.57], poor glycemic control [(p < 0.000); OR 0.29], lack of trust in pharmaceutical products [(p < 0.000); OR 5.08], poor patient-doctor relationship [(p = 0.06); OR 1.47], being readily available and cheaper [(p < 0.0000; OR 6.1], and beliefs that CAM products have fewer side effects [(p < 0.000; OR 12.32] and can help in diabetes control [(p < 0.000); OR 35.76]. Conclusion: It is concluded that older age, female's gender, duration of diabetes, diabetes-related complications, and CAM use are associated. It is need of the time that both healthcare professionals and researchers work together for the awareness of diabetes and its complications in general public.

Keywords: *DM (diabetes mellitus), CAM (complementary and advanced medicines), KAP (knowledge, attitude and practices)*

Introduction

Diabetes Mellitus (DM) is an expression that is used for a group of metabolic diseases, associated with chronic hyper glycaemia [1]. DM is the part of metabolic disorder that is characterized as abnormal level of glucose in blood as a result of defects in insulin release, action of insulin, or both. The persistent high levels of glucose in bloodstream is congruent with damage in function of different organs like kidney, eyes, nerves, heart and blood vessels [2]. These days patient ratio of diabetes increasing due to sedentary life styles including higher use of junk food [3]. Carbohydrate consumption increases the postprandial glucose levels in people with diabetes and is the major macro-nutrient of the diet in glycemic control [4, 5]. In addition to it, a person's body weight, lipid levels and blood pressure have direct effect on food choices and energy balance [6].

Complications that cause deaths, DM is at 4th position. In a year, more than 3 million people died with diabetes and its related complications. Worldwide, diabetes put burden on healthcare systems, and on patients, their families who face social, financial and emotional strains [6]. By 2050, there will be 853 million adults with diabetes. The International Diabetes Federation reports a 46 % increase in diabetic's patients compared to current projections with 3 out of 4 adults living in the low-and-middle income countries. The data represent a significant threat to the public health in the in the next 25 years [7]. Due to side effects of the common drugs prescribed by the health care providers, there is an increasing trend towards the use of Complementary and Alternative Medicine (CAM) in diabetic's patients.

The National Centre for Complementary and Alternative Medicine of the Unites States have defined CAM as "a group of medical and health care systems, practices, and products that are not presently considered to be the part of conventional medicines" [8]. Medicinal plants, a dominant component of CAM have an important role in worldwide for health beings. Metformin (biguanides) is the first drug of choice in type II diabetes treatment, derived from the plant of Galega officinalis, although that time it was classified as an alternative medicine [9, 10]. So far, more than 400 types of plants and compounds have been extracted for use in type II diabetes patients and more than 1200 have been used for the diabetes mellitus. Garlic preparations, cinnamon and fenugreek and multivitamins are popular over the counter CAMs being used by diabetic patients [11].

The trend in worldwide use of CAM products has been increasing in diabetes mellitus, overall prevalence ranges from 30 to 57 % in some studies. It was observed that diabetic patients are using CAM products 1.6 times more as compare to non-diabetics. The United Kingdom and Australia record a 46 percent prevalence among diabetes. India, a country that believes in tradition and having a rich history of healing practices, records a higher use of 67 percent among its diabetic patients. The majority patients around (97%) used naturopathy which includes use of herbs [12]. This brings about an unrecognized issue of using herbal medicines in comparison with conventional medicines, enhancing the possibility of different interactions and adverse drug reactions. Alternative treatments i.e. herbal supplements can be one of the risk factors, especially if a person is taking the CAM products with the prescription products [13].

Due to increase prevalence of diabetes these days, diabetic patients are more frequently using CAM for the management of diabetes

[14]. However, professional guidance and education related to diabetes care yet has not been adapted. This study aimed to assess the knowledge, attitude, and practices (KAP) of people with type 2 diabetes mellitus (T2DM) about complementary and alternative medicines in Multan, Pakistan.

Method

In this survey, KAP levels were evaluated. Where, K means knowledge of diabetes, A means attitude to the diabetes and P means practices or behavior to the diabetes. In diabetes mellitus practices may involve increase activity, healthy eating, improves the hurdles to lose weight and lifestyles. Researchers believe that knowledge, attitude and practices (KAP) are correlated and knowledge and attitude directly influence the preventive practices of disease [15].

It was a cross sectional, observational survey, that was analyzed in diabetic OPD at Nishtar Medical college and university Multan, Pakistan. During the time period of October 2019 to January 2020 (4 months), data was collected from those type 2 diabetic patients who are visiting OPD for routine follow-ups. Verbal consents were taken from each participant of the survey. A questionnaire was designed for the purpose of interview of the participants. Type 2 diabetic patient's socio-demographic features i.e. age, education, marital status, gender, employment level and habits of smokers were asked. Medical features also analyzed in this study, i.e. treatment of diabetes (insulin or oral), duration of diabetes, diabetes related complications, diabetes control and other complications was assessed.

The questionnaire contained different types of questions regarding KAP including 3 question to access knowledge, 4 questions to access attitude and 7 questions to access practices. In diabetic type 2 patients who gave the verbal consent, type of complementary and alternative medicines used, recommender of complementary and alternative medicines, and user behavior was recorded. Date was analyzed by using SPSS. Standard deviation (SD), mean (n) and continuous variables were calculated. Frequencies and percentages were calculated for categorical variables. Medical data, socio-demographic data and KAP features had relationship, it was calculated by using Chi square test. ≤ 0.05 value of p was taken as significant. Odds ratio (OR), and confidence interval (CI) was also determined.

