

## A survey amongst Complementary Alternative Medicine (CAM) users with type 2 diabetes

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### Abstract

**Background:** This survey studied the different types of Complementary Alternative Medicine (CAM) usage, the reasons of CAM usage and the out-of-pocket expenditure incurred by CAM users with Type 2 diabetes. **Methods:** This was a descriptive, cross-sectional survey that involved 132 Type 2 diabetes patients. **Results:** A total of 30.2% of the patients used dietary supplements, followed by traditional Chinese medicine (TCM) (25.1%) and traditional Malay medicine (17.9%). Two main reasons for using CAM include: the need of patients for more control of their diabetes and also dissatisfaction with conventional medicine. More than half of the patients spent around USD 7.2 to USD 13.9 per month on CAM as an out-of-pocket expenditure. Less than 20% of the patients consult their physicians before using CAM. About 57% of patients stated that their diabetes control did not show any improvement or worsen after CAM usage. **Conclusion:** CAM was widely used among Type 2 diabetics as an adjunct to their conventional therapy. More than half of the patients found that CAM did not give improvement nor worsens their diabetes control. CAM was one of the alternative treatments considered by Type 2 diabetes patients in complement with the conventional treatment for their diabetes control.

**Key words:** complementary alternative medicines, Type 2 diabetes, out of pocket expenditure

### Introduction

Diabetes mellitus is a chronic debilitating medical condition that affects about 33, 000 individuals in Malaysia and 300 cases of death were caused by this disease in year 2002. Diabetes mellitus is prevalent in Malaysia and has shown an increasing trend from 1996 to 2002. The number of diabetics in Malaysia is expected to double by the year 2010.<sup>1</sup> Over 90% of those with diabetes have Type 2 diabetes, including those with at young age.<sup>1</sup>

Advances in the management of diabetes mellitus in the form of new drugs, new sources of insulin and new approaches to practices are recommended for physicians.<sup>2</sup> However, the growing utilization of complementary and alternative medicine (CAM) represents one of the characteristic phenomenons facing scientific medicine. Public interest in the use of CAM is on the rise. The use of CAM in the management of chronic disease is well known in developed countries and is practiced to some extent in industrialized countries. Diabetic patients are more likely to use CAM because of the chronic course of the disease.

A large number of CAM treatments have been recommended for diabetes. Various degree of hypoglycemic effects have been attributed to most of these agents.<sup>3</sup> However, the efficacy of most CAM therapy for glucose control and diabetes management is unproven.<sup>4</sup> In

general, the scientific literature on the efficacy of CAM in the treatment of diabetes is relatively sparse and diverse.

High rates of CAM use are well documented in the general population without clear clinical benefits.<sup>5</sup> In fact, there are conflicting reports in the literature about the benefits of CAM and reports of adverse outcomes from the use of CAM in people with diabetes have raised several concerns.<sup>6</sup> A major concern is that people with diabetes may use CAM agents in place of clinically proven conventional diabetes treatment.<sup>5</sup> Another concern is the risk of drug interaction when these agents are used as complements to conventional treatment. Finally, there is concern that some of these agents may worsen glycemic control or even create additional complications for people with diabetes.<sup>3</sup>

Therefore this survey was conducted to improve the awareness of the usage of CAM among adult diabetes patients. The study also examined the following specific objectives:

- (1) To study the different types of CAM usage amongst CAM users with type 2 diabetes.
- (2) To explore the reasons of CAM usage amongst CAM users with type 2 diabetes.
- (3) To calculate the out-of-pocket expenditure of CAM incurred by CAM users with with type 2 diabetes.

### Methods

#### Study Design

This was a descriptive, cross-sectional survey involving face-to-face interview with patients based on a structured questionnaire format. This study was carried out in the

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Endocrine Ward and also in the Diabetic Clinic of the University Malaya Medical Centre (UMMC).

