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Self-efficacy for prevention of diabetic foot ulcer among patients with type 2 diabetes mellitus

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Abstract

Background: It is estimated that by 2040 there will be more than 642 million people with diabetes in the world and 80% of those people will live in developing countries. This means that every 6 seconds there is one person with diabetes who dies. WHO estimates that the number of DM sufferers in Indonesia will increase from 8.4 million in 2000 to around 21.3 million in 2030. Currently, Indonesia is ranked as the fourth largest DM sufferer after China, India, and the US. The prevalence of diabetes mellitus in Lampung Province has increased with prevalence (1.2%).
Purpose: To determine of self-efficacy for prevention of diabetic foot ulcer among patients with type 2 diabetes mellitus
Method: A descriptive correlational design to determine the relationship between variables. The sample is 107 respondents and the sample is taken using purposive sampling. Data were collected using a questionnaire, foot care confidence scale (FCCS), and treatment behavior scale for diabetes (FCBS for Diabetes). The independent variable of this research is self-efficacy of DM patients and the dependent variable of this research is foot care activity. Data analysis using Spearman Rho correlation test (α = 0.05).
Results: Spearman Rho correlation test showed that there was a relationship between self-efficacy of people with diabetes mellitus and behavior in foot care activities. *p-value* = 0.000 (p <0.05), r = 0.786.
Conclusion: High self-efficacy in respondents with type-2 diabetes mellitus will increase behavior related to foot care activities.

Keywords: **Self-efficacy; Prevention; Diabetic foot ulcer; Patients; Type 2 diabetes mellitus**

INTRODUCTION

Diabetes mellitus is a chronic, progressive disease characterized by the body's inability to metabolize carbohydrates, fats, and proteins which is the initial cause of hyperglycemia (high blood sugar levels). Chronic hyperglycemia in diabetes mellitus is associated with long-term damage, dysfunction or failure of organs, especially the eyes, kidneys, nerves, heart, and blood vessels (Black & Hawk, 2021).

It is estimated that by 2040 there will be more than 642 million people with diabetes in the world and 80% of those people will live in developing countries (Susanti, & Pramana, 2020). This means that every 6 seconds there is one person with diabetes who dies. WHO estimates the number of people with DM in Indonesia from 8.4 million in 2000 to around 21.3 million in 2030 (Hariyono, & Sababa 2018).

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The total number of people with diabetes mellitus in the world is 425 million people with a prevalence of 8.8% of the world's population living with diabetes mellitus, if not handled properly the incidence of diabetes mellitus will increase to 629 million people in 2045 (Cho, Shaw, Karuranga, Huang, Fernandes, Ohlrogge, & Malanda, 2018).

The prevalence of diabetes mellitus based on Basic Health Research (2018) in Indonesia there has been a significant increase in the prevalence of diabetes mellitus in the last 5 years from 6.9% in 2013 to 8.5% in 2018 an increase from 2013-2018 of 1.6 %. In Indonesia the prevalence of diabetes (Haima & Fitriani, 2020).

Researchers interviewed 25 diabetic ulcer patients at Pringsewu Hospital in March 2019 with the reasons for foot ulcers. Many answered that they did not use footwear which caused the feet to be scratched by wood or sharp objects, bitten by insects. There are patients who state that they do not know that they have DM, while there are patients who are poorly controlled for their diabetes conditions. Patients come to the hospital if they have complaints related to their disease problems. Patients do not understand the proper foot care method to prevent diabetic foot ulcers (Sari, Haroen, & Nursiswati, 2016).

RESEARCH METHODS

This study used a descriptive correlational design that revealed the correlation between variables related to recognizing the relationship between self-efficacy/self-efficacy of diabetics and foot care activity behavior. This research was conducted in the working area of public health centers, Pringsewu Lampung on February – April 2021.

The population is diabetics and sampling using purposive sampling technique obtained 107 respondents. The instrument used in this study was a Foot Care Confidence Scale (FCCS) questionnaire, with a value range of 6 to 12, and to measure the self-efficacy of diabetics which consisted of 12 questions. The interpretation of the results is that high scores indicate high self-efficacy and low scores indicate low self-efficacy.

