Traditional and Complementary Medicine (T/CM) use and its associated factors among Type 2 Diabetic Mellitus patients in Kelantan, Malaysia

ROSLINDA ABDUL RANIMMED[1], ROSNANI ZAKARIAMMED[1], SOO HUAT TEOHMMED[2], SHAIFUL BAHARI ISMAILMMED [1], NANI DRAMAN,MMED [1,*]

[1]*Department of Family Medicine, School of Medical Sciences, Universiti Sains Malaysia, Health Campus,16150, Kubang Kerian, Kelantan, Malaysia*

[2]*Lifestyle Science Cluster, Advanced Medical & Dental Institute, Universiti Sains Malaysia 13200 Kepala Batas, Penang, Malaysia*
Correspondence to Nani Draman, E-mail:drnani@usm.my, Hp:01115184421/Fax: 097676608

ABSTRACT

Aim: To determine the proportion of traditional and complementary medicine use and its associated factors among patients with type 2 diabetes mellitus.

Methods: A cross sectional study was conducted among 202 patients with Type 2 Diabetes Mellitus. The inclusion criteria are age more than 18 years old, diagnosed to have diabetes type 2 and on oral anti hyperglycemic medications or insulin or both. Patients with diabetes type 1 and having mental problem were excluded from the study. The case report form consist of patients' socio-demographic data, diabetic history and complications, types of T/CM used, and diabetes control. The data were analyzed using descriptive statistic and multiple logistic regression.

Result: The mean age of the respondents is 59.98 (9.1). Majority are Malays, unemployed and with no diabetic complications. The proportion of traditional and complementary medicineuse is 87 (43.1%). Gender and race were found to be significantly associated with the used of traditional and complementary medicine.

Conclusion: The proportion of used among diabetic patients is moderate. Gender and race were found significantly associated with the used of traditional and complementary medicine

Keywords: traditional and complementary medicine; type 2 diabetes mellitus; herbs

INTRODUCTION

The use of traditional and complementary medicine (T/CM) is part of many Eastern cultures. Despite allopathic medicine becoming the predominant medical system in the Eastern part of the world, T/CM is still in demand[1]. T/CM refers to wide range of clinical therapies other than conventional medicine[2]. In Malaysia, T/CM is an important part of itsculture and has a positive perception regarding its efficacy and potential benefits among the general public [1,3].There are several main T/CM practice areas available in Malaysia such as Islamic, Malay, Chinese and Indian medicine which can be further divided into their diverse subgroup practices [3]. And recently, several Western alternative medicinal systems such as homeopathy, osteopathy and chiropractic medicine have also gained ground in Malaysia[3].

The recognition of T/CM by the Malaysia's Ministry of Health with the establishment of T/CM division, echoes with the ethos and strategic advocacy efforts of the World Health Organization (WHO)[4].The WHO has urged its member states to integrate T/CM in national health systems, establish quality assurance systems and allow an increased access to safe and effective T/CM [3].The WHO-SAGE multi-country study reported that the proportion of T/CM consultations from total health visits per year was highest in India (20%) followed by China (8.5%) and Ghana (3.1%) [5].Akin to this, a high prevalence of T/CM usage was reported in Malaysia. Kew et al. in his large scale survey found the prevalence of T/CM use to be 25.9% [6]. And this estimate increased to 31.7% among people with cardiovascular and metabolic risk factors [6]. In the state of Sarawak, it was reported that more than 80% of the patient population disclosed use of T/CM to their primary care doctors [6]. Factors leading to increased use of T/CMinclude an associated perception of increased benefits and fewer complications, preferences to be treated holistically, inaccessibility to doctors and poor affordability of allopathic medicines [7].