### **Study Population**

The study populations include all adult Type 2 diabetic patients attending the Endocrine & Diabetic Wards from December 2005 to February 2006. They include both in-patients and out-patients. For in-patients, the screening of the study population was done through the patients' case notes, whereas for out-patients, patients were approached and identified by the interviewer. All the patients who fulfilled the inclusion criteria were selected.

### **Inclusion and Exclusion Criteria**

**Inclusion Criteria:** Adults of more than eighteen years of age, diagnosed with Type 2 diabetes; currently using or had previously used CAM within the past three months.

**Exclusion Criteria:** Patients less than eighteen years of age; Diagnosed with diabetes other than Type 2 diabetes mellitus; Non CAM users

### **Data Collection Procedure**

The study was reviewed and approved by the Medical Ethics Committee, University of Malaya Medical Centre (UMMC). A pilot study was carried out after approval from the Medical Ethics Committee of UMMC.

For the purpose of this study, the definition of CAM from the National Centre for Complementary and Alternative Medicine<sup>7</sup> was applied.

After the eligible study population was identified, the patient information sheet was given to the patients. The nature of the survey in terms of its purpose and methodology was explained to the patients. If the patients agreed to participate in the survey, consent forms were given to obtain their signature. If the patients were physically incapable of responding or in any other situation that would not allow the patients to answer, family members were allowed to answer on behalf of the patients. Patients or family members were only interviewed after consent form was signed and their consents were obtained. A face-to-face interview was conducted with each patient by the interviewer.

### **Survey Instrument**

The questionnaire was read by the interviewer to the patients and patients were asked to answer. The questionnaire was adapted from a survey on the use of CAM.<sup>8</sup> The original author had been notified and was duly acknowledged.

The questionnaire was divided into two sections. The first section asked for demographic data including age, gender, ethnic group, educational level and the duration of Type 2 diabetes.

In the second section, questions about CAM use were asked. Based on the review of literature and the most often used CAM, twelve types of CAM were listed namely acupuncture, aromatherapy, ayurveda, traditional Chinese

medicine, chiropractic, dietary supplements (Alpha-lipoic acid, chromium, CoQ10, garlic, magnesium, Omega-3 fatty acids, multivitamins), traditional Malay medicine, massage therapy, meditation, qi gong and yoga. Patients were asked whether they had used one or more of the above-mentioned CAM in the three months and also the cost per month. Patients were also asked to name other types of CAM that were used but were not listed in the questionnaire.

An estimate of the out-of-pocket expenditure on CAM was calculated to find out the amount of money that the patient spend to treat his/her illness. Out-of-pocket expenditure was defined as the fee paid by the consumers of health services directly to the provider at the time of delivery.<sup>9</sup> In this study, only those expenditure in which the patients need to pay by themselves without any source of reimbursement or incentive for using CAM due to their Type 2 diabetes was calculated. The questionnaire also inquired about how the patients learned about the CAM therapy, the reasons of using CAM, the awareness of their physicians regarding CAM usage and whether they had consulted any physicians prior to use.

### **Data Analysis**

The data collected were analyzed using *Statistical Package for Social Sciences (SPSS)*. A *p* value of less than 0.05 was considered to be statistically significant.

For reasons of CAM usage, patients who gave their answers as given below was classified to indicate dissatisfaction with conventional medicines in diabetes:

- a) Conventional medicines did not help.
- b) Conventional medicines have too many side effects.

## **Results**

### **Characteristics of Studied Patients**

Out of 150 CAM users approached during the period of the interview, 132 patients agreed to be interviewed. The response rate for the study was 88.0%. From the demographic aspect, majority of the patients interviewed were female, Chinese and in the age group of 51 to 64 years old with a mean age of  $55.97 \pm 8.93$  years old. Most of the patients attained secondary education. The mean duration of diabetes mellitus was  $8.91 \pm 6.41$  years. The Chinese (37.1%) was the most frequent users, followed by the Malays (31.8%) and the Indians (30.3%).

