SELF-CARE BEHAVIORS AMONG TYPE 2 DIABETES MELLITUS PATIENTS AT HOSPITAL UNIVERSITI SAINS MALAYSIA

by

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TABLE OF CONTENTS

CHAPTER 3: RESEARCH METHODOLOGY

CHAPTER 4: RESULT

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES

ABBREVIATIONS

DM	-	Diabetes Mellitus
USM	-	Universiti Sains Malaysia
HUSM	-	Hospital Univesiti Sains Malaysia
NHMS	-	National Health and Morbidity Survey
KRK	-	Klinik Rawatan Keluarga
SPSS	-	Statistical Package for Social Science
HBM	-	Health Belief Model

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ABSTRACT

The purpose of this cross-sectional study is to determine the self care behaviours among type II diabetes mellitus who attend to Klinik Rawatan Keluarga in Hospital USM. The respondents of 45patients of type II diabetes mellitus were studied. The Diabetes Health Beliefs Patients adopted from the Health Beliefs Model was used as the theoretical framework of the study.

A self-administered questionnaires used in this study was demographic data and level of self care behaviours questionnaires, which were distributed to the respondent by non-probability, convenience sampling method. The data was analysed by using Statistical Package for Social Science (SPSS) software version 20. In Kruskal Wallis and Mann-Whitney analysis, significant association were found between selected demographic data (level of education and income) and patient's self care behaviours. From this study, score of self-care behaviors among type II diabetes mellitus patients at Hospital USM were at moderate level. 95.56 % from 45 respondents have score from 24-37,which was at moderate level and others 4.44 % at poor level of self care behaviors. There were no respondent at good self care behaviors. The mean score and standard deviation of 10 items in Self Care Behaviour is 28.17 and 3.79 respectively, ranging from 20 to 36 marks.

Malaysian living with diabetes cope everyday with suffers from the disease and fears of complication secondary to diabetes, resulting in rates of blindness, renal disease and lower limb amputations. Understanding how they cope with diabetes is important. Although studies have been done on self care behaviours in developed countries, little is known about self-care behaviours among type II diabetes mellitus patient in Hospital Universiti Sains Malaysia.

TINGKAH LAKU PENJAGAAN DIRI DI KALANGAN PESAKIT DIABETES MELITUS JENIS 2 DI HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRAK

Tujuan kajian keratan rentas ini aladalah untuk mengenalpasti tingkah laku di kalangan pesakit kencing manis tahap II yang menerima rawatan di Klinik Rawatan Keluarga, Hospital Universiti Sains Malaysia. 45 orang pesakit telah mengambil bahagian dalam kajian ini. "Diabetes Health Belief Patients" di adaptasi daripada "Health Beliefs Model" telah digunakan sebagai kerangka teori dalam kajian ini. Soal selidik " self-administered" yang terdiri daripada soalan yang berkaitan dengan data demografi (tahap pendidikan dan pendapatan) dan tingkah laku pesakit kencing manis telah digunakan dalam kajian ini. Analisa data menggunakan "Statistical Package for Social Science (SPSS) software version 20". Dalam analisa "Kruskal Wallis" dan "Mann-Whitney", keputusan analisa menunjukkan hubungan signifikasi antara data demografi(tahap pendidikan dan pendapatan) dengan tingkah laku pesakit diabetes. Daripada kajian ini juga, skor tahap tingkah laku pesakit kencing manis tahap II di Hospital USM adalah pada tahap sederhana. 95.56 peratus daripada responden memounyai skor 24-37, iaitu pada tahap sederhana dan selebihnya, iaitu 4.44% pada tahap tidak baik. Tidak ada responden berada pada pahap baik bagi skor tahap tingkah laku pesakit. Pesakit kencing manis di Malaysia bukan sahaja perlu menyesuaikan diri dengan kehidupan yang terhad, malah mereka menderita daripada penyakit yang dihadapi dan pada masa yang sama mempunyai perasaan takut terhadap komplikasi yang berkaitan penyakit kencing manis seperti buta, penyakit buah pinggang dan amputasi sebahagan daripada anggota badan. Memahami dan mendalami cara mereka menyesuaikan diri adalah penting. Walaupun banyak kajian tentang tingkah laku pesakit manis telah di lakukan di negara maju, tetapi maklumat tentang tahap kelakuan pesakit kencing manis di Hospital USM adalah pada tahap minimum.

CHAPTER 1 : INTRODUCTION

1.1 Background of the Study

Almost all regions in this world, people develop diabetes every day. The prevalence of type 2 diabetes mellitus was estimated to increase rapidly. With this situation, there will be an increase in complications that come from the disease. Treatment for hyperglycemia need to be improving to lower the risk of the complications (Eliasson *et al.*, 2007). There was an estimated increase in the worldwide prevalence of diabetes mellitus from 2.8% in 2000 to 4.4% in 2030. This makes diabetes mellitus as one of the most significant problems that need to be noted in health systems around the world (Mc Hugh *et al.*, 2009).

