



UNIVERSITI PUTRA MALAYSIA

***EFFECTS OF SELF-EFFICACY ENHANCING PROGRAM ON FOOT
SELFCARE
BEHAVIOUR AMONG ELDERLY WITH DIABETES IN RUMAH SERI
KENANGAN, PENINSULAR MALAYSIA***

SITI KHUZAIMAH AHMAD SHARONI

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By

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**Thesis Submitted to the School of Graduate Studies,
Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of
Doctor of Philosophy**

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

EFFECTS OF SELF-EFFICACY ENHANCING PROGRAM ON FOOT SELF-CARE BEHAVIOUR AMONG ELDERLY WITH DIABETES IN RUMAH SERI KENANGAN, PENINSULAR MALAYSIA

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September 2017

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Faculty : Medicine and Health Sciences**

Background: Diabetes has a significant impact on health especially among the elderly population. The Self-efficacy theory could improve foot self-care behaviour among the elderly with diabetes to prevent the risk of foot problems. There is a dearth of publications related to theory based intervention to improve foot self-care behaviour among the elderly with diabetes living in an institutional care in Malaysia.

Objectives: This study aims to develop, implement and evaluate the effectiveness of a self-efficacy enhancing program on foot self-care behaviour among the elderly with diabetes in Rumah Seri Kenangan, Peninsular Malaysia.

Methods: A Randomised Controlled Trial was conducted for 12 weeks in six Rumah Seri Kenangan, Peninsular Malaysia, Malaysia. Elderly with diabetes aged 60 years and above who fulfilled the inclusion criteria were invited to participate in this program. Using a randomised cluster design, the respondents were randomly allocated by an independent person into two groups (intervention and control). The intervention group received the self-efficacy enhancing program on foot self-care behaviour. Four self-efficacy components; performance accomplishments, vicarious experience, verbal persuasion, and physiological and emotional states were translated into program interventions. The program consisted of four visits; the first visit included screening and baseline assessment and the second visit involved 30 minutes of group seminar presentation. The third and fourth visits entailed a 20-minute one to one follow-up discussion and evaluation. A series of visits to the respondents was conducted throughout the program. Meanwhile, the control group received the usual health care. The primary outcome is foot-self-care behaviour. Foot care self-efficacy (efficacy expectation), foot care outcome expectation, knowledge of foot care, quality of life, fasting blood sugar and foot condition are the secondary measures. Data were analysed with descriptive and inferential statistics (t-test, Mann-U, Chi-Square, Fisher's exact, repeated measures Analysis of Variance, Mixed Designs Analysis of Variance and McNemar) using the Statistical Package for the Social Sciences version 20.0.

Results: 184 respondents were recruited but only 76 met the selection criteria and were included in the analysis at baseline, week-4 and week-12 post-intervention. The acceptability profile rate and healthcare provider compliance were high. Foot self-care behaviour, foot care self-efficacy (efficacy expectation), foot care outcome expectation and knowledge of foot care improved in the intervention group compared to the control group ($p < 0.05$). However, some of these improvements did not significantly differ compared to the control group for QoL physical symptoms, QoL psychosocial functioning, common skin conditions, overall foot hygiene and overall foot condition ($p > 0.05$). Fasting blood sugar, other foot conditions and infections, nail conditions and foot complications did not show any statistical improvement across the time effects between the two groups ($p > 0.05$).

Conclusion: The self-efficacy enhancing program improved foot self-care behaviour with respect to the delivered program thus reducing the risk of foot problems. It is expected that in the future, the Self-efficacy theory can be incorporated into diabetes education to enhance foot self-care behaviour and improve physical and psychosocial outcome of elderly with diabetes living in other institutional care facilities.

