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**National Cheng Kung University Hospital - TAIWAN**  
Bandung, 16<sup>th</sup> – 17<sup>th</sup> July, 2018

**Conference Book**  
**International Conference on Health Care**  
**and Management**

“Evidence to inform action on supporting and implementation of  
SDGs”

**Secretary Office :**

**STIKep PPNI Jawa Barat (Intitute of Nursing Science PPNI West Java)**

Jalan Ahmad IV No. 32 Cicendo, Bandung 40173

West Java – Indonesia

Phone: +62 22 6121914

*E-mail: [info@icon-stikeppni.org](mailto:info@icon-stikeppni.org)*

*Website: [www.icon-stikeppni.org](http://www.icon-stikeppni.org)*

**National Cheng Kung University Hospital**

No.138, Sheng Li Road, Tainan, Taiwan 704, R.O.C.

Tel : 886-6-2353535

E-mail : [hospital@mail.hosp.ncku.edu.tw](mailto:hospital@mail.hosp.ncku.edu.tw)



**Conference Book International Conference on Health Care and Management:**

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This book published by:

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Phone.: +62 22 6121914

*E-mail: info@icon-stikeppni.org*

*Website: www.icon-stikeppni.org*

**National Cheng Kung University Hospital (NCKUH)**

No.138,Sheng Li Road,Tainan, Taiwan 704, R.O.C.

Tel : 886-6-2353535

E-mail : hospital@mail.hosp.ncku.edu.tw

**Chief Editor:**

Linlin Lindayani, Ph.D

**Member:**

Irma Darmawati, M.Kep.,Ns.Sp.Kep.Kom

Henri Purnama, MNS



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## Welcome Message



Assalamualaikum Warahmatullahi Wabarakatuh

Dear honorable guests,  
Sustainable Development Goals (SDGs) as an agreement of sustainable development objectives agreed by all countries at the 2015 UN sessions. Each country including Indonesia has an obligation to implement this joint development plan by applying universal, integration and inclusive principles by ensuring that no one missed or “No-one Left Behind” Indonesia has Nawa Cita or 9 priority agenda which should synergize with SDGs and can be used as health program application in Indonesia to also achieve SDGs.

On behalf of the organizing committee and the Nursing Society of Indonesia, I am glad to invite you to join ICHM 2018 (International Conference on Health Care and Management) in Bandung, Indonesia on July 16-17, 2018.

The conference is expected to reveal some solutions for evidence-based health care and scientific facts to be discussed by various viewpoints from diverse speakers from around the world with the title “Evidence to inform action on supporting and implementation of SDGs. Through the International Conference is expected to improve health services, especially in the field of nursing in Indonesia to improve the human development index.

We hope all participant could benefit from the exciting program and will surpass your expectation and that will be an inspiring event.

Warm regards,

A handwritten signature in black ink, appearing to read 'Dhika Dharmansyah'.

**Dhika Dharmansyah**  
Conference chair



Assalamu'alaykum Wr.Wrb  
Good morning and best wishes for all of us.

Ladies and gentlemen, in such a great and happy day, let's praise and thank to Allah Swt who has given us grace and mercy to all of us to gather in this International Conference on Health Care Management event today.

First of all, we would like to gratitude and appreciate highly to national Cheng Kung University Hospital has given the opportunity and confidence to our institution STIKep PPNI Jabar for the second time in collaboration to organize International Conference on Health Care Management with theme: "Evidence to inform action on supporting and implementation of SDGs". This event is one of follow up The memorandum of Understanding between NCKUH with STIKep PPNI Jabar.

STIKep PPNI Jabar is as a nursing education institution carry out the mandate to create professional nurse, we must implement all TRIDHARMA University activities in academic atmosphere that aims to broaden and improve nursing and existence of nurse profession capacity in nation developing continually.

As we know the university academic quality is determined by its researches and graduates result quality. The research work results may be either a right against managing intellectual wealth equity as well as scientific work which is able to be publicized through scientific journals and scientific gathering forums of the same scientist background both in national and international level.