In the most developed countries, diabetes is now the fourth leading cause of death. About more than 190 million people suffered from diabetes mellitus, its incidence is approaching epidemic proportions (McGill and Felton, 2007). The number of diabetes cases in Americas will change from 33 million to 66.8 million in the same period (Moreira Jr *et al.*, 2010). Besides being the sixth leading cause of death in the United States, diabetes is ranked as one of the deadliest and most costly diseases. The estimated cost of treating diabetes totals $132 billion, with long-term complications accounting for much of the cost of treating the disease (Pinto *et al.*, 2006).

In people over 70 years old, the prevalence of diabetes keeps increasing with age, reaching a plateau at 10–20% (depending on study populations, screening strategies and diagnostic criteria). In the coming decades, the prevalence of diabetes is expected to rise sharply worldwide (Vischer *et al.*, 2009). The World Health Organization (WHO) has estimated that in the year 2030, Malaysia would have a total of 2.48 million people with diabetes. The third National Health and The World Health Organization (WHO)

has estimated that in the year 2030, Malaysia would have a total of 2.48 million people with diabetes (Letchuman *et al.*, 2010). The prevalence of diabetes mellitus and impaired glucose tolerance were 10.5 % and 16.5 % in the state of Kelantan in north-east Malaysia (Eid *et al.*, 2003).

1.2 Problem Statement

Nowadays, the increased in the prevalence of type 2 diabetes mellitus associated with the increasing of population age, urbanization increases, diets become 'westernized' and levels of physical activity decrease. The International Diabetes Federation predicts that more than 330 million people will have diabetes worldwide by 2030 (McGill and Felton, 2007). The guideline of the American Diabetes Association states that diabetes self management education is an integral component of medical care, for both diabetes mellitus type 1 and type 2 patients. Self-monitoring of blood glucose is considered to be a cornerstone of diabetes care (Maxwell *et al.*, 2009).

Report by The Finnish and the United States Diabetes Prevention Programs (DPP) indicated that the incidence of type 2 diabetes mellitus among adults at high risk for diabetes can be reduced through an intensive lifestyle intervention (Harwell *et al.*, 2011). In Ireland, there was a rising prevalence of diabetes mellitus that expected to increase from 4.7% of the population in 2005 to 5.6% by 2015. This increasing prevalence will raise the cost of health services towards diabetes mellitus (Mc Hugh *et al.*, 2009).

Study in Venezuela by Moreira Jr et al, show that the overall prevalence of inadequate glycemic control was high (76%) , and greater than previous estimates from other studies including type 1 and 2 diabetic patients in Germany (40%), Denmark (51%) and Kenya (61%) (Moreira Jr *et al.*, 2010) .

Some risk is particularly high in long-standing diabetes such as increased risk of falls, recurrent falls and fractures in subjects with or without preexisting disabilities; this risk also associated with diabetes mellitus. Reported risk factors among diabetic patients include female gender, impaired mobility, orthostatic hypotension, high body mass index (BMI) and poor diabetic control but not hypoglycemia (Vischer *et al.*, 2009).

Diabetes mellitus contribute high proportion of cause of blindness in adults, of non-traumatic lower-limb amputation and of kidney failure resulting in transplantation and dialysis. Furthermore, the risk of coronary heart disease is two to four times higher in diabetes patients. The risk of stroke or peripheral vascular disease also increasing highly. As a consequence, the management and treatment of type 2 diabetes mellitus involves more than the focus on control of blood glucose values only, but patients must asking for a multidisciplinary approach to reducing macro- and micro-vascular risk factors (Wens *et al.*, 2007).

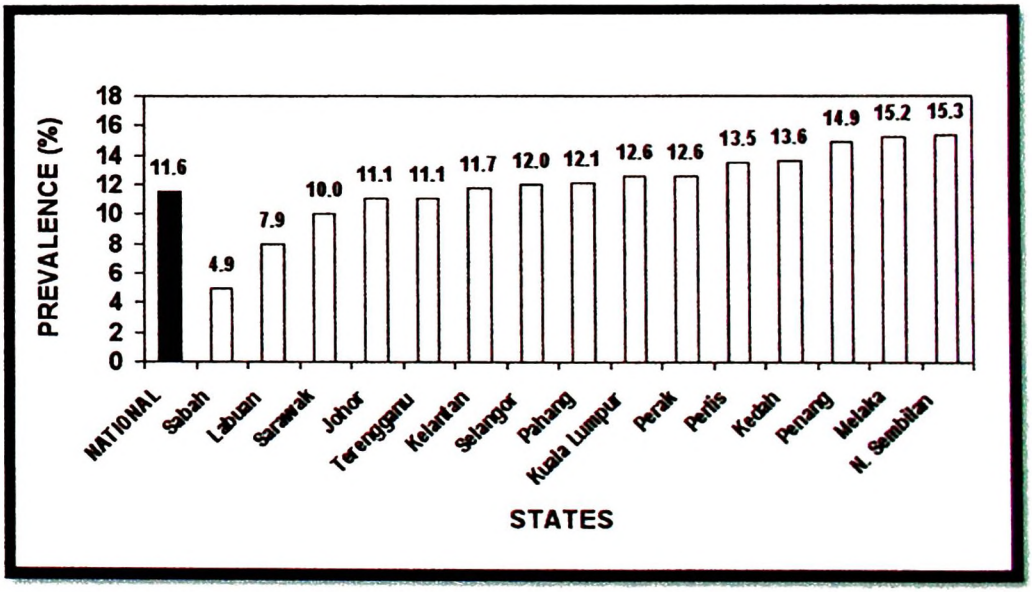

Figure 1 : Prevalence of Diabetes Mellitus in Malaysia (■) and by states (□).