Keywords: Education, diabetes, elderly, foot, self-efficacy, institutional care

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KEBERKESANAN PROGRAM PENINGKATAN KECEKAPAN KENDIRI
UNTUK PENJAGAAN KAKI KENDIRI DI KALANGAN WARGA TUA YANG
MENGHIDAP DIABETES YANG MENETAP DI RUMAH SERI KENANGAN,
SEMENANJUNG MALAYSIA**

Oleh

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Latarbelakang: Diabetes memberikan kesan yang signifikan terhadap kesihatan terutamanya di dalam populasi warga tua. Teori Kecekapan Kendiri (Self-efficacy Theory) dapat mempertingkatkan tingkah laku penjagaan kaki sendiri oleh warga tua yang menghidap diabetes untuk mengurangkan risiko masalah berkaitan kaki. Terdapat kekurangan penyelidikan yang mengkaji intervensi berdasarkan teori untuk mempertingkatkan tingkah laku penjagaan kaki sendiri di kalangan warga tua yang menetap di pusat penjagaan di Malaysia.

Objektif: Kajian ini bertujuan untuk membina, melaksanakan dan menilai keberkesanan program peningkatan kecekapan kendiri untuk penjagaan kaki sendiri di kalangan warga tua yang menghidap diabetes yang menetap Rumah Seri Kenangan, Semenanjung Malaysia.

Kaedah: Ujian Rawak Terkawal telah dijalankan selama 12 minggu di enam buah Rumah Seri Kenangan, Semenanjung Malaysia, Malaysia. Warga tua yang menghidap diabetes, berusia 60 tahun ke atas dan memenuhi kriteria kemasukan telah dijemput untuk mengambil bahagian di dalam program ini. Menggunakan rekabentuk rawak kluster, peserta telah dibahagikan secara rawak oleh individu bebas ke dalam dua kumpulan (intervensi dan kawalan). Kumpulan intervensi telah menjalani program peningkatan kecekapan kendiri untuk penjagaan kaki sendiri. Empat komponen kecekapan kendiri: pencapaian tingkah laku, pengalaman melalui pemerhatian, sokongan lisan dan keadaan fisiologi dan emosi diterapkan sebagai intervensi ke dalam program. Program ini melibatkan empat kunjungan: kunjungan pertama merupakan saringan dan penilaian awal dan kunjungan kedua merupakan seminar berkumpulan selama 30 minit. Kunjungan ketiga dan keempat melibatkan perbincangan individu dan penilaian selama 20 minit. Sepanjang program, kunjungan berterusan telah dilakukan. Kumpulan kawalan menerima penjagaan kesihatan yang lazim. Hasil utama adalah tingkah laku penjagaan kaki sendiri. Kecekapan kendiri penjagaan kaki (jangkaan

kecekapan), jangkaan hasil penjagaan kaki, pengetahuan mengenai penjagaan kaki, kualiti hidup, kandungan gula sewaktu berpuasa (FBS) dan keadaan kaki merupakan ukuran sekunder. Data dianalisis menggunakan ujian statistik deskriptif dan inferens (ujian-t, ujian Mann-U, ujian Chi-Square, ujian tepat Fisher, analisis varians ukuran berulang, analisis varians rekabentuk campuran dan ujian McNemar) menggunakan perisian Statistical Package for the Social Sciences versi 20.0.

Keputusan: Seramai 184 responden telah dipilih tetapi hanya 76 yang memenuhi kriteria pemilihan dan terlibat di dalam analisis permulaan, minggu ke-4 dan minggu ke-12 selepas intervensi. Kadar profil kebolehterimaan dan kepatuhan kakitangan penjagaan kesihatan adalah tinggi. Tingkah laku penjagaan kaki, kecekapan sendiri (jangkaan kecekapan) penjagaan kaki, jangkaan hasil penjagaan kaki dan pengetahuan mengenai penjagaan kaki meningkat di dalam kumpulan intervensi berbanding kumpulan kawalan ($p < 0.05$). Namun begitu, beberapa peningkatan tidak menunjukkan perbezaan signifikan berbanding kumpulan kawalan iaitu bagi gejala fizikal kualiti hidup (QoL), fungsi psikososial kualiti hidup (QoL), penyakit kulit lazim, kebersihan kaki keseluruhan dan kesihatan kaki keseluruhan ($p > 0.05$). FBS, penyakit kaki lain dan jangkitan, kesihatan kuku dan komplikasi kaki tidak menunjukkan peningkatan signifikan merentasi masa antara kedua kumpulan ($p > 0.05$).