Nevertheless, the publishing of journal researches is published by its university. Nowadays, it is irregular because there are both financial and scientific manuscript availability drawbacks. Scientific regular manuscripts are very limited because manuscript contributor is only from its university as well.

The high education Research and technology ministry data in 2017, it stated that there were an increase of research work publishing done by practitioners, academicians and researchers of Indonesian. The amount of Indonesian research publishing on international journal certifiable indexed Scopus tended to increase. The high education Research and technology ministry data on December 1<sup>st</sup> 2017 noted that Indonesia scientific research publishing reached 14.100 journals. Meanwhile, on October 1<sup>st</sup> 2017 there were as many as 12.098 journals.

However, internally nurse profession scientific research journals are still less of publishing. It is alleged to the low of quantity and quality publishing about nursing. One of the drawbacks is rarely the interaction between nursing scientists and experts in scientific conferences. Some efforts are carried out by STIKep PPNI to encourage and to accelerate sharing knowledge amongst the nursing experts. Accordance to the goals, National Cheng Kung University Hospital Taiwan and STIKep PPNI have made MoU and held as this International conferences organizer. Hopefully, it is able to bridge all stakeholders, practitioners, and academicians in supporting the quality of the human resources especially, nurses and health workers as well.

The honourable ladies and gentlemen,  
Nowadays, in the global era, the transformation runs rapidly and consequently it makes the knowledge based society. Information and communication technology development are very important in on its role in manifesting society development based on the knowledge. The higher education of society will be higher of health service quality demands specially nurse.

Accordance to the effort, this International conference aims to,

1. Facilitate the knowledge sharing between health experts and nurses to encourage the goal of health human resource quality.
2. Produce health scientific and nursing articles deserve to be published on international scopus indexed journal.
3. Make communication networking amongst Universities, research institution, nurse practitioners, and other stakeholders.

I truly believe that all participants through the 2 days in international conference, our goals above are able to be manifested well.

Finally, I would like to thank to all of participants diligently and with spirit of attending this international conference on health care management.

Wish the conference is able to be knowledge sharing event and delightful and successful as well, the conference will be enlightened and interchange will do great help for us after attending this conference, especially STIKep PPNI Jabar and generally for all profession nurses to provide health services to communities, aamiin ya robbal alamin.

Wassalamu'alaykum Wr.wb.

Kindest regards,



The Dean of STIKep PPNI Jabar



Excellencies, Distinguished Delegates, Ladies and Gentlemen,  
Selamat Siang,

I'm ChyunYu Yang, the superintendent of National Cheng Kung University Hospital in Tainan, Taiwan.

On behalf of our hospital, it is my pleasure and privilege to welcome all of you to participate in the international conference on health care and management 2018.

To our eminent speakers and delegates who have come from UK, Netherland, Korea, Japan, Thailand, Singapore, Taiwan, and Indonesia, I bid you a very warm welcome to Bandung. We are indeed honoured to have you here with us. We have about 1.000 participants from different place in Indonesia and countries gathered here today, making our conference a truly meaningful one.

This is our second time collaborate with STIKEP PPNI Jawa Barat to hold an international conference. Last year, we have very successful conference with the theme focus on infection control and disaster management. And this year, our conference theme is "evidence to inform action on supporting and implementation of SDGs".

The Sustainable Development Goals (SDGs) known as the global goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. Goal 3 addresses all major health priorities and calls for improving reproductive, maternal and child health; ending communicable diseases; reducing non-communicable diseases and other health hazards; and ensuring universal access to safe, effective, quality and affordable medicines and vaccines as well as health coverage.

However, the world seems still far from ending maternal mortality, with more than 303,000 deaths in pregnancy or childbirth occurring annually. NCDs are also a growing problem, causing 40 million deaths in 2015.

But, All in all, we can take comfort in the fact that SGD indicators are moving in the right direction. Yet we still have plenty of work to do.

I wish in the next two day and a half, we have the opportunity - and indeed the responsibility - to prepare and add knowledge related the current situation and progress reflection of SDGs.

