UNIVERSITI PUTRA MALAYSIA

KNOWLEDGE, ATTITUDE AND PRACTICE IN PREVENTION OF FOOT ULCER AMONG DIABETES MELLITUS PATIENTS IN A PUBLIC HEALTH CLINIC, SELANGOR, MALAYSIA

KHALAF ABDELFATTAH MOHD AWWAD

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By

KHALAF ABDELFATTAH MOHD AWWAD

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

March 2019

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DEDICATION

Firstly, I dedicate this to God.

Secondly, I dedicate this to my parents, my wife, and my kids.

Thirdly, I dedicate this to my Associate Professor and Co-Supervisor, Dr. Soh Kim Lam and Dr. Niazlin Binti Mohd Taib respectively.

Lastly, I dedicate this to all the staff in Universti Putra Malaysia.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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March 2019

Chairman : Associate Professor Soh Kim Lam PhD, MHSc, RN
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Introduction: Globally, diabetes has risen from 108 million in 1980 to 422 million in 2014. In comparison to ten other regional countries in Asia, Malaysia had the highest number of cases of diabetes and raised blood sugar levels, which can lead to foot ulcer complications. The knowledge, attitude, and practice of diabetic foot management are important factors in the management of diabetic patients.

Objective: The objective of the study was to assess the knowledge, attitude, and practice of diabetic patients regarding the prevention of foot ulcers in Klinik Kesihatan Seri Kembangan.

Method: A cross-sectional study was conducted among 483 diabetic patients at Klinik Kesihatan Seri Kembangan. The data were collected using a pre-tested self-administrated structured questionnaire. The study analysis was done using Statistical Package for Social Sciences (SPSS) version 24 software. Descriptive statistics, the Chi-square test, and Logistic regression were used in this study. All tests were estimated to be two-sided and the statistical significance was considered to be at $p< 0.05$.

Results: A total of 483 diabetic patients participated in this study of which 279 (57.8%) were female and 204 (42.2%) were male. The majority (237 or 49.1%) of the respondents had secondary school education and 298 (61.7%) were married. The majority of the respondents had satisfactory knowledge (68.7%) and practice (57.8%) whereas the attitude was unfavourable (61.7%). There were 150 respondents with favourable attitude who had good knowledge, while 198 respondents with

unfavourable attitude had good knowledge; this finding showed a significant association between knowledge and attitude. The predictors were statistically significantly associated with knowledge, attitude, and practice.

Conclusion: The study concluded that the levels of the participants were satisfactory for knowledge, unfavourable for attitude, and satisfactory for practice. There was also a significant association between knowledge and attitude regarding the prevention of foot ulcers. It also indicated that socio-demographics were associated with knowledge, attitude, and practice in respect of the prevention of foot ulcers.

Keywords: Knowledge, Attitude, Practice, Foot Ulcer, Diabetic Foot

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

PENGETAHUAN, SIKAP DAN PRAKTIK DALAM PENCEGAHAN ULSER KAKI DI KALANGAN PESAKIT DIABETES MELLITUS DI KLINIK KESIHATAN AWAM, SELANGOR, MALAYSIA

Oleh

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Pengerusi : Profesor Madya Soh Kim Lam PhD, MHSc, RN
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Pengenalan: Secara global, diabetes telah meningkat dari 108 juta pada tahun 1980 kepada 422 juta pada tahun 2014. Tambahan pula, bila dibandingkan di antara Sepuluh negara lain di Asia mereka mendapati bahawa Malaysia mempunyai kes diabetes yang tertinggi dan kenaikan paras gula darah yang boleh mengakibatkan komplikasi ulser kaki. Pengetahuan, sikap dan amalan mengenai pencegahan kaki diabetik merupakan faktor penting dalam pengurusan kaki diabetik sebagai penanda atau penentuan tindakan yang diperlukan dalam penjagaan untuk mencegah komplikasi lanjut.

Objektif: Adalah untuk menilai pengetahuan, sikap dan amalan pesakit diabetes mengenai pencegahan ulser kaki di Klinik Kesihatan Seri Kembangan.

Kaedah: Satu kajian rekabentuk keratan rentas telah dijalankan ke atas 483 pesakit diabetes di Klinik Kesihatan Seri Kembangan. Data telah diambil dengan menggunakan borang soal selidik berstruktur. Data yang diperolehi telah dianalisa menggunakan perisian Statistical Package for Social Science (SPSS) versi 24. Statistik deskriptif, chi-square, dan Regresi logistik telah digunakan untuk menggambarkan ciri-ciri responden manakala. Semua ujian dianggarkan dua belah dan kepentingan statistik dianggap pada $p < 0.05$.