### **Types of CAM Usage**

Among 132 patients that have used CAM, 85 patients (64.4%) were using only one type of CAM while 35.6% were using two types of CAM. Dietary supplements were the most widely used, followed by traditional Chinese medicine and traditional Malay medicine. About 15% of the patients had used other forms of CAM such as acupuncture, aromatherapy, massage, qi gong, yoga and others.

Traditional Malay medicine and ayurveda was used exclusively by the Malays and the Indians. Out of 45 patients that used TCM, 33 of them were Chinese (73.4%) and six were Indians and Malays, respectively (13.3%). For dietary supplements, 23 Chinese (42.6%), 20 Indians

(37.0%), ten Malay patients (18.5%) and a Pakistani (1.9%) were using it.

**Reasons for CAM Usage**

Majority of patients (47%) used CAM because they needed more control on their diabetes. A large proportion of the patients were also dissatisfied with their conventional medicines for diabetes regarding their side-effects (34.1%) and efficacy (16.6%).

This study revealed that patients learned about CAM usage from a variety of sources. The recommendation of CAM usage by their family or friends (68.2%) was the most common route followed by media (15.1%) and health care professionals (14.4). Only a small proportion of patients obtained their information of CAM through books and internet. Forty patients (30.3%) that consist of 23 male (57.5%) and 17 female (42.5%) had discontinued their CAM during the time of interview. Majority of them did not give any reasons of stopping the CAM (78.0%). Some of the reasons were that: no significant effects were found after the CAM usage (17.5%) and a high total cost of diabetes treatment (4.5%). None of the patients that used CAM had stopped their conventional medications.

A total of 57 patients (43.2%) believed that their diabetes condition improved after CAM use. Eighteen patients believed that their conditions were better with the use of dietary supplements, 12 with traditional Malay medicine, 10 with ayurveda, four with acupuncture, two with aromatherapy and one with chiropractic, massage therapy and qi gong, respectively. On the other hand, another 72

patients (54.5%) believed that their condition stayed about the same. Twenty two patients believed that their conditions stayed about the same with the usage of TCM, 24 with dietary supplements, 12 with traditional Malay medicine, eight with ayurveda and six with other types of CAM. On the contrary, there were three patients (2.3%) that thought their diabetes condition had worsened following the CAM use. All of the three patients that thought their condition had worsened with the use of traditional Chinese medicine.

Most of the patients obtained their CAM supplements or CAM services through the CAM practitioners (68.9%) followed by the pharmacists (22%). However, a small proportion of the patients obtained the CAM they used from direct selling (7.6%) and other routes (1.5%).

This study exposed that less than 20% of the patients declared that their physicians were aware of their CAM usage for the treatment of their diabetes. There was a significant association between the awareness of physicians reported by the patients toward CAM usage and ethnicity ( $\chi^2=11.35, p=0.010$ ) while gender, age, education level and duration of diabetes showed no significant difference (Table 1).

Prior to the use of CAM, more than 80% of the patients using CAM did not consult any physician, pharmacist or other health care professionals. Table 2 shows that only education level of the patients demonstrated a significant difference between the disclosure to physicians, pharmacists or other health care professionals on CAM usage among patients with type 2 diabetes ( $\chi^2=9.70, p=0.021$ ).

**Table 1:** Awareness of physicians towards CAM Usage

Characteristics	Aware			$\chi^2$	p value	
	Yes	No	Total			
Gender	Male	14	44	58	1.82	0.177
	Female	11	63	74		
Ethnic	Malay	2	39	41	11.35	0.010*
	Chinese	12	38	50		
	Indian	10	30	40		
	Others	1	0	1		
Age	18 to 30	1	1	2	4.43	0.351
	31 to 40	0	2	2		
	41 to 50	9	32	41		
	51 to 64	12	42	54		
	65 and above	3	30	33		
Education Level	Complete Primary Education	4	39	43	5.74	0.125
	Complete Secondary Education	12	48	60		
	College, A Levels	5	13	18		
	University	4	7	11		
Duration of Diabetes Mellitus (years)	<1	2	6	8	6.97	0.223
	1 to 3	4	20	24		
	4 to 5	7	11	18		
	6 to 10	6	29	35		
	11 to 15	4	18	22		
	>15	2	23	25		
	<b>Total</b>	25	107	132		

Data was reported as number. \* p value was significant (p<0.05).

