

COMPLEMENTARY AND ALTERNATIVE
MEDICINE (CAM) PRACTICE AMONG PATIENTS
WITH TYPE 2 DIABETES MELLITUS IN HOSPITAL
UNIVERSITI SAINS MALAYSIA

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WITH TYPE 2 DIABETES MELLITUS IN HOSPITAL
UNIVERSITI SAINS MALAYSIA

by

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Dissertation submitted in partial fulfilment
of the requirements for the degree
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CERTIFICATE

This is to certify that the dissertation entitled “COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) PRACTICE AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS IN HOSPITAL UNIVERSITI SAINS MALAYSIA” is the bona fide record of research work done by Ms NUR ATHIRAH BINTI ZULKIFLI, Matric Number 131218 during the period from September 2018 to May 2019 under my supervision. I have read this dissertation and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for the degree of Bachelor of Nursing (Honours).

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DECLARATION

I hereby to declare that this dissertation is the result of my own investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching research and promotional purposes.

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LIST OF ABBREVIATIONS AND ACRONYMNS

CAM	Complementary and Alternative Medicine
USM	Universiti Sains Malaysia
WHO	World Health Organization
SPSS	Statistical Package Social Sciences

**PENGGUNAAN UBAT-UBATAN KOMPLEMENTARI DAN ALTERNATIF
(CAM) DALAM KALANGAN PESAKIT KENCING MANIS JENIS 2 DI
HOSPITAL USM**

ABSTRAK

Penggunaan Ubat-ubatan Komplementari dan Alternatif (CAM) adalah kumpulan pelbagai jenis sistem perubatan, amalan, dan produk yang tidak dianggap sebagai sebahagian daripada ubat konvensional. CAM digunakan secara meluas dalam kalangan pesakit diabetes sebagai tambahan kepada terapi konvensional di negara-negara membangun. Tujuan kajian ini adalah untuk mengenalpasti penggunaan ubat-ubatan komplementari dan alternatif (CAM) dalam kalangan pesakit kencing manis Jenis 2 di Hospital USM. Kajian keratan rentas ini telah dijalankan ke atas 82 pesakit kencing manis Jenis 2 (T2DM). Peserta dipilih melalui kaedah pensampelan mudah dan memenuhi kriteria pemilihan responden. Data dianalisis secara statistik menggunakan pakej perisian SSPS versi 24. Penemuan menunjukkan bahawa penggunaan CAM dalam kalangan pesakit T2DM di Hospital USM adalah rendah ($n = 37$, 45.1%). Jantina ($p = .003$) dan status pekerjaan ($p = .041$) mempunyai hubungan yang signifikan dengan penggunaan CAM. Walau bagaimanapun, umur ($p = .367$), kaum ($p = 1.000$), status perkahwinan ($p = .823$), tahap pendidikan ($p = .841$), pendapatan isi rumah ($p = .166$) dan tempoh didiagnosis dengan T2DM ($p = .362$) tidak mempunyai persamaan yang signifikan secara statistik dengan penggunaan CAM. Majoriti pengguna CAM menggunakan terapi berasaskan biologi seperti peria ($n = 25$, 30.1%) dan Misai Kucing ($n = 19$, 22.9%) untuk mengawal T2DM. Penemuan kajian ini juga menunjukkan bahawa pengguna CAM menggunakan CAM kerana mereka percaya bahawa CAM mampu mengawal diabetes dengan lebih baik ($n = 34$, 41.0%), mudah didapati dan lebih murah serta kurang kesan sampingan ($n = 28$, 33.7%). Hasil kajian ini juga menunjukkan bahawa pesakit T2DM tidak menggunakan CAM kerana tidak mahu bercampur dengan ubat-ubatan yang telah dipreskripsikan kepada mereka ($n = 43$, 51.8%). Kesimpulannya, kajian ini menunjukkan penggunaan CAM adalah tidak lazim dalam kalangan pesakit T2DM. Walau bagaimanapun, masih terdapat keperluan untuk mengenal pasti amalan CAM dalam kalangan pesakit T2DM dan menguruskannya dengan sewajarnya.

**COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) PRACTICE
AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS IN HOSPITAL
UNIVERSITI SAINS MALAYSIA**

ABSTRACT

Complementary and Alternative Medicine (CAM) is a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine. CAM is widely used among diabetic patients as an adjunct to conventional therapy in developing countries. The aim of this study was to identify the CAM practice among patients with Type 2 Diabetes Mellitus in Hospital USM. A cross-sectional study was conducted on a total of 82 Type 2 Diabetes Mellitus (T2DM) patients. Participants were selected through convenience sampling method and fulfilled the inclusion criteria. Data was statistically analyzed using the software package SSPS version 24. The finding shows that the prevalence of CAM practice among T2DM patients in Hospital USM was low (n=37, 45.1%). Gender (p = .003) and occupational status (p = .041) had a significant association with CAM practice. However, age (p=.367), race (p= 1.000), marital status (p= .823), level of education (p= .841), household income (p = .166) and duration diagnosed with T2DM (p= .362) had no statistically significant association with CAM practice. The findings shows that majority of CAM user use biological based therapy such as bitter gourd (n=25, 30.1%) and Misai Kucing (n=19, 22.9%) to manage T2DM. CAM users had practice on CAM because they believe that CAM had better diabetes control (n=34, 41.0%), easily available and cheaper and also had fewer side effects (n=28, 33.7%) respectively. This research also showed that T2DM patients did not practice on CAM because they do not want to mix up with their current medications (n=45, 51.8%). In conclusion, this present study revealed CAM practice was not prevalent among T2DM patients. However, there is still a need to identify CAM practice among T2DM patients and manage it appropriately.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Complementary and Alternative Medicine (CAM) is a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine (Ching et al., 2013). An important distinction exists between complementary medicine and alternative medicine. Complementary medicine is used together with conventional medicine, whereas alternative medicine is used in place of conventional medicine.

Complementary and Alternative Medicine (CAM) includes a wide variety of therapies and practices. It can be divided into five categories which are biological-based therapies like vitamins, minerals and herbs; alternative medical systems like acupuncture or Ayurveda; energy therapies like reiki, therapeutic touch, healing touch, magnet therapy and qi gong; manipulative and body-based systems like chiropractic or massage; and mind-body interventions like meditation, hypnosis, guided imagery, visualization, relaxation therapy, art and music therapy, tai chi or yoga (Complementary, Alternative, & Integrative Medicine, n.d.).

Many of these "natural" products are considered to be safe because they are present in or produced by nature. However, that is not true in all cases. Some may affect how well other medicines work in your body. There is a potential risk of drug interaction when these agents are used as adjuvants to allopathic medicine. They may also interfere negatively with glycemic control and cause adverse effects and additional complications.

CAM is widely used among diabetic patients as an adjunct to conventional therapy in developing countries. This could result in ineffective diabetes management and cause adverse effects especially since the CAM usage is rarely disclosed to their healthcare provider.

Diabetes mellitus is a chronic disease which is inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced (WHO, 2018). Such a deficiency results in increased concentrations of glucose in the blood, which in turn damage many of the body's systems, in particular the blood vessels and nerves (WHO, 2018). Whereas, Type 2 Diabetes Mellitus (T2DM) are results from the body's inability to respond properly to the action of insulin produced by the pancreas. Type 2 diabetes is much more common and accounts for around 90% of all diabetes cases worldwide. It occurs most frequently in adults, but is being noted increasingly in adolescents as well (WHO, 2018).

The prevalence of diabetes mellitus worldwide is projected to rise to 552 million representing 10% of the global adult population by 2030 up from 366 million in 2011 (International Diabetes Federation, 2013). Malaysia is one of the 22 countries and territories of the International Diabetes Federation Western Pacific (IDF WP) Region. There are 425 million people have diabetes in the world and 159 million people in the WP Region, by 2045 this will rise to 183 million people. There were over 3 492 600 cases of diabetes in Malaysia in 2017 (International Diabetes Federation, 2018). The burden is worse in the developing world which represents over 80% of cases. In Hospital USM, the number of T2DM patients increased from 1527 persons in 2013 to 3354 persons in 2017 even though there was a slight decrease in 2018. Table 1.1 shows the number of T2DM patients in Hospital USM.

Table 1.1: Statistic of T2DM patients in Hospital Universiti Sains Malaysia from 2013-2018

YEAR	T2DM	T2DM (18 years old and above)
2013	1527	1524
2014	1860	1849
2015	2215	2212
2016	3116	2990
2017	3354	2987
2018	1962	1971

Source: Record Unit, Hospital USM.

