

**THE EFFECTIVENESS OF THE EDUCATIONAL
INTERVENTION TOWARDS IMPROVING THE
KNOWLEDGE, ATTITUDE, AND PRACTICE ON
WOUND CARE AND THE HEALING RATE OF
DIABETIC FOOT ULCER**



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UMS
UNIVERSITI MALAYSIA SABAH

**FACULTY OF MEDICINE AND HEALTH
SCIENCE UNIVERSITI MALAYSIA SABAH
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UMS

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I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or produced by another party in fulfilment, partial or otherwise, of any master's degree or degree at another University or institute of higher learning, except where due acknowledgement is made in the text.

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Melvin Ebin Bondi
16th December 2020

ABSTRACT

Healthcare professionals (HCP) with substantial knowledge, attitude, and practice (KAP) on wound care management are in high demand to effectively manage complex wounds. This study aimed to determine the effectiveness of an educational intervention towards the management of wound care and its outcome on the duration of healing Diabetic Foot Ulcer (DFU). This was a quasi-experimental of pretest-posttest study design using a self-developed questionnaire on KAP and assessment of the duration of the healing rate of DFU. There were 82 HCPs and 60 patients recruited in this study and assigned to both intervention and control groups. The HCPs in the intervention group attended an educational intervention training, while there was no educational intervention set in the control group (treatment as usual). The duration of the healing rate of DFU patients in both groups was monitored for three months. This study found that there was a statistically significant improvement in the mean difference of KAP scores in the intervention group compared to the control group after the education intervention, in which for knowledge ($M=8.23$, $SD=0.25$, $P <0.001$), attitude ($M=14.34$, $SD=0.89$, $P<0.001$), and practice ($M=12.33$, $SD=1.2$, $P <0.001$). Independent T-test revealed that the duration of healing of Diabetic Foot Ulcer in the intervention group is shorter by ($M=2.38$, $SD= 1.84$) after the educational intervention compared to patients in the control group ($M=8.90$, $SD=2.79$, $p<0.001$). Multiple linear regression proved a statistically significant relationship between HCPs who attended the educational intervention and improvement in their KAP scores; Knowledge $F (8/73)=151.11$, Beta: 8.27, $p<0.001$), Attitude $F (8/73)=31.57$, Beta: 14.30, $p<0.001$), and Practice $F (8/73)=12.64$, Beta:12.18, $p<0.001$), adjusted for the confounding factors. These findings conclude that the educational intervention was effective towards improving the level of KAP and contribute to shorter duration of DFU healing. Besides, better healing rate improved the quality of life and reduced micro-economic burdens of DFU patients. This study provides baseline data for higher authority at the Sabah State Health Department and the Ministry of Health, Malaysia, towards initiating further strategic plans of action in the future.

Keywords: Attitude, Diabetic Foot Ulcer, Educational Intervention, Knowledge, Practice, Wound Care Management

ABSTRAK

KEBERKESANAN INTERVENSI PENDIDIKAN BAGI MENINGKATKAN TAHAP PENGETAHUAN, SIKAP, DAN PRAKTIS TERHADAP PENGURUSAN LUKA DAN TAHAP PENYEMBUHAN ULSER KENCING MANIS KAKI

Pengamal perubatan dengan tahap pengetahuan, sikap dan amalan yang tinggi amatlah diperlukan bagi pengurusan luka yang efektif. Kajian ini bertujuan untuk menentukan keberkesanan intervensi pendidikan terhadap pengurusan luka dan keberkesanannya kepada tempoh penyembuhan luka Kencing Manis kaki. Ini merupakan kajian quasi-eksperimen berbentuk penilaian pra ujian dan pasca ujian menggunakan borang soal selidik dan penilaian keadar penyembuhan luka kaki diabetes. Sebanyak 82 pengamal perubatan dan 60 pesakit telah direkrut dan diagih kepada dua kumpulan; kumpulan intervensi dan kumpulan kawalan. Pengamal perubatan di dalam kumpulan intervensi diberikan intervensi pendidikan manakala tiada intervensi latihan diberikan kepada kumpulan kawalan (pengurusan adalah seperti biasa). Kadar penyembuhan ulser kencing manis dinilai dalam tempoh 3 bulan Hasil dapatan kajian menemukan terdapat perubahan yang signifikan pada perbezaan purata markah bagi tahap pengetahuan, sikap dan amalan bagi kumpulan intervensi berbanding kumpulan kawalan. Pengetahuan ($M=8.23$, $SD=0.25$, $P < 0.001$), sikap ($M=14.34$, $SD=0.89$, $P < 0.001$), dan amalan ($M=14.34$, $SD=0.89$, $P < 0.001$). Ujian T-sample menemukan tempoh penyembuhan luka kaki bagi pesakit kencing manis adalah lebih pendek $M=2.38$, $SD= 1.84$) berbanding pesakit yang dirawat di dalam kumpulan kawalan ($M=8.90$, $SD=2.79$, $p < 0.001$). Regresi linear berganda membuktikan bahawa terdapat hubungkait diantara tahap intervensi pendidikan dengan perubahan markah bagi tahap pengetahuan $F (8/73)=151.11$, Beta: 8.27, $p < 0.001$), amalan $F (8/73)=31.57$, Beta: 14.30, $p < 0.001$), dan sikap $F (8/73)=12.64$, Beta: 12.18, $p < 0.001$). Kesimpulannya, penemuan ini membuktikan bahawa intervensi pendidikan adalah efektif dalam meningkatkan tahap pengetahuan, sikap, dan amalan dan sekaligus mempengaruhi tempoh penyembuhan luka kencing manis kaki. Selain daripada itu, kadar penyembuhan yang pendek meningkatkan kualiti hidup dan mengurangkan beban pesakit kencing manis kaki. Kajian ini menggariskan data bagi kegunaan pihak atasan di peringkat Jabatan Kesihatan Negeri Sabah kearah pelan tindakan yang strategik di masa hadapan.

