

UNIVERSITI SAINS MALAYSIA



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**KNOWLEDGE AND PRACTICE
OF FOOTCARE AMONG PEOPLE WITH TYPE 2 DIABETES MELLITUS IN
HOSPITAL UNIVERSITI SAINS MALAYSIA**

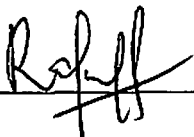
**Dissertation submitted in partial fulfillment for the Degree of
Bachelor of Health Science in Nursing**

ELENSER ANAK UNING

APRIL 2007

CERTIFICATE

This is to certify that the dissertation entitled '**Knowledge and Practice of Foot Care among People with Type 2 Diabetes Mellitus in Hospital Universiti Sains Malaysia**' is the bonafide record of research work done by **Elenser anak Uning** with matric number: **77925** during the period of July 2006 to March 2007 under my supervision. This dissertation submitted in partial fulfillment for the degree of Bachelor of Health Science in Nursing. Research work and collection of data belong to University Science of Malaysia.



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ABBREVIATIONS

ADA	American Diabetes Associations
DPN	Diabetic Peripheral Neuropathy
DM	Diabetes Mellitus
HBM	Health Beliefs Model
HUSM	Hospital Universiti Sains Malaysia
IDDM	Insulin Dependent Diabetes Mellitus
LEA	Lower Extremity Amputation
NIDDM	Noninsulin Dependent Diabetes Mellitus
RCTs	Randomized Controlled Trials
Type 1 Dm	Type 1 Diabetes Mellitus
Type 2 DM	Type 2 Diabetes Mellitus
US	United States
WHO	World Health Organization

**Knowledge and Practice of Foot Care among People with Type 2 Diabetes Mellitus
in Hospital Universiti Sains Malaysia**

ABSTRACT

Background of the study: Diabetes may result in many other health conditions but the most common outcome of diabetes is complications associated with the foot. Unfortunately, diabetic foot tends to be underrecognised as a health issue, despite the fact that ulceration, gangrene and amputations are more common complication of diabetes. The most basic measure in preventing the diabetic complications would be self management of foot care.

Objectives: The aim of the study is to determine the knowledge about foot care and its practice among people with type 2 diabetes mellitus in HUSM.

Methodology: This study was a cross-sectional design and descriptive study. Seventy Type 2 DM patients who were attending to HUSM selected wards and Diabetes Center were recruited in this study. Each respondent was given a self-administered questionnaire. From this questionnaire, the knowledge score and practice of foot care were calculated and analyzed using *Statistical Package for Social Science version 11.0* (SPSS). Deficiency in foot care knowledge and practices that increase the risks of diabetic foot were identified.

Results: The mean knowledge score was 6.53 (S.D. 1.99) out of possible 10. There was a significant relationship between sex and knowledge score, in which man had higher knowledge score compared to female. Other sociodemographic factors have no significant relationships. Deficiency in knowledge includes the inadequate knowledge of

frequency to inspect foot, inability to check the water temperature before washing feet and inability to check footwear before wearing it. Practices that put patients at high risks include did not inspect foot daily, always wear slipper and failed to check temperature of the water before wash feet.

Conclusion: This study revealed that the level of foot care knowledge is moderate among people with type 2 DM in HUSM. The practice of foot care is also found unexpectedly low among the DM patients. This study also has highlighted some areas of foot care knowledge and practice that are deficient. Those aspects of foot care knowledge which are low needs improvement and those undesirable practices that put patients at risk of developing foot problems should be changed and replace with good foot care practice.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Diabetes mellitus is not an uncommon endocrine disorder throughout the world. A statistic done by World Health Organization (WHO) has shown that for the year of 2004, it is more than 150 million world's population suffering from diabetes. In Malaysia alone, the number is increasing with 8.3% or 800, 000 of Malaysian has diabetes and among this, 78 000 are Kelantan residents (*Utusan Malaysia* 15 June, 2006). The number becoming higher with WHO (2003) estimating that the prevalence of diabetes patient will increase to 2,479,000 by the year 2030 in Malaysia (http://www.who.int/diabetes/facts/world_figures/en/index6.html).