There were many reasons that drive patients with T2DM to use suitable CAM practices for controlling blood sugar in the Eastern and Western worlds. Some of these reasons include lower cost, safety, fewer side effects, greater control of treatment strategy, in effectiveness of modern medications, promotion of health and well-being and the difficulty accessing physicians in hospitals. Several researchers had found that there were more complex reasons associated with philosophical congruence related to CAM use such as patients' values, worldviews, spiritual or religious philosophies, beliefs or culture in relation to the nature and meaning of health and illness (Shin et al, 2008).

In most high-income countries and some low-income countries, the reported incidence of CAM use among people with or without T2DM ranges between 17.0% and 72.8% (Al-Eidi et al., 2016). CAM use prevalence in the USA ranged from 31% to 57% among diabetes patients (Bell et al., 2006), 63% in Bahrain (Khalaif & Whitford, 2010), 62% in Mexico (Argaez-Lopez et al., 2003) and 25% in Canada (Ryan, 2001). China had a long tradition of use of herbal medicine for diabetes. The findings of a systematic review reported that Chinese herbal medicines were reported to be more effective for diabetes compared with lifestyle modification alone (Grant, 2009). In China, traditional medicines accounts for 40% of all healthcare delivered (WHO, 1999). According to a study by

Jennifer et al. in 2016, 83% of patients had used traditional Chinese medicine. Use was greatest for Chinese herbal medicine (55.8%). Only 1.3% of patients used acupuncture and 6.8% Qi Gong or Tai Qi.

The efficacy of CAM in these diseases was still not validated and some type of CAM may be ineffective and pharmacologically incompatible with patient's antidiabetic medications. This situation is further compounded by the fact that many of these patients do not disclose their CAM use to their physicians putting them at risk of adverse drug reactions and interactions. Notable risks of CAM were addressed. Some practices such as acupuncture can cause fatal infections while others such as herbs cause serious toxicities. Herbal medicinal products are potential sources of health risks as they could cause herb-drug interaction or be subjected to contamination, adulteration, or substitution with other toxic products (Ernst & Pittler, 2002). Therefore, it is of utmost importance that there should be clarity among the physicians so that they can make safe choices and avoid interactions with CAM. Thus, this study was conducted to evaluate the use of CAM among patients with T2DM and also the reasons influencing CAM usage.

1.2 Problem Statement

The practice of CAM was relatively common among patients with T2DM around the world. People with chronic diseases such as T2DM often consult with CAM practitioners or self-manage with CAM therapies based on their own knowledge. A study by Ai-Eidi et al. (2016) in Riyadh found that 30.5% T2DM patients had ever use CAM but only 6.6% of them had discussed with their physician about their CAM products. This situation was further compounded by the fact that many of these patients do not disclose their CAM use to their physicians. This could put them at risk of adverse drug reactions and interactions. Besides that, the study also had found that 25.8% of them had combine CAM with T2DM medications whereas a study by Sadiq et al. (2017) found that 96.63% of T2DM patients that use oral hypoglycaemic medication is a CAM user. There is a potential risk of drug interaction when these agents are used as adjuvants to allopathic medicine. They may also interfere negatively with glycemic control and cause adverse effects and additional complications.

Relatives and friends were associated with CAM use. This was proven by a study by Sadiq et al. (2017) that found 58.18% of T2DM patients got information regarding CAM from their relatives while 20% of them got from their friends. In addition, a study by Al-Eidi et al. (2016) found that 37.0% of T2DM patient had prescribed CAM from their friends. This indicates that the involvement of patients' friends and families during diabetic counselling regarding efficacy and potential side effects of CAM is important.

In Malaysia, there are 12,000 plants. However, only about 1,300 herbs had been found to have therapeutic benefits (Ching et al, 2013). This indicates that local herbs were underutilized, as not much study has been done on useful local herbs in treating or controlling diabetes (Ibrahim, 2006). However, uses of herbs like bitter gourd, Misai Kucing, garlic and ginseng are believed to reduce blood sugar levels. So far, no study regarding CAM practices among T2DM patients had been found conducted in Hospital USM. Based on the researcher's observation while doing clinical posting in medical wards in Hospital USM, most patients with T2DM had practice on CAM at home. All the above issues that arise regarding the CAM practice had inspired the researcher to conduct this study to assess the practice of CAM among T2DM patients in Hospital USM.