Kesimpulan: Program peningkatan kecekapan sendiri telah berjaya mempertingkatkan tingkah laku penjagaan kaki sendiri melalui program yang dijalankan, yang dapat mengurangkan risiko masalah berkaitan kaki. Di masa hadapan, teori Kecekapan Kendiri dijangka boleh diterapkan ke dalam pendidikan diabetes untuk mempertingkatkan tingkah laku penjagaan kaki sendiri serta memperbaiki hasil fizikal dan psikososial bagi warga tua yang menghidap diabetes dan menetap di pusat penjagaan lain.

Kata kunci: Pendidikan, diabetes, warga tua, kaki, kecekapan sendiri, pusat penjagaan

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I certify that a Thesis Examination Committee has met on 7 September 2017 to conduct the final examination of Siti Khuzaimah binti Ahmad Sharoni on her thesis entitled "Effects of Self-Efficacy Enhancing Program on Foot Self-Care Behaviour among Elderly with Diabetes in Rumah Seri Kenangan, Peninsular Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

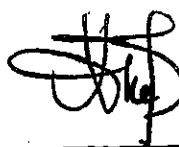
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LIST OF ABBREVIATIONS

ADA	American Diabetes Association
BMI	Body Mass Index
CI	Confidence Interval
CPG	Clinical Practice Guideline
FBS	Fasting Blood Sugar
GCP	Good Clinical Practice
GDM	Gestational Diabetes
HbA1c	Glycated/ Glycoslated haemoglobin
HHS	Hyperglycemia Hyperosmolar State
IDF	International Diabetes Federation
IPH	Institute for Public Health
MOH	Ministry of Health
NHMS	National Health and Morbidity Survey
NORM	National Orthopaedic Registry Malaysia
NCDs	Non-Communicable Diseases
OR	Odds Ratio
QoL	Quality of life
RBS	Random Blood Sugar
RSK	Rumah Seri Kenangan
SCT	Social Cognitive Theory
SMBG	Self-Monitoring Blood Glucose
WHO	World Health Organization
%	percentage
n	number/ frequency
≥	greater than or equal to
α	alpha
β	beta (power)
<	less than
>	greater than
=	equal
mmol/L	millimole per liter
SD / ±	standard deviation
χ ²	Chi-Square Test

CHAPTER 1

INTRODUCTION

1.1 Introduction

Diabetes has a significant impact on health especially among the elderly living in an institutionalised care. Self-care behaviour is essential to prevent diabetic foot problems. This chapter provides background information on diabetes and the related problem statements, and the significance and objectives of the study as well as a section on the definition of the terms that will be used in this study.

1.2 Background information

Diabetes is the most common non-communicable disease affecting the elderly. It is the fifth leading cause of death worldwide, accounting for 4.6 million sufferers annually (Roglic & Unwin, 2009). Diabetes is a hyperglycaemic state that resulted from defects in insulin secretion, insulin action or both, and is included in the group of metabolic disease (Clinical Practice Guideline, 2009). There are three main types of diabetes; Type 1 diabetes known as insulin-dependent diabetes, Type 2 diabetes known as non-insulin-dependent diabetes, and gestational diabetes (Burke et al., 2011). Type 2 diabetes (commonly known as diabetes) accounts for 90% - 95% of all types of diabetes cases [American Diabetes Association (ADA), 2014].

The non-modifiable risk factors of diabetes are age, gender, ethnicity and genetics [International Diabetes Federation (IDF), 2013a]. A sedentary lifestyle, obesity, changes in dietary habits and reduction in physical activities are the modifiable factors that contribute to a higher prevalence of diabetes (Burke et al., 2011).