Keputusan: Sejumlah 483 orang pesakit diabetes telah mengambil bahagian dalam kajian ini terdiri dari 279 (57.8%) perempuan dan 204 (42.2%) lelaki. Majoriti responden berpendidikan daripada sekolah menengah 237 (49.1%) dan sudah berkahwin 298 (61.7%). Majoriti 332 (68.7%) responden mempunyai pengetahuan

yang memuaskan mengenai pencegahan ulser kaki; 298 (61.7%) daripada responden mempunyai sikap tidak baik terhadap pencegahan ulser kaki; 279 (57.8%) responden mempunyai amalan yang memuaskan mengenai pencegahan ulser kaki. Terdapat 150 responden dengan sikap yang baik yang mempunyai pengetahuan yang baik dan 198 responden dengan sikap yang kurang baik yang mempunyai pengetahuan yang baik dan penemuan ini mempunyai kaitan yang signifikan antara pengetahuan dan sikap.

Kesimpulan: Hasil daripada kajian ini mendapati bahawa tahap responden adalah memuaskan untuk pengetahuan, tidak sesuai untuk sikap, dan memuaskan untuk amalan. Terdapat juga persamaan penting antara pengetahuan dan sikap mengenai pencegahan ulser kaki manakala tiada hubungan yang signifikan antara pengetahuan dan amalan serta sikap dan amalan. Ia juga menyebabkan sosio-demografi dikaitkan dengan pengetahuan, sikap, dan amalan pencegahan ulser kaki.

Kata kunci: Pengetahuan, Sikap, Amalan, Ulser kaki, Kaki Diabetik

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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

AOR	Adjusted Odds Ratio
BMI	Body Mass Index
CI	Confidence Interval
COR	Crude Odds Ratio
DF	Degree of Freedom
DFU	Diabetic Foot Ulcer
DM	Diabetes Mellitus
DV	Dependent Variable
IDF	International Diabetes Federation
IV	Independent Variable
KAP	Knowledge, Attitude, and Practice
MOH Malaysia	Ministry of Health (Malaysia)
MYR	Malaysian Ringgit
NHMS	National Health and Morbidity Survey
NMRR	National Medical Research Register
PIS	Participant Information Sheet
SD	Standard Deviation
SPSS	Statistical Package for Social Science Program
UPM	Universiti Putra Malaysia
WHO	World Health Organization
X^2	Chi Square

CHAPTER 1

INTRODUCTION

1.1 Background

Diabetic foot ulcers cause damage or loss of skin tissue to the diabetic patient's lower limb (Schaper et al., 2012). Foot ulceration in diabetic patients is considered to be a very important and serious problem that can lead to prolonged treatment and worse – amputation of the lower limb – if appropriate strategies and care are not taken to prevent such an occurrence (Muhammad-Lutfi, Zaraihah, & Anuar-Ramdhan, 2014). Diabetic foot ulcers are one of the most common complications in hospitals and a serious risk for diabetic patients (Dangol, 2015). Common causes of foot ulcers include trauma, neuropathy, and deformity (Clayton & Elasy, 2009). Further, history of diabetic foot ulcers has a large impact on a patient's physical role, physical functioning, and mobility (WG Meijer, 2001).

Studies suggested that 25% of diabetic patients are hospitalised due to foot ulcers (Addisu, Eshete, & Hailu, 2014; Ahmad & Ahmad, 2015; Al-Maskari & El-Sadig, 2007; Al-Naggar et al., 2017). Specifically, in Malaysia, 12% of the complications of diabetic foot ulcers are attributed to diabetic patients who had been admitted to the hospitals (Dangol, 2015). Further, the National Health and Morbidity Survey in 2011 reported that the prevalence of diabetes mellitus in Malaysia was 15.2% (Kaur, Tee, Ariaratnam, Krishnapillai, & China, 2013). It is also anticipated that 15% to 20% of these diabetics will be hospitalised with foot complications at some time during the course of their disease, and that 12% to 24% of the affected individuals with foot ulcers will require amputation (Shojaiefard, Khorgami, & Larijani, 2008). The prevalence of foot ulceration in patients who were attending a diabetic outpatient clinic was 6.0% (Letchuman et al., 2010). The risk factors for the development of diabetic foot ulcers, may be due to poor knowledge or attitude among the patients or due to delays by staff of the health care providers in giving the necessary medical treatment (Pollock, Unwin, & Connolly, 2004). Hence, if these issues are properly addressed they could be controlled and the bad results from foot complications reduced accordingly.