Kata Kunci : Sikap, Ulser Kencing Manis kaki, Intervensi pendidikan, pengetahuan, amalan, pengurusan luka

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LIST OF ABBREVIATIONS

BC	- Before Christ
DFU	- Diabetic Foot Ulcer
HbA1C	- Hemoglobin A1c
KAP	- Knowledge, Attitude, Practice
KKM	- Kementerian Kesihatan Malaysia
KPI	- Key Performance Indicator
MOH	- Ministry of Malaysia
MREC	- Malaysia Research Ethics Committee
NMRR	- National Medical Research Registry
PAHO	- Penampang Area Health Office
SPSS	- Statistical Package for Social Science
TIMES	- Tissue, Infection, Moisture, Edge, Skin Surrounding
UMS	- Universiti Malaysia Sabah
CPD	- Continuous Professional Development
CME	- Continuous Medical Education



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CHAPTER 1

INTRODUCTION

1.1 Overview

The first chapter of this research opens up with the study's background and further describes the problem statement in the study site. This is followed by the study's significance, justification, research objective, research questions, research hypothesis, and research variables. This chapter concludes with the definition of the terms used in this study.

1.2 Background of the Study

Wound care management is essential to speed up healing in order to prevent infection and complications (Chaby et al., 2007). The cleaning and bandaging of wounds had been recorded in 2100 BC where the practice of wound cleansing was done using home available products such as beer and hot water for wound washing, mixtures of herbs, honey, and ointments as a primary layer, and bandaging as an outer layer (Broughton et al., 2006). The Revolution of wound dressing has evolved over the years, especially after World War II, where first aid and surgical products were highly demanded (Boulton, 2004). However, the practice of modern dressing was not commonly used back then.

The current management for wounds involves a multidisciplinary approach of pharmacological and non-pharmacological that includes nutrition, wound debridement, and modern dressing approach aside from proper dressing techniques alone, as according to AWC et al., (2014). In the last decades, a significant number of complex medical technological advances led to increasing demand for wound care educational training for healthcare professionals, especially doctors, Assistant Medical Officers, and nurses (Greenwell et al., 2018).

Wound infection and non-healing wounds represent a silent epidemic that affects a significant fraction of the world population and poses a significant and gathering threat to the public health and economy (Ministry of Health, 2016). In the United Kingdom, around 200,000 patients suffer from chronic wounds due to infection.

Global economic impact on wound care cost, according to Nussbaum et al., (2018) reported that hospital outpatient cost was ranging from 9.9 billion US dollars to 35.8 billion US dollars. On the other hand, the global cost of treatment for an inpatient with a chronic and infected wound is estimated to be between 5.0 billion US dollars to 24.3 billion US dollars per year (Harries et al., 2016).

Based on the Malaysian National Health and Morbidity Survey, (2019), the overall prevalence of Diabetes mellitus (known and undiagnosed) among adults of 18 years and above was 3.9 million. There was an overall increasing trend in the 40-49 years age group and 60 years and above. About 8.9% (347, 100) of them did not know that they have diabetes.