Resources: NHMS III

Figure 1 showed the prevalence of diabetes mellitus in Malaysia and by states in 2006. The national prevalence was 11.6%. The highest prevalence among state was Negeri Sembilan with 15.3% while the lowest was Negeri Sabah with 4.9%.

According to National Health and Morbidity Survey (NHMS) III (2006), 73.5% of the people with known diabetes sought treatment from the government facilities versus 20.3% from private facilities. Self-treatment was also reported; 2.9% of the people with known diabetes claimed to obtain their medications from alternative or traditional, medicinal and direct selling. As expected, higher utilization of government facilities was by those living in the rural areas (79.1%) compared to the urbanites (70.8%) and by females (77.3%) compared to males (68.5%). In contrast, private facilities were utilized more by the males (23.6%) compared to females (17.8%) and the highest being the Chinese (32.1%) followed by the Indians (19.9%) and the Malays (17.2%). Based on income, government facilities were mostly used by those with household earning of RM2000/month and below, while private facilities catered for the higher income groups. This shows that the demographic data can change how patients care about diabetes mellitus.

In order to facilitate the appropriate care of diabetes, the patients and the members of his/her family must have an understanding of the disease and must be trained in its management and in the treatment of related emergencies. Knowledgeable trained personnel are essential to avoid the immediate health risks of low blood glucose and to achieve the metabolic control to prevent later complications.

1.3 Research Objective

The general objective of this study is to examine self-care behavior among type 2 diabetes mellitus patients at Hospital USM.

1.3.1 Specific Objectives

I. To determine score of self-care behavior among type 2 diabetes mellitus patients at Hospital USM.

II. To determine the relationship between self-care behavior and selected demographic data among type 2 diabetes mellitus patients at Hospital USM.

1.4 Research Questions

I. What is the score of self-care behavior among type 2 diabetes mellitus patients at Hospital USM?

II. What is the relationship between self-care behavior and selected demographic data among type 2 diabetes mellitus patients at Hospital USM?

1.5 Hypothesis

1.5.1 H_A: There are significant relationship between self-care behavior and selected demographic data among type 2 diabetes mellitus patients at Hospital USM.

H_O: There are no significant relationship between self-care behavior and selected demographic data among type 2 diabetes mellitus patients at Hospital USM.

1.6 Definition of Operational Terms

1.6.1 Self-care behavior

- The actual application or use of an idea, belief, or method, as opposed to theories relating to it: or repeated exercise in or performance of an activity or skill so as to acquire or maintain proficiency in it (Soanes and Stevenson, 2004). In this study, self-care behavior include control diet, exercise, smoking, take medication, make regular appointment with doctor regarding diabetes control, foot care, dental care and eye care.

1.6.2 Type 2 Diabetes Mellitus

- Diabetes is a condition where there is an abnormally high level of sugar (glucose) in the blood. This arises because the body produces little or insufficient insulin (NADI, 2009). Type 2 diabetes mellitus means human body decreased sensitivity to insulin (insulin resistance) or from a decreased amount of insulin production. It occurs most frequently in patients older than 30 years and in patients with obesity (Brunner & Suddarth's, 2010). In this study, type II diabetes patients came from both genders, able to understand Bahasa Malaysia language and receive treatments at Klinik Rawatan Keluarga, Hospital USM.

1.7 Significance of the study

This study will contribute its findings most benefit to health care providers and clinicians in delivering health services to diabetic patients. In order to increase awareness among patient about diabetes and to bring down the prevalence of diabetic patients in country, health care providers and clinicians need to more focus on patients self-care behaviors. This because, most of the patients do not take seriously about the high level of glucose in their body by showing less impression in their behaviors, such as their diet, activity daily living, exercise, body weight and taking medication. Majority of the diabetic patient does not need to being hospitalized, so they are on their own at their house and environment in community setting, that why they need to be more aware about their behaviors towards self-care for diabetic patients during received treatment.

As known, diabetes was the disease that increases every time among the people over the country. Diabetes was dangerous because in can give effect until the end of life. If being detected with diabetes, people should more aware about their activity in daily living, more cautious about their diet and need to start their health plan by seeing health care provider and clinicians. In order to increase and improve patient's self-care behaviors, they need to increase their belief about complication, sign and symptom of diabetes. Hopefully it can create more awareness among health care providers and also among clinicians about the important of practice in order to deliver and improve self-care behaviors among diabetes patient

CHAPTER 2 : LITERATURE REVIEW

2.1 Introduction

This chapter provides some reviews of selected literatures on previous studies or researches by using deductive reasoning. It also provided a detailed explanation of the framework to explain the issue or phenomenon of the study. Apart from that, it is also helpful to emphasis on methodology, variables selected findings, statistical analysis and results of hypothesis from the previous studies.