Results

The study involved two hundred and twenty-three (223) diabetic patients. Ten patients were rejected, and twelve patients' answers weren't considered because their replies weren't enough. All the other (211) patients, were included in the study. In terms of gender ratio, 83 (39.3%) were females and 128 (60.7%) were male. Their ages had mean of 61 ± 13 years (range is 54 to 78years). Almost all patients had the age of above sixty years. It was observed that more than 50% of study population was married (65.4%). Almost 14.2% was illiterate and about 41.2% were on job. All the participants of this study were diagnosed with type 2 diabetes, and out of these patients 8.1% were newly diagnosed. The mean duration of the disease was 8.6±3.5 years, within the range of 0 to 17 years.

It was observed that most of the participants are treating their diabetes by oral tablets (49.2%) and about half of the patients (34.7%) had diabetes related complications. Peripheral neuropathy was the most common complication that was about 43.3%. Only 34.1% from total subjects had targeted blood glucose control. More than one-third patients were obese 79 (37.4%), with 88 (41.7%)

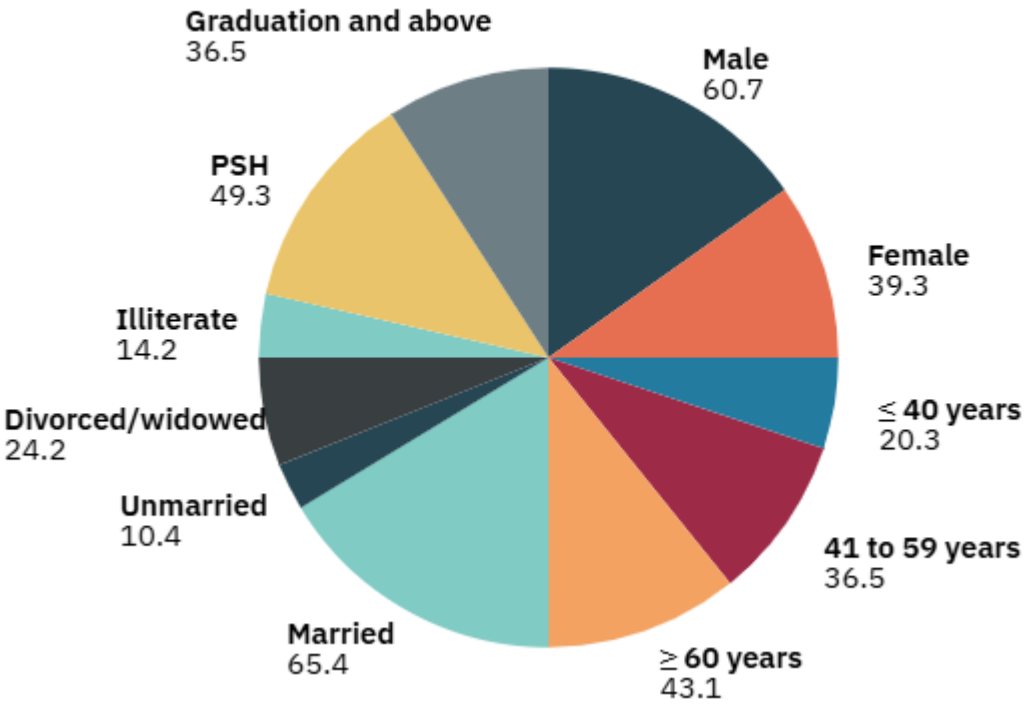
ischemic heart disease and almost half of the patients were with hypertension 99(42.6%). All the demographic characteristics are mentioned in Table 1.

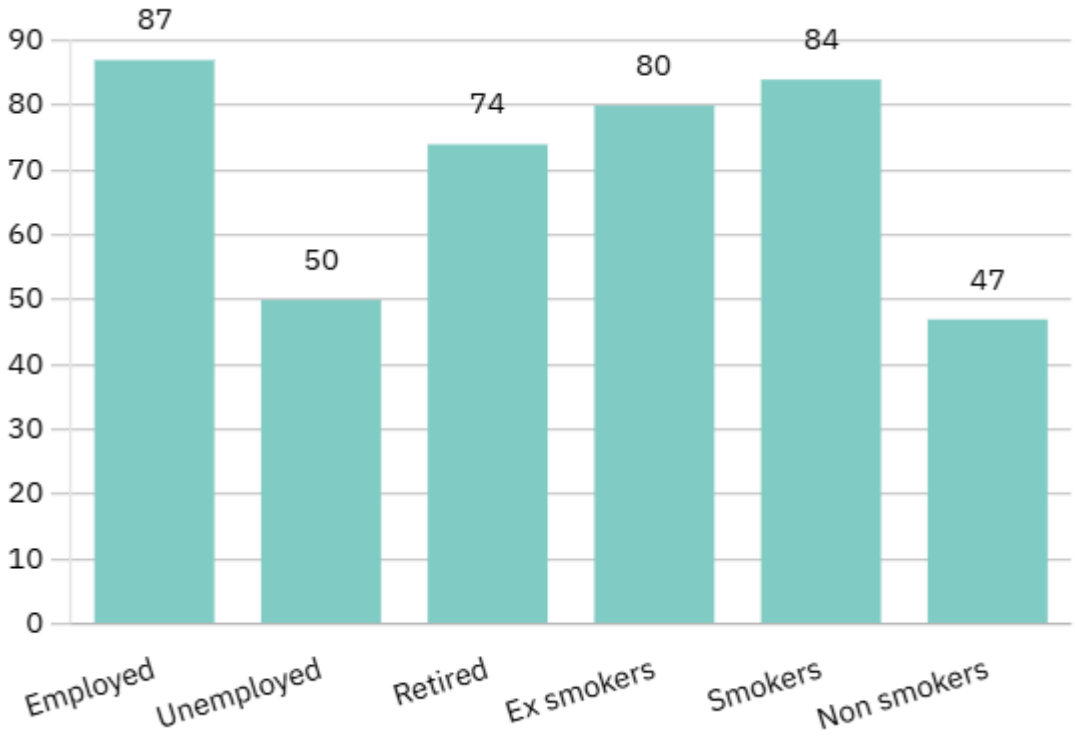
Table 1: *Socio-Demographic & Clinical Features of the Patients (n=211)*