Foot care behavior is measured based on the foot nursing activity behavior scale for diabetes (FCBS) which consists of 17 questions, foot care score, with a value range of 7 to 13 (Pour Haji et al, 2016). The analytical test used is the Spearman Rho Correlation Test ($\alpha = 0.05$) with SPSS v-23. The letter of ethics was obtained from Malahayati University with the ethics number No. 2267 EC/KEP-UNMAL/V/2021.

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RESULTS

Table 1. Demographic Characteristics N= 103

Variables	Result	p-value	OR
Age (Mean+SD) Range (Years)	(64.93 ± 69.776) (45- 65)	0.935	
Gender (n/%)			
Male	85/79.4	0.243	
Female	22/20.6		
Ethnicity (n/%)			
Javanese	94/87.9	0.147	
Lampungnese	11/10.3		
Sundanese	2/1.9		
Religion (n /%)			
Muslim	103/96.3	0.051	
Other	4/3.7		
Education (n /%)			
Primary school	41/38.3	0.407	
Junior high school	52/48.6		
Senior High School	12/11.2		
Employment (n /%)			
Farmers	51/47.7	0.759	
Housewives	45/42.1		
Civil servants/ military / police / pensions	7/6.5		
Private sector	4/37		
Self efficiency (n /%)	61/88.4		
A high category	8/11.6		
A low category			
Foot care practice (n /%)			
Regularly	64/69.8	**.000**	**42,292**
irregularly	43/40.2		**(0,617-0,886)**

Based on the above table shows the characteristics of respondents consisting of type II diabetes mellitus patients with mean age of 64.93 years with a standard deviation of 69.776 years and a range of 45-65 years, the majority manifold male sex 85 (79.4%) respondents, ethnicity Javanese 94 (87.9%), and Muslim 103 (96.3%%), having junior high school education 52 (48%), and working as farmers 51 (47.7%) and have a high

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self efficacy 61 (88.4%) while respondents who perform foot care 64 (69.8%).

The relationship between age and foot care (p-value 0.935), the relationship between gender and foot care (p-value 0.243), the relationship between ethnicity and foot care (p-value 0.047), the relationship between religion and foot care (p - value 0.051), the relationship between education and foot care (p-value 0.407), the relationship between work and foot care (p-value 0.759), the relationship between self-efficiency and foot care (p- value 0.000).

DISCUSSION

The results of the study are in accordance with previous researchers, this study found that mostly women. Women are more affected by diabetes than men, especially type 2 diabetes mellitus. This is due to a decrease in the production of the hormone estrogen, which maintains a balance in blood sugar levels and increases fat storage. The respondents of this study were in the age group above 55 years. Diabetes mellitus often occurs after the age of 40 years. With increasing age, there will be impaired glucose tolerance. The aging process also causes physiological changes that affect homeostasis. One of them is a change in the function of pancreatic beta cells. The degenerative process of beta cells will cause inadequacy in producing insulin and have an impact on increasing blood sugar levels (Srimati. 2018; Mildawati, Diani, & Wahid. 2019))

The results of the study are in accordance with previous researchers, changes due to age such as vascular changes are associated with the occurrence of insulin resistance peripheral in type 2 diabetes. Decreased glucose intolerance affects the sensitivity of peripheral cells to insulin. This is what causes an increase in blood sugar levels in the elderly (Sholehudin, 2019).

The results of the study are in accordance with previous researchers, age, level of education, have received health education about how to treat diabetic feet, and have long suffered from DM. positive, objective, and open to information about the disease (Ngurah & Sukmayanti, 2014). The results of this study are mostly lower secondary education. Someone with secondary education, has the ability to receive, process information well. A person's educational background affects the ability to understand objects and information. Refers to the concept that the higher the education, the easier it is to receive and process information.

Based on the description above, it can be concluded that the people in the Puskesmas area in Pringsewu Regency who perform foot care are female, aged 56-65 years, educated below junior high school and work as a farmer.