Most patients with diabetes are either asymptomatic or unaware of the related symptoms of polydipsia, polyuria, blurring of vision, fatigue, paresthesias and skin infections (ADA, 2014). However, the elderly with underlying diabetes often describe symptoms of fatigue, blurred vision, change in weight (gain or loss) and infections (e.g., foot or leg wound, vaginitis, or urinary tract infection), numbness of extremities and vision changes (Feinglos & Bethel, 2008).

A venous plasma glucose level (fasting) of ≥ 7.0 mmol/L and or venous plasma glucose level (random) of ≥ 11.1 mmol/L are values for the diagnosis of diabetes (Clinical Practice Guideline, 2009). In the symptomatic individual, one abnormal glucose value is sufficient for the diagnosis of diabetes, but for individual who is asymptomatic, two abnormal glucose values are required in the diagnosis of diabetes (Clinical Practice Guideline, 2009).

There are several treatments involved in the management of diabetes. Types of anti-hyperglycaemic agents used by patients with diabetes are oral medication (e.g., Biguanides, Sulphonylureas and Alpha-Glucosidase Inhibitors) and insulin therapy (e.g., Actrapid, Humulin R, Insulatard and Mixtard 30) (Clinical Practice Guideline, 2015). Letchuman et al. (2010) stated that patients with diabetes are either on oral medication (77.1%), on insulin alone (3.1%) or treated with both oral and insulin (4.1%). Similarly, most elderly with diabetes are usually on oral hypoglycaemic medication, followed by insulin only or a combination of oral hypoglycaemic agents (Vischer et al., 2009; Ooi et al., 2011).

Complications of diabetes are commonly divided into acute and chronic. Diabetic ketoacidosis (DKA), hyperglycemic hyperosmolar state (HHS) and hypoglycemia are acute complications. The chronic complications are mostly classified as macrovascular and microvascular diseases (Meiner & Lueckenotte, 2006). The common macrovascular diseases are myocardial infarction, cerebrovascular and peripheral vascular disease and co-morbidity (Rizvi, 2007; Ooi et al., 2011; IDF, 2013a). Diabetic retinopathy, nephropathy and neuropathy are the most common microvascular complications (American College of Foot and Ankle Surgeons, 2006; Fowler, 2008; Bhuvaneshwar, Epstein, & Stern, 2007). It was reported that an elderly with diabetes has a poor health status, both physically and mentally, as compared to those without the disease (OR: 1.64; 95% CI: 1.20, 2.23) and this contribute to a diminished quality of life (Brown et al., 2004). A previous study found that 64% of Malaysian elderly with diabetes were having physical disability and 45% of them were mentally unstable (Johari et al., 2016). It can be stated that status of physical and psychological health affects the quality of life.

Self-efficacy is found to be appropriate for application in health intervention programs to improve self-care behaviour among patients with diabetes (van der Bijl et al, 2001; McDowell et al, 2005; Sturt et al., 2006; Wu et al., 2007; Shi et al., 2010). To date, few published intervention studies related to self-efficacy education programs focused on foot self-care behaviour among elderly with diabetes living in public long-term care institutions in Malaysia.

1.3 Problem statement

The global prevalence of diabetes is 415 million (IDF, 2015), where more than 134.6 million occurred among the elderly, and the number of elderly with diabetes is expected to increase to 252.8 million by 2035 (IDF, 2013a). The prevalence is expected to increase between 2000 and 2030 due to population growth, obesity, aging and urbanisation (Wild et al., 2004; Noh et al., 2007; Shaw, Sicree, & Zimmet, 2010).