In recent decades, an increasing population of diabetic patients is resorting to use of traditional medicines[5].Globally this statistic has been reported, the prevalence of T/CM used among diabetes patients range from 1.7% to 72.8%, and in Malaysia which is 62.5% due to different definitions in the studies[8,9].Patients with diabetes mellitus (DM) report a number of T/CM use which includes herbal remedies, vitamins as well as spiritual remedy[9-13]. Most popular herbal remedies used for the treatment of DM are reported to be true cinnamon (*Cinnamomum Verum*), bitter gourd (*Momordica Charantia*), garlic (*Allium Sativum*), fenugreek (*Trigonella FoenumGraecum*), ginseng (*Panax Ginseng*) and Misai Kucing (*Orthosiphon Stamineus Benth*) [10-12].In addition to these organic products, many Malaysians also seek spiritual help from local imams and faith healers[9]. The reasons for diabetic patients favour to choose T/CM are due to diabetes is a chronic and incurable disease[9]. Furthermore, T/CM is organic in nature, patient's preferences to be treated holistically and the availability of the T/CM[13,14].

Despite the prevalent use of T/CM in the region, there has been little progress in establishment of quality assurance, training of traditional health practitioners, or regulation of herbal products. Moreover, little research has been done to establish efficacy, side effect profile and drug interaction of these products[9,11-13].Hence, this study was designed to gauge the prevalence of T/CM usage among

diabetic patients and to explore the factors associated with its use. Primary care setting was chosen for this study since approximately 75% of Malaysian with DM visit both government and private primary care facilities for their treatment[15].The aim of this study is to determine the proportion of traditional and complementary medicine (T/CM) use and its associated factors among patients with type 2 diabetes mellitus.

METHODOLOGY

This is a cross sectional study conducted at KRK (Klinik RawatanKeluarga/Primary care clinic), Hospital Universiti Sains Malaysia (USM), KubangKerian, Kelantan, Malaysia. Age group ≥ 18 years old, diagnosed to be diabetes type 2 and on oral anti hyperglycemic medications or insulin or both were included in this study. Patients with diabetes type 1 and having mental problem were excluded from the study. Sample size calculations were done using power and two sample proportions was 202 sample[16].

Patients with type 2 diabetes mellitus is defined as someone who was clinically diagnosed with diabetes or istaking diabetic medication. T/CM use is defined as using T/CM at least once in his/her lifetime or the past 12 months. Types of T/CM use - diverse health practices, approaches, knowledge and beliefs incorporating plant, animal, and/or mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness[17].

The questionnaire was designed to capture patients' socio-demographic data, diabetic complications, types of T/CM used, and frequency of usage and total money spent on T/CM in a month. Results of the patients glycosylated hemoglobin (HbA1C) within the last 6 months and information regarding diabetes complication was obtained from the patients' medical records. The questionnaire were discussed with two family medicine specialists. Pretest questionnaires were conducted among 15 diabetic patients at Klinik PakarPerubatan/Specialist Clinic (KPP), Hospital USM to assess the content validity and to estimate the total time required for an interview.

Data collection procedure: The data was collected using self-guided interview. Patients with type 2 diabetes mellitus who came for a scheduled visit to KRK for diabetes follow up were selected using a universal sampling method. Related information regarding the study was explained verbally. The inclusion and exclusion criteria were applied and informed consent were obtained.The case report form was given and the HbA1c and number of complications were obtained from a patients' records. The questionnaires took an average of 10 minutes to be completed.

This study protocol was approved and accepted by the Human Research and Ethics Committee, Universiti Sains Malaysia, Ref: USM/JePem/14090305.

RESULTS

Overall 210 subjects were approached for this study. However, five subjects did not complete the questionnaire due to their name being called by the nurses and three subjects refused to participate. Therefore, only 202 subjects participated in this study, resulting in the respond rate of 96.2%. The mean (SD) age of the study subjects was 59.98(9.1) years old. The majority of the patients were Malays (86.1%) and female (54%). The socio-demographic details of the study subjects is presented in Table 1.