1.3 Research Questions

1. What is the prevalence of CAM practice among T2DM patients in Hospital USM?
2. What are the common types of CAM practices among T2DM patients in Hospital USM?
3. What are the reasons of using CAM among T2DM patients in Hospital USM?
4. Is there any association between socio-demographic characteristic (gender, age, race, marital status, level of education, occupational status, household income, duration of T2DM diagnosed) and CAM practice among T2DM patients in Hospital USM?

1.4 Research Objectives

1.4.1 General Objective

General objective of this proposed study is to identify the complementary and alternative medicine (CAM) practice among patients with Type 2 Diabetes Mellitus in Hospital USM.

1.4.2 Specific Objectives

1. To determine the prevalence of CAM practice among T2DM patients in Hospital USM.
2. To identify the common types of CAM practices among T2DM patients in Hospital USM.
3. To identify the reasons of using CAM among T2DM patients in Hospital USM.
4. To determine the association between socio-demographic characteristic (gender, age, race, marital status, level of education, occupational status, household income, duration of T2DM diagnosed) and CAM practice among T2DM patients in Hospital USM.

1.5 Hypothesis

Hypothesis 1 :

H_0 : There is no significant association between socio-demographic characteristic (gender, age, race, marital status, level of education, occupational status, household income, duration of T2DM diagnosed) and CAM practice among T2DM patients in Hospital USM.

H_A : There is a significant association between socio-demographic characteristic (gender, age, race, marital status, level of education, occupational status, household income, duration of T2DM diagnosed) and CAM practice among T2DM patients in Hospital USM.

1.6 Definition of Terms (Conceptual/Operational)

The terms used in this research proposal is referring to the definitions as below:

1. Complementary and Alternative Medicine (CAM)

Conceptual Term

A group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine (Barnes et al., 2008).

Operational Term

CAM in this study refers to T2DM patients who prescribed treatment or practices other than conventional medicine with or without discussing with their physician.

2. Complementary and Alternative Medicine (CAM) Practice

Conceptual Term

Complementary medicine refers to the use of non-conventional therapy, in conjunction with regular treatment, while alternative medicine refers to the use of non-conventional treatment (Sadiq et al., 2017).

Operational Term

CAM practice in this study is defined as consumption of either biological-based therapies like herbal and dietary supplement; alternative medical systems, like acupuncture or Ayurveda; energy therapies like Reiki; manipulative and body-based systems like chiropractic or massage; or mind-body interventions like tai chi or yoga (Complementary, Alternative, & Integrative Medicine, n.d.). The practice of CAM were measured by using questionnaire in Section II (Appendix A).

3. Type 2 Diabetes Mellitus (T2DM)

Conceptual Term

Type 2 Diabetes Mellitus are results from the body's inability to respond properly to the action of insulin produced by the pancreas (WHO, 2018).

Operational Term

In this study, it refers to T2DM patients admitted into medical wards in Hospital USM either new cases or old cases.

1.7 Significance of Study

It is important to do a study on Complementary and Alternative Medicine (CAM) practice among patients with T2DM because the usage CAM is increasing worldwide. The increases could be attributed to a variety of reasons such as dissatisfaction with modern medications that are associated with major complications (WHO, 2013).

Diabetes Mellitus is recognized globally as a major public health problem with a significant morbidity and mortality. It is associated with a variety of serious complications. The results of this research will help physicians, diabetic patients and the public to have a better understanding of the current state of CAM modalities among diabetes patients and to establish health education programs for self-care in chronic diseases. Besides, the involvement of patients' friends and the families during diabetic counselling regarding efficacy and potential side effects of CAM is important. This is because some type of CAM may be ineffective and pharmacologically incompatible with patient's anti-diabetic medications or may even cause interactions.

In addition, we hope this study will encourage health care professionals to enquire about CAM use among their patients before making clinical decision. This is because many patients do not disclose their CAM use to their physicians. This could putting them at risk of ARDs and interactions. This study may be a step forward towards guiding diabetic patients to appropriately use evidence-based CAM therapies in order to maximize their effectiveness. This study will also encourage the concerned health authorities to develop suitable policies and guidelines regarding CAM.