In closing, I encourage delegates to participate actively in the interesting discussions over the next two days. I wish everyone a successful and fruitful conference.

Thank you.

## Conference Committee

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## FACTORS ASSOCIATED WITH THE RISK OF DIABETIC FOOT ULCER AMONG PATIENTS WITH TYPE 2 DIABETIC MELLITUS IN OUTPATIENTS DEPARTMENT OF GENERAL HOSPITAL IN INDONESIA

<sup>1</sup>**Dian Anggraini**, <sup>2</sup>**Herdiman**, <sup>3</sup>**Juan Carlo Triatmaka**  
<sup>1,2,3</sup>STIKEP PPNI JAWA BARAT, Bandung, West Java, Indonesia  
Corresponding Email: dians\_23@yahoo.com

### ABSTRACT

**Background:** Diabetic foot ulcers are a debilitating complication of diabetes mellitus (DM), lead to the high morbidity and care cost. This complication can be prevented as often caused due to minor trauma. Understanding risk factors associated with diabetic foot ulcer would provide information to improve the outcome and decreasing the risk of progression. **Objectives:** The purpose of this study was to determine the relationship between blood sugar levels, cholesterol levels, blood pressure, body mass index (BMI), and patients' knowledge towards diabetic foot care with the risk of diabetic foot ulcer. **Methods:** This study was used cross-sectional design conducted at district general public hospital in Cimahi, West Java, Indonesia. All patients with type 2 DM, an adult aged and had diabetic foot ulcer were recruited. Diabetic Foot-Care Knowledge Scale (DFKS) was used to assess patient's knowledge of diabetic foot ulcer. This research used Multiple Linear Regression to analyze the data. **Results:** A total of 68 patients with type 2 DM were agreed to join this study, 58.8% were female, and the majority aged over 45 years old (85.3%). The results showed more than had uncontrolled blood sugar level and good knowledge of diabetic foot ulcer. We found a significant relationship between cholesterol levels and BMI with diabetic foot ulcers, explained about 11.8% of the variance. **Conclusion:** Cholesterol level BMI significant associated with a diabetic foot ulcer. Continuing education related to a healthy lifestyle for a patient with type 2 DM is necessary.

**Keywords:** BMI, cholesterol levels, diabetic mellitus type 1, knowledge, foot ulcer

### INTRODUCTION

The prevalence of type 2 diabetes mellitus (DM) is increasing rapidly worldwide. Indonesia is ranked as the seventh highest prevalence in the world, with 8.5 million being diagnosed with diabetics. According to the National Health Survey in 2013, the prevalence of DM was increased from 1.1% in 2007 to 2.1% in 2013 from the total population of 250 million, in which about 95% were typed 2 DM and only 5% type 1 DM (National Health Survey, 2013). Complications arising from hyperglycemia can either be macrovascular or microvascular. Complications that usually occur in people with diabetes mellitus are cataracts, heart disease, kidney disease, sexual impotence, difficult for wound healing or gangrene injuries, lung infections, vascular disorders, and stroke (Ministry of Health, 2005).

A diabetic foot ulcer is one of a devastating complication of diabetes mellitus, which leads to increased overall morbidity in patients (Packer & Manna, 2018). A diabetic foot ulcer is a condition of the deepest infection, ulcers or destruction of skin tissue which majority in the legs. It is usually due to nerve abnormalities and peripheral arterial blood vessels. If the diabetic ulcer is not prevented, it can lead to amputation. Amputation greatly affects the individual, not only in cosmetic terms but

also the loss of productivity, increasing dependence on others and the expensive medical cost (Rizky, Rudy, dan Zulkarnain, 2015).