Diabetes may result in many other health conditions such as retinopathy, kidney disease and heart disease but the most common outcome of diabetes is complications associated with the foot. People with diabetes can develop many different foot problems. Even ordinary problems can get worse and lead to serious complications. Unfortunately, diabetic foot tends to be underrecognised as a health issue, despite the fact that ulceration, gangrene and amputations are more common complication of diabetes rather than dialysis and blindness (Young, 2005). According to Gregg *et al.* (2004) lower extremity disease, including peripheral arterial disease, peripheral neuropathy, foot ulceration and lower extremity amputation is twice as common in diabetic persons compared to non-diabetic persons and it affects 30% of diabetic person who are older than 40 years old. It is

therefore not surprising that diabetes causes burden to its sufferer whether if it is emotional, physical, productivity, economy losses (Singh *et al.*, 2005). Thus, appropriate steps that can reduce and prevent the incident of complications involving the diabetic foot are ought to be implemented. This includes controlling hyperglycemia and hypertension, and identifying people who are at the high risk in developing diabetic foot complications. Annual screening for these conditions by health care professional is strongly recommended by American Diabetes Association (ADA, 2004). But the most basic measure in preventing the diabetic complications would be self management of foot care.

Foot care is one of the components in diabetes self care practice apart from monitoring blood glucose level, healthy diet, regular exercise and medication adherence (Roberts, 2005). Generally self management of foot care requires the diabetic person to give special attention to their foot by doing daily foot care practice. This daily foot care includes daily self-inspection of feet for sores and irritations, washing and carefully drying the foot, moisturizing the dry skin and cracked heels, nail care and the use of practical footwear (Roberts, 2005). It is an essential and cost effective diabetic foot management practice (Waxman *et al.*, 2003; Hosler & Melnik, 2006) apart from being easy and does not require any special equipment to perform (Hosler & Melnik, 2006).

1.2 Research Problem Statement

Foot care is one of the diabetes self care management and it generally easy to perform and cost effective as it does not require special equipment (Holser & Melnik, 2006). The importance of the foot care in preventing diabetic foot complications is undeniable as demonstrated in previous studies.

Figure 1.1 shows an increased trend of type 2 diabetes mellitus in Hospital Universiti Sains Malaysia (HUSM). This increased number describes the possibility of increase diabetic foot as it is known that people with diabetes hold two-fold risks in getting foot complications compared to non-diabetic (Gregg *et al.*, 2004). Moreover, diabetic foot lesions are one of the most serious causes of morbidity among diabetic people and often require a long hospital stay (Calle-Pascual *et al.*, 2001).

Even though in Figure 1.2, diabetic foot does not show consistent trend in HUSM, the researcher wants to know the knowledge and practice of foot care of diabetic patients attending HUSM including the sociodemographic factors which may have associations with foot care. Health Belief Model is being used in trying to understand the foot care behavior.

