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Complementary Therapies Used Among Adult Patients with Type 2 Diabetes Mellitus in Aceh, Indonesia

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Purpose: This study aimed to reveal Complementary Therapies (CT) use among adult patients with type 2 diabetes mellitus (T2DM) in Aceh, Indonesia, and to determine the reasons of using the CT.
Methods: A descriptive, cross-sectional study was undertaken using a self-reported questionnaire. One hundred and fifty four adult patients with T2DM has been completed the questionnaire. Descriptive statistics was used to analyze the data.
Results: Herbs as a part of biological based therapies were the most popular of CT use among subjects in this study (100%) followed by mind-body intervention (94.2%), manipulation and body based methods (19.5%) and alternative medical methods (3.9%). The reasons for using each CT based on the belief in effects of CT on lowering blood sugar (100%), maintaining healthy body (76.6%), and relieving symptoms of DM (35.7%). Relatives and friends (98.7%) were main resources to obtain the CT information, and the family members (91.0%) were main support of CT use. While, the nature (89.0%) was the easiest source to access a CT product, followed by local markets (36.4%).
Conclusion: This study found that herbs were believed by all subjects could reducing blood glucose, maintaining healthy body, and relieving symptoms of DM. Family members and easy to access the CT products from nature took the important role in influencing a person to use CT. More experimental studies examining effects of each CT especially herbal medicine and mind-body intervention are needed in the future.

Key words: Complementary therapy, type 2 diabetes mellitus, Indonesia

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Introduction

Diabetes mellitus (DM) is a disorder of carbohydrate metabolism characterized by high blood glucose levels (hyperglycemia) that affects about 7 million adult Indonesian people with DM, which led Indonesia to become the 9th largest number of people with DM in the world in 2010 and is estimated to be the 6th largest number in 2030 (Shaw, Sicree, & Zimmet, 2010, p.10). Population growth, ageing of population and urbanization with associated lifestyle change is likely to lead to increase the numbers with diabetes by 2030 (Shaw et al., 2010). This is emerging as a major health issue in Indonesia.

Currently, the conventional treatment of T2DM included lifestyle modification of diet and exercise, oral hypoglycemic drugs, and/or insulin (Manya, Champion and Dunning, 2012). However, changes in behavior and lifestyle are not easy for people with DM. The complexities of treatment plans, the chronic illness, the complications of the disease, and threat of death drive adult patients with DM seek out alternative ways in managing their conditions, optimizing their health and alleviating complications through the use of complementary and alternative medicine (CAM) (Chang, Wallis, & Tiralongo, 2007). In addition, living with DM was an independent predictor of CAM use (Egede, Ye, Zheng, & Silverstein, 2002).

Complementary and alternative medicine (CAM) is defined as a group of diverse medical and healthcare system, products, approach, knowledge and beliefs that consist of 5 domains: 1) alternative medical system, 2) mind-body intervention, 3) biologically-based therapies, 4) manipulative and body-based methods, and 5) energy therapies (Fabian, Toscher, Elmadfa, & Pieber, 2011; Khalaf, & Whitford, 2010). Birdee and Yeh (2010) confirmed that there are two terms used in CAM: 1) Complementary Therapy refers to therapies that are used in conjunction with conventional medicine, and 2) Alternative Medicine (AM) refers to therapies that are used as a substitute for conventional medicine.

Studies showed that most of adult patients with DM used CAM in conjunction with conventional treatment. For example, a literature review of CAM used among adult patients with DM in nine countries suggested that the prevalence of CAM used ranges from 17% to 72.8%, and nearly half of adult patients with DM used some forms of CAM in conjunction with conventional medicine as the CT (Chang et al., 2007). In addition, a study in Taiwan found about 22.7% adult patients with DM used the CAM with conventional medicine before and 61.0% after diagnosis with T2DM (Chang, Wallis, & Tiralongo, 2011).

The patterns and the reasons of CT use among adult patients with DM are limited, especially in Indonesia. Currently, no existing studies assessing CT use among adult patients with T2DM in Indonesia has been found.

The purposes of this study were to reveal Complementary Therapies among adult patients with T2DM in Aceh, Indonesia, and to determine the reasons of using these CT.

