

## **THE IMPACT OF FOOT CARE EDUCATION ON KNOWLEDGE OF PREVENTION THE RISK FOR DIABETIC ULCERS AMONG DIABETIC PATIENTS**

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### **ABSTRACT**

Diabetic foot ulcers are the fastest growing chronic complications of diabetes mellitus, unmanaged diabetic complications such as diabetic foot ulcers will have a negative impact on the quality of life of individuals, health education, information and communication about DFU and foot care needs to be improved. The purpose of this study was to determine the impact of foot care education on knowledge of diabetic ulcer risk prevention in people with diabetes mellitus in the working area of the Mutiara Barat Health Center, Pidie Regency. This type of research is quasi-experimental research. The population in this study were all diabetes mellitus sufferers in the working area of the Mutiara Barat Health Center, Pidie Regency, in the last 1 month as many as 63 patients. Sampling was done purposive sampling technique as many as 25 people. The results showed that there was an effect of foot care education on knowledge of diabetic ulcer risk prevention in people with diabetes mellitus in the working area of the Mutiara Barat Health Center, Pidie Regency, which obtained a significance value of  $p = 0.001$  where  $p < 0.05$ . Health education provides moderate to moderate knowledge in helping diabetes mellitus patients to increase their knowledge about diabetic foot ulcer prevention. It is hoped that good knowledge will raise awareness, will and strength, so that it can change the behavior of diabetes mellitus patients into adaptive behavior that can prevent diabetic ulcers from occurring.

Keywords: diabetic ulcer risk prevention; knowledge; diabetic patients

### **INTRODUCTION**

Patients with diabetes mellitus are prone to amputation due to complications from ulcers that do not heal. Blood glucose levels that are not maintained for a long time can cause nerve damage, one of which is in the feet. Arterial disease is the biggest risk factor for peripheral amputation caused by high blood glucose levels that cause nerve damage to the legs and blood vessels (Mehraj, 2018). The International Diabetes Federation (IDF, 2020) states that there are 463 million adults living with diabetes in 2019, which is around 9.3% of the world's population in this age group and the number of deaths from diabetes and its complications is estimated at 4.2 million. The prevalence of diabetes is predicted to increase to 578 million (10.2%) in 2030 and to 700 million (10.9%) in 2045. It is estimated that almost half of all people (49.7%) living with diabetes do not have diabetes diagnosed. Additionally, there are an estimated 374 million individuals with impaired glucose tolerance (IGT) and it is projected that nearly 21.3 million female live births are affected by some form of hyperglycemia in pregnancy. In 2017, around 5 million deaths worldwide were caused by diabetes in the age range of 20-99 years (Cho et al., 2018).

Diabetes mellitus is a common metabolic disorder. Among the various complications, diabetic neuropathy and peripheral vascular disorders are closely related to diabetic foot ulcers (DFU). Lower extremity ulcers and amputations are ongoing problems among individuals with diabetes. (Jeon et al., 2017). A large number of diabetic foot ulcer (DFU) patients require amputation every year, which worsens their quality of life, increases their social burden, and shortens their life expectancy. Considering these negative effects, it is important to explore the risk factors influencing amputation in DFU patients. Risk factors that exacerbate amputation in DFU include male sex, history of smoking, history of foot ulcers, osteomyelitis, a lower body mass index, and a higher white blood cell count, but age, hbA1c levels were not associated with amputation in patients with DFU (Lin et al., 2020).

Diabetic foot ulcers or diabetic foot ulcers are the fastest growing chronic complication of diabetes mellitus, globally more than 400 million people are diagnosed with DFU, and this condition contributes to lower limb amputation in 85% of people with DFU and leads to increased hospitalizations and increased risk of death. Neuropathy and peripheral arterial disease predispose to deformity or trauma, and aggravating factors such as infection and edema are etiologic factors for the development of DFU. DFU requires identification of the etiology and assessment of comorbidities to provide an appropriate therapeutic approach, which is indispensable for reducing the risk of lower extremity amputation. (Perez-Favila et al., 2019). Diabetic foot ulcers (DFU) are a common complication of diabetes that can be prevented through being active on the feet, but many people with diabetes do not follow foot care recommendations. Knowledge of diabetics about DFU is important to identify to prevent ulceration or the impact of its management (Coffey et al., 2019).