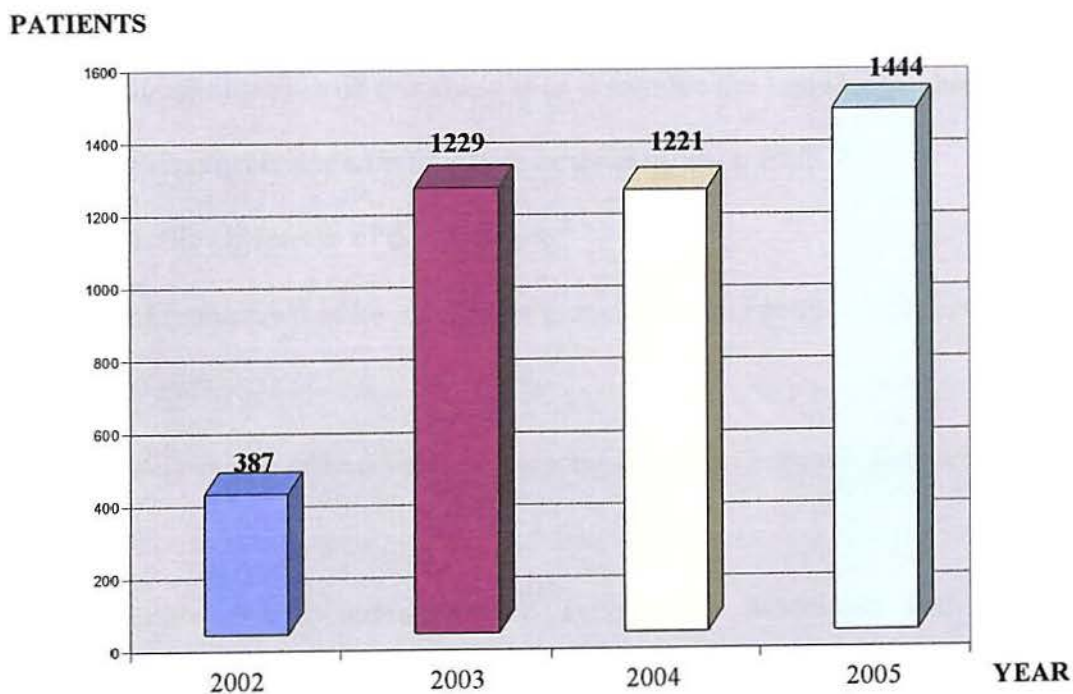


Figure 1.1: The number of Type 2 Diabetes Mellitus patients in HUSM according to year

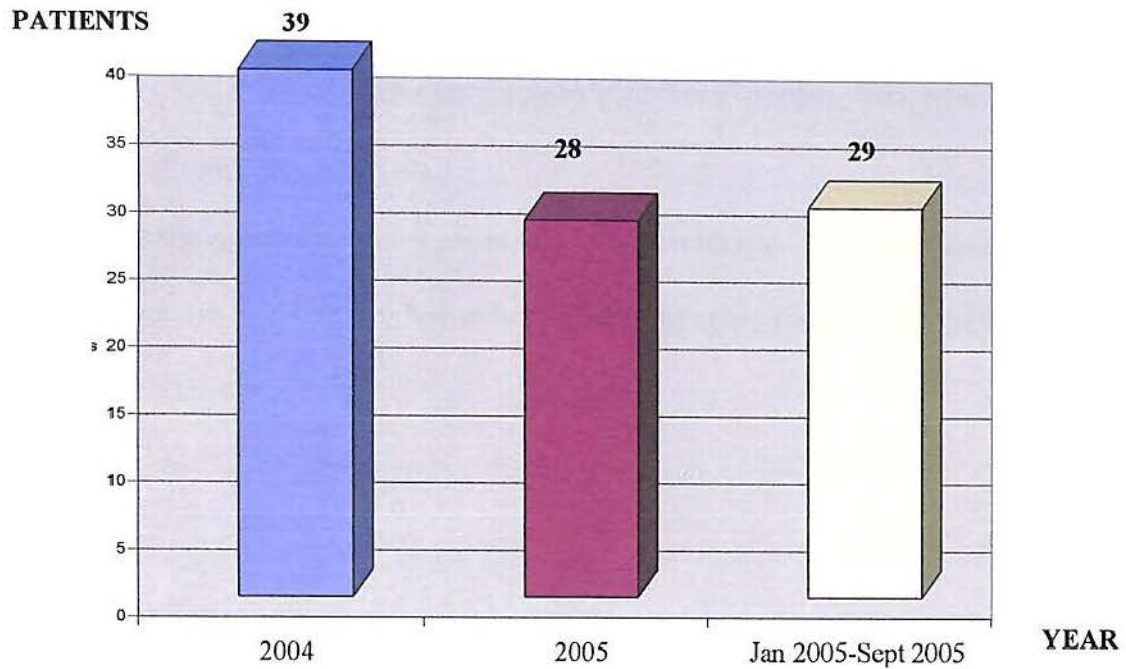


Figure 1.2: The numbers of patient with diabetic foot in HUSM according to year

1.3 Objectives of the Study

The general objective of this study is to determine the knowledge about foot care and its practice among people with type 2 diabetes mellitus in HUSM.