Sr. #	Socio-demographic feathers	Frequency=n (%)	Sr. #	Medical features	Frequency =n (%)
Gender			**Duration of diabetes**		
1	Male	128 (60.7%)	1	Recently diagnosed	17 (8.1%)
2	Female	83 (39.3%)	2	< 5years	71 (33.6%)
Age			3	5 to < 10 years	84 (39.8%)
1	≤ 40 years	43 (20.3%)	4	More than 10 years	56 (26.5%)
2	41 to 59 years	77 (36.5%)	**Medication used**		
3	≥ 60 years	91 (43.1%)	1	Oral tablets	104 (49.2%)
Marital status			2	Insulin	66 (31.2%)
1	Married	138 (65.4%)	3	Both	41 (19.5%)
2	Unmarried	22 (10.4%)	**Complications**		
3	Divorced/widowed	51 (24.2%)	1	No	137 (65%)
Education			2	Yes	74 (35%)
1	Illiterate	30 (14.2%)	**Type 2 DM complication n=67**		
2	Primary/secondary/high school	104 (49.3%)	1	Peripheral neuropathy	29 (43.3%)
3	Graduation and above	77 (36.5%)	2	Cardiovascular disease	19 (28.3%)
Employment status			3	Foot wound	18 (26.9%)
1	Employed	87 (41.2%)	4	Retinopathy	16 (23.8%)
2	Unemployed	50 (23.7%)	5	Nephropathy	8 (11.9%)
3	Retired	74 (35.1%)	6	Others	1 (1.4%)
			HbA1c levels		
1	Ex smokers	80 37.9%)	1	➢ 7%	139 (65.9%)
2	Smokers	84 (39.8%)	2	≤ 7% 72 (34.1%)	
3	Non smokers	47 (22.2%)	**Clinical complications**		
			1	Blood pressure	99 (65.9%)
			2	Hyperlipidemia	90 (42.6%)
			3	IHD (ischemic heart disease)	88 (41.7%)
			4	Obesity	79 (37.4%)
			5	Others	10 (4.7%)

The KAP levels towards the CAM used by the study patients were also studied. It was observed that almost all of the patients heard about the alternative medicines. Almost50 % of patients said that CAM use is effective (n=105, 49.7%) and 38.85% said that CAM use is safe (N=81). When attitude towards the alternative medicines used was evaluated, it was observed that 74.8% patients would tell to their physicians about of CAMs, 8.1% of study patients will use CAM even their physicians didn't allow them. Reasons of CAM used was assessed that they have low side effects (57.3%) and almost 49.2% perceived that it will help to control their diabetes.

Patients were late while visiting to physicians so, it is the one of the reasons of CAM use (35%). Other reasons are lack of trust in conventional therapies (19.4%), cost (27.5%), poor relation with physician (3.8%) and sometimes physicians also prescribed CAM (2.4%). In addition, 122 (57.8%) patients were using CAM therapies to diabetes. While, 66 patients (54.1%) said that they will advise the use of CAM in their circle. These resulted are reported in Table 2.

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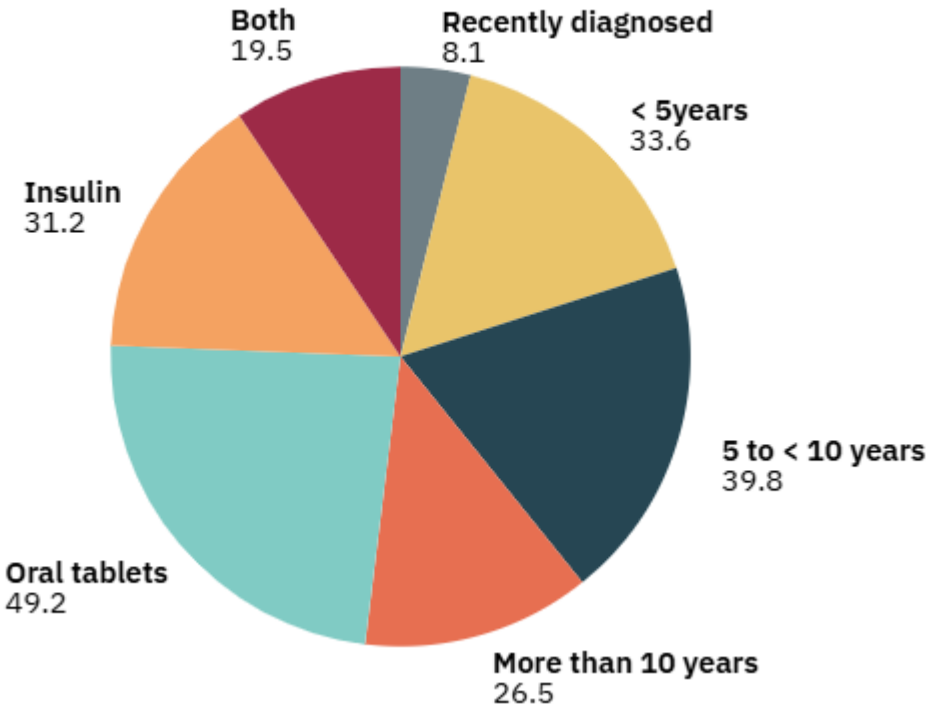
Both
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Recently diagnosed
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< 5years
33.6
Insulin
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5 to < 10 years
39.8
Oral tablets
49.2
More than 10 years
26.5