Diabetic Foot Ulcers are one of the complications of Diabetes mellitus, which has reported to be increasing in numbers over the past decades, worldwide (Falanga et al., 2017). The annual Diabetic Foot Ulcer (DFU) prevalence in the general population globally was 4% to 27% (Chun et al., 2019), whereas the prevalence in the younger patients with either type 1 or type 2 Diabetes mellitus was lower (1.7% to 3.3%), and higher in the elderly adult patients by 5% to 10%. This was due to the recurring incident of the non-healing DFUs is high (Nussbaum et al., 2018). World Health Organization, (2016) projected that 15% of patients with diabetes are expected to suffer from DFU throughout their lifetime, and roughly 20% of all admitted diabetes patients have Diabetic Foot Ulcers. In Malaysia, the prevalence of DFU is reported from 2.2% to 5.9% according to Malaysian National Health and Morbidity Survey, (2019). To date, Diabetic Foot Ulcer is a significant cause of morbidity in patients with diabetes and is a leading cause of hospitalization in public and private hospitals in Malaysia (Guest et al., 2018).

Educational intervention on wound care management has been proven by many researchers to be effective in improving knowledge, attitude, and practice among healthcare professionals (Priyadarshani & Samarawickrama, 2017). Many theories postulated that educational training could develop critical thinking and improve medical students and healthcare professionals' level of knowledge, attitude, and practice. (Hrynychak & Batty, 2012).

In 2014, the Ministry of Health, Malaysia, published the first edition of the Wound Care Manual to address common types of wounds, including diabetic foot

ulcers, pressure ulcers, burns, venous ulcers, arterial ulcers, and non-healing ulcers. The purpose of this wound care manual was to be used as a reference guideline on wound care management for all healthcare professionals.

In conjunction with that, in 2018, the Ministry of Health, Malaysia, released a circular to establish a wound care unit in public health (all healthcare clinics) as a key performance indicator (KPI) as a continuity of care to patients. The new KPI's implementation to establish a wound care unit in Sabah's health clinics was effective in January 2018, including health clinics under the administration Penampang Area Health Office.

1.3 Problem Statement

The wound care manual published by the Ministry of Health, Malaysia, includes an educational training package. However, the educational training for East Malaysia, particularly in Sabah and Sarawak (hospital and health clinic), was delayed and had not been initiated since the released of the new circular in 2018. The delayed educational training has led the researcher to initiate the educational intervention at Penampang Area Health Office based on the wound care manual with some modification on the module content to suit the standard of treatment available at the health clinic setting. The new module was designed and developed specifically on addressing common wound problems in the primary healthcare setting, including a flow chart management on patient referral to the hospital.

The health clinic's negative service impact is observed when there was a significant increase in the workload burden of Diabetic Foot Ulcers (DFU) reported from 2016 to 2019. An annual wound report derived from both clinics showed an increasing case. In 2016, the number of DFU cases referred from the tertiary hospital was 511, increasing to 592 in 2017, 794 in 2018, and 917 in 2019.

Negative implications caused to the clinic was the cost of caring for DFU patients. In 2018, the cost to buy the wound care products for DFU was approximately RM 20,000 and increasing to RM 40,000 in 2019 at Penampang Area Health Office. This increased in budget happened due to the increasing number of dressing visits to the clinic. The effectiveness in delivering quality wound care management has also been affected due to limited resources and assets such as financial and bed

capacities available in the health clinic. There are only two beds in wound care unit at Penampang Health Clinic and four beds at Putatan Health Clinic, with approximately 30 patients per day.

The patient has also been affected economically due to the unsatisfactory progress of wound healing. The average dressing visit of one patient to the clinic is five times a week with a registration fee of RM1.00 per visit, and due to the infection rate and delayed wound healing, one patient could spend approximately RM20.00 per month for dressing alone. Harries et al., (2016) postulated delayed wound healing requires frequent dressing visits of more than three months.

The quality of living of patients was also affected where they need to travel to the health clinic for dressing, fuel consumption, time invested, including the waiting time to get the treatment. Apart from the economic burden, the activity of daily living of the patients has affected particularly those DFU patients that had extremities amputated, such as losses of productivity, preventive efforts to maintain wellness, rehabilitation, and home care treatment. According to the statistic in 2018 and 2019 at Penampang Area Health Office, it was reported that the duration of healing of Diabetic Foot Ulcer for both health clinics was reportedly slow. The approximate healing duration took five months and up to one year in both health clinics.

These issues are essential to address towards comprehensive and holistic management of wound care, better patient outcomes, and to advert the negative implications for the organizations, healthcare professionals, and the patients.

1.4 Significant of the study

The healthcare sector is an ever-changing area that requires comprehensive skills and training. This educational intervention is essential to improving the competency of healthcare professionals for better patient outcomes. The educational intervention provides an exceptional opportunity to extend and equip healthcare professionals with tremendous knowledge, attitude, and practice on wound care management. This study will develop empowerment, competency, and confidence to the healthcare professionals and allow them to practice evidence-based towards providing quality patient care.