The specific objectives of the study are:

- 1.3.1 To identify the level of knowledge of foot care among people with type 2 diabetes mellitus in HUSM
- 1.3.2 To identify the practice of foot care among people with type 2 diabetes mellitus in HUSM
- 1.3.3 To identify the sociodemographic factors that associated with foot care knowledge and practice

1.4 Research Questions

- 1.4.1 What is the level of foot care knowledge among people with type 2 diabetes mellitus?
- 1.4.2 What is the practice of foot care among people with type 2 diabetes mellitus?
- 1.4.3 Are there any associations between sociodemographic factors with the knowledge and practice of foot care?

1.5 Hypotheses

1.5.1 Null hypothesis:

There are no associations between the sociodemographic factors with the knowledge of foot care among people with type 2 diabetes mellitus in HUSM.

1.5.2 Null hypothesis:

There are associations between the sociodemographic factors with the practice of foot care among people with type 2 diabetes mellitus in HUSM.

1.6 Definition of Terms

- 1.6.1 *Knowledge* is defined by New Oxford American Dictionary (2002) as “facts, information and skills acquired by a person through experience or education”. In this research, the knowledge that the researcher wants to know is the knowledge about foot care.

1.6.2 *Practice* is defined by New Oxford American Dictionary (2002) as “the actual application or use of an idea, belief or method as opposed to theories about such application or use”.

1.6.3 *Foot care* is defined by New Oxford American Dictionary (2002) as “cleansing and inspecting the feet for the purposes relaxation, cleanliness and healthy skin”. In diabetes context, it is defined as “the special attention given to prevent the circulatory disorders and infections that frequently occur in the lower extremities of diabetic patients”(Mosby’s Medical, Nursing & Allied Health Dictionary, 2002).

1.6.4 *Sociodemographic factors* in this study are age, sex, race, education level, marital status, household income and occupations.

1.6.5 Type 2 Diabetes Mellitus

Diabetes mellitus (DM) is a complex disorder of carbohydrate, fat and protein metabolism that is primarily a result of deficiency or complete lack of insulin secretion by the beta cells of the pancreas or resistance to insulin (Mosby’s Medical, Nursing & Allied Health Dictionary, 2002). There are 4 types of DM, but in this research, it will only involve the people with type II diabetes mellitus (DM II). DM II is a condition of fasting hyperglycemia that occurs despite the availability of endogenous insulin (LeMone & Burke, 2004).

1.7 Significant of the Study

1.7.1 This study will reveal the level of patients’ knowledge and their foot care practice

- 1.7.2 Helps in increasing the level of foot care knowledge among type 2 diabetes mellitus
- 1.7.3 Helps in providing appropriate health education regarding foot care practice
- 1.7.4 Helps in identify barriers to foot care practice and ways to overcome it

1.8 Theoretical Conceptualization of Foot Care Practice

The Health Belief Model (HBM) is a psychological model. It was one of the first theories of the health behavior, and remains one of the most widely recognized in the field. The HBM was developed in the 1950s by social psychologists Hochbaum, Rosenstock and Kegels who were working in the U.S. Public Health Services in order to help them to explain why so few people were participating in programs to prevent and detect disease. So, it is designed to explain health and predict preventive health behavior (Glanz, K., Marcus Lewis, F. & Rimer, B.K., 1997).