Methods

Sample

This study was conducted at the endocrine Outpatients Department (OPD) of general hospital Banda Aceh, Indonesia. A convenient sampling method was used to recruit adult patients with T2DM who visited the endocrine OPD of the hospital and met the inclusion criteria of this study. The inclusion criteria were: 1) was diagnosed with T2DM at least 2 years (based on hospital document), 2) used at least one type of CT for at least three months, 3) agreed to participate in this study, and 4) be able to communicate in the Indonesian both verbally and in writing. Total of 154 adult patients with T2DM decided to participate in the study.

Instruments

The instrument used in this study was developed by the researcher based on the National Center for Complementary and Alternative Medicine (NCCAM) and relevant literature related to T2DM. The instrument composed of three parts: 1) Demographic Information, 2) Complementary Therapy Use Questionnaire, and 3) Population Characteristics which include health belief, personal resource, family resource, community resource, perceived and evaluated needs. The content validity of the instrument was established by three experts in this area. Two of them were academic professionals from Faculty of Nursing, Prince of Songkla University, Thailand, and another one was a nurse at the endocrine OPD of general hospital, Banda Aceh, Indonesia. All items of the questionnaire were approved by the three experts. The content validity index (CVI) score was 0.7. The test-retest reliability was used to ensure the consistency and stability of data over time and over condition. The Kappa coefficient of each items showed 0.46 to 1.00. Based on Viera and Garrett (2005), this value indicated moderate to almost perfect agreement.

Ethical Consideration

The study was conducted with permission and approval of the Research Ethics Committee of the Faculty of Nursing, Prince of Songkla University, Thailand and general hospital Banda Aceh Hospital. Potential subjects were given information regarding purpose of the study and methods of data collection. They were informed that they have the right to withdraw from this study at any time and for any reason, or no reason at all. Subjects who decided to participate in the study were given an inform consent form to read and sign. The inform consent composed of the study purpose, confidentiality, anonymity, and withdrawal at any time without negative consequences.

Data Analysis

Data were collected from 154 adult patients with T2DM at the endocrine OPD of the general hospital, Banda Aceh, in March 2013. Descriptive statistics was used to analyze data. The demographic data and CT use of the subjects were analyzed and presented as a frequency, percentage, range, mean, and standard deviation (SD).

Results

Demographic Information of the Subjects

Total of 154 adult patients with T2DM have been completed the questionnaire. The result revealed that the prevalence of T2DM seems to relate with adult age. In age range of 40-49 years, the prevalence of T2DM was 28.6% whereas in age range of 50-59 years, the prevalence of T2DM was 45.5%. The majority of subjects were women, married, Muslim, government staff, and graduated from college or university.

Table 1 *Demographic Information of the Subjects (N = 154)*

Characteristics	*n*	%
Age (Mean = 52.1, SD = 8.6, min-max = 32-73 years)		
30-39	13	8.4
40-49	44	28.6
50-59	70	45.5
60-69	22	14.3
>70	5	3.2
Gender		
Female	89	57.8
Male	65	42.2
Marital Status		
Married	133	86.4
Single	4	2.6
Widow/widower	17	11.0
Religion		
Muslim	152	98.7
Christian	2	1.3
Occupation		
Retirement	19	12.3
Government staff	45	29.2
Private staff	20	13.0
Farmer	15	9.7
Business	10	6.5
Others	45	29.2

Characteristics	*n*	%
Age (Mean = 52.1, SD = 8.6, min-max = 32-73 years)		
30-39	13	8.4
40-49	44	28.6
50-59	70	45.5
60-69	22	14.3
>70	5	3.2
Education status		
No School	3	1.9
Elementary School	15	9.7
Junior High School	17	11.0
Senior High School	56	36.4
College/ University	59	38.3
No formal education	4	2.6

Types of Complementary Therapies Used by the Subjects

All subjects in this study argued that they used biological based therapies, especially herbs. The top three types of herbs use by the subjects were Bay leaf, Soursop leaf, and Mangosteen rind. The other types of CT use by subjects in this study were mind body intervention, manipulation and body based methods, and alternative medical methods. All subjects stated they used CT conjunction with conventional treatment. One third of the subjects used CT combined with diet, and 29.9% of the subjects used CT combined with exercise (Table 2).

