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Correlation of Knowledge and Foot Care with Reccurent Occurrence of Diabetic Foot Ulcer in Patients with type 2 DM at Ulin Banjarmasin Hospital

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Abstract: Diabetic foot ulcers (DFU) are a complication in patients with DM characterized by clearly visible wounds, usually on the soles of the feet, which can cause loss of sensation or nerve death. Factors affecting the incidence of UKD include lack of knowledge and implementation of foot care in patients with type 2 DM. Objective: Knowing the relationship between knowledge and foot care on the incidence of recurrent diabetic foot ulcers in patients with type 2 diabetes in RSUD Ulin Banjarmasin. Methods: Quantitative research method with a cross sectional approach. In this study, the sampling technique used was purposive sampling with a total of 51 respondents. Results: The results of the Spearman Rank test analysis showed a significant relationship between knowledge and foot care on the recurrence of diabetic foot ulcers. Knowledge has a moderate correlation (r = 0.371) and foot care has a strong correlation (r = 0.713).Conclusion: Based on the results of the study, the knowledge of respondents on the recurrence of UKD showed that 13.7% had good knowledge, 66.7% had sufficient knowledge and 2% had poor knowledge with the first ulcer. The implementation of foot care also showed that 17.6% had good implementation, 82.4% had sufficient implementation of foot care.

Keywords: *Diabetic Foot Ulcer, Foot Care, Knowledge*

1. Introduction

Diabetic foot ulcers (DFU) are wounds on all or half of the skin that can extend to tissues in the deep layers of the skin such as tendons, muscles, bones, or joints that occur in people with DM. This condition is caused by high levels of glucose in the blood. If DFU is sustained, untreated and the wound does not heal, the wound will become infected. DFU often leads to gangrene and lower limb amputation (Bachri et al., 2022). The prevalence of DFU worldwide is 6.4%, the highest in Belgium is 16.6%, and the lowest in Australia is 1.5%, in other countries and continents such as North America 13%, Asia 5.5%, Europe 5.1% while the incidence of DFU tends to be higher in men than women, namely 4.5% and 3.5% (Hermawati et al., 2021). In Indonesia, the prevalence rate of DFU is around 12% and the risk of DFU is around 55.4%. DFU

can experience infection where there are about 44-68% of patients with DFU patients who undergo inpatient treatment in the hospital triggering lower limb amputation (Delima, 2022).

Patients with DM with DFU are at high risk of developing recurrent complications due to various factors. Neuropathy can cause loss of sensation in the feet, so people with DM may not be aware of small cuts or injuries that could develop into a DFU. In addition, ischemia or poor blood flow to the lower extremities can slow down the healing process and increase the risk of infection. Untreated infections can aggravate the condition of DFU and lead to amputation. Lack of knowledge about poor foot care can contribute to the recurrence of DFU. Even after the wound has healed, the affected area remains vulnerable due to the resulting scarring and ongoing nerve damage. Therefore, good foot care, strict blood sugar control and regular monitoring are essential to prevent recurrent DFU (Raflis, 2021).

DFU has a negative impact on biological, psychological, socioeconomic and spiritual aspects (Tjomiadi & Manto, 2022). If DFU does not receive proper care, it can cause impacts such as the onset of infection that can spread to the inside of the foot and can result in amputation (Made Dyah Ayu & Rahmawati, 2022). DFU is a serious complication of the disease with a high mortality rate, DFU can cause sufferers to be unable to work again so that income is reduced, disrupt social interaction and will have an impact on psychological conditions (Susanti & Amita, 2021).

Knowledge is the beginning of changes in a person's behavior that can indicate a person's ability to carry out self-care. DFU is unlikely to appear if the patient has good knowledge and proper application of foot care. Generally, DFU occurs due to improper foot care, excessive pressure on the feet and also repeated trauma (Rosyid et al., 2020). Foot care is one aspect of self-management where patients must do things such as washing their feet every day, drying their feet after washing and always checking their feet if using closed footwear (Ningrum et al., 2022).

Based on the results of preliminary study research that has been carried out by researchers, data from Banjarmasin Ulin Hospital on type 2 DM patients with UKD complications in the Diabetic Foot Clinic in September - November were 215 people with a total number of Diabetic Foot Polyclinic visits of 1,171 visits, with details in September totaling 458 visits, in October 376 visits, and in November totaling 337 visits. Based on the description above, the researcher is interested in knowing "The Relationship between Knowledge and Foot Care on the Recurrence of Diabetic Foot Ulcers in Type 2 DM Patients at Ulin Banjarmasin Hospital".

2. Materials and Methods

The research method used in this study is a quantitative method with a cross sectional approach. This research was conducted in the Diabetic Foot Polyclinic room of Ulin Hospital Banjarmasin. The population of this study were type 2 DM patients with UKD complications who performed outpatient care at the Diabetic Foot Polyclinic Room of Ulin Hospital Banjarmasin, totaling 205 people. The sample used in this study was 51 respondents, the sampling technique used purposive sampling technique in accordance

with the inclusion and exclusion criteria determined by the researcher.
Data collection instruments used in this study used a questionnaire sheet on knowledge of UKD and implementation of foot care. The data listed in the questionnaire sheet are patient initials, respondent code, age, gender, year diagnosed with DM, latest education, category of long suffering from DM and category of first / recurrent diabetic injury.