HBM addresses the individual's perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy). This model argues that people will ready to act if they are:

- Believe they are susceptible to the condition (perceived susceptibility)
- Believe the condition has serious consequences (perceived severity)
- Believe taking action would reduce their susceptibility to the condition or its severity (perceived benefits)
- Believe costs of taking action (perceived barriers)
- Are exposed to factors that prompt action (cue to action)

- Are confident in their ability to successfully perform an action (self-efficacy)

The application of HBM can be seen in a broad range of health behaviors and subjects populations. Conner & Norman (1996) identified HBM in preventive health behaviors, which include health-promoting (e.g. diet, exercise) and health-risk (e.g. smoking) behaviors as well as vaccination and contraceptive practices, in sick role behaviors, which refer to compliance with recommended medical regimens, usually following professional diagnosis of illness and in clinic use, which includes physician visits for a variety of reasons. (http://www.tcw.utwente.nl/theorieenoverzicht/Theory%20clusters/Health%20Communication/Health_Belief_Model.doc/).

HBM predicts that individuals will take preventive measure if they perceived themselves to be susceptible to a condition and if they believe the serious consequences of the problem (Nutbeam & Harris, 1999). In diabetic foot incidence, if diabetic persons know their risks in getting the diabetic foot, they will be more likely to take actions by practicing foot care behavior. But according to the HBM there are may be some modifying factors such as demographic, socio-economic, knowledge and sociopsychological that can influence an individual's decision.

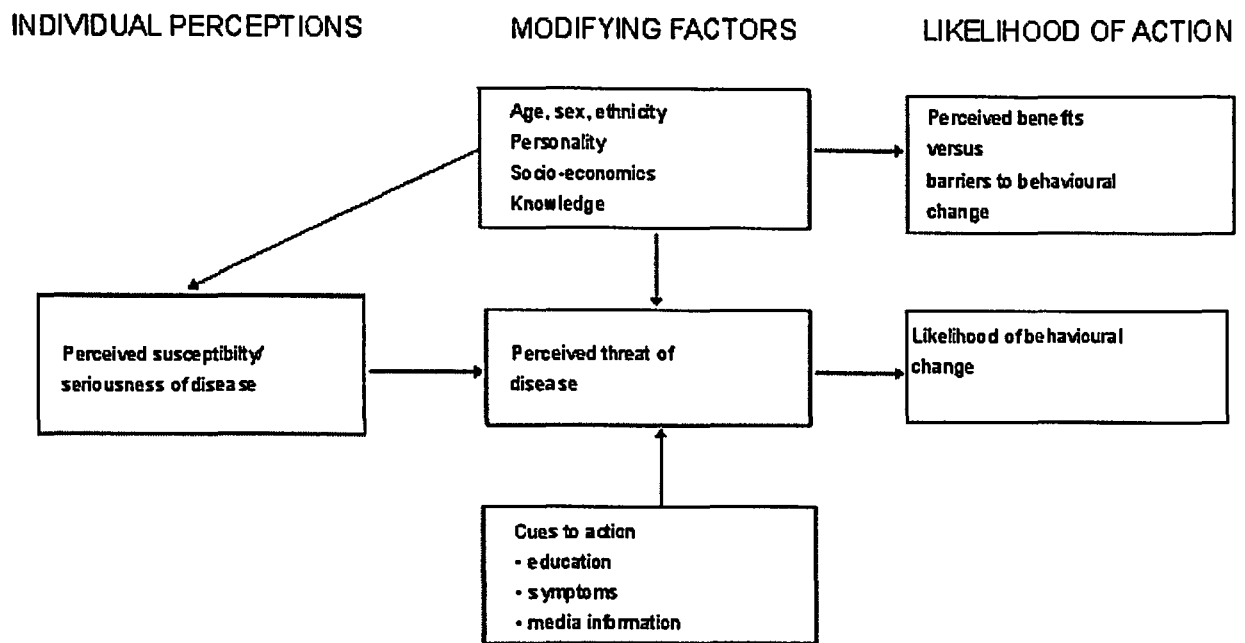


Figure 1.3: Conceptual model modified from Health Belief Model (Glanz et al, 2002)

CHAPTER 2

LITERATURE REVIEW

2.1 Diabetes Mellitus

Diabetes mellitus (DM) is a common metabolic disorder throughout the world. It has been discovered long time ago and since then, the prevalence of diabetic has been increased and becomes a global burden.