The proportion of T/CM used among diabetic patients was 87(43.1%). However, none of the diabetic patients used acupuncture, yoga, tai chi, homeopathy, reflexology and traditional healer. Only two diabetic patients went for massage (for diabetic healing purposes) and one patient underwent spiritual cleansing, cupping and electric therapy. Table 2 showed the detail about the T/CM used among these patients.

Using multiple logistic regression, gender and race were found to be significantly associated with the used of T/CM (Table 4).

There were no significant interactions between the significant independent variable and no multicollinearity problem. The Hosmer and Lemeshow goodness-of-fit test was not significant (*p* value 0.744) showing that the model is fit. The model fitness was also supported by the classification table of 58.9% and an area under the ROC curve of 59.8(95%CI 0.519, 0.676)

Table 1: Socio-demographic of the study subjects (n=202)

	mean(SD)	n (%)
Age(years)	59.98 (9.1)	
Gender		
Male		93 (46)
Female		109 (54)
Race		
Malay		174 (86.1)
Chinese		21 (10.4)
Indian		4 (2.0)
Others		3 (1.5)
Employment		
Unemployed		73 (36.1)
Professional		28 (13.9)
Non-professional		52 (25.7)
Pensioner		49 (24.3)
Income (RM)	1600 (2000)[a]	
Education		
None		10 (5.0)
Primary		38 (18.8)
Secondary		116 (57.4)
Tertiary		38 (18.8)
DM treatment		
OHA		107 (53)
Combined		95 (47)
No of DM complications		
None		142 (70.3)
One complication		47 (23.3)
Two complication		9 (4.5)
Three complication		4 (2)
Retinopathy		
No		184 (91.1)
Yes		18 (8.9)
Neuropathy		
No		196 (97)
Yes		6 (3)
Nephropathy		
No		185 (91.6)
Yes		17 (8.4)
Erectile dysfunction		
No		200 (99.0)
Yes		2 (1.0)
Ischemic disease		

No		179 (88.6)
Yes		23 (11.4)
Stroke		
No		191 (94.6)
Yes		11 (5.4)
Peripheral vascular disease		
No		202 (100)
Yes		0 (0)
DM control		
No		169 (83.7)
Yes		33 (16.3)
HbA1c (%)	8.20 (3.20)[a]	

[a]median(IQR)

Table 2: Traditional and complementary medicine (T/CM) used among diabetic patients (n=202)

	n (%)
Herbs	
No	155 (76.7)
Yes	47 (23.3)
Others	
No	145 (71.8)
Yes	57 (28.2)
Method T/CM used	
0 method	115 (56.9)

1 method	66 (32.7)
2 method	19 (9.4)
3 method	1 (0.5)
4 method	1 (0.5)
Frequency of using T/CM	
Infrequent (1- 3x/weeks)	28 (32.2)
Frequent (4-6 days/weeks)	1 (1.1)
Very Frequent (daily/more)	58 (66.7)
Reason for using T/CM	
To control DM	37 (42.5)
As add on medication for DM	42 (48.3)
Cheap	3 (3.4)
Belief no side effect	1 (1.1)
Other reasons	4 (4.6)
Who introduce the T/CM	
Friends	36 (41.4)
Family	28 (32.2)
Doctors	3 (3.4)
Social media	15 (17.2)
Others	5 (5.7)

Associated factors of the used of T/CM among diabetic patients

Table 3: Simple Logistic Regression on associated factors of the used of T/CM among diabetic patients