**Table 2:** Consultation with Physicians, Pharmacists or Other Health Care Professionals before CAM Usage

Characteristics		Consult			$\chi^2$	p value
		Yes	No	Total		
Gender	Male	13	45	58	0.81	0.248
	Female	12	62	74		
Ethnic	Malay	4	37	41	3.65	0.302
	Chinese	12	38	50		
	Indian	9	31	40		
	Others	0	1	1		
Age	18 to 30	1	1	2	8.50	0.075
	31 to 40	0	2	2		
	41 to 50	12	30	42		
	51 to 64	10	40	50		
	65 and above	2	34	36		
Education Level	Complete Primary Education	2	40	42	9.70	0.021*
	Complete Secondary Education	14	49	63		
	College, A Levels	6	11	17		
	University	3	7	10		
Duration of Diabetes Mellitus (years)	<1	2	6	8	6.93	0.226
	1 to 3	7	18	25		
	4 to 5	6	14	20		
	6 to 10	5	29	34		
	11 to 15	4	17	21		
	> 15	1	23	24		
	<b>Total</b>	25	107	132		

Data was reported as number. \* p value is significant ( $p < 0.05$ ).

### Out-of-pocket Expenditure of CAM

Majority of the patients (52.3%) spent around United States Dollars (USD) 7.2 to USD 13.9 per month on CAM. Five patients (3.8%) spent less than USD 6.9 per month on CAM while 43.9% of the patients spent more than USD 13.9. One patient spent more than USD 55.5 for CAM usage.

More than 70% of the 132 patient were earning more than USD 1110.3 per month. The approximate monthly household incomes for around 2% of the patients were less than USD 555.2. A significant association was noted between the out-of-pocket expenditure and the monthly household income ( $\chi^2 = 138.50$ ,  $p < 0.001$ ).

### Discussion

#### Characteristics of Studied Patients

In this study, the Chinese female patients were the most frequent users of CAM. The UMMC is one of the popular choices of hospital that serve the population for the Klang Valley area. From some of the studies done in Western countries, there were several associations between the demographic factors and CAM usage.<sup>10,11</sup> However, it was not comparable to this study as non CAM users were not included in this study.

This study showed that older patients were more likely to use CAM. The result was similar with Egede's survey.<sup>10</sup> The higher likelihood of CAM use in these groups of patients could be due to the decreasing health status of the patients following an increasing age. They may feel anxious about their health condition and therefore have a tendency to seek alternative medication for their diabetes. However,

most of the surveys done elsewhere involved all age groups compared with this study.<sup>10, 12</sup>

The duration of diabetes of Type 2 diabetes in the patients studied varied from a few months to almost twenty years. Many patients decided to indulge in CAM usage once they were diagnosed with diabetes. Therefore patients with longer duration of diabetes were not necessarily having greater urge to use CAM.

Most of the patients that used CAM in this study had only attained secondary education. This was not the case in other studies where more educated patients seemed more likely to use CAM than other individuals with diabetes.<sup>10</sup> This particular group of patients may be the target of appropriate health education as more information is needed prior to CAM usage.