A study shows that knowledge and behavior of diabetic foot care is still the biggest concern among diabetics in Indonesia. This study shows that DM patients with good DM foot care knowledge may not always turn their knowledge into practice. Based on the results of our study, the knowledge and behavior of diabetic foot care among the participants in this study was inadequate. Knowledge gaps and inadequate diabetic foot care behaviors indicate the need for interactive educational interventions about foot care. (Sulistyo et al., 2018). Based on the problems above, researchers are interested in further studying the impact of foot care education on preventing the risk of diabetic ulcers in diabetic patients.

## **METHOD**

This study applied a quantitative design type is quasi-experimental research., Sampling was done purposive sampling technique as many as 25 people. This study was conducted at working area of the Mutiara Barat Health Center, Pidie Regency, agt 08th until sept 10th 2022. Data were collected with a questionnaire with 15 items questions were measured using a 2-point dichotomy scale the intervention provided was health education with leaflet media, before being given an intervention, a measurement of knowledge about diabetic ulcer prevention pre and post intervention. Data were analyzed using descriptive statistics and non parametric is wilcoxon rank test.

## RESULTS AND DISCUSSION

Table 1.  
Demographic Data/Characteristics of Diabetic Patients (n=25)

Variable	f	%
Gender		
Man	7	28,00
Woman	10	72,00
Education		
Elementary school	8	32,00
Junior high school	10	40,00
Senior high school	5	20,00
College	2	8,00
Work		
Housewife	7	28,00
Farmer	12	48,00
Self-employe	6	24,00

Table 1 shows demographic data/characteristics of diabetic patient, majority of gender is 72 % of respondent were male, 40 % had a junior high school (SMP), and 48 % the respondent's occupation is a farmer. Educational background affects the level of one's knowledge.

Table 2.  
Knowledge of Diabetic Ulcer Risk Prevention Before Being Given Foot Care Education of Diabetic Patients (n=25)

Knowledge	f	%
High	4	16,0
sufficient	12	48,0
less	9	36,0

Table 2 shows that the majority of knowledge on preventing the risk of diabetic ulcers before being given education on foot care in patients with diabetes mellitus were in the sufficient knowledge category with 12 respondents (48.0%).

Table 3.  
Knowledge of Diabetic Ulcer Risk Prevention Before Being Given Foot Care Education of Diabetic Patients

Knowledge	f	%
High	16	64,0
sufficient	5	20,0
less	3	12,0

Table 3 shows that the majority of knowledge on preventing the risk of diabetic ulcers after being given education on foot care in patients with diabetes mellitus were in the high knowledge category with 16 respondents (64.0%).

Table 4.  
 Analysis Differences in Knowledge Before and After Foot Care Education

Catagory	Mean Rank		<i>P-Value</i>
	Before	After	
Knowledge	0,00	11,50	0,001

Table 4 shows the results of statistical tests using the Wilcoxon Signed Ranks test, which shows that there is a significant difference between before and after the foot care education intervention on increasing knowledge of diabetic ulcer risk prevention in diabetic patients

Foot ulceration is a major problem for diabetics. A study examining patients and health care staff on the outcome of diabetic foot complications in hospitals in Nigeria showed that a total of 155 patients, 64 (41%) were male and 91 (59%) women, with a mean age of  $49 \pm 3$  years and a mean duration of diabetes  $6 \pm 2.6$  years. At the start of the program, 70% of patients had no knowledge of foot care education. Only 13.5% know that diabetic foot ulcers can occur related to long duration of diabetes, nerve damage, blocked blood vessels, foot deformities, and uncontrolled blood glucose. Ninety-two percent of patients prefer home remedies, herbal remedies, or a chemist in case of an ulcer. After the program, 77% will seek hospital treatment as the first choice, and the amputation rate has decreased from 50% in 2009 to 10% in 2017 (Anumah et al., 2022). The results of a systematic review of twenty-six studies and a meta-analysis of 9 studies show that diabetic foot education increases the level of knowledge and behavior of diabetic patients. Educational interventions with long-term follow-up are necessary to address the increasing health care needs of patients with diabetes (Yıldırım Ayaz et al., 2022).