Independent variable	non T/CM used	T/CM used	Regression coefficient(b)	Crude Odds ratio (95% CI)	Wald stat(df)	p-value
Age	60.1(9.4)[a]	59.9(10.7)[a]	-0.010	0.99 (0.963,1.018)	0.508 (1)	0.476
HbA1c	7.9(3.3)[b]	8.7(3.6)[b]	0.069	1.072(0.971, 1.184)	1.880(1)	0.170
Sex						
Male	47(50.5)	46(49.5)		1	2.858(1)	0.091
Female	68(62.4)	41(37.6)	-0.484	0.616 (0.351,1.080		
Race						
Others	21(75)	7(25)		1	4.113(1)	0.043
Malay	94(54)	80(46)	0.937	2.553 (1.032,6.317)		
Employment						
Unemployed	74(60.7)	48(39.3)		1	1.737(1)	0.188
Employed	41(51.3)	39(48.8)	0.383	1.466(0.830, 2.591)		
Income						
<3000	96(58.9)	67(41.1)		1	1.320(1)	0.251
≥3000	19(48.7)	20(51.3)	0.411	1.508(0.748,3.041)		
Education						
None/Primary	30(62.5)	18(37.5)		1	0.794 (1)	0.373
Secondary/Tertiary	85(55.2)	69(44.8)	1.353	1.353 (0.696,2.631)		
DM treatment						
OHA	63(58.9)	44(41.1)		1	0.342 (1)	0.553
Combined	52(54.7)	43(45.3)	0.169	1.184(0.678, 2.069)		
Number of Diabetic complications						
0	85(59.9)	57(40.1)		1		
1	25(53.2)	22(46.8)	0.272	1.312(0.676, 2.549)	0.644(1)	0.422
>2	5(38.5)	8(61.5)	0.870	2.386(0.743, 7.662)	2.134(1)	0.144
Diabetic control						
No	95(56.2)	74(43.8)		1	0.217(1)	0.641
Yes	20(60.6)	13(39.4)	-0.181	0.834(0.390, 1.787)		

[a]mean(SD)
[b]median(IQR)

Table 4: Multiple Logistic Regression on associated factors of the used of T/CM among diabetic patients

	Regression coefficient(b)	Crude Odds ratio(95% CI)	Wald stat(df)	*p*-value
Gender				
Male		1		
Female	-0.578	0.561(0.316, 0.998)	3.869(1)	0.049
Race				
Others		1		
Malay	1.053	2.866(1.140,7.208)	5.010(1)	0.025

DISCUSSION

Various studies around the world have documented a wide range of prevalence for T/CM use amongst diabetic patients. Depending on the geographical regions, the prevalence ranges from 17% to 72.8 %[8].The lowest estimates are from Europe and North America, whereby 17% was reported in the United Kingdom and 31% in Canada[18,19].The highest prevalence of T/CM use in diabetic patients has been reported from South America and Asia[8,20,21].The estimated prevalence is 62% in Mexico. While in Asia, the observed prevalence is 61% for Taiwan, 65% for Korea and 67.7% from India[8,21]. A recent study from Lebanon reported the T/CM use to be 38% among diabetic patients attending two referral hospitals[22].

In the Malaysian setting, the use of T/CM among diabetic patients is similar to other Asian countries[9,23].Earlier cross sectional study conducted by Ching et al. in year 2013 reported high proportion (62.5%) of diabetic patients attending a primary care clinic were using T/CM.[9]This in concordance with a study done in the East Coast of Peninsular Malaysia which found 63% of general outpatient department patients used T/CM and 41% reported T/CM use over the last twelve months[23]. Our present study found 43.1% of diabetic patients reported use of T/CM which is lower than the prevalence reported from other Asian countries. These variations from different parts of the world may be attributed to the difference of perceptions attached to T/CM, accessibility to T/CM methods and practitioners. It may also be partly due the different definitions of T/CM and study designs employed by various research teams across the countries[22].