Knowledge, attitude, and practice of the diabetic foot is an important factor in diabetic foot management and may be utilised as a gauge to determine the level of practice in foot care (Heisler & Piette, 2005). Knowledge of the disease among diabetic patients refers to the issue of self-care management and relates to the actual and target health outcomes (Gale, Vedhara, Searle, Kemple, & Campbell, 2008). Positive results can be achieved if foot care is combined with knowledge, attitude, and practice (Muhammad-Lutfi et al., 2014).

Although there have been a few recent studies evaluating the levels of knowledge, attitude, and practice of diabetic foot ulcers in Malaysia, no recent research has been

undertaken in Malaysia (Muhammad-Lutfi et al., 2014). Previous study showed that there was a low level of knowledge, attitude, and practice in Malaysia, thereby indicating the need for enhanced educational strategies to enable diabetic patients to improve their knowledge about foot ulcers (Naicker et al., 2009).

1.2 Problem Statement

The World Health Organization (WHO) reported that the number of people with diabetes has risen from 108 million in 1980 to 422 million in 2014 (Organization, 2016). In Malaysia, studded reported that in comparison with ten other regional countries, including Vietnam, China, Japan, and Singapore, Malaysia had second highest number of trend prevalence of diabetes and raised blood sugar level, both of which can lead to foot ulcer complications (Chan et al., 2009). The Third National Health and Morbidity Survey also reported an increment in the incidence of diabetes mellitus among Malaysian adults aged 30 years and older ranging from 6.3% in 1986 to 14.9% in 2006, and 31% in 2011 (Hakimah et al., 2016). A study in Malaysia showed that the prevalence of amputation resulting from diabetes was 4.3% (Letchuman et al., 2010).

A study done in Malaysia among hospitalised diabetic foot patients showed that the prevalence of amputation due to diabetic foot was 88.7%; the figure comprised both minor and major amputations (Hakimah et al., 2016). According to Bakker (2005), every 30 seconds a lower limb is lost due to diabetes somewhere in the world (Bakker et al., 2005). In addition, the result of the previous study showed that amputation rates can be reduced by 49% if patients follow appropriate plans and strategies (Bakker et al., 2005). This indicates the need to educate diabetics and for a new diagnosis of diabetes concerning the ulcers of the foot to ensure the safety of their lives and their feet (Bakker et al., 2005). Thus, appropriate education on foot care and early treatment are expected to prevent foot infections and ulcers, and decrease the risk of amputation (Boulton, Vileikyte, Ragnarson-Tennvall, & Apelqvist, 2005).

A cross-sectional study undertaken in 2009 showed that diabetic patients with foot ulcers had lower knowledge scores than those without foot ulcers; the study investigated the knowledge and practice of 100 diabetic patients in Kuala Lumpur (Naicker et al., 2009). The results of the study showed very poor knowledge regarding foot ulcers and associated complications. Their general knowledge and understanding of foot ulcers were just less than average; however, inadequate knowledge about foot ulcers may lead to limb amputation and other complications. This indicates the need for enhanced educational strategies to enable diabetic patients to improve their knowledge about foot ulcers (Naicker et al., 2009).

1.3 Objectives

1.3.1 General Objective

To assess the knowledge, attitude, and practice of diabetic patients regarding the prevention of foot ulcers in Klinik Kesihatan Seri Kembangan.

1.3.2 Specific Objectives

1. To determine the socio-demographics of diabetic patients regarding the prevention of foot ulcers.
2. To assess the level of knowledge, attitude, and practice of diabetic patients regarding the prevention of foot ulcers.
3. To assess the socio-demographic association with knowledge, attitude, and practice of diabetic patients regarding the prevention of foot ulcers.
4. To assess the relation among the level of knowledge, attitude, and practice regarding the prevention of foot ulcers.
5. To determine the predictors of knowledge, attitude, and practice of diabetic patients regarding the prevention of foot ulcers.
6. To investigate the predictors association with knowledge, attitude, and practice among diabetic patients regarding the prevention of foot ulcers.