Self Efficacy

The results showed that of the 107 respondents who had high self-efficacy and performed foot care, 61 people (88.4%) while respondents who had low self-efficacy and did not perform foot care 35 people (95.1%). Spearman Rho test showed *p-value* = 0.000 (p <0.05), r = 0.786.

Self-efficacy is defined as an individual's belief in his ability to organize and perform certain tasks to get the desired results (Kusuma & Hidayati, 2014). Self efficacy will affect how a person thinks, feels, motivates himself, and acts (Purwanti, 2013). Self-efficacy is also related to motivation, motivation has an influence on patient self-efficacy. Someone who has high motivation will show something positive in terms of DM management (Wu et al., 2006). Self-efficacy plays an important role in the process of behavior change, because self-efficacy can stimulate motivation towards health behavior through expectations from beliefs 'Self-efficacy is a person's ability based on the beliefs held to act and behave specifically. Outcome expectancy provides confidence that involvement in certain behaviors will produce the desired results and goal congruence helps a person resolve confusion and anxiety related to health goals (Aquarisnawati, Mustamiah, & Kumala, 2016). A good self-efficacy also affects the actions of patients in maintaining their health and the mindset of DM patients in self-care for diabetes mellitus. Someone who has good efficacy

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will always stick to his goals, and vice versa someone who has low self-efficacy will have low commitment to his goals. The higher the self-efficacy value of diabetes mellitus patients, the higher the confidence level of DM patients in performing self-care related to diabetes. Someone who suffers from DM and has a high self-efficacy score will have the potential to optimally carry out diet, exercise, independent blood glucose control, drug consumption, and diabetic foot care (Rachmawati, Sahar, & Wati. 2019).

High self-efficacy encourages the formation of a mindset to achieve expected results and thoughts to achieve real results expectations, but this must be supported with good goals. Knowledge and trust are components that underlie the implementation of individual and family self-management, because knowledge and belief have an impact on more specific behaviors, namely self-efficacy, outcome expectations and goal alignment, leading directly to changes in self-management behavior, increasing knowledge related to improving self-behavior and social facilitation. The results of other studies show that the higher a person's self-efficacy, the better the self-care of his feet, and vice versa if the value of a person's self-efficacy is low, the self-care of his feet will also be low. Self-efficacy has a significant relationship with foot self-care behavior in the elderly diagnosed with diabetes mellitus. This is also supported by the results of other studies which state that there is a relationship between self-efficacy and independent foot care behavior (Hamedan, Hamedan, & Torki, 2012). Foot care behavior is one part of self care in DM patients. DM patients who have good self-efficacy will be motivated and encourage themselves to maintain their health by obediently managing DM foot care independently which is more optimal when compared to DM patients who have low self-efficacy (Sa'adah, Primanda, & Wardaningsih, 2016).

Someone who has good self-efficacy, will encourage himself to behave positively in his life, so that in treating DM patients suffering from DM patients are able to maintain their diet, and are able to adhere to a healthy lifestyle according to DM treatment management including diabetic foot care (Hatmanti, 2017).

The author concludes that there is a relationship between self-efficacy and foot care behavior. Foot care behavior is one of the components in self care in DM patients. This is because DM patients who have good self-efficacy will be motivated and encourage themselves to maintain their health by performing DM management including more optimal foot care compared to DM patients who have low self-efficacy.

Based on the description above, it can be concluded that the community in the public healt centers area in Pringsewu Regency has high self-efficacy in treating diabetes mellitus foot care to prevent diabetic ulcers. According to the researcher, this is because the community already knows, is willing and able to carry out the diabetes mellitus foot care program.

CONCLUSIONS

The results of the study obtained respondents who were dominated by an average age of 64.93 years, male 79.4%, Javanese 87.9, Islamic religion 96.3, junior high school education 48.6, farmer occupation 47%, self efficacy 88.4%, foot care 69.8%. The all of the variables such as age, gender, ethnicity, religion, education, occupation, and self-efficacy, the self-efficacy variable is the one associated with foot care, the p-value is 0.000 below 0.005.

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