Table 2 *Complementary Therapies Used among Adult Patients with T2DM (N = 154)*

Characteristics	*n*	%
Biological based therapies (*N* = 154, 100%)		
Herb	154	100.0
Vitamin	107	69.5
Nutrition	59	38.3
Animal extract	14	9.1
Mind body intervention (*n* = 145, 94.2%)		
Pray/religion practice	145	100.0
Meditation (Zikr)	137	94.5
Traditional medicine	21	14.5
Acupuncture	7	4.8
Manipulation and body based methods (*n* = 30, 19.5%)		
Massage	26	89.6
Other (keep body warm with hot coals, sauna bath and ceragem)	4	13.8
Alternative medical methods (*n* = 6, 3.9%)		
Chinese medicine	6	100.0

Characteristics	*n*	%
Use CT combine with other methods		
Diet	62	40.3
Regular exercise	46	29.9
Take medicine	154	100.0

Note. Percentage exceeds hundred due to multiple responses.
Ceragem is an automated tool that combines thermal and massage with infrared heat radiation, emitted through jade and Epoxy Carbon Panel for restoring the function of the whole body (Lee, Park, & Kim, 2011).

Table 3 *Types of Herbs Used by Adult Patients with T2DM (N = 154)*

Scientific name	Common name	Indonesian name	Parts of used	Mode of Used	%
Syzygium polyanthum	Bay	*Salam*	Leaves	Decoction	50.0
Annona muricata L	Soursop	*Sirsak*	Leaves	Decoction	39.6
Garcinia mangostana	Mangosteen	*Manggis*	Rind	Decoction	26.0
Psidium guajava L	Guava	*Jambu biji*	Leaves, Fruit	Decoction, Juice	17.5
Syzygium cuminii	Jemblang	*Jemblang*	Bark	Decoction	11.7
Andrographis panniculata	-	*Sambiloto*	Leaves, Stem	Decoction	11.7
Areca catechu L	Betel nut	*Pinang*	Fruit	Decoction	11.0
-	Breadfruit	*Sukun*	Leaves	Decoction	10.4
-	Traditional herb	*Daun-daun obat kampong*	Leaves, Bark, Raw	Decoction	9.1
Momordica charantia	Bitter melon	*Buah pare*	Fruit, Leaves	Juice, Decoction	6.5
Allium sativum	Garlic	*Bawang putih*	Bulbs	Juice	5.2
-	Aloe vera	*Lidah buaya*	Leaves	Decoction	5.2
Phaleria macrocarpa	-	*Mahkota Dewa*	Leaves, Fruit	Decoction	-
-	Rosella tea	*Teh rosella*	Leaves	Decoction	3.2
Andropogon nardus	-	*Serai*	Stem	Decoction	2.6
-	South africa leaf	*Teh Afrika*	Leaves	Decoction	1.9
Piper crocatum	-	*Sirih merah*	Leaves	Decoction	1.9
Curcuma xanthorrhiza	-	*Temulawak*	Bulbs	Decoction	1.3
Muntingia calabura L	-	*Daun seri*	Leaves	Juice	1.3
Boussingaultia basselloides	Heartleaf maderavine madevine	*Binahong*	Leaves	Juice	0.6
-	Carrot	*Wortel*	Root	Juice	0.6
Mimosa pudica	-	*Putri malu*	Leaves, stem	Decoction	0.6

Note. Percentage exceeds hundred due to multiple responses.

Health and Medical Information

The majority of subjects were suffering from diabetes complications and other health problems. More than a half of the subjects were diagnosed with T2DM within 5 years; approximately one third of the subjects were diagnosed with T2DM between 5-10 years. The prevalence of DM complications varied based on each type of complications: retinopathy, neuropathy, and foot ulcer. Some subjects had comorbidity: hypertension, ischemic heart disease, and hypercholesterol.