Regarding this study entitled "Self-care Behaviors Among Type 2 Diabetes Mellitus Patients At Hospital USM", the review include type 2 diabetes mellitus, incidence and prevalence of type 2 diabetes mellitus, management of type 2 diabetes mellitus, knowledge of self-care behaviors, practice of self-care behaviors, the relationship of self-care behaviors and selected demographic background and framework that being used in this study.

2.2 Diabetes Mellitus

2.2.1 Classification of Diabetes Mellitus

Diabetes mellitus is a condition where there is an abnormally high level of sugar (glucose) in the blood. This arises because the body produces little or insufficient insulin. Diabetes mellitus is characterized by a disorder in metabolism of carbohydrate and subsequent derangement of fat and protein metabolism. Disturbance in production and action of insulin, a hormone secreted by the Islets of Langerhans in the pancreas is implicated in the disease (Okolie *et al.*, 2009a). Diabetes mellitus can cause of leg amputation, kidney failure

requiring dialysis, and irreversible blindness. In our digestive system, most of the food we eat is broken down into glucose, a type of sugar. The glucose will be used by our body cells for growth and energy. To enable the glucose to enter into the cells, our body needs insulin. Insulin is a hormone which is produced in the pancreas.

There are three types of diabetes mellitus which are type 1 diabetes mellitus, type 2 diabetes mellitus and gestational diabetes mellitus. Type 1 diabetes mellitus is a chronic disease characterized by an absolute loss of insulin secretion, mainly due to the selective autoimmune destruction of pancreatic b cells (Yokota *et al.*, 2005). Non Insulin Dependent or type 2 diabetes mellitus is metabolic disorder resulting from the body's inability to make enough or properly use insulin, it is the most common form of the disease. Type 2 diabetes mellitus diabetes results from the body's inability to make enough or properly use insulin. Often type 2 diabetes mellitus can be controlled through diet and exercise alone, but sometimes these are not enough and either oral medications or insulin must be used.

Symptoms of type 2 diabetes mellitus , such as thirst, frequent urination and fatigue, can be mild and may cause little interruption to activities of daily living, it is the complications of the disease, including vascular disease, kidney disease and nerve damage, that result in substantial morbidity and mortality. Three-quarters of people with diabetes die from cardiovascular disease (McGill and Felton, 2007). Type 2 diabetes mellitus is a chronic disease with glycemic control largely determined by patient's self-management, and the attitudes and beliefs of patients with type 2 diabetes mellitus are important factors to consider from diagnosis. There are important differences between men and women with

type 2 diabetes mellitus regarding attitudes and beliefs (Aguilar, 2012). Gestational diabetes, also known as gestational diabetes mellitus, GDM, or diabetes during pregnancy, is a type of diabetes that only pregnant women get. If a woman gets diabetes when she is pregnant, but never had it before, then she has gestational diabetes(Temple, 2006).

2.2.2 Prevalence of Diabetes Mellitus (DM)

Prevalence by World Health Organization in 2000 reported that there are 151 million people with DM and estimated that this number will increase to 221 million in 2010 and 366 million in 2030. Of this number 10–15% are Type 1 diabetes mellitus and 85–90% are Type 2 Diabetes mellitus (Kartal and Özsoy, 2007). There was an estimated increase in the worldwide prevalence of diabetes mellitus from 2.8% in 2000 to 4.4% in 2030. This makes diabetes mellitus as one of the most significant problems that need to be noted in health systems around the world (Mc Hugh *et al.*, 2009). This increasing prevalence were also stated in study by Heijden et al., (2012), worldwide prevalence in 2000 of diabetes mellitus was 171 million. This is expected to increase up to 366 million in 2030. Approximately 90% of the people with diabetes mellitus have type 2 diabetes mellitus (Heijden *et al.*, 2012). This showed that the prevalence of type II diabetes mellitus increasing rapidly in all over the world.

A study in Nigeria showed that diabetes mellitus is associated with a high disease burden where healthcare services and accessibility are poor. Unfortunately in Nigeria, communicable diseases remain the priority health condition for the Ministry of Health. Most of the reports on morbidity and mortality rates of diabetes in Nigeria were made in the 1960s and 1970s and therefore may not reflect the current situation (Adibe *et al.*, 2011).