Diabetic foot problems have a great impact on the patient. Diabetic foot problems is accountable for morbidity and permanent disability (Singh et al., 2013). The most common diabetic foot abnormalities are calluses, fissures, deformities, and loss of the protective sensation of pain (Chin & Huang, 2013). These diabetic foot problems may

lead to the development of ulcers. The cases of foot ulcers and amputations could be due to poor hygiene, and foot injury associated with barefoot walking (Boulton, 2005).

In Malaysia, the National Health Morbidity Survey reported that the prevalence of diabetes is 15.2% (2.6 million), where 7.2% are known to have diabetes and 8.0% are previously undiagnosed with diabetes (Ministry of Health Malaysia, 2011). The National Diabetes Registry reported that the prevalence of diabetes in Malaysia has increased from 11.6% in 2006 to 15.2% in 2011 and is projected to increase to 21.6% by the year 2020 (Feisul & Azmi, 2013).

Microvascular and severe late complications cases (e.g., blindness, stroke and leg amputation) in this country were reported at about 75% and 25.4% respectively (Mafauzy et al., 2011). The National Orthopaedic Registry Malaysia (NORM) (2009), stated that 55.3% patient who has a family history of diabetes will develop diabetic foot problems. Patients with diabetic foot problems have a 35.2% and 21.9% chance of developing neuropathy and skin disorders respectively (Abdullah & Abdullah, 2010). The National Diabetes Registry reported that the prevalence of neuropathy is 70%, diabetic foot ulcer is 11.1% and 11.0% for amputation (Feisul & Azmi, 2013). The incidence and average annual incidence of diabetic foot ulceration is about 10% and 1% respectively (Faridah & Azmi, 2009).

The ageing population in Malaysia is becoming a challenge for the healthcare system. The life expectancy of males and females are 71.9 and 76.4 years respectively (Department of Statistics Malaysia, 2010). Urbanisation, improvements in nutrition and public health, also advances in medical and healthcare has contributed to an increased life expectancy and to the demographic changes (Poi, Forsyth & Chan, 2004).

The elderly in this country need adequate care and facilities for a better quality of life and healthy ageing (Abbas & Saruwono, 2012). The elderly in rural areas tend to reside with their family (Hairi, Bulgiba, Mudla, & Said, 2011). However, a majority of the younger generation nowadays are working. Therefore, it is becoming increasingly difficult for family members to take care of their elders. Most of them are not at home during the day due to work commitments. The lack of family members at home can be a major barrier to family support (Wan-Ibrahim & Zainab, 2014). As a result, the elders are at risk of being abandoned. Some of them stay in institutional care or day care centers.

In Malaysia, there is a public institutional care facility called the Rumah Seri Kenangan (RSK) available for the elderly living alone or who are unable to manage themselves. However, there are limited studies published related to the elderly in this setting. Therefore, additional research addressing the relationship between a diabetes education program and the outcomes in this setting is crucial.

1.4 Significance of study

The findings from this study would create awareness among the elderly with diabetes in RSK of the significance of foot self-care behaviour. Besides, it can also improve their knowledge of foot care, foot care self-efficacy (efficacy expectation), foot care outcome expectation, quality of life and foot conditions.

The information from the findings of this study may contribute as baseline information for the ministry. It is hoped that in the future, such health promotion programs for the elderly living in institutional care facilities can help increase their health status, towards healthy ageing.

Several studies had inquired on the need to explore the significance of Self-efficacy theory in improving foot self-care behaviour among elderly with diabetes in various settings. In Malaysia, very few researchers engaged in theory-based interventions in relation to foot self-care behaviour for diabetes especially in an institutional care setting. By introducing Self-efficacy theory in this study, it is hoped that current traditional healthcare may be improved. Therefore, this research aspires to contribute new findings and bridge the gaps related to this issue.

1.5 Research question

Does self-efficacy enhancing program improve foot self-care behaviour, foot care self-efficacy (efficacy expectation), foot care outcome expectation, knowledge of foot care, quality of life, fasting blood sugar and foot condition of elderly with diabetes across the study period?