Daily foot care in diabetic patients prevents foot infections. structured teaching program on foot care in patients with diabetes mellitus in increasing their knowledge. A study that examined the effect of a structured teaching program on foot care among patients with diabetes mellitus in increasing knowledge with a pre-experimental one group pre test-post test design, as many as 60 diabetes mellitus patients were selected using a purposive sampling technique and then an assessment of the level of knowledge by using a structured questionnaire. education one by one was given to diabetes patients using a structured teaching program. The post test was carried out after 5 days. The results showed that the average pretest level of knowledge was 8.73 and the standard deviation was 3.64. The average post-test knowledge level is 10.1 and the standard deviation is 3.40 with an average difference of 1.37. Comparison between pre-test and post-test knowledge scores revealed that there was a significant difference in knowledge scores after the structured teaching program ( $t=10.70$ ;  $p<0.05$ ). Therefore, it was concluded that a structured teaching program is an effective method for providing moderate to moderate knowledge in helping diabetes mellitus patients to increase their knowledge about diabetic foot ulcer prevention (Janet et al., 2019).

Other research that is relevant to this research is research conducted by (Ahmad Sharoni, n.d.), in this study, the intervention group will be given seminars and demonstration of foot self-care behavior. Whereas the control group will receive regular health care, this activity lasts for 12 weeks, the results show that after completing the program, foot self-care behavior, foot care efficacy, foot care outcomes, knowledge about foot care and quality of life increased in the

intervention group. Another factor that influences knowledge and behavior in preventing diabetic ulcer complications is self-efficacy. Self-efficacy theory can be included in diabetes education to improve foot self-care behavior and improve physical and psychosocial outcomes of elderly people with diabetes.

Potential risk factors for foot ulceration include not receiving regular foot care education; wearing the wrong footwear; diabetes duration; nervous pain; and peripheral arterial disease. (Alshammari et al., 2022). Foot care education has a positive impact on foot self-care behavior and self-efficacy in individuals with diabetes (Goodall et al., 2020). The results of a systematic review of twenty-six studies and a meta-analysis of 9 studies show that diabetic foot education increases the level of knowledge and behavior of patients with diabetes. Educational intervention with long-term follow-up is necessary to address the increasing health care needs of patients with diabetes (Yıldırım Ayaz et al., 2022).

Unmanaged complications of diabetes such as diabetic foot ulcers will have a devastating impact on the quality of life of individuals with diabetes and place a huge economic burden on families, governments and health care services. However, these complications can be prevented with adequate patient knowledge and practice regarding DFU and foot care. There are some people with diabetes who have poor knowledge about DFU but have awareness about foot care, especially on foot cleaning and inspection, preventing irritation after washing, appropriate footwear, and not walking barefoot. improvement of health education, information, and communication about DFU and foot care that is centralized and adapted to the understanding of people with diabetes can prevent DFU and reduce mortality from this complication, which is the main target of the sustainable development goals (SDG) in mitigating the burden of non-communicable diseases (PTM) such as diabetes (Adeyemi et al., 2021).

Another study on the investigation of foot care knowledge and behavior in patients with diabetes to determine the effects and current challenges of foot care education, as a basis for improving education and reducing diabetic foot complications, the results show that knowledge and foot care behavior in patients with diabetes are at low to moderate levels. , especially on items related to foot self-examination, prompt treatment of foot problems, and regular foot examinations by professionals. Individuals at high risk of developing foot complications did not score higher on the knowledge and behavior questionnaire. These data suggest there is a need for improvements in instruction and patient uptake and application of knowledge. the effectiveness of delivering foot care education should be based on foot risk stratification, and the implications of foot ulcer prevention (Liu et al., 2020).

## **CONCLUSION**

Daily foot care in diabetic patients prevents foot infections. foot care education in patients with diabetes mellitus can increase their knowledge. Diabetic foot ulcer complications can be prevented with adequate patient knowledge and practice regarding DFU and foot care. \improvement of health education, information, and communication about DFU and foot care that is centralized and adapted to the understanding of people with diabetes can prevent DFU and reduce mortality from this complication. Foot care education has a positive impact on foot self-care behavior and self-efficacy in individuals with diabetes

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