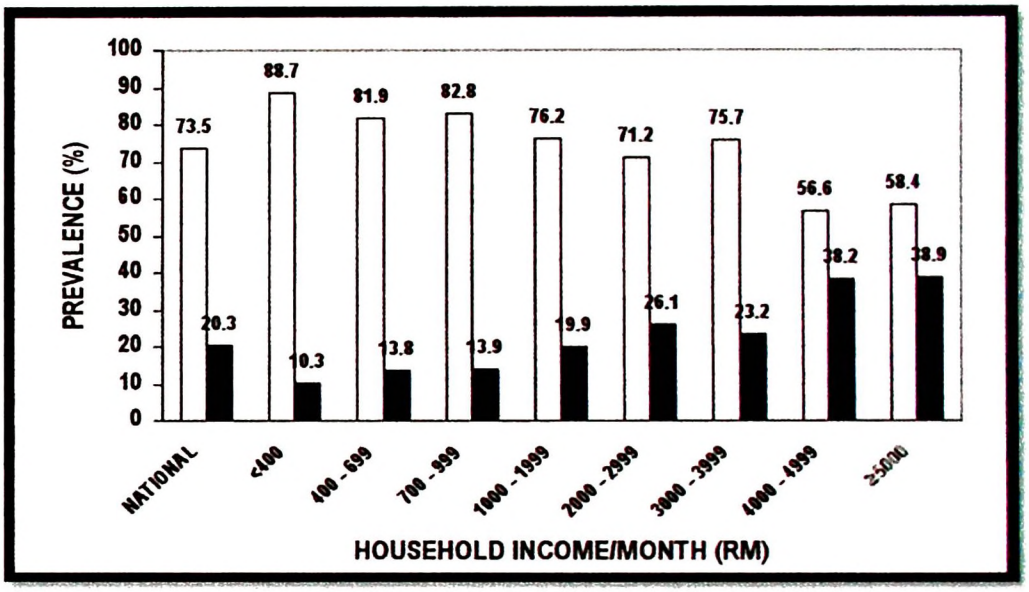

Figure 2: Percentage of people with diabetes seeking treatment at Government hospitals and clinics (□) and at private hospitals and clinics (■) by household income (RM).

Resources: NHMS III

Figure 2 showed the percentage of people with diabetes seeking treatment at government hospitals and clinics and at private hospitals and clinics by household income in Malaysia 2006. At all level of income, more people seek for health care at government hospitals and clinics compared to private hospitals and clinics. However, patients seek for healthcare at private hospitals and clinics increased with monthly income.

2.2.3 Knowledge of self-care behaviors

In this study, knowledge are about diet, exercise, medication, self monitoring blood glucose, eye care, foot care, dental care, sign and symptom and complication regarding type 2 diabetes mellitus. The process of diabetes self-management education is often complex, demanding and not given much emphasis at professional level because of the time limitation of clinicians. Today, teaching people to manage their diabetes has become an important part of the clinical management of diabetes. Study of patient's knowledge and practices about diabetes is important in developing various intervention strategies and educational method (Padma *et al.*, 2012).

A study in India shows that the knowledge of diabetes in patients is only on low percentage and that most patients may not be able to take appropriate early intervention sufficiently and may seek medical care only at very late stages. The result from this study show only 52 (51.5%) patients actually knew the symptoms of hypoglycemia. This study confirms that patient knowledge about the treatment and complications of diabetes is limited, especially with regard to preventive aspects. This show that health care provider and clinicians need to empower patients with the knowledge required to help them obtain maximum benefit from their treatment for diabetes (Gulabani *et al.*, 2008).

In order to provide the appropriate care of diabetes, the patients and their family members must have an understanding of the disease and must be trained in its management and in the treatment of related emergencies that have possible to occur. Person with knowledge and been trained are essential to avoid the immediate health risks of low blood glucose and to achieve the metabolic control to prevent other complications. Studying patients' profile will help in determining their needs for care and knowledge.

The findings from a study in Nigeria show that majority of the diabetic patients in the Federal Medical Center Umuahia have knowledge of what diabetes mellitus is but do not know the causes, control, prevention, self-care measure and other self monitoring. Health care providers and clinicians should join to help diabetic patients live healthy by give them the right and important information regarding care of diabetes mellitus. Lack of knowledge will give more difficulties to them (Okolie *et al.*, 2009a). Although knowledge alone does not guarantee requisite behavior modifications or effective self-care, the assessment of diabetes self-care related knowledge is an important first step from which to individualize diabetes education programs and make evaluations of their effectiveness (Adibe *et al.*, 2011).

Community knowledge, culture and beliefs about diabetes are a prerequisite for individuals and communities to take action to control the disease. This knowledge affects their attitude and uptake of health services, including health education. Diabetes education, with consequent improvements in knowledge, attitudes and skills, will lead to better control of the disease, and is widely accepted to be an integral part of comprehensive diabetes care.

2.2.4 Practice of self-care behaviors

An operational definition of care for persons with diabetes would include guidance on risk factor control for all of the following, include dietary intake and weight management; glycemic and lipid control; and foot and eye care (Vaccaro and Huffman, 2012). Physical inactivity is one of the major risk factors for type 2 diabetes mellitus and related complications. Increasing physical activity reduces the risk for type 2 diabetes mellitus and its complications by enhancing metabolic control (Heijden *et al.*, 2012). Previous studies have already associated severity of depression with poorer adherence to dietary guidelines and medication regimens [6,7], and higher BMI scores. This could explain the difficulties faced by this group with self-management. One aspect of the depression these patients experience has been linked to side-effects of diabetes medications. The main side-effect with significant implications for diabetes management is hypoglycemia (Mosnier-Pudar *et al.*, 2010).