In summary, this study is important in guiding diabetic patients to appropriately use evidence-based CAM therapies. The knowledge regarding CAM is vital especially among diabetic patients because some CAM usage may be harmful towards their health if they are wrongly consumed. Besides, it is also important for physician to clarify the CAM usage among their patients before making clinical decision so that they can make safe choices and avoid potential side effects of CAM. Lastly, this study could encourage health authorities to develop suitable policies and guidelines regarding CAM.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature related to CAM practice among patients with T2DM in Hospital USM. This chapter cover the prevalence of CAM practice and theoretical framework the type of CAM use among T2DM patients. Besides that, this chapter acknowledged possible reasons related to CAM use among T2DM patients. These help clarify and determine the research design and tools that were required to achieve the research's objectives. The selected and tools that were used for data collection were also included in this chapter.

2.2 Review of Literature

2.2.1 Prevalence of CAM Practice among T2DM Patient

According to a study by Ching et al. (2013) in Malaysia, the prevalence of CAM use among DM patients in the study population was high (62.5%). The increased use of CAM practices has been associated with the increased incidence of chronic diseases, especially diabetes mellitus which is considered to be a global public health problem associated with significant morbidity and mortality and a huge burden on public health systems (Manya, Champion & Dunning, 2012). This can be supported by a study by Mohamed et al. (2016) in Qatar and Al-Eidi et al. (2016) in Riyadh where the prevalence of CAM usage among DM patients in the study population was high which is 53% and 30.5% respectively.

Patients may have positive views of CAM due to its organic nature which can present fewer side-effects, preferences to be treated holistically and increased availability of CAM. In India, a study from the state of Uttar Pradesh reported a prevalence of 68% CAM use among diabetes patients (Kumar, Bajaj & Mehrotra, 2006) whereas, CAM use for selected chronic diseases (HIV, epilepsy, rheumatoid arthritis and diabetes) was reported to be 35% with the highest use of CAM among diabetes patients (63.2%) in Maharashtra (Bhalerao et al, 2013).

However, according to a recent study by Sadiq, Khajuria and Khajuria (2017), among a total of 280 T2DM patients consented to participate in the study, 110 were CAM users (39.28%) and 170 (60.71%) were non-CAM users. This study found that frequency of CAM users before anti-diabetic treatment were 7.27% and after conventional treatment, CAM usage increased to 92.72% which is almost similar to observations made by others. However, this may be under-reported since many patients may feel embarrassed about divulging information in regards to CAM use whereas others may use different types of CAM that are not specified in the study definition (Mohamed et al., 2016).

The variability in estimated prevalence of CAM use in the diabetic population is mainly attributed to studies' diverse methods, various definitions and the criteria of different CAM practices used across the world. Notably, the prevalence of CAM use is expected to be low among patients with newly diagnosed conditions, including DM, who first seek modern medications, and tend to refuse CAM therapies as shown in the study by Al-Eidi et al. in 2016.

2.2.2 The Type of CAM Use among T2DM Patient

CAM use can be divided into five categories which are biological-based therapies like herbal and dietary supplement, alternative medical systems like acupuncture or Ayurveda, energy therapies like Reiki, manipulative and body-based systems like chiropractic or massage and mind-body interventions like tai chi or yoga (Complementary, Alternative, & Integrative Medicine, n.d.).

In a study by Ching et al. (2013), biological therapy which involved the herbal products (50.0%) were the most widely used, followed by manipulative-body based systems (9.2%), energy system (8.8%), alternative medicine systems (4.6%) and mind-body system (1.7%). Bitter gourd (30.4%) was the most popular natural product consumed by respondents. Other commonly used herbal products included Misai Kuching (24.2%) and garlic (13.3%).

A study by Khalaf and Whitford (2010) also shows that the majority of CAM users used natural medicine as a form of CAM with 32% using alternative and medical practices, 10% using mind-body interventions, 31% using manipulative and body based methods and 3% using energy therapy. Commonly used forms of natural medicine included garlic (36%), bitter melon (31%), cinnamon (30%) and fenugreek (27%). This is consistent with a study by Mohamed et al. (2016) that shows herbal powder (54%) was the most widely used, followed by bitter gourd (44%), fenugreek (40%), cinnamon (26%), ginger (18%) and coriander (16%).

Meanwhile, a study by Al-Eidi et al. (2016) shows most commonly used CAM therapies were herbs (n=62, 30.4%), wet cupping (n=42, 20.9%), vitamins and minerals (n=36, 17.6%), cautery (n=34, 16.7%), roqia (n=22, 10.8%) and other products (n=8, 3.8%). People suffering from various chronic diseases also commonly use honeybee products, hijama and spiritual therapies such as roqia (El-Olemy & Al-Bedah, 2012).