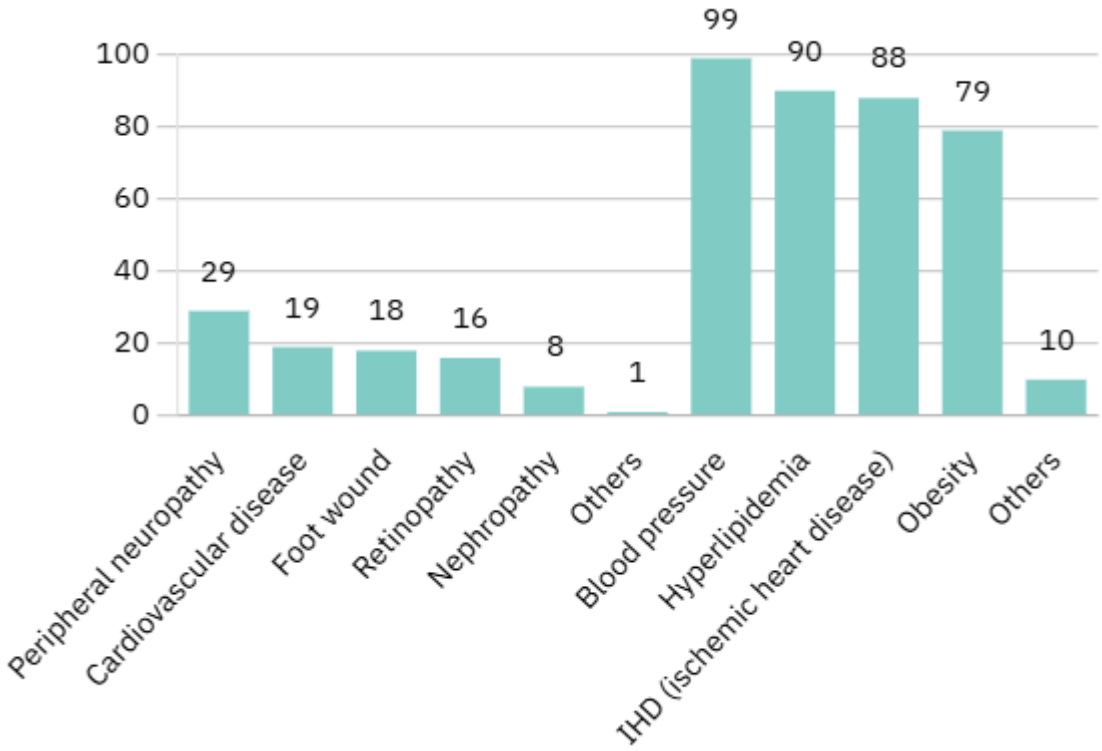
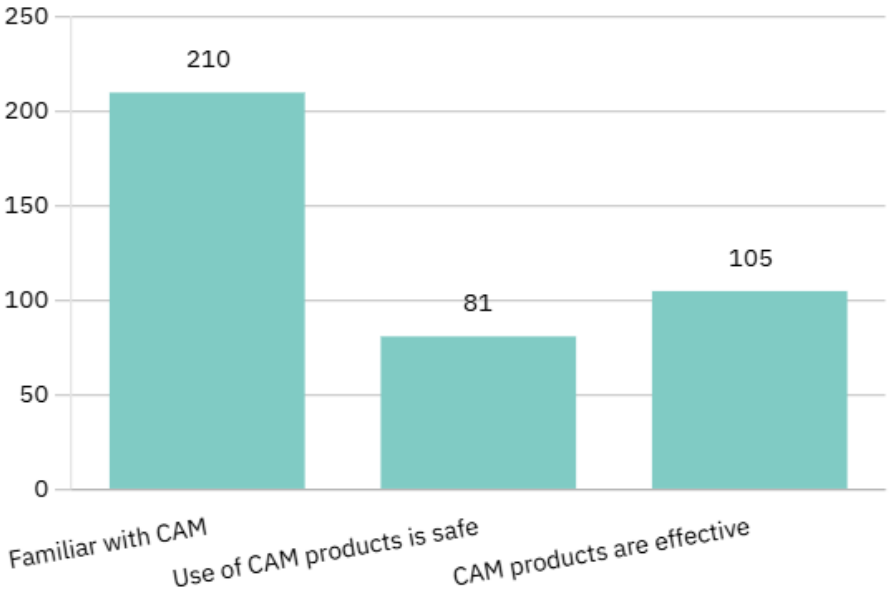
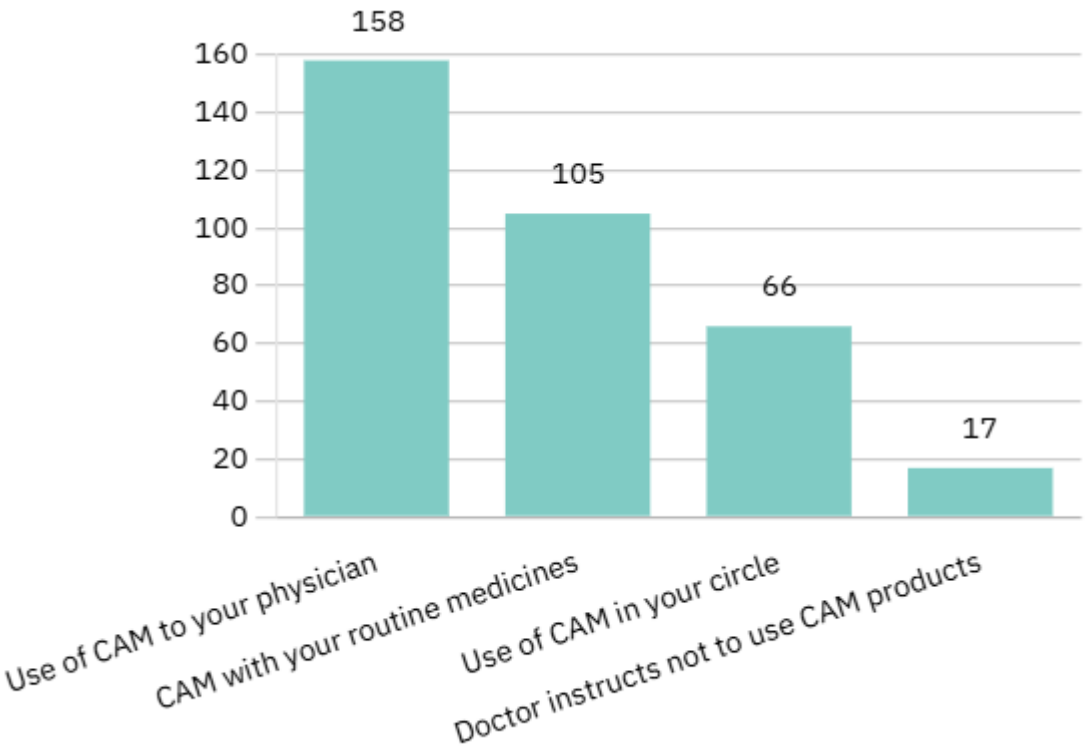