Table 4 *Health and Medical Information of the Subjects (N = 154)*

Characteristics	*n*	%
Health problems and diabetes complications		
Yes	141	91.6
No	13	8.4
Diabetes complications*		
Retinopathy	124	87.9
Neuropathy	106	75.2
Foot ulcer	26	18.4
Nephropathy	1	0.7
Comorbidity		
Hypertension	59	41.8
Ischemic heart disease	12	8.5
Hypercholesterol	10	7.1
Cerebrovascular accident	3	2.1
Low back pain	3	2.1
Loss appetite	2	1.4
Hypotension	1	0.7
Muscle pain	1	0.7
Duration of diagnosis with diabetes mellitus (years)		
2 – 5	80	51.9
>5 – 10	51	33.1
>10 – 15	19	12.3
>15	4	2.6
Frequency of blood glucose test		
Once per month	15	9.7
Once per two months	25	16.2
Once per three months	26	16.9
If got weakness	88	57.1

Note. *Percentage exceeds hundred due to multiple responses.

Belief Associated with Complementary Therapies Used

All subjects believed that CT could decrease blood sugar (100%), maintain healthy body (76.6%), and relieve the symptoms of diabetes complications (35.7%). Few subjects believed CT could decrease hypercholesterol.

Table 5 *Belief Associated With CT Used of the Subjects (N = 154)*

Characteristics	*n*	%
Belief on use of CT		
Decrease blood glucose	154	100.0
Maintain healthy body	118	76.6
Relieve the symptoms of diabetes complications	55	35.7
Reduce blood pressure	19	12.3
Prevent complications of diabetes	13	8.4
Reduce cholesterol	6	3.9
Reduce side effect of diabetes medication	4	2.6

Note. Percentage exceeds hundred due to multiple responses.

Sources of Support, Information and Complementary Therapies Product

This study found that the family members such as parent, brother, and sister play a key role in supporting subjects to use CT, followed by relatives, and friends. However, the main resources of information regarding CT use were obtained from relatives and friends, other diabetic patients, and family members. For the sources of CT products, the subjects reported they obtained the CT products from environment around their house, from local markets, and from traditional healers.

Table 6. *The Sources of Support, Information and CT Product (N = 154)*

Characteristics	*n*	%
The sources of support regarding use of CT		
Family member	131	85.1
Relatives	55	35.7
Friends	19	12.3
The sources of information regarding use of CT		
Relatives and friends	152	98.7
Diabetes patients	92	59.7
Family member	76	49.4
Mass media	31	20.1
CT practitioner	21	13.6
Ustadz	21	13.6
Traditional healer	17	11.0
Physicians	6	3.9
Nurses	1	0.6
The sources of CT product		
Environment around the house	137	89.0
Markets	56	36.4
Traditional healer	20	13.0
CT practitioner	19	12.3
Friends	12	7.8
Family member	7	4.5

Note. Percentage exceeds hundred due to multiple responses.

Discussion

The result showed that the majority of subjects were female. The similar study that is conducted in urban population in Indonesia found female suffers from DM more than male (Miharja, 2009). Globally, diabetes prevalence is similar in men and women especially in men < 60 years old and in women at older ages (Wild, Roglic, Green, Sicree, & King, 2004). There are more women with DM than men from this study, and a greater number of women than men in most populations and the increasing prevalence of diabetes with age are the most likely explanation for this observation.

The majority of age of subjects were between 50-59 years old (45. 5%) with the mean age was 52.1 years. A study in urban population in Indonesia found that age range of adult patients with DM was between 45 to 64 years (Miharja, 2009). A study found similar finding that the majority of adult patients with DM in developing countries were in the 45-64 years old age group and the over 64 years old age group in developed countries. The effects of age on increasing prevalence of diabetes are the most likely explanation for this observation (Wild et al., 2004). In addition, recently lifestyle of Indonesian people have changed. More people prefer sedentary lifestyle, unhealthy diet such as low fiber, and western diet such as fast food which could influence the incidence of DM especially in urban younger people (Prijadi, Nila, & Hartono, 2013).