Many risk factors associated with diabetic ulcers, such as; gender, age  $\geq 45$  years old, knowledge level, occupation, family history of diabetes, activity, exposure to secondhand smoke, high BMI (BMI), blood pressure, stress, and cholesterol levels. However, the results show that age ( $\geq 45$  years), family history of diabetes, physical activity, body mass index (BMI), blood pressure, stress and cholesterol levels were major risk factors (Trisnawati and Setyorogo, 2013). Another study conducted by Martha (2012) also revealed that factors associated with diabetic foot ulcers divided into two group, namely modifiable risk factors and irreversible risk factors. Modifiable risk factors included high blood sugar, hypertension, obesity, stress, activity, cholesterol and irreversible were included age and family history. In West Java, there has not been any study conducted on this complication; furthermore, the associated factors with a diabetic foot ulcer. Therefore, this study was designed to identify factors associated with diabetic foot ulcer among patients with type 2 DM.

## **METHODS**

### **Research design and sample**

A cross-sectional design will be used to examine health literacy among patient with type 2 Diabetes Mellitus in outpatients department of the general public hospital at Cimahi, West Java, Indonesia. The target population of this study was patients with type 2 Diabetes Mellitus who are visiting this department. Purposive sampling will be applied. The inclusion criteria of participants were patients with type 2 Diabetes Mellitus, at least 18 years old, understand spoken and written Bahasa Indonesia. Patients with blindness, mental disorder, and cognitive impairment were excluded from the study.

### **Instrument**

Demographic data include gender, age, employment, educational level. Illness duration was also collected. The data of blood glucose and cholesterol level were extracted from patient's medical record. Measurement of body weight and height was conducted before patients' clinical consultation time. The risk of diabetic foot ulcer was decided by a physician through comprehensive physical examination. This examination was documented in *Nova Scotia Scale* instrument. Also, the Diabetic Foot-Care Knowledge Scale (DFKS) was delivered to assess patients' knowledge towards diabetic foot ulcer.

### **Procedure**

The Institutional Review Board (IRB) and permission letter from STIKEP PPNI Jawa Barat and Study hospital were obtained before data collection. After obtaining the IRB and research permission, an invitation letter to conduct research was sent to the directors of education and practice department of study hospital. Then, the researcher approached the head nurse and gave information how the data collection is performed. The head nurse provides a name list of potential participant. The researcher approached the participants in the outpatient internal department waiting area. The researcher explained the content of the questionnaires clearly to avoid response bias. After consenting to participate in the research, participants asked to complete all the information needed that take about 15 to 20 minutes. After completing all questionnaires, the participant returns the questionnaire, and the researchers rechecked the completeness of the questionnaires.

### **Data analysis**

Data analyses were performed using Statistical Package for the Social Sciences (SPSS) Version 17.0 for Windows. The sociodemographic were set as nominal scale in the level of measurement. Data presented as a percentage for categorical data. The bivariate and multivariate were performed in this study to confirm the purposes of this study by using linear regression. The study considers p-value  $<0.05$  as a statistically significant result.

## RESULTS

### *Demographic characteristics and clinical information of patients with type 2 DM*

A total of 68 patients with type 2 DM agreed to join in this study. More than half (58.8%) were female, age over 45 years old were 85.3%. The majority of education (42.6%) were graduated from the college and university and many of the works as entrepreneur or government officer. Above 66% were diagnosed with type 2 DM ranged from 1 to 5 year (Table 1).

Data related to clinical information showed that above 60% of the respondents having uncontrolled blood sugar levels and 58.8% had a normal blood pressure of 58.8%. One-third of patients had controlled cholesterol levels of 75%, and 58.8% with normal BMI. Furthermore, most of them (89.7%) had good knowledge and low risk for foot ulcers by 57.4% (Table 2).

Table 1. Demographic characteristics of patients with type 2 DM (n=68)

	n= 68	%
<b>Gender</b>		
Male	28	41.2
Female	40	58.8
<b>Age</b>		
< 45 years old	10	14.7
> 45 years old	58	85.3
<b>Education level</b>		
Illiterate	1	1.5
Elementary school	5	7.4
Junior high school	6	8.8
Senior high school	27	39.7
College/university	29	42.6
<b>Illness duration</b>		
1-5 years	45	66.2
> 5 years	23	33.8
<b>Working</b>		
Entrepreneur	20	29.4
Governmental employee	14	20.6
Household	10	14.7
Private sector employee	6	8.8
Retired	11	16.2
Military	4	5.9
University students	3	4.4

### *Factors associated with risk of diabetic foot ulcer*

Bivariate analysis using Spearman Rank Correlation Coefficient showed that total cholesterol and body mass index were significantly associated with the risk of diabetic foot ulcers in patients type 2 diabetes mellitus ( $\rho$  0.034 and  $\rho$  0,044, respectively,  $<\alpha$  0.05). However, we did not found any correlation between fasting blood glucose level, blood pressure, and knowledge level of foot care to risk ulcers (Table 3).