According to a recent study by Sadiq et al. (2017), evaluation of the type of CAM use revealed Ayurveda was the most common CAM modality (44.54%) followed by Naturopathy (10.09%), herbal medicines and bitter gourd (9.09%) each and fenugreek seeds (8.18%). This is due to the much acceptance of these alternative pathies in rural areas than urban. The study had maximum CAM users from rural background (71%). The Ayurveda dispensaries those provide free medicines are more concentrated in the rural areas.

CAM use is deeply rooted and influenced by multicultural and religious nature. It had ethnic diversity and this influences CAM use as well. Uses of herbs like bitter gourd, Misai Kucing (Orthosiphon Stamineus Benth), garlic (Allium Sativum) and ginseng (Panax Ginseng) are believed to reduce blood sugar levels. Bitter gourd, also known as Momordica Charantia is a tropical vine that is widely believed to bring down blood sugar levels, despite a lack of robust evidence (Ching et al., 2013). Bitter gourd was widely used as Ayurveda treatment in India. It was found to be the most common herb used as before 15th century and traditional Malay medicine has been strongly influenced by the animistic culture of Hindu-Buddhism, thus the use of the bitter gourd is already deeply ingrained in the Malay population.

2.2.3 Reasons of Using CAM among T2DM Patients

There are many factors associated with CAM use among patients with T2DM as reported in the previous studies. According to Ching et al. (2013). More than half of survey respondents (n=50) pursued CAM therapies because they believed CAM can help them achieve better control in diabetes (58.0%), easily available and better value for money (17.3%). Some use it because they are following the example of other CAM users (17.3%). This is further supported by Al-Eidi et al. in 2016 where the study shows that fewer side effects (n=144, 47.7%), good diabetic control (n=111, 36.8%), and easily available with low costs (n= 52, 17.2%) is mostly associated with the reasons of CAM use.

Meanwhile, a study by Sadiq et al. (2017) revealed that most common reason for using CAM as reported by 32.72% users because of its safety. Effectiveness account for 20.90% and low cost of CAM (19.09%) were the other reasons stated for using CAM. Among CAM users only small proportions of the patients (2%) did experience difficulty in controlling their blood sugar levels in spite of addition of CAM modality to their conventional anti-diabetic medications. These findings are similar with previous studies those also observed CAM use to be safe, effective, cheap and prevent complications.

2.2.4 Factors Associated to CAM Usage among T2DM Patients

According to a study in Malaysia by Ching et al. (2013), they found no significant relationship in CAM usage and gender, mean age, ethnic group, education level, or total household income. This could be because the studied population was diabetic patients, who might be more likely to resort to CAM therapies regardless of any socio-demographic status. However, the study found that females were 1.8 times more likely to use CAM than males and 75% of them were Malays, followed by Indians (18%) and Chinese (6%) (Ching et al., 2013). This is because CAM use is deeply rooted and influenced by its multicultural and religious nature.

A study by Khalaf and Whitford (2010) from Bahrain revealed that CAM users were more likely to be females (56%), have diabetes for a longer time and have T2DM complications. Notably, the prevalence of CAM use is expected to be low among patients with newly diagnosed conditions, including DM, who first seek modern medications and tend to refuse CAM therapies. This is supported by a study in Taiwan that found that CAM use among people with T2DM was significantly associated with a history of previous CAM use for other conditions, efficacy of CAM and a longer duration of diabetes. A study by Al-Eidi et al. (2016) also found there is statistically significant associations between the usage of CAM practices with a variety of sociodemographic, clinical, and attitudinal variables of patients with T2DM. The factors were age above 51 years and unemployment.

A study in Qatar in 2016 by Mohamed et al. shows that females were 1.2 times more likely to use CAM than males whereas a study by Sadiq et al. (2017) also shows that 56.36% of CAM users were females. Most of CAM users belong to rural areas (70.90%), having low socioeconomic status (89.09%) and between 40 to 59 years old (52.72%). Patients with less than eight years duration of disease (56.36%) were more prone to use CAM. Most of the patients (92.72%) started using CAM after their anti-diabetic treatment.