The present study found that a half of the subjects who used CT were diagnosed with T2DM within 5 years. Literatures revealed that adult patients with DM tended to look for CT after they were diagnosed with DM. A study conducted in Malaysia reported patients with T2DM started to use CT since they were diagnosed with DM within a few months. These patients used CT because they believed that conventional medicine have more side effects. In addition, they perceived that combining CT with conventional medicine would help their diabetes (Huri, Lian, Hussain, Pendek, & Widodo, 2009).

The most common type of CT used by subjects in this study was biological based therapy, especially herbs. This indicated a deep rooted belief in the healing of diabetes mellitus. The top three types of herb used in this study include bay leaves, soursop leaves, and mangosteen. These findings are congruent with several studies with demonstrated widespread use of herbal medicine as the most preferred CT (Ali-Shtayeh, Jamous, & Jamous, 2012; Khalaf et al., 2010; Shojaii, Dabaghian, Goushegir, & Fard, 2011; Wazaify, Afifi, El-Khateeb, & Ajlouni, 2011). A literature reported some spice herbs such as bay leaves, cinnamon, and other natural products, have been used to control blood glucose among adult patients with T2DM (Khan & Safdar, 2003).

It was reported that bay leaves may be effective in reducing fasting and postprandial blood glucose levels with no appreciable change on other parameters such as lipid profile, glycated protein, and amino acids in 30 patients with Non Insulin Dependent Diabetes Mellitus (NIDDM) (Khan et al., 2003). From patient's perception the spice herbs and other plant products are considered as more natural, economic and safe product to be used as conjunction treatment for diabetes mellitus. A study at Maryland evaluated the effects of 49 types of herbs included spices, culinary herbs, and medicinal plants on insulin function among adult patients with insulin-dependent utilization of glucose. They found that Cinnamon was the most effective bioactive product followed by witch hazel, green and black tea, bay leaves, nutmeg, cloves, mushrooms, brewer's yeast, and all spices. They concluded that spices, culinary herbs, and some medicinal plants which used in daily life could reduce the glucose level and improve insulin metabolism (Broadhurst, Polansky, & Anderson, 2000).

However, the animal components such as snake blood, leech, and antlion were less used by subjects in this study. It is possible that the subjects received this information from other adult patients, not from the scientific or clinical practice. Other possible reasons were that these animals are dangerous animals and difficult to find in their environment. According

to Ahmad and Anwar (2009), they agreed that many diseases were the result of imbalance in the body that could be stabilized by releasing blood. Patients who livings with diabetes have high blood viscosity due to glucose remains in the blood and cause the thickening of arteries. This condition will create complication in the body. Leech has a substance which has anti-coagulant function and blood flow. This substance will help prevent blood clots, and dilute the blood flow of patients. A case report from India showed that leech therapy proved very effective for cleaning diabetic wound and the ulcer healed completely within 30 days (Dwivedi, 2012).

The reason why herbs, especially bay leaves, soursop leaves, and mangosteen, were used the most in the present study may associate with the ease of accessibility, lower costs, and social acceptance. Moreover, bay, soursop, and mangosteen are trees which are easy grown up in Indonesia. Subjects in this study reported it was easy to access these herbs from environment closed to their houses. Bay leaves are usually used as a spice ingredient in cooking Indonesian food. It is easy to find in local markets with low price. Soursop and mangosteen are favorite fruits for Indonesian people and these fruits can be found easily.

Another reason why these herbs were popular used as CT in Indonesia might be due to most of the subjects believed that herbs and some CT would decrease blood sugar, maintain healthy body, and relieve the symptoms of diabetes complications. A previous study stated that one of the factors driving the use of CT is the belief that the intervention works and make a different health outcome (Fowler & Newton, 2006). The subjects believed in the effect of CT, even though the CT was informed without scientific proof. This finding was similar to a study conducted in Palestine which reported herbal remedies would be effective in slowing down the progression of disease, relieving symptoms of the disease, and reducing side effects of conventional medicine (Ali-Shtayeh et al., 2012). The finding revealed that the use of CT is not only to treat diabetes mellitus but also to promote wellness and quality of life.