Diabetes mellitus can be divided into three types which are type 1 DM, type 2 DM and gestational-induced DM. Type 1 DM is the result of pancreatic islet cell destruction and a total deficit of circulating insulin. Therefore it is also known as insulin dependent diabetes mellitus (IDDM). To survive, people with type 1 diabetes must have insulin delivered into their body by injection or a pump. This type of DM is often occurs in childhood and adolescent even though it may occur at any age.

At the other hand, type 2 DM is due to the inability of the pancreas to produce adequate insulin for the body's needs or alternatively, the body itself becomes resistance to the effects of insulin and causing high blood sugar level. Type 2 DM usually occurs after the year of 40 and so it is known as noninsulin dependent diabetes mellitus (NIDDM). Type 2 DM is associated with older age, obesity, a family history of diabetes, a history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity (ADA, 2005). Diabetes in older adult may result in multiple, complex health care problems and needs due to normal physiologic changes in the elderly (Lemone & Burke, 2004).

Management of diabetes includes pharmacology and self-care management. Pharmacology consists of oral hypoglycemic agents and insulin therapy. Both of these are used to control hyperglycemia in diabetic patients. Apart from this, self-care management is very important in diabetic patients to control blood glucose level and at the same time helps in decreasing the risk of diabetes-related complications such as retinopathy, neuropathy, kidney diseases and cardiovascular diseases. The relationship between controlling diabetes and complications risk can be seen in a research done by Mafauzy (2005) in which he concluded that majority of diabetic patients treated at the primary care level which were not satisfactorily controlled is associated with a high prevalence of diabetes complications. These self care activities includes self monitoring of blood glucose level, healthy diet, exercise and foot care practice.

2.2 Complications Involving the Diabetic Foot

Diabetes, regardless of age can result in many health complications, whether if it is a short term complications or long term complications. Short term complication problems which include diabetic ketoacidosis and hypoglycemia are usually not difficult to treat but the real thrills are the long term complications of diabetes. Among these long term complications are retinopathy, kidney disease, heart disease and foot complications.

The high incidence of diabetes complications involving the feet is the result of neuropathy, angiopathy and infection (Lemone & Burke, 2004). Other risk factors may include previous foot ulcer, improper footwear, poor metabolic control, psychological factors, tobacco smoking and low socioeconomic status (Urbanic-Rovan, 2005).

Diabetic neuropathy can involve sensory, motor or autonomic nerves. In sensory neuropathy, the perception of pain and sense of touch including the ability to feel heat and cold of the foot are absent, which may contribute to the unnoticed trauma such as minor cuts, scrapes, blisters or pressure sores at the foot. The person with sensory neuropathy thus is at the higher risk of developing ulcers prior to the trauma at the foot. At the other hand, motor neuropathy leads to muscle atrophy, foot deformity, altering the distribution of forces during walking and causing reactive thickening of skin (callus) at sites of abnormal load. The ischemic necrosis of tissues beneath the callus leads to breakdown of skin and subcutaneous tissue, resulting in a neuropathic ulcer with a punched-out appearance (Urbanic-Rovan, 2005). Moreover, autonomic neuropathy which results in loss of sweating, leaving the skin dry and vulnerable to cracks and fissures, and altering neurogenic regulation of cutaneous blood flow and finally lead to tissue ischemia.

Secondly, angiopathy causes tissue ischemia by causing vascular changes in the lower extremities leading to arteriosclerosis. Atherosclerotic peripheral vascular disease is twice as common in persons with diabetes as in persons without diabetes (Greg et al., 2004; Singh et al., 2005) and it particularly affects the femoropopliteal and smaller vessels below the knee (ADA, 1999) leading to the formation of blockages in the affected blood vessels. Poor circulation contributes to diabetic foot problems by reducing the amount of oxygen and nutrition supplied to the skin and other tissue, causing injuries to heal poorly. Poor circulation can also lead to swelling and dryness of the foot. Preventing foot complications is more critical for the diabetic patient because poor circulation