The present study found that malesare more likely than females to use T/CM. This finding is similar with a study by Othman and Farooqui, which was conducted in an East Malaysia's tertiary hospital, which found more males were using T/CM[24].In agreement with the finding, Hassan and Shaaban conducted their study in the same clinic as the present study and amongst patients visiting the clinic irrespective of their underlying medical problems, found that T/CM users were significantly higher in males[23].However, there were other studies which reported a conflicting finding. A Malaysian prospective population-base cohort study reported a high proportion of females using T/CM and they are 54% more likely than males to use T/CM[25]. Similarly, Ching et al. found that female diabetic patients attending a primary care clinic in urban city of Malaysia, were 1.8 times more likely than males to use T/CM[9]. The difference in the finding may be contributed by the unique patients' socio-demography in current study such as locality (Kota Bahru is situated in semi-urban area with mixture of villages and housing areas), ethnicity representation (Kelantan with Malay Muslim majority; 86.1% in current study), level of education and income[9,25].

The other significant predictor of T/CM use is ethnicity. Malaysia is a multicultural country with three major ethnics namely Malay, Chinese and Indian. Malay is the predominant ethnic group in Peninsular Malaysia constituting 63.1% of the population and they are exclusively Muslim[26].Malay diabetic patients has nearly three times higher odds to use T/CM than other ethnics.The use of T/CM has been associated with traditional beliefs rooted deep in the Malaysian culture and Islamic medicinal systems[9].Probable explanation of Malay being the major users of T/CM could be that it is ingrained in their heritage which was strongly influenced by the animistic culture of Hindu-Buddhismas well as Islamic belief system[9,27]. Contrary to our finding, study by Abdullah et al. found Chinese ethnicity has higher odds (1.37 95%CI 1.35,1.41, *p*<0.001)of using T/CM than Malay[25].This is likely due to difference in population selected whereby the former had a well representation form all ethnicities as compared to our study which has much higher Malay ethnic patients.

Use of herbs (23.3%) was found to be the major form of T/CM used by the respondents in present study. High use of herbal remedies has been shown in previous investigations as well. For instance, biological based therapy which includes herbal products were used by 40% of patients for either health problems or health maintenance[28]. Similarly, in a cross-sectional study done among diabetic patients attending tertiary hospital found that herbal treatment was the most commonly used T/CM modality at 64.9% which was nearly threefold from our finding[16].In another study, varieties of herbal mixtures and natural ingredients were also reported to be the commonest method of T/CM use among 31.7% of subjects who have cardiovascular risk factors[6]. The trust may have originated from the knowledge being passed down from generations to generations and at the same time, propagated by the availability of the ingredients in this region[28].Moreover, there are multiple studies exploring role of natural products in preventing and managing diabetes[10,11,29]. The results of these studies may be wrongly interpreted by public as a well-established treatment in diabetes or manipulated by health product agents to sell their product, causing the high prevalence of herbal use.

The other prominent trend observed was the use of 'other methods' as T/CM in 28.2% of the respondents; of which comprised of honey, juices, vitamins and supplements. It concurred with an earlier survey conducted in Malaysia which indicated that 88.9% of general population used biologically-based therapy (which included vitamins and supplements) as remedy for their health problems[28]. However, honey, vitamins, juices and other supplements have yet to be established for diabetes treatment. Since the effects of some of these T/CM supplements have not been studied extensively. In relation

to diabetes treatment and control, our study found only 14.9% of respondents using T/CM had their diabetes controlled. Conversely in a study from Turkey, diabetics using T/CM namely herbal products were found to have better glycaemic control as compared to non-users of T/CM[30].However, only a small proportion of their respondents were using 'other methods' which was not specified. These observations call for more robust research through randomized, controlled clinical trials to assess the effect of natural products on blood glucose levels.