Table 2. Clinical information of patients with type 2 DM (n=68)

	n	%
<b>Fasting blood glucose</b>		
Controlled	25	36.8
Uncontrolled	43	63.2
<b>Blood pressure</b>		
Normal	40	58.8
Hypertension	28	41.2

<b>Cholesterol level</b>		
Controlled	51	75
Uncontrolled	17	25
<b>Body Mass Index</b>		
Normal	40	58.8
Obesity	28	41.2
<b>Knowledge of foot care</b>		
Good	61	89.7
Lack	7	10.3
<b>Risk of ulcer</b>		
Low	39	57.4
High	29	42.6

Based on the linear regression, total cholesterol and BMI were significantly associated with risk of diabetic foot ulcer. The significance value for the effect of total Cholesterol and BMI on the risk of diabetic foot ulcer was 0.017  $p < 0.050$  and F value 4.360  $> F$  table 3.14 (Table 4). In this research, the value of R square 0.118, it means that the effect of total cholesterol and BMI were 11.8% associated with a diabetic foot ulcer.

Table 3. Correlation between variable interests with the risk of diabetic foot ulcer

	<b>p- value (Sig 2.tailed)</b>	<b>(%)</b>
Fasting blood glucose	0.406	40.6
Blood pressure	0.645	64.5
Total cholesterol	0.034	3.4
Body mass index	0.044	4.4
Knowledge of diabetic foot care	0.991	99.1

## DISCUSSION

### *Characteristics of respondent*

According to Suardana (2014), characteristics of patients with type 2 diabetes mellitus that can be a risk factor of diabetic foot ulcers were gender, age, education level, duration of diabetes mellitus, and occupation. Respondents in this study showed that more than half were female, the results of this study were in line with the results of Rizky, Rudy and Zulkarnain (2015) research, where the majority of respondents who suffer from diabetes mellitus who are at risk of ulcers are women. Women patients have menopause phase that causes the decrease of estrogen hormone. Estrogen is a protective factor (immunity) against disease, one of which is atherosclerosis. Atherosclerosis can cause vascular disorders in diabetics so that women are more susceptible to diabetic ulcers. Furthermore, Arianti, Yetti, and Nasution (2012) state that the age can cause the risk of diabetic foot ulcers. Based on the American Diabetic Association (2010) the age of diabetics is categorized into two, age  $< 45$  years and age  $> 45$  years old, in which majority aged  $> 45$  had a greater risk of ulcers. Furthermore, duration of illness was associated with risk of ulcers as stated by Arianti, Yetti, and Nasution (2012) said that suffer from diabetes mellitus for over five years was a risk factor for diabetic ulcers because neuropathy tended to occur about five years. This is because the longer the diabetes mellitus the chances of chronic hyperglycemia getting bigger. Chronic hyperglycemia can lead to complications of diabetes mellitus, namely; retinopathy, nephropathy, and diabetic ulcers.

Also, Mahfud (2012) states that the level of education and knowledge alone is not enough in preventing the risk of someone exposed to a disease. The ability of a person to prevent the occurrence of a disease can be influenced by several factors, such as; the individual's behavior towards the illness (how to wear shoes and the type of shoe used), lifestyle, and whether or not for a routine health check. In this study also obtained the result where the majority of respondents work as an entrepreneur. Mahfud (2012) said one of the factors that affect the occurrence of disease (diabetic foot ulcers) is activity. Type of work can also affect the risk of disease, especially in type 2 diabetes mellitus. Working as an entrepreneur has a risk for injury, such as; falling, hit by heavy objects, stumbling, and others.