In addition, a study by Mohamed et al. (2016) also found that patients with higher levels of education were more likely to be CAM users (62%). This can be supported by a study by Sadiq et al. (2017) where CAM was prevalent in educated patients (90.90%) more than illiterates (9.09%). A study by El-Olemy & Al-Bedah (2012) in Riyadh also found that the most common users of CAM practices were older females, housewives and illiterates.

2.3 Theoretical/Conceptual Framework

2.3.1 Socio-Behavioral Model

This study tested a modification of the Andersen Behavioral Model of health services use to assess the effects of predisposing factors, enabling resources, need, and personal health practices on the use of CAM. The initial behavioral model - the model of the 1960s is depicted in Figure 2.1.



Figure 2.1: Socio-Behavioral Model

The Socio-behavioral Model proposes that utilization of conventional health care services is a function of societal, health services system, and individual determinants (Andersen & Newman, 1973). The Andersen's Behavioral Model of Health Care Utilization, initially developed in the late 1960's, suggests that people's use of health services is a function of their predisposition to use services, factors which enable or impede use and their need for care, thus providing a way to conceptualize these variations in utilization rates and consumption of medical resources (Andersen & Newman, 1973).

In this model, use of services was defined as a function of 3 main elements which were need, enabling, and predisposing factors. Need factors, which have been shown to account for the majority of the explained variability in physician use, include the individual's perceived health care need and other indicators of their health status. Factors such as self-reported number of symptoms, self-perceived health, number of bed days, restricted activity and activities of daily living were part of the patient's perceived need of health care. Those who report poorer health were more likely to use complementary and alternative medicine (Barnes, Bloom, & Nahin, 2008). Also, those who report a greater number of diagnosed health conditions were more likely to use CAM.

Enabling factors include items such as the individual's income, health insurance status and access to a source of regular care. In general, higher levels of income were associated with increased CAM use. Most studies find either a positive or no relationship between insurance status and use (Barnes, Bloom, & Nahin, 2008). However, individuals who did not receive or delayed needed conventional care because of cost were more likely to use CAM.

Finally, predisposing factors include demographic variables, socioeconomic status, attitudes, and beliefs (Wolinsky, 1978). It suggests that people's use of health services was a function of their predisposition to use services, factors which enable or impede use and their need for care. They also include health-related knowledge, attitudes, and beliefs, including those specific to complementary and alternative medicine. In general, women were more likely than men to use complementary and alternative medicine (Barnes, Bloom, & Nahin, 2008).

Framing T2DM patients on CAM practice within a model of conventional health services utilization allow us to identify the extent to which this model were useful tool in better understanding T2DM patients on CAM use in particular.

2.3.2 Conceptual Framework of the Study

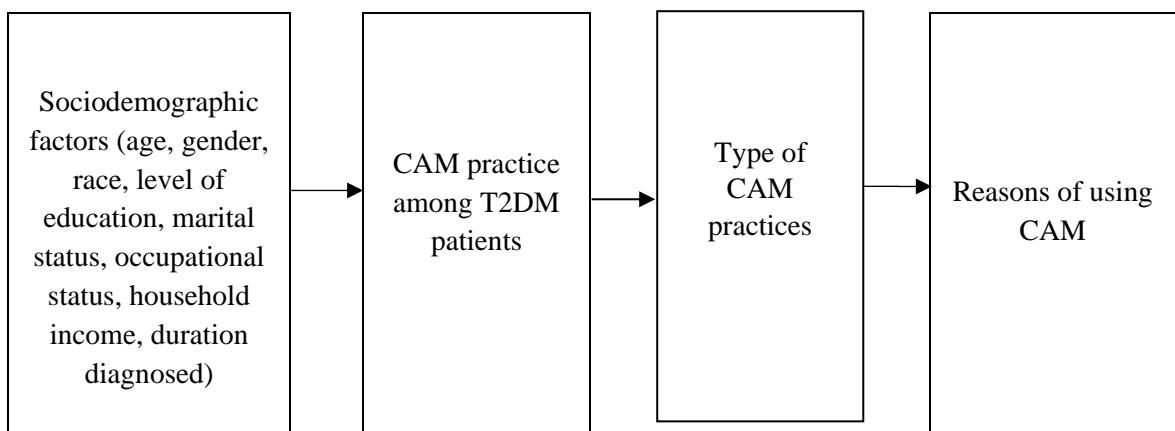


Figure 2.2: Conceptual framework to study the CAM practice among patient with T2DM in Hospital USM.