In the present study, the reasons for using T/CM were also explored. A considerable proportion of diabetic patients (42.5%) used T/CM as the treatment for diabetes. Compared to the studies of Kew Y et al. and study in Lebanon, approximately 20% of their patients used T/CM as substitute to conventional medical treatments[6,22].The use of T/CM as sole treatment for diabetesis a worrying trend. The effects of these T/CM on diabetic patients requires comprehensive study. It is possible that such trust in T/CM is perpetuated by patients' belief in 'second chance' to cure diabetes to avoid lifelong treatment and monitoring[22,25].Moreover, such belief coupled with patients' loss of trust in allopathic treatment was found to be associated with diabetic patients who were less educated and living in rural areas in Malaysia which corresponded with the demography of our study population[25].The most common reason for T/CM use among diabetes patient in this study was as complementary or add on therapy alongside medical treatments which amounted to 48.3%. This concurred with studies from Malaysia which found approximately 20% to 50 % of patients with diabetes and other cardiovascular diseases used T/CM concurrently with their treatments[6,16]. It was theorized that combination of both T/CM and allopathic medicine will complement each other for better management of diseases and promote faster recovery[24].

From our study, friends and family members influenced 41.4% and 32.2% of our diabetic patients, respectively. These observations are in congruence with the findings from other studies in Malaysia and as well as in other countries[22,24].We postulate that such occurrence is due to patients more comfortable in discussing T/CM choices to manage their chronic illnesses with family and friends rather than medical doctors. On the same note, doctors may not be comfortable to suggest for such treatment. However, these speculations should be studied thoroughly using qualitative method.

There are few limitations in the study. Cross sectional design of this study limits establishing cause and effect relationship between independent variables and use of T/CM. Skewed distribution towards Malay ethnicity and use of non-probability sampling complicates generalizability of current results to Malaysian population. Moreover, self-reported measures may pose recall bias which may not represent the actual results.

CONCLUSION

In conclusion, the proportion of traditional and complementary used among diabetic patients was87 (43.1%)and gender and race were found significantly associated with the used of traditional and complementary medicine

REFERENCES

1. Ozturk M, Altay V, Latiff A, et al. A Comparative Analysis of the Medicinal Plants Used for Diabetes Mellitus in the Traditional Medicine in Turkey, Pakistan, and Malaysia. *Plant and Human Health* 2018;1:409-61.
2. Birdee GS, Yeh G. Complementary and alternative medicine therapies for diabetes: a clinical review. *Clinical Diabetes*2010;28:147-155.
3. Institute for Public Health, Ministery of Health Malaysia . National health and morbidity survey 2015. Vol. IV, Traditional & complementary medicine (T&CM). 2015; http://iku.moh.gov.my/images/IKU/Document/REPORT/nhmsreport2015vol2.pdf.
4. World Health Organisation (WHO). National policy on traditional medicine and regulation of herbal medicines: Report of a WHO global survey. Geneva (CH): WHO Press. 2005; http://apps.who.int/medicinedocs/en/d/Js7916e/.
5. Oyebode O, Kandala N-B, Chilton PJ, Lilford RJ. Use of traditional medicine in middle-income countries: a WHO-SAGE study. *Health Policy Plann* 2016;31:984-91.
6. Kew Y, Chia YL, Lai SM, et al. Traditional and complementary medicine (TCM) among study population with cardiovascular risk; use and substitution for conventional medicine in Pahang, Malaysia. *Med J Malaysia* 2015;70 :86-92.
7. Johny AK, Cheah WL, Razitasham S. Disclosure of Traditional and Complementary Medicine Use and Its Associated Factors to Medical Doctor in Primary Care Clinics in Kuching Division, Sarawak, Malaysia. J *Evid Based Complement Alternat Med.* 2017;2017:e5146478
8. Chang Hy, Wallis M, Tiralongo E. Use of complementary and alternative medicine among people living with diabetes: literature review. *J Adv Nurs*2007;58:307-19.
9. Ching SM, Zakaria ZA, Paimin F, Jalalian M. Complementary alternative medicine use among patients with type 2 diabetes mellitus in the primary care setting: a cross-sectional study in Malaysia. *BMC Complement Altern Med* 2013;13:148.
10. Nahas R, Moher M. Complementary and alternative medicine for the treatment of type 2 diabetes. *Can Fam Physician* 2009;55:591-96.
11. Modak M, Dixit P, Londhe J, Ghaskadbi S, Devasagayam TPA. Recent advances in Indian herbal drug research guest editor: Thomas Paul Asir Devasagayam Indian herbs and herbal drugs used for the treatment of diabetes. *J Clin Biochem And Nutr* 2007;40:163-73.
12. Al Saeedi M, El Zubier A, Bahnassi A, Al Dawood K. Patterns of belief and use of traditional remedies by diabetic patients in Mecca, Saudi Arabia. *East Mediterr Health J,* 2003;9: 99-107
13. Astin JA. Why patients use alternative medicine: results of a national study. *JAMA* 1998;279:1548-53.
14. Vincent C, Furnham A. Why do patients turn to complementary medicine? An empirical study. *Br J Clin Psychol* 1996;35:37-48.
15. Institute for public health. Ministry of Health. National health and morbidity survey 2015. Vol. II, Non-communicable diseases, risk factors & other health problems. . 2015. http://iku.moh.gov.my/images/IKU/Document/REPORT/nhmsreport2015vol2.pdf
16. Hasan SS, See CK, Choong CLK, Ahmed SI, Ahmadi K, Anwar M. Reasons, perceived efficacy, and factors associated with complementary and alternative medicine use among Malaysian patients with HIV/AIDS. *J Altern Complement Med* 2010;16 :1171-76.
17. World Health Organization. WHO guidelines for assessing quality of herbal medicine with referencces to contamination and residues. 2007. Cited Jun 2018. Available from