Table 2: *Knowledge, Attitude and Reasons of Practices (KAP) for the use of CAM*

Sr#	Variables	Frequency n (%)
	Knowledge	
1	Have you familiar with CAM?	210 (99.5%)
2	Do you think that use of CAM products is safe?	81 (38.4%)
3	Do you think that CAM products are effective?	105 (49.7%)
	Attitude	
1	Will you discuss the use of CAM to your physician?	158 (74.8%)
2	Will you combine the CAM with your routine medicines?	105 (49.8%)
3	Will you advise the use of CAM in your circle?	66 (31.3%)
4	Would you follow your doctor, if he instructs not to use CAM products?	17 (8.1%)
	Reasons of Attitude/practices	
1	Perception of fewer side effects by CAM	121(57.3%)
2	Belief that CAM help to control diabetes	104 (49.22%)
3	Delayed physician checkups	74 (35.0%)
4	Easy availability of CAM	58 (27.5%)
5	lack of trust in conventional therapies	41 (19.4%)
6	Poor communication with the physician	8 (3.8%)
7	Physician prescribed CAM	5 (2.4%)
	Using CAM for diabetes type II	
1	Yes	122 (57.8%)
2	No	89 (42.2%)

Characteristics of CAM users is shown in Table 3 which described that herb users were highest among CAM and composed of nearly 81% (N=98). About 36% (n= 44) got recommendations from their family members. Whereas, in only 1.6 % (N=2) CAM use was prescribed by the doctors. There were some patients (27%) who mixing their conventional therapies to CAM therapies while remaining using separate. Only 18.6% were satisfied with their use of CAM, and 14.6% said that they had informed their doctors.