1.4 Research Hypothesis

a. What is the description of the respondent's socio-demographic characteristics?
b. What is the level of knowledge, attitude, and practice of diabetic patients?
c. There is a relationship between the socio-demographics with the knowledge, attitude, and practice scores among diabetic patients regarding prevention of foot ulcer.
d. There is a relationship between the knowledge score and the attitude score regarding the prevention of foot ulcers.
e. There is a relationship between the knowledge score and the practice score regarding the prevention of foot ulcers.
f. There is a relationship between the attitude score and the practice score regarding the prevention of foot ulcers.
g. What are the predictors of knowledge, attitude, and practice of diabetic patients regarding the prevention of foot ulcers?
h. There is a relationship between the predictors with the knowledge, attitude, and practice scores among diabetic patients regarding prevention of foot ulcer.

1.5 Aim and Significance of Study

This study aimed to assess the level of knowledge, attitude, and practice regarding prevention of foot ulcers among diabetic patients in Malaysia. It has also determined the relationship between knowledge, attitude, and practice regarding the prevention of foot ulcers among diabetic patients in Malaysia as well as the relationship between knowledge, attitude, and practice, and the patient's demographics. Thus, good knowledge, attitude, and practice regarding diabetic foot ulcers will limit the problems and complications. This study has potential benefits to the staff, patients, and organizations by providing information concerning the levels of knowledge, attitude, and practice among diabetic patients. Accordingly, appropriate strategies can be used by organizations or multidisciplinary teams to reduce the rate of diabetic foot ulcers and associated complications. According to Orem's theory, others feel happy if someone takes care of their health and their lives.

1.6 Foot Ulcer

1.6.1 Definition of Foot Ulcer

A foot ulcer is a universal medical complexity in patients with diabetes mellitus (Turns, 2011). Also, foot ulcers are the products of the shared effects of diabetes-linked vascular disease and neuropathy (Boulton, Kirsner, & Vileikyte, 2004).

1.6.2 Causes

1.6.2.1 Peripheral Neuropathy

Neuropathy is defined as damage to the nerves (Brem, Sheehan, Rosenberg, Schneider, & Boulton, 2006). People with diabetes have a 30% to 50% risk of rising chronic peripheral neuropathy, with 10% to 20% of those diagnosed with neuropathy developing sharply neuropathic symptoms (Marshall & Flyvbjerg, 2006).

1.6.2.2 Peripheral Vascular

Peripheral vascular will occur when the fatty deposits hinder the blood flow in the legs and feet, and stiffening of the elastic layer of the arterial wall takes place, thereby making it less able to shrink and expand normally. The devitalised tissue is unable to withstand the pressure of walking and bearing weight or repeated minor trauma, thereby placing the foot at increased risk of ulceration and amputation (Lavery et al., 2008).

1.6.3 Diabetic Foot Ulcer Assessment

Timely and early assessment of the foot at risk can significantly avoid foot ulceration and limb amputation (Holt, 2013). Amputations are 15 times more common for those with diabetes than those without diabetes (Brem et al., 2006).

1.6.4 Classification of Ulcers

The classification of a foot wound is based on a comprehensive assessment that is appropriate to simplify treatment and be generally predictive of expected outcomes (Association, 2004). A number of systems currently attempt to accurately describe the severity of foot ulcers (Association, 2004). The Wagner system is one of the systems used to describe the severity of the foot wound and predict the results in table 2.1 (Oyibo et al., 2001). This system, which has six grades that classify ulcers consistent with the depth and extent of the wound, is an easy procedure and provides a guide for specialists to arrange treatment (Nather et al., 2017).

Table 1.1 : Wagner ulcer classification system

Grade	Features
0	Skin intact
1	Superficial ulcer
2	Deeper, full-thickness extension of ulcer
3	Deep abscess or osteomyelitis associated with ulcer
4	Partial forefoot gangrene with ulcer
5	Extensive foot gangrene with ulcer

Source (Oyibo et al., 2001)

1.6.5 Treatment

1.6.5.1 Non-Operative

Foot care education involves medical footwear, increased monitoring, and a focus on strict glucose control, which can greatly reduce the incidence of ulcers. Wound care is the first and fundamental step in the management of foot ulcers (Lipsky et al., 2004). Patients should be educated about the importance of maintaining good blood sugar, wearing appropriate shoes, avoiding trauma, and performing repeated self-examinations (Lipsky et al., 2004).

1.6.5.2 Operative

Surgical intervention for diabetic foot ulcers begins with appropriate soft tissue (Chellan et al., 2012) management consisting of deep infections, removal of necrotic tissue, and reduced wound tension (Lipsky et al., 2004).

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