1.6 Research objectives

1.6.1 General research objective

- 1) To determine the demographic data, clinical characteristics, foot self-care behaviour, foot care self-efficacy (efficacy expectation), foot care outcome expectation, knowledge of foot care, quality of life and foot condition of respondents in the intervention and control groups
- 2) To develop and implement the self-efficacy enhancing program on foot self-care behaviour for the elderly with diabetes
- 3) To determine the respondents' acceptability of the self-efficacy enhancing program at the end of study (week-12)

- 4) To determine the effects of the self-efficacy enhancing program on foot self-care behaviour, foot care self-efficacy (efficacy expectation), foot care outcome expectation, knowledge of foot care, quality of life and fasting blood sugar of the elderly with diabetes within the group (intervention and control) at baseline (before the program), week-4 after the program and week-12 after the program
- 5) To determine the effects of the self-efficacy enhancing program on foot self-care behaviour, foot care self-efficacy (efficacy expectation), foot care outcome expectation, knowledge of foot care, quality of life, fasting blood sugar and foot condition of the elderly with diabetes between groups (intervention and control) at baseline (before the program), week-4 after the program and week-12 after the program

1.7 Research hypothesis

- 1) There will be a significant difference in foot self-care behaviour, foot care self-efficacy (efficacy expectation), foot care outcome expectation, knowledge of foot care, quality of life and fasting blood sugar of the elderly with diabetes within the intervention and control groups at baseline (before the program), week-4 after the program and week-12 after the program
- 2) There will be a significant difference in foot self-care behaviour, foot care self-efficacy (efficacy expectation), foot care outcome expectation, knowledge of foot care, quality of life, fasting blood sugar and foot condition of the elderly with diabetes between intervention and control groups at baseline (before the program), week-4 after the program and week-12 after the program

1.8 Conceptual and operational definitions

The conceptual and operational definitions in this study are as follows:

Foot self-care behaviour

In this study, foot self-care behaviour was measured based on the number of days (in one week) and frequency in performing the behaviour. Patients need to perform behaviours such as examination of feet, hygiene, skin and nail care and wear suitable shoes (Chin & Huang, 2013).

Foot care self-efficacy (efficacy expectation)

In this study, foot care self-efficacy (efficacy expectation) describes how confident the elderly with diabetes were in undertaking foot self-care behaviour (Sloan, 1998).

Foot care outcome expectation

Foot care outcome expectation in this study is defined as the self-belief (level of confidence) that a foot behaviour will have the desired effect.

Knowledge of foot care

In this study, knowledge of foot care is knowledge of information regarding diabetic foot complications, the risk factors and foot care that needs to be performed by the elderly with diabetes.

Quality of life

In this study, the quality of life of the elderly with diabetes was measured in terms of foot problems (if any) that may affect their activities of daily living (ADLs) and well-being (Vileikyte, Peyrot, & Bundy, 2003).

Fasting blood sugar

Normal range values for fasting blood sugar in this study ranged between 4.4 and 6.1 mmol/L (GCP, 2015).

Foot condition

In this study, the foot condition of the elderly with diabetes were measured by foot score, consisting of the condition of nails and skin, infections and complications (Baba et al., 2015).

Elderly

An elderly can be defined as a person aged 60 years and above (Department of Statistics Malaysia, 2010).

Diabetes

In this study, an elderly with diabetes was selected to participate if they have been diagnosed with diabetes by a medical doctor according to the clinical criteria based on positive venous plasma glucose level (fasting ≥ 7.0 mmol/L and/ or random ≥ 11.1 mmol/L) (Clinical Practice Guideline, 2009).

1.9 Summary

The prevalence of the elderly with diabetes developing diabetic foot complications has a significant impact on the patients. Apart from that, there were very few published studies related to diabetes foot self-care behaviour in local institutional care. As an elderly becomes older, special care would be needed to improve their health status. Chapter 1 outlined the background and problem statements as well as the significance of this study, presenting its objectives, research questions and operational definitions.

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