Behavioral change focuses on nutrition, physical activity and psychosocial coping skills. Self-monitoring of blood glucose is also considered an important aspect of diabetes self-care. Studies have demonstrated that knowledge about medications, diet, exercise, home glucose monitoring, foot care, and treatment modifications is necessary to effectively self manage diabetes (Adibe *et al.*, 2011). Diabetic patients must not only alter their diet and behavior, however they must also monitor their disease and recognize when a change in treatment is necessary (Maxwell *et al.*, 2009).

2.2.5 Relationship self-care behaviors and demographic data.

Lower socioeconomic groups are not only disproportionately affected by type 2 diabetes mellitus, they also have more diabetes related complications and higher diabetes related mortality compared to diabetic patients in higher socioeconomic groups (Vissenberg *et al.*, 2012). Health care education reported received may differ by race and ethnicity as a consequence of the communication process. There were no relationships regarding health care education, medical advice, diabetes self-management, health outcomes by ethnicity and race with self-care behavior reported in the literature. Diabetes mellitus is a public health problem requiring a multilevel systems approach for prevention and treatment by health care providers. Multilevel must include level of education, income, ethnicity and gender (Vaccaro and Huffman, 2012).

In Nigeria, an essential component that has been missing from the health care delivery system is the active involvement of the patients who are the key to achieving therapeutic goals in ambulatory care (Maxwell *et al.*, 2009). As evidenced by the study, patients who were more self aware about the disease, having knowledge and regularly involved in self-care practices achieve better glycemic control and better management of the disease. Regular inculcation of health education, making the patient aware regarding the disease and encouraging self-care management during treatment will reduce health care burden and help achieve optimal control of the disease with minimal long term complications (Padma *et al.*, 2012).

2.3 Conceptual Framework

This study use Health Belief Model (HBM) to explain the conceptual framework regarding the topic chosen. According to Nutbeam and Harris, HBM is one of the longest established theoretical models designed to explain health behavior by better understanding beliefs about health. It was originally articulated to explain why individuals participate in public health programs such as health checks and immunization programs and has been developed for application to other types of health behavior (Nutbeam and Harris, 2002).

For over 4 decades, the Health Belief Model (HBM) has been used both to explain change and maintenance of health behavior and as a guiding framework for health behavior interventions. The HBM has been used in studying behaviors such as attending screenings for high blood pressure, breast cancer, or hepatitis B; exercising; smoking cessation; compliance with antihypertensive, diabetes self-management, and medication regimens. This model relates psychological theories of decision making to an individual's decision about health behaviors(Pinto *et al.*, 2006).

The model suggested that an individual taking action related to a given health problem is based on the interaction between four different types of belief. The model predicts that individuals will take action to protect or promote health if they perceived themselves to be susceptible to a condition or problem and if they believe it will have potentially serious consequences: they perceived threat. They believed course of action is available which will reduce their susceptibility or minimize the consequences and that the benefits of taking action outweigh the costs or barriers.

The Health Belief Model is beneficial in assessing health protection or disease prevention behaviors. Health-related behavior may also be explained by the Health Belief Model. It is also useful in organizing information about clients' views of their state of health and what factors may influence them to change their behavior. The Health Belief Model, when used appropriately, provides organized assessment data about clients' abilities and motivation to change their health status (Kartal and Özsoy, 2007).

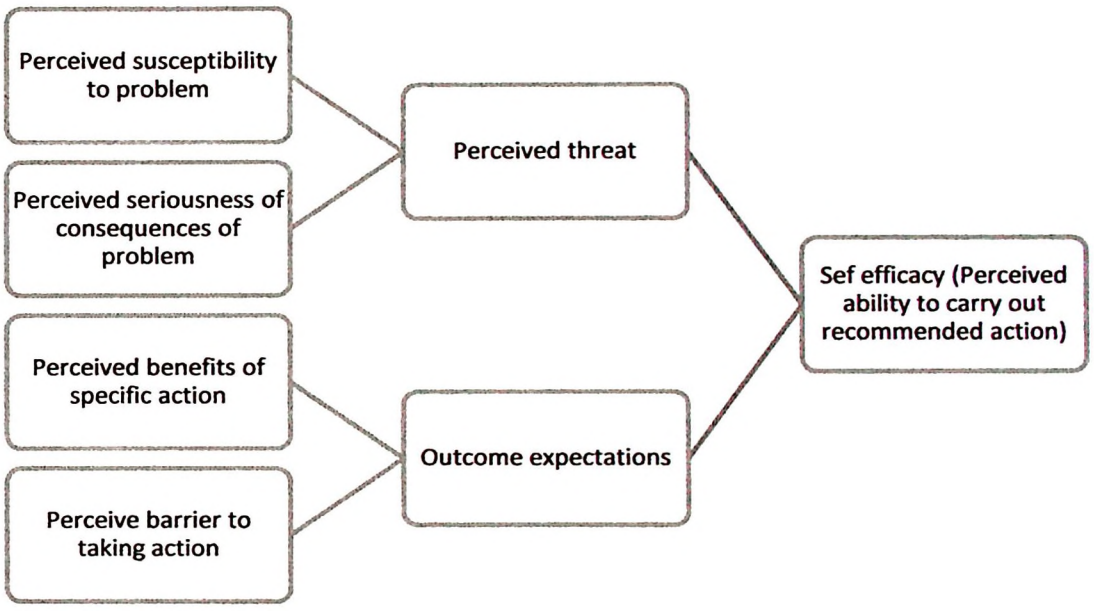

FIGURE 3 : Health Belief Model (HBM)