The researcher constructed a conceptual framework according to the Revised Socio-Behavioral Model (Andersen & Newman, 1973). The researcher decide to use this model to help her understand the participants of her study in terms of CAM practiced by them. Based on Figure 2.3, socio-demographic factors including age, gender, race, level of education, marital status, occupational status, household income and duration diagnosed with T2DM were assessed to see whether there was any association with CAM practice. Following this, the researcher determined the type of CAM practices and the reasons of using CAM.

2.4 Instrumentation

A modified version of the international questionnaire to measure use of Complementary and Alternative Medicine (I-CAM-Q) which was originally developed by the National Research Center in Complementary and Alternative Medicine (NAFKAM) of the University of Tromso, Norway (Quandt et al., 2009) was revised in this study. It is an English-language questionnaire designed to identify the use of CAM across national and cultural groups. It comprises four main areas regarding visits to complementary practitioners, complementary treatments received from medical doctors, use of herbal and dietary supplements and the use of self-help. Each area in the I-CAM-Q was assessed in two ways. First, binary ('Yes' or 'No') data were collected to assess the reasons for CAM use. Second, for each CAM practice that a respondent had used, how helpful the treatment was thought to be was scored in a Likert-type response item with a one to four range ('Very', 'Somewhat', 'Not at all', 'Do not know').

In this study, the researcher only used the first way which was binary data to assess the reasons of using CAM among T2DM patients in Hospital USM. Questions were added to collect demographic information, as the original questionnaire did not include demographic questions. In a study by Conrady and Bonny (2017), they used the pre-existing questionnaires assessing health literacy (HLQ) and CAM use (I-CAM-Q) among diabetic patients. They piloted the combined questionnaire in a single practice with 137 respondents and demonstrated the tool had suitable usability with the response rate of 47% (n = 374). Besides, a study by Chang, Wallis and Tiralongo (2011) also was reviewed in this study. A total of 326 participants completed the questionnaire with a response rate of 87.4%. The survey instrument was divided into three sections which were demographic characteristics, pattern of CAM use, and experience of CAM use.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

In this chapter, the researcher had described the materials and method to conduct the study. It includes research design, population and setting, sampling plan, instruments, data collection, data analysis and expected research outcomes. In addition, there was also description about the ethical consideration that necessary to complete this study.

3.2 Research Design

This study utilised descriptive, quantitative study design and the data were collected through a cross-sectional survey. In a cross-sectional study design, the researcher measured the outcome and the exposures in the study participants at the same time. Unlike in case-control studies or cohort studies, the participants in a cross-sectional study were selected based on the inclusion and exclusion criteria set for the study. Once the participants had been selected for the study, the researcher followed the study to assess the exposure and the outcomes. These studies can usually be conducted relatively faster and are inexpensive. These types of designs will give us information about the prevalence of outcomes or exposures (Setia, 2016).

3.3 Population and Setting

This study was conducted among hospitalized patients with T2DM in medical wards, 7 Utara and 7 Selatan in Hospital USM. This is because majority of patients admitted into these wards are having Type 2 Diabetes Mellitus.

3.4 Sampling Plan

3.4.1 Sample

In this study, the inclusion and exclusion criteria of the participants are as below:

- a) Inclusion criteria
 - i) In-patients diagnosed with T2DM.
 - ii) Age 18 years old and above.
 - iii) Agreed to participate.
 - iv) Understand Malay or English language. (Al-Eidi et al., 2016)
- b) Exclusion criteria
 - i) Pregnant women (to exclude gestational diabetes).
 - ii) Age below 18 years old (high probability having Type 1 Diabetes Mellitus).
 - iii) Patients with intellectual disabilities. (Al-Eidi et al., 2016)

3.4.2 Sampling Method

In this study, the researcher used convenience sampling method which is a non-probability sampling. Convenience sampling is a non-probability sampling in which members of the target population are selected for the purpose of the study if they meet certain practical criteria such as geographical proximity, availability at a certain time, easy accessibility or the willingness to volunteer. It is easier to access and available at given time to participate in the study (Etikan, Musa & Alkassim, 2016). This means, all T2DM patients in medical wards that met the criteria were included in the study until achieved the number of required participant as calculated in the sample size. Only those who fulfil the inclusion criteria were invited to participate in this study.