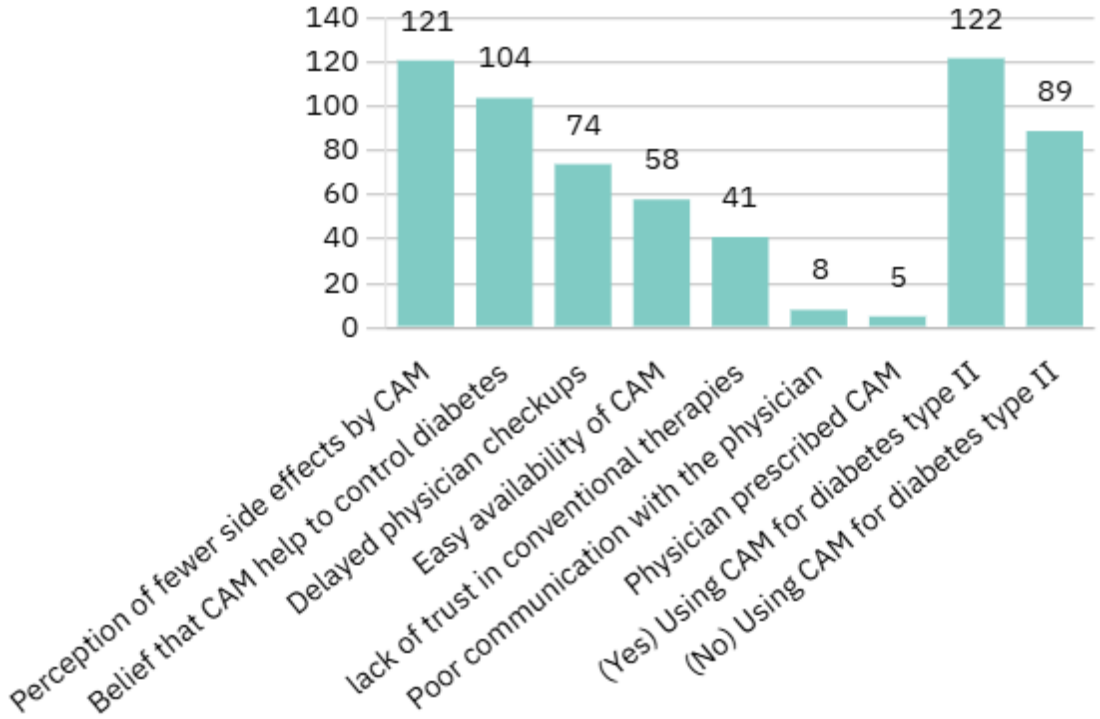
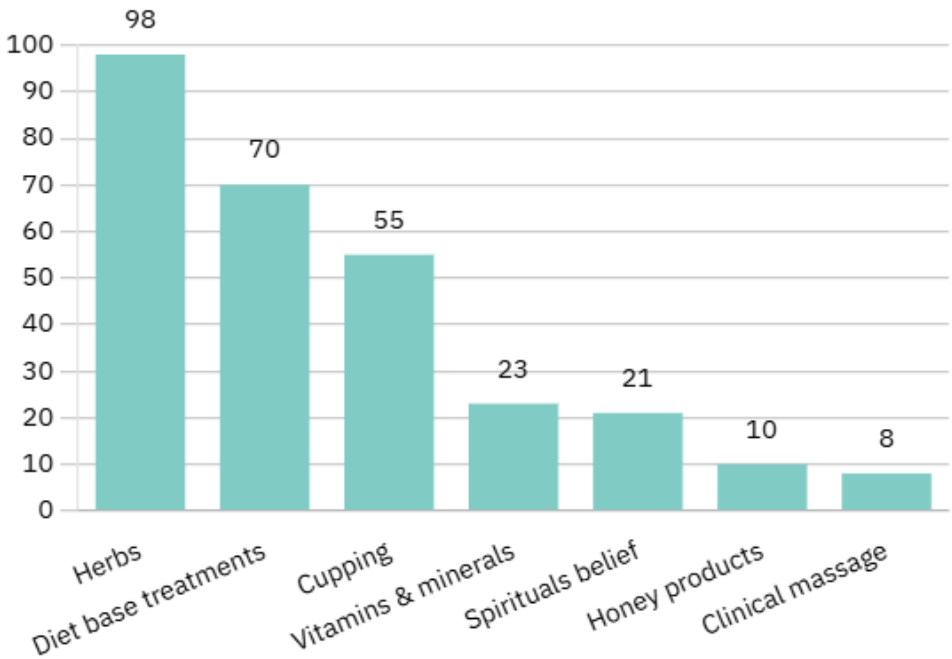


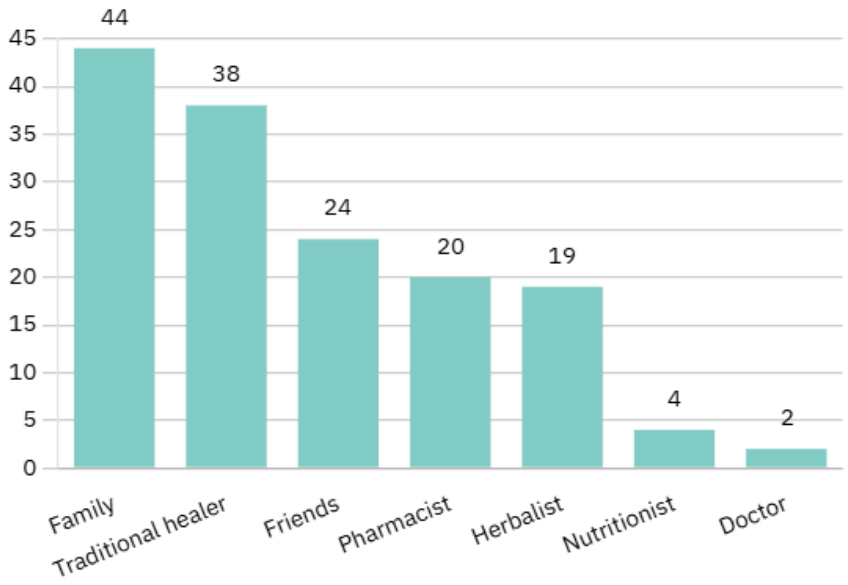
Table 3: *Impacts of using CAM in Participants*

Sr.#	Variables	Frequency n (%)
CAM practices used		
1	Herbs	98 (80.3%)
2	Diet base treatments	70(64.6%)
3	Cupping	55 (45%)
4	Vitamins & minerals	23 (18.9%)
5	Spirituals belief	21 (17.2%)
6	Honey products	10 (8.2%)
7	Clinical massage	8 (6.6%)
Recommendation of CAM given by		
1	Family	44 (36%)
2	Traditional healer	38 (31.1%)
3	Friends	24 (19.7%)
4	Pharmacist	20 (16.4%)
5	Herbalist	19 (15.6%)
5	Nutritionist	4 (3.3%)
6	Doctor	2 (1.6%)
User behavior		

1	Have you used CAM ever other than diabetes?	82(67.2%)
2	Have you been using CAM in Diabetes?	66 54.1%)
3	Have you combined your CAM in conventional therapies?	33 (27%)
4	Want to use CAM product in future?	29 (23.8%)
5	Have you satisfied with the use of CAM?	23(18.6%)
6	Have you discussed the use of CAM to your doctors?	18 (14.6%)