#### Types of CAM Usage

CAM has many different definitions around the globe. The term CAM is mostly used in Western countries whereas complementary or traditional medicine is commonly used in Asian countries.<sup>13</sup> The estimate of CAM use in Malaysia differ considerably from those in the Western countries due to the diversity of types of CAM used.<sup>10</sup> The estimate of CAM use will vary based on the type of country, ethnicity and beliefs. Consistent with other recent studies, it was found that CAM use is common among diabetic patients.<sup>10, 14,15</sup>

The type of CAM used by patients in this study differs from other studies. This is because the Malaysian population has

unique ethnicity compared to other countries. Three main races in the Malaysian population are the Malays, the Chinese and the Indians while the survey done by Egede *et al*<sup>10</sup> involved ethnicity of Hispanic, black, white and others. Egede *et al*<sup>10</sup> also reported that the commonly used CAM in Western countries were nutritional advice and lifestyle diets, spiritual healing, herbal remedies, massage therapy and meditation while MacLennan *et al*<sup>16</sup> described that the most popular forms of CAM among Australians were non-prescribed vitamins, chiropractic, herbal medicines and mineral supplements. The CAM used in Malaysia was more traditionally-based which consists of traditional medicines from each of the ethnic background.

In this study, it was discovered that dietary supplements were the most commonly used CAM by the patients for treating diabetes. All of the dietary supplements used were over-the-counter (OTC) products. They were widely available in all pharmacies in Malaysia and no prescriptions were needed to purchase them. These suggest the popularity of dietary supplements usage amongst Type 2 diabetes patients. However, the American Diabetes Association and the American Dietetic Association do not have specific formal recommendations for the use of dietary supplements in people with diabetes. Therefore, a wise consideration should be employed before dietary supplements could be recommended to this group of patients.

TCM was the second most commonly used CAM in this study. Its use was found to be highly intensive in Malaysia due to its easy accessibility. There were many TCM centers in Malaysia either in rural or urban areas. It may also be because the Chinese have a stronger belief in their traditionally-based TCM. Furthermore, in this study, the Chinese contributed to the highest percentage in terms of ethnic group.

The use of traditional Malay, Chinese and Indian medicine (ayurveda) has a tendency to follow ethnic groups. However, TCM had also been used by some Malay and Indian patients in addition to the Chinese. On the other hand, traditional Malay and Indian medicine were used almost exclusively by members of their respective ethnic groups. Strong cultural beliefs probably contribute to the reasons for the use of CAM pertaining to their ethnicity. A study done in Singapore<sup>17</sup> revealed similar findings. This may be due to the similarity of ethnic groups and population between Malaysia and Singapore. A few patients indulged in meditation, qi gong and yoga after they were diagnosed with diabetes. Although these CAM may not have any significant effect in reducing the blood sugar levels, patients still use it as they believe it will reduce the stress induced by their disease.<sup>18</sup>

### **Reasons of CAM Usage**

Almost half of the patients interviewed in this study used CAM because they believed that conventional medicine gave more adverse effects and due to the lack of trust in conventional medicines. Ernst<sup>19</sup> had stated that dissatisfaction with the conventional medicine of diabetes may be one of the important reasons that patients turned to

CAM usage. A study done by Barnes *et al*<sup>20</sup> also revealed that adults aged more than eighteen years old who used CAM were more likely to do so because they assumed that the combination of CAM with conventional medicines would help their diabetes and also they thought that it would be interesting to try CAM usage for the treatment of diabetes.

In this study, it was found that family and friends had the most influencing power on the decision of the patients to use CAM. Family members and friends have a close relationship with the patients and they always communicate with each other. Therefore, it is necessary to cooperate with not only patients, but also with relatives and friends when discussing the problems or treatment for diabetes. On the other hand, very few patients described the internet as a source of CAM information despite its wide accessibility. This may be due to the lack of reliability of the information found through the internet.

This study showed that most of the patients discontinued their use of CAM without a valid reason. This may indicate that they did not, after all, rely too much on the CAM use for treating their diabetes. Some patients initiated CAM usage just because they want to have a try. The patients will choose to give up the use of CAM if no significant effect was noted.