### *Factors associated with risk of diabetic foot ulcer*

Total cholesterol has associated the risk of diabetic foot ulcers. The results of this study were consistent with Hastuti (2008) that total cholesterol levels and the risk of diabetic foot ulcers were significant associated. Total cholesterol levels of  $\geq 200$  mg / dl can lead to poor circulation to most tissues and cause hypoxia and tissue injury, stimulate inflammatory reactions and cause atherosclerosis resulting in narrowing of the lumen of the blood vessels that will cause tissue circulatory disturbances resulting in decreased blood supply to blood vessels characterized with the loss or decrease in pulse in the dorsal artery of pedis, tibialis and poplitea, the feet become atrophy, cold and thickened nails. A case-control study by Prac in Hastuti (2008) also stated that people with diabetes mellitus with uncontrolled cholesterol three times higher risk of diabetic ulcers than controlled cholesterol levels.

Also, body mass index showed significant associated with the risk of diabetic foot ulcers. This was consistent with Istiqomah and Efendi (2013). O'Neals (2008) suggests that obesity is one of the main factors in diabetic foot ulcers because mechanically, people who are obese or overweight tend to increase plantar pressure. Obese people tend to have diabetes; this is due to decreased sensitivity to insulin (insulin resistance) or due to decreased insulin production. The limited ability of the Langerhans beta cells to produce insulin in quantity and quality leads to increased blood sugar in people with obesity. With normal BMI it is possible to balance the insulin produced with the amount of blood sugar in circulation. Normal blood sugar is a conducive atmosphere for blood viscosity, oxygen perfusion, and nutrition as well as immunity to muscle, liver and fat cells. This condition will support the wound healing process that can be proved by the growth of granulation and wound epithelization (Supriyatin et al., 2007).

No significant association between fasting blood sugar levels and the risk of diabetic foot ulcers can be influenced by other factors. Research conducted by Hastuti (2008) emphasized other factors may associate with the risk of ulcers in diabetics, including age, stress, diet, exercise intensity, and treatment. Fasting blood sugar itself can also be influenced by other factors, such as no or minimal glycosuria, no ketonuria, no ketoacidosis, rarely hypoglycemia, and normal HbA1C (Glycated Hemoglobin or Glycosylated Hemoglobin). The HbA1C test is useful for assessing long-term glycemic status and is useful for all types of people with diabetes mellitus.

In preventing the risk of diabetic foot ulcers, having good knowledge alone is not enough, good behavior or lifestyle is required so that the risk of diabetic foot ulcers does not occur, such as wearing appropriate shoes when traveling, using appropriate footwear, diligent checking and caring feet, perform routine control to the doctor. Monalisa and Gultom (2009) said that the lifestyle or behavior of diabetics in preventing and treating the illness could prevent complications (diabetic foot ulcers). Examining and treating the feet every day, especially the soles of the feet, toes, between the toes, nail care, foot skin care, to the type of shoe used is very important. Diabetes mellitus patients should be aware that foot care activities are part of everyday life, in addition to diabetics at risk of infection, vasculopathy disorders, and neuropathy so that the feet of diabetics are usually fissure, numbness (sensation of palpability is reduced) , and skin integrity disorders. When the disorder occurs diabetics cannot feel pain when stumbling, step on sharp objects, or injured. In people with diabetes mellitus, when the wound will be difficult to recover. This happens because in diabetic patient's neuropathy and vascularization disorders that will result in reduced nutritional supply so that wounds are difficult to heal. Hard-to-heal wounds will allow bacteria and microorganisms to enter and cause infection and risk causing diabetic foot ulcers.

### **CONCLUSION**

There was a significant relationship between cholesterol and body mass index with the risk of diabetic foot ulcers in patients with type 2 diabetes mellitus. Provide counseling or health promotion on the concept of occurrence, complications, and how to care and apply it at

home is important to be implemented in routine care. Future studies to explore other risk factors is needed including diet, exercise, and adherence to the treatment.

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