(Sources: Nutbeam & Harris, 2002)

It could easily be used by health care providers and clinicians to determine the beliefs in need of interventions. Once nurses understand patient's beliefs, they can begin to interact with the patients to devise strategies that will alter beliefs and behaviors. To decrease DM mortality through early detection nurses must broaden their understanding of the factors that influence with diabetes patients screening behaviors(Kartal and Özsoy, 2007).

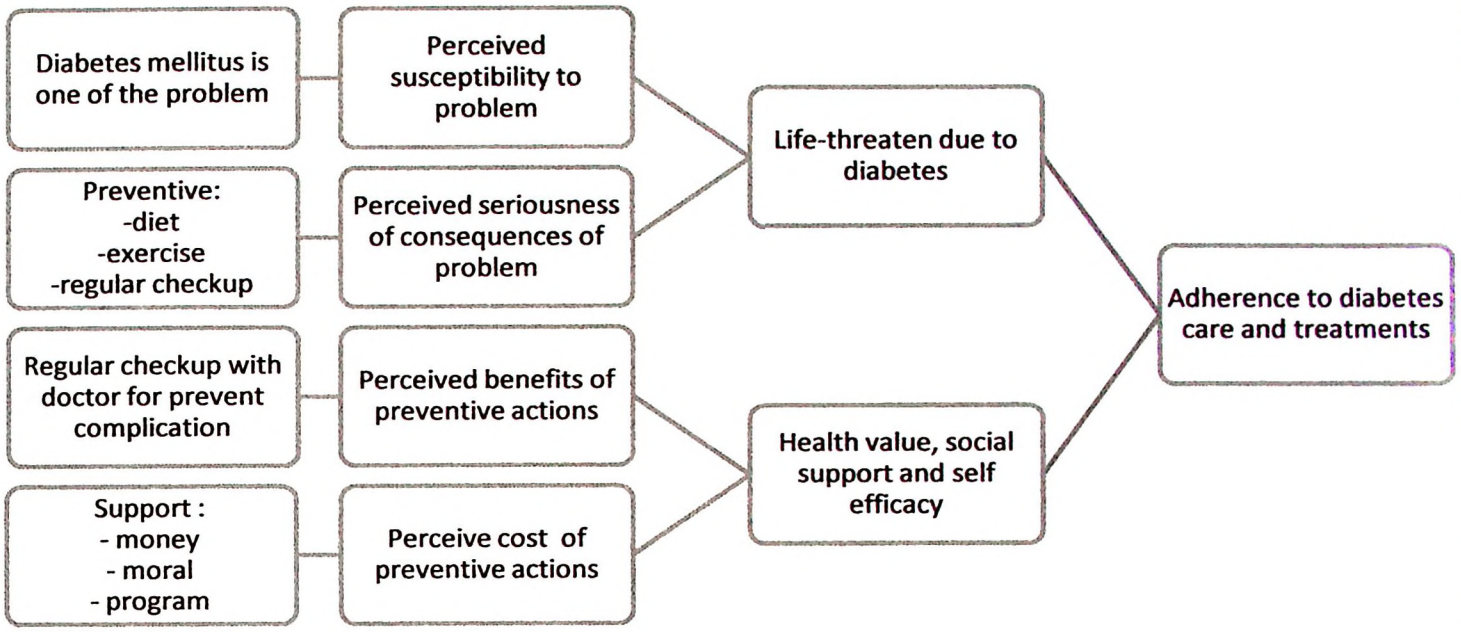

FIGURE 4 : Diabetes Health Beliefs Patients adopted from the Health Beliefs Model

Sources : (Gillibrand and Stevenson, 2006)

In a study conducted by Daniel and Messer (2002), who applied the HBM to study the relationships between health beliefs and behavioral adherence with prescribed regimens as well as glycemic control in the similar individual in Aboriginal person with DMT2. They evaluated the four domains of diabetes health beliefs, namely susceptibility, severity, benefits and barriers. The finding suggested that high perceived severity of diabetes and low perceived barriers to therapeutic behaviors were related to healthful HbA1c as well as reductions in HbA1c. Result indicated that individual beliefs about barriers related to control and severity of complications are important factors influencing the ability of Aboriginal people with DMT2 to achieve control of blood glucose.

Patients varied in perceived susceptibility for the 8 diabetes-related conditions (hypoglycemia, hyperglycemia, diabetic foot infections, eye problems, cardiovascular risks, blood pressure problems, cholesterol problems, and kidney diseases). For conditions reported as susceptible, patients felt that meeting with their pharmacists on a regular basis might not do much to reduce their susceptibility to incurring these conditions. Although the threat to getting most diabetes-related conditions cannot be completely eliminated, the risk of these conditions can be substantially reduced with tight glycemic control, and patients can delay or prevent these conditions (Pinto *et al.*, 2006).