All the patients continued their conventional medication while they are on CAM. This showed that CAM was used to complement conventional diabetes medications rather than as an alternative, because the interview was carried out in a teaching hospital and not at public area. Most of the patients visited the hospital to refill their medication or prescriptions. They only used CAM to complement the use of the diabetic medication given by the physicians. Our observation was comparable to other studies of CAM usage among diabetic patients.<sup>10, 11</sup> It will be important for physicians to realize that most of the individuals with diabetes use CAM as a complement to conventional treatment. As a result, health care providers should acquaint themselves with the knowledge on common CAM for diabetes, their mechanism of action, drug-drug interactions and their likely adverse effects. In addition, pharmacists could play significant roles in providing the above-mentioned information and therefore prevent unwanted circumstances due to the use of CAM.

Although a large number of patients believed that their diabetes improved, they actually had used CAM along with conventional medication, thus making it difficult to arrive at a conclusion about the efficacy of a specific CAM intervention. It was found in this study that all the three patients that considered their conditions worsened by CAM usage were using TCM. It was not stated clearly what type of TCM caused these incidences. The reasons why TCM caused these problems were not disclosed. Conclusion on the safety profile of TCM could not be made as this condition may also be caused by drug-drug interactions, drug-food interactions and other concurrent reasons.

There was a large proportion of patients seeking CAM from the CAM practitioners. This result was rational as the traditionally-based CAM can only be obtained through CAM practitioners. Most of the patients obtained their dietary supplements from pharmacists. This was due to the broad set up of pharmacies in which dietary supplements are easily accessible.

A high proportion of the CAM users did not consult their CAM use with their physicians. Less than a quarter of the CAM users informed their physicians about their CAM use. Lack of communication between the physicians and the patients and lack of time for counseling may be the reasons for this finding. A study in Singapore had also found similar conditions where only a small percentage of patients discussed their CAM use with their physician.<sup>12</sup> Although specific reasons for lack of disclosure of CAM use were not addressed in this study, it gave a significant impact on diabetes care. Potential drug-drug interaction could occur due to poor physician-patient communication. It is suggested that the physicians should ask their patients about their use of CAM whenever they obtain their history.

It is not possible to provide quality care to patients in an environment in which health care providers are not aware of the treatments they are using. High quality patient-health care provider communication is essential for supporting diabetes self care and is associated with the glycemic control of the patients. Thus enhancing patient-provider communication about CAM use might improve diabetic control and prevent side effects.

#### **Out-of-pocket Expenditure of CAM**

There was a wide diversity on the amount of money spent on CAM expenditure per month, from less than USD 2.8 to around USD 27.8. The costs of CAM use in Malaysia were considered to be non-expensive compared to other countries such as Korea which was USD 390 per month.<sup>12</sup> The cost incurred on usage of CAM in the Western countries may be equal to that paid for the purchase of drugs for diabetes<sup>11</sup> and this increases the financial burden on the patients. Nevertheless, this finding cannot be concluded as the costs for purchasing conventional medicine to treat diabetes were not studied in this study.

This study supported the fact that higher earning power could affect CAM use. This study showed patients with higher income have greater purchasing power and therefore are able to spend on CAM. This was because most of the expenditures on CAM were out-of-pocket expenditures. Some studies done in US and also Singapore had also shown that patients with higher income level had a greater tendency to use CAM.<sup>3,17</sup> However, CAM usage in Western countries is mostly covered by health insurances.<sup>16,21</sup> In the future, the health insurance company in Malaysia may take this into consideration in order to minimize the burden of patients using CAM.

#### **Conclusion**

In conclusion, a high proportion of Type 2 diabetes patients use CAM as a complement to their conventional medicine.

More than half of the patients found that CAM did not give improvement nor worsens their diabetes. CAM was one of the alternative treatments considered by Type 2 diabetes patients in complement with the conventional treatment for their diabetes control.

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