http://apps.who.int/medicinedocs/index/assoc/s14878e/s14878e.pdf

18. Leese G, Gill G, Houghton G. Prevalence of complementary medicine usage within a diabetes clinic. *Practical Diabetes Int* 1997;14:207-8.

19. Ryan E, Pick M, Marceau C. Use of alternative medicines in diabetes mellitus. *Diabetic Med* 2001;18:242-5.

20. Argáez-López N, Wacher NH, Kumate-Rodríguez J, et al. The use of complementary and alternative medicine therapies in type 2 diabetic patients in Mexico. *Diabetes care*2003;26:2470-71.

21. Kumar D, Bajaj S, Mehrotra R. Knowledge, attitude and practice of complementary and alternative medicines for diabetes. *Public Health.* 2006;120:705-11.

22. Naja F, Mousa D, Alameddine M, Shoaib H, Itani L, Mourad Y. Prevalence and correlates of complementary and alternative medicine use among diabetic patients in Beirut, Lebanon: a cross-sectional study. *BMC Complement Altern Med*2014;14:185.

23. Hassan F, Shaaban J. Use of traditional/complimentary medicine (T/CM) among adult patients attending Family Medicine Clinic at Hospital Universiti Sains Malaysia. *Int Med J* 2005;12:133-8

24. Othman CN, Farooqui M. Traditional and complementary medicine. *Procedia-Soc Behav Sci*2015;170:262-71.

25. Abdullah N, Borhanuddin B, Patah AEA, et al. Utilization of Complementary and Alternative Medicine in Multiethnic Population: The Malaysian Cohort Study. *J Evid Integr Med*2018;23: 1-9

26. Malaysia DoS. Population Distribution and Basic Demographic Charcteristic Report 2010.Available at https://www.dosm.gov.my

27. Hutch RA. Health and healing: Spiritual, pharmaceutical, and mechanical medicine. *J Relig Health* 2013;52:955-65.

28. Siti Z, Tahir A, Farah AI, et al. Use of traditional and complementary medicine in Malaysia: a baseline study. *Complement Ther Med* 2009;17:292-99.

29. Basch E, Mphil SB, Collins J, Dacey C, et al. Flax and flaxseed oil (Linum usitatissimum): a review by the natural standard research collaboration. J Soc Intergr Oncol2007;5:92-105.

30. Ilhan M, Demir B, Yüksel S, et al. The use of complementary medicine in patients with diabetes. *North Clin Istanb.* 2016;3:34-38.

31.