Furthermore, this study will also accomplish and achieve the Ministry of Health, Malaysia's key performance indicator (KPI) and National Strategic Plan for Non-Communicable Diseases 2016-2025, extending the implementation of public health's wound care program and prevent diabetic foot ulcer complication (amputation).

In addition to that, reduced workload burdens and better patient outcomes address the unfavourable consequences for both organizations and patients. The study will contribute to education, medical practice, and future research in the public health sector, particularly in Sabah. Besides, this study will provide baseline data for the Sabah State Health Department's higher authority to plan for the initiation of continuous professional development concerning improving the quality of patient care.

1.5 Justification

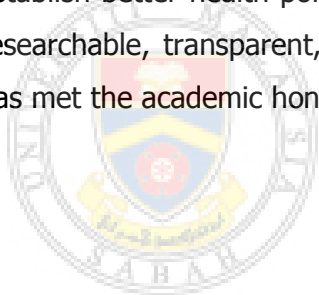
This study has scientific and practical relevance. Scientifically, it will help to gauge the baseline level of knowledge, in turn, to educate and increase the level of knowledge, attitude, and practice on wound care among healthcare professionals at Penampang Area Health Office. Palaian et al., (2006) concluded that short course intervention improved knowledge and skills in evidence-based practice.

The practical relevance is, with the acquired knowledge, healthcare professionals will provide excellent wound care management towards a better patient outcome, particularly on the duration of healing of Diabetic Foot Ulcer and their quality of life. By understanding the concept of wound care management,

healthcare professionals can provide better healthcare services to our current and future wound management in Sabah. This relevance was supported and in line with the study by Magbanua & Lim-Alba, (2017), where diabetic foot ulcers' healing rate improved after educational training among the healthcare professionals.

Public health focuses on maximizing health so that society can achieve its most cherished values. It is essential to highlight the current unmet issues, burdens, health outcomes, disparities, and threats to health to improve health policies. Therefore, the outcome of this study will allow the Sabah State Health Department and Ministry of Health Malaysia to strengthen and orient health systems and health policy in the public health through evidence-based strategies to address the prevention and control of DFU complications based on one of the objectives in the National Strategic Plan for Non-Communicable Disease 2016-2025.

This study offers a platform for public health leaders, potential stakeholders, and other organizations to engage and collaborate on multisectoral action to establish better health policies to prevent and control DFU. Therefore, this study is researchable, transparent, and free from duplication of any previous studies, and has met the academic honesty.



1.6 Research Questions

- a) What is the baseline level of knowledge, attitude, and practice in both intervention and control groups?
- b) What is the duration of healing of Diabetic Foot Ulcer in both intervention and control groups?
- c) Is there an improvement of scores on knowledge, attitude, and practice in both intervention and control groups?
- d) Is there any improvement in the duration of healing of Diabetic Foot ulcers in both intervention and control groups after the educational intervention?

1.7 Research Objective

1.7.1 General Objective

This study aims to evaluate the effectiveness of the educational intervention towards improving the level of knowledge, attitude, and practice on wound care and the healing rate of Diabetic Foot Ulcer.

1.7.2 Specific Objectives

- a) To determine the baseline level of knowledge, attitude, and practice of the Healthcare Professionals on wound care.
- b) To determine the duration of healing of Diabetic Foot Ulcer in both intervention and control groups.
- c) To evaluate the improvement of knowledge, attitude, and practice scores for both intervention and control groups.
- d) To evaluate the improvement in the duration of healing of Diabetic Foot Ulcer for both intervention and control groups.

1.8 Research Hypothesis

1.8.1 Null Hypothesis

- a) The baseline level of the healthcare professional's knowledge is low, negative attitude, and low level of practice in both the intervention and control groups.
- b) The duration of healing of Diabetic Foot Ulcer is longer in both groups.
- c) There is no significant difference in the improvement of scores in knowledge, attitude, and practice after the educational intervention in both groups.
- d) There is no significant difference in the improvement of the duration of healing of Diabetic Foot ulcers in both groups after the educational intervention.

1.8.2 Alternative Hypothesis

- a) There is moderate to a high level of knowledge, positive attitude, and high level of practice of the healthcare professionals in the intervention group after the educational intervention.
- b) The duration of healing of Diabetic Foot Ulcers is shorter in the intervention group after the educational intervention.
- c) There is a significant improvement in scores of knowledge, attitude, and practice in the intervention group compared to the control group.
- d) There is a significant difference in the duration of healing of Diabetic Foot ulcers in the intervention group after the educational intervention compared to the control group.