It was observed that KAP level and demographic features of the patients are correlated to the use of CAM. It was also evaluated that demographic characteristics and medical features also had a significant association with the use of CAM (P < 0.000; 0R 0.24; CI 0.14, 0.42), age (p < 0.000), diabetes duration (p < 0.000), marital status (p < 0.04), education status (p < 0.000), employment status (P <0.000), diabetes complications were (p < 0.000: OR 2.57: CI 1.53, 4.34) and blood glucose control (p < 0.000 OR; 0.29, CI; 0.17, 0.5).KAP related features that were significantly related to the use of CAM, include lack of trust in conventional therapies p< 0.000; OR 5.08: CI 0.43; 0.26, delayed doctors' appointments p < 0.000; OR 0.43, 0.26.,072, Weak patient doctor relation p< 0.000 OR 1.47; CL; 0.26, 8.17.





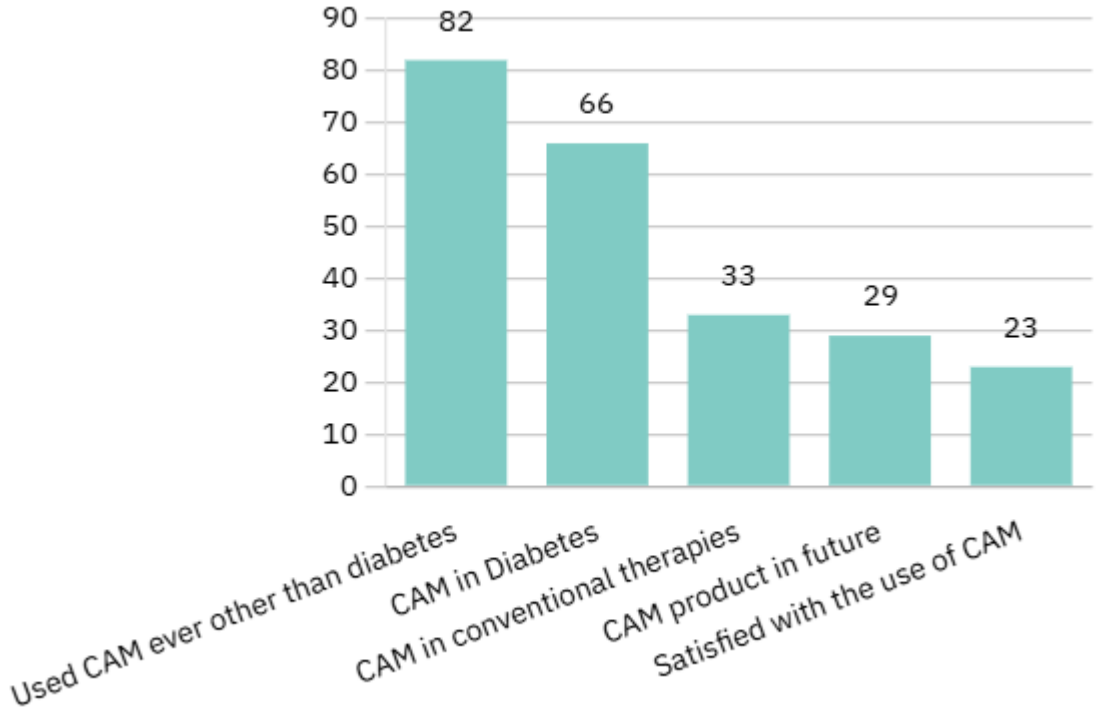


Table 4: *Significance Of The Relationship Between Use Of CAM And Demographics*

Variables	Frequency n (%)	Use of CAM		P value	Odds ratio	CI (95%)
		Yes (n =122) 57.8%	No (n= 89) 42.2%			
Gender						
Male	128 (60.7%)	58 (45.3%)	70 (54.7%)			
Female	83 (39.3%)	64 (77.1%)	19 (22.9%)	<0.000	0.24	0.14, 0.42

AGE IN YEARS						
≤ 40 years	43 (20.3%)	15 (34.9%)	28 (65.1%)			
41- 59 years	77 (36.5%)	39 (50.6%)	38 (49.4%)	<0.000	N/A	N/A
≥ 60 years	91 (43.1%)	68(74.7%)	23 (25.3%)			
Marital Status						
Married	138 (65.4%)	79 (57.2%)	591 (42.8%)			
Unmarried	22 (10.4%)	9 (40.9%)	13 (59.1%)	0.04	N/A	N/A
Divorced / Widowed	51 (24.2%)	34 (66.7%)	17 (33.3%)			
Education						
Illiterate	30 (14.2%)	23 (76.7%)	7(23.3%)			
Primary / secondary / high school	104 (49.3%)	77 (74.0%)	27 (26.0%)	<0.000	N/A	N/A
Graduation and above	77 (36.5%)	22 (28.6%)	55 (71.4%)			
Employment Status						
Employed	87 (41.2%)	28 (32.2%)	59 (67.8%)			
Unemployed	50 (23.7%)	39 (78.0%)	11(22.0%)	< 0.000	N/A	N/A
Retired	74 (35.1%)	55 (74.3%)	19 (25.7%)			
Diagnosis duration of diabetes						
Recently diagnosed	17 (8.1%)	6 (35.3%)	11(64.7%)			
<5 years	71 (33.6%)	30 (42.3%)	41 (57.7%)			
				<0.000	N/A	N/A
5 to <10 years	84(39.8%)	57 (67.9%)	27(32.1%)			
Greater than 10 years	56 (26.5%)	42 (75.0%)	14 (25.0%)			
Medication used in diabetic patients						
Oral tablets	104 (49.2%)	55 (53.1%)	49(46.9%)			
Insulin	66 (31.2%)	43 (65.1%)	23 (34.9%)			
Both	41 (19.5%)	24 (58.5%)	17 (41.5%)	0.25	NA	NA
Diabetes related complications						
No	137 (65%)	90(65.7%)	47(34.3%)			
Yes	74 (35%)	32 (43.4%)	42 (56.6%)	<0.000	2.57	1.53, 4.34
Blood sugar level control						
HbA1c ≤ 7%	72 (34.1%)	28 (38.9%)	44 (61.1%)			
				< 0.000	0.29	0.17, 0.5
HbA1c > 7%	139 (65.9%)	95 (68.3%)	44 (31.7%)			
Medical comorbidities						
yes	149 (70.6%)	83 (55.8%)	66 (44.2%)			