CHAPTER 3: RESEARCH METHODOLOGY AND METHODS

3.1 Research Design

A cross-sectional design and descriptive statistics was used to determine the self-care behaviors among type 2 diabetes mellitus patients at Hospital USM.

3.2 Population and Setting

This study was conducted at Klinik Rawatan Keluarga in Hospital USM. The target populations are patients who attend Klinik Rawatan Keluarga for appointment and medical checkup.

3.3 Sampling Plan

3.3.1 Sample

According to Malaysian National Health Morbidity Survey III (2006), prevalence of diabetes mellitus cases in Kelantan was 11.1 %. This prevalence was used to estimate the sample size.

Inclusion criteria

- Patients with type 2 diabetes mellitus
- Male and female
- Able to understand Bahasa Malaysia.
- 18 years and above
- Consented to participate in the study
- Fit to answer the questions in the questionnaires forms.

Exclusion criteria

- Have difficulty in understanding the questionnaire or communicate in Malay language.
- Patients with type 1 diabetes mellitus and gestational diabetes mellitus
- Unwilling to participate in the study
- Less than 18 years old

3.3.2 Sampling Method

The sample was selected via convenient (access easily) method which was a simple random sampling. The subjects was selected just because they are easiest to recruit for the study and the researcher did not consider selecting subjects that are representative of the entire population. Thus, it cannot be generalized to type 2 diabetes mellitus population but can only do so for cases under study.

3.3.3 Sampling Size

The calculation of sample size for this study:

Using the finding of 11.1 % prevalence rate of DM cases in Kelantan. (NHMS III, 2006), the prevalence sample size of clients at the HOSPITAL USM, Kelantan was calculated by using single proportion formula (Naing, 2003).

$n = (z/\Delta)^2 \, p\,(1-p)$ z = 95% of Confidence Interval = 1.96

Δ = 0.05 (decided by researcher)

p = 0.111 (prevalence from journal)

$n = (1.96 / 0.05)^2 \; 0.111 \; (1 - 0.111)$

$n = (39.2)^2 \; 0.111 \; (0.889)$

$n = (1536.64) \; 0.099$

$n = 152.127$

n = 152± drop out of 10%

∴ For this study, the subjects range between 137 and 167 are the sample size.

3.4 Variables

3.4.1 Variables Measurement

Dependent variable is self-care behaviors and independent variable is selected demographic data. This study was used administered questionnaire which consist of 2 parts, part A consisted of 8 questions regarding demographic data of patients and part B consists of questionnaires to assess patient's level of self-care behaviors.

3.5 Instrumentation

3.5.1 Instrument

The data for this study was a quantitative study and thus data was collected using a self-administered questionnaire which consist of 2 parts. Questionnaires form was used as an instrument to carry out this study. It consist 2 parts:

3.5.1.1 Part A

Part A consisted of 8 questions regarding demographic data of patients such as age, gender, marital status, ethnic, level of education, occupation, monthly income and duration of being diagnosed have diabetes mellitus.

3.5.1.2 Part B

Part B consists of 10 questionnaires to assess patient's level of self-care behaviors. This questionnaires used a score of 5, 4, 3, 2 and 1 for always, often, sometimes, rarely and never, respectively. According to Maxwell et al., (2009) on the 5 point scale, "5" represented the highest mean score while "1" represented the lowest mean score. And on the 10 item scale the lowest possible score would be 10 while the highest possible score would be 50. According to Denise F. Polit, Cheryl Tatano Beck, Bernadette P. Hungler, researcher divide the score into 3 groups :

10-23 = poor self care behaviour

24-37 = moderate self care behaviour

38-50 = good self care behavior

3.5.2 Translation of Instrument

The questionnaire of Part B is in English version and it is already translated to Bahasa Malaysia by the researcher of previous study, Knowledge and Practice of self-care behaviours among type 2 diabetes mellitus at Diabetic Centre in Hospital Universiti Sains Malaysia(HOSPITAL USM), Kubang Kerian, (Noraini, 2011)

3.5.3 Validity and Reliability

The questionnaire was adapted from previous researcher, Noraini (2011). She already had done pilot study with 14 patients take part in the study that done at HOSPITAL USM. The questionnaires also being validated by 3 nursing lectures of Pusat Pengajian Sains Kesihatan (PPSK). The Chronbach's Alpha coefficient of Section B questionnaires that consists 10 items was 0.74 .

3.6 Ethical Considerations

Before conducting the study, ethical clearance was obtained from the Research Ethics and Committee (Human) of USM as well as written consent and questionnaire. The subjects in this study was given adequate information from the researcher about the aim and procedure about the study. Inform consent was taken and the subjects were informed that the participation is optional and they can withdraw from the study at any time they wanted. Subjects were also informed that their answers are confidential and subjects' anonymities were assured by using only code numbers. The study gives no harm to the subjects and the information mainly used for academic purpose. All the information gathered is strictly confidential and was only be used to carry out this study.