In addition, change in society which related to a patient self-empowerment paradigm may influence subjects to have positive views of CT as it has fewer side effects (Ching, Zakaria, Paimin, & Jalalian, 2013). Most adult patients with T2DM in this study had poor blood-glucose control. About 57.1% of subjects reported that they checked blood glucose if they feel tired. Blood glucose control is a conventional treatment which requires the patients with T2DM to be disciplined and pay more attention on appropriate diet, healthy lifestyle, and behavior modification. This requirement is not easy for patients with T2DM. Interestingly, this study found that using CT helped patients to be more confident to control their blood glucose. It is possible that CT usage has been embedded into the Muslim belief and cultural heritage that is already integrated into their life (Loukas, Saad, Tubbs, & Shoja, 2010; Stevensen, 1999).

The present study showed that relatives and friends (98.7%), patients with T2DM (59.7%), and family members (49.4%) play a key role in influencing the subjects' decision in using herbs and other CT. These findings were similar to other studies in Thailand (Moolasarn, Sripa, Kuessirikiet, Sutawee, Huasary, Chaisila et al., 2005), Taiwan (Chang, Wallis, & Tiralongo, 2011), and Jordan (Wazaify et al., 2011). Friends and family members are persons who have close relationship with the patients. Family is a support system to family members and has an important role to promote patients' wellbeing. Family has more powerful in helping persons with health problems to achieve and maintain behavioral change. In contrast, one study conducted in Austria showed that 43% of the subjects were motivated to use cinnamon by their physicians, and only 3% of subjects reported that they received advice from family and/or friends. This study found few physicians and nurses recommended subjects in using CT. A previous study suggested that nurses and other health professional need to understand patients regarding their CT use (Chang et al., 2007; Chang et al., 2011; Fabian et al., 2011; Moolasarn et al., 2005). Patients are often unwilling to share the information about

their use of CT to health professional. However, health professional should understand that the patients have choices to use CT because CT also provide the benefits for patients such as less invasiveness, greater control with low price, and choices over personal health.

In terms of mind body intervention, the majority of the subjects in the present study used praying and meditation (*Zikr*) as CT conjunction with conventional medicine to control diabetes mellitus. This finding is not surprising and it consistent with a previous study which conducted in Sydney and found that 25% of adult patients living with diabetes used prayer while receiving the treatment of diabetes mellitus (Manya et al., 2012). A literature showed that personal spiritual practices can play an important role in promoting health and relieving illness (Yeh, Eisenberg, Davis, & Phillips, 2002). Spiritual practice is strick in Muslim culture. Muslim people must pray 5 times a day followed by zikr. Zikr meditation, however, it can be practiced at any time. In a regular basis, Zikr meditation is performed twice a day, in the morning and evening. Zikr is the practice with respect to the Allah, or Lord of Muslim people. The Zikr can be practiced in sitting position or lie comfortably with eyes closed, and think of the Allah then say the following words: Subhanallah, alhamdulillah, allahu akbar (Soliman & Mohamed, 2013). The Muslim people believed that health and illness come from the command of Allah related to people lifestyle and behavior in the previous time. The illness will be relieved if people request to Allah and Allah accept their supplications (du'a).

The alternative medical methods was used less by subjects in this study. Adult patients with T2DM got Chinese medicine for DM from Chinese stores with high price. It was very expensive because of imported from China. This study provided new basic knowledge about CT use and reasons of using CT in adult patients with T2DM in Indonesia. On the other side, the study also has some limitations. The generalization of result of this study may be limited because of using convenience sample in public hospital in Aceh province, and most of the samples were Acehnese and Muslim.

Conclusion

This study examined types of complementary therapies used and reasons for CT use among adult patients with T2DM at a hospital in Banda Aceh, Indonesia. Herbs and mind body intervention were popular used among this sample regarding the belief in decreasing blood sugar and maintaining healthy body. Subjects received information regarding CT use from family members, relatives, and friends. The main resources for getting CT products include nature and the local markets.

Healthcare professional working at endocrine OPDs especially DM OPD should pay more attention and seek for more knowledge regarding complementary therapies used among adult patients with T2DM. Types of CT, reasons for usage, usefulness, possible side effects, and appropriate ways of using these complementary therapies need to be explored by the nurses and health care personals. Scientific studies and researches about effect of each CT should be further studied and informed to patients with T2DM and their families.

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