No	62 (29.4%)	39 (62.9%)	23 (37.1%)	0.26	0.73	0.42, 1.27
Lack of trust in conventional therapies						
Yes	41 (19.4%)	35 (85.3%)	6 (14.7%)			2.28
				<0.000	5.08	
No	170 (80.6%)	108 (51.4%)	102 (48.6%)			11.32
Delayed tp see the physician						
Yes	92 (35.2%)	41 (44.6%)	51 (55.4%)			
No	169 (64.8%)	110 (65.1%)	59 (34.9%)	0.001	00.43	0.26, 0.72
Poor communication of patients and doctor						
Yes	8 (3.8%)	4 (50%)	450(%)			
				0.06	0.3	0.08, 1.18
No	203 (96.2%)	105 (51.8%)	98 (48.2%)			
Doctor suggesting it						
Yes	5 (2.4%)	3 (60%)	2 (40 %)			
No	206 (97.6%)	147 (71.4%)	59 (28.6%)	00.65	1.47	0.26, 8.17
Availability and better value of money						
Yes	58 (27.5%)	31 (53.4%)	27 (46.6%)			3.02,
No	153 (72.5%)	90 (58.8%)	63 (41.2%)	<0.000	6.1	12.32
Perception of CAM had fewer side effects						
Yes	121 (57.3%)	93 (76.8%)	28 (23.2%)	<0.000	12.32	6.83,
No	90 (42.7%)	29 (32.2%)	6167.8(%)			22.22
Perception that CAM help to treat diabetes						
Yes	104 (49.2%)	98 (94.2%)	6 (5.8%)	<0.000	35.76	16.79,
No	107 (42.2%)	33 (30.9%)	74 (69.1%)	76.15		

P-vale of Chi-square test is reported.

Discussion

This study is the first of its kind conducted to assess the use of complementary and alternative medicine (CAM) among patients with diabetes mellitus in Multan. The findings reveal that while a substantial proportion of participants were familiar with various CAM modalities, their understanding of evidence-based efficacy and potential drug interactions remained limited. The generally positive attitude toward CAM reflects growing patient trust in traditional and alternative treatment approaches. However, the identified gaps in knowledge and inconsistent practices emphasize the need for structured education and professional guidance to promote the safe and effective use of CAM [16].

Current research has shown that about half of diabetic patients consider the use of CAM to be effective. These findings suggest a moderate level of confidence among patients in the therapeutic potential of alternative medicine, which may arise from personal

experience rather than scientific evidence [17]. Unfortunately, only 15% of patients were using CAM with their physician's approval, reflecting underlying self-reliance and possible distrust or dissatisfaction with the outcomes of conventional treatments. The main reasons cited for CAM use perceived low side effects and its potential to help control diabetes. These results align with global findings where patients often turn to alternative therapies seeking safer, more "natural" options [18].

In this study, herbal remedies were identified as the most commonly used form of CAM among the diabetic patients. This predominance of herbal use is consistent with trends observed in many developing countries where traditional and plant-based remedies are deeply rooted in cultural and social practices [14, 19, 20]. The findings also revealed that the participant's decision to adopt CAM was largely shaped by family influence rather than professional advice. Similar results are stated in a study which analyses the social influence on cam use in prostate cancer patients [21]. This underlines the pivotal role of social networks in health-related decision-making. The limited physician involvement may stem from inadequate communication, insufficient knowledge or lack of training [22], and skepticism regarding alternative therapies [23].

Despite widespread use, only a small proportion of patients reported satisfaction with their experience, and even fewer informed their doctors about their CAM use. These patterns suggest that while CAM practices are prevalent, they are often based on informal advice and self-experience rather than professional guidance. This emphasizes the urgent need towards patient counseling, herbal product regulation, and to incorporate CAM awareness into diabetes care programs [14]. Furthermore, the concomitant use of CAM with conventional antidiabetic medications raises concerns about potential drug-herbs interactions and safety risks. This has previously been described as a double-edged sword as it can cause both benefits and adverse effects [24].

The results of this study also demonstrated a significant association between CAM use and various clinical characteristics of the patients. Factors such as age, duration of diabetes, cost of treatment and presence of diabetes-related complications were all found to influence CAM use. These associations suggest that older patients, those with longer disease duration, or those experiencing diabetes-related complications, are more inclined towards CAM to improve their glycemic control. These findings are consistent with previous research reporting where sociodemographic determinants influence health care behaviors [23, 25].

Consequently, this study finding generally highlight the importance of strengthening patient provider relationships, improving access to medical care, and promoting confidence in evidence-based diabetes management to reduce unsafe or unsupervised use of CAM.

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