3. Results and Discussion

This study was conducted by researchers by collecting data directly through filling out questionnaires by research respondents about knowledge of diabetic foot ulcers and implementation of foot care on the recurrent incidence of diabetic foot ulcers in type 2 DM patients at Ulin Banjarmasin Hospital in April-May 2024.

Table 1. Characteristics of Respondents

Characteristics	Frequency	Persentage(%)
Duration of DM		
<10 years	26	51
>10 years	25	49
Age		
Lansia (46-65 tahun)	42	82,4
Manula (>65 tahun)	9	17,6
Level of Education		
Elementary School	8	15,7
Junior High School	13	25,5
Senior High School	25	49
Bachelor	5	8,9
Gender		
Female	29	56,9
Male	22	43,1
Job		
Housewife	24	47,1
Labor	5	9,8
Private Employee	16	31,4
Civil Servants	6	11,8

Sumber: Data Primer, 2024

Based on the results of research on the characteristics of respondents based on the length of time suffering from DM, most of the respondents with Diabetic Foot Ulcers (UKD) suffered from DM for <10 years, namely 26 people (51%). From the results obtained, we can know that most of the patients with diabetic foot ulcers (UKD) at Ulin Banjarmasin Hospital are elderly respondents (46-65 years old). The results of the research findings based on the last education of the respondents, the majority of SMA, namely 25 people (49%) and the smallest remaining S1 as

many as 5 people (8.9%). This study based on the gender characteristics of respondents at Ulin Banjarmasin Hospital showed that most were women, namely 29 people (56.9%). The results of the research findings based on the occupation of respondents found the majority as housewives 24 people (47.1%) and the least laborers as many as 5 people (9.8%).

Table 2. Respondent Knowledge

Knowledge	Frequency	Persentage (%)
Good	12	23,5
Moderate	38	74,5
Bad	1	2
Total	51	100

Sumber: Data Primer, 2024

Table 2 shows that most of the respondents had moderate knowledge about diabetic foot ulcers (DFU), namely 38 people (74.5%). In addition, there are 12 people (23.5%) who have good knowledge about diabetic foot ulcers (DFU). There was one respondent (2%) who had bad knowledge about diabetic foot ulcers (DFU).

Table 3. Implementation of Foot Care

Foot Care	**Frequency**	**Persentage (%)**
Good	9	17,6
Moderate	42	82,4
Total	51	100

Sumber: Data Primer, 2024

Table 3 shows that 42 people (82.4%) of the respondents had moderate foot care implementation, and 9 people (17.6%) had good implementation.

Table 4. Reccurent Incidence of Diabetic Foot Ulcers

DFU Occurrence	Frequency	Persentage (%)
First	12	23,5
Recurring	39	76,4
Total	51	100

Sumber: Data Primer, 2024

In this study, the sample was purposively selected by involving 51 respondents who were DM patients who developed diabetic foot ulcer (DFU) complications and met the inclusion and exclusion requirements. Based on table 4.10 above, most respondents experienced recurrent diabetic foot ulcers (DFU) as many as 39 people (76.5%) and respondents who experienced the first diabetic foot ulcer (DFU) were 12 people (23.5%).

Table 5. Results of the Spearman Rank Correlation Test of Knowledge on the Recurrence of Diabetic Foot Ulcers

Knowledge	Incidence of Diabetic Foot Ulcers						*p*	*r*
	First		Recurring		Total			
	f	%	f	%	f	%		
Good	7	13,7	5	9,8	12	23,5	0,007	0,371
Moderate	4	7,8	34	66,7	38	74,5		
Bad	1	2	0	0	1	2		
Total	12	23,5	39	76,5	51	100		

Sumber: Data Primer, 2024

The analysis of this study was carried out with the Spearman Rank test showing a p-value of 0.007 ($p < 0.05$) which indicates that there is a significant relationship between knowledge and the incidence of diabetic foot ulcers (DFU). The correlation coefficient (r) obtained was 0.371 indicating that there was a moderate level of correlation.

This study emphasizes that knowledge about DFU is associated with the incidence of diabetic foot ulcers, both for first and recurrent ulcers. Patients with good knowledge were more likely to have a first ulcer than a recurrent ulcer, while patients with fair knowledge were more likely to have a recurrent ulcer. This suggests that better knowledge can reduce the frequency of recurrent ulcers, although it does not completely eliminate the risk of first ulcers. According to Luthfa & Fadilah (2019), good knowledge related to diabetic foot ulcers is often obtained after experiencing the condition before. Although good or sufficient knowledge can help prevent ulcer occurrence, factors such as non-compliance in care and poor blood sugar control can still lead to the risk of diabetic foot ulcers.

Ramadhani & Situmorang (2022) stated that people who first develop diabetic foot ulcers may have poor knowledge because this condition is new to them and they have never received information regarding the complications of diabetic foot ulcers. The lack of understanding about the causes, signs and symptoms, and management of ulcers makes their knowledge about good foot care limited. Therefore, it is important to provide appropriate and easy-to-understand health education to them to ensure they can take good care and understand their condition.

This study is in agreement with Romina's (2022) study which showed that the better the knowledge, the lower the incidence of diseases, including diabetic foot ulcers (DFU), with a p- value of 0.003. Conversely, poor knowledge increases the risk of DFU. Therefore, improving patient knowledge through health education on prevention, early recognition and treatment of DFU is essential. Family and healthcare support is also crucial to help patients apply their knowledge in daily care. With improved knowledge and proper foot care implementation, it is hoped that the incidence of pressure ulcers, especially recurrent ulcers, can be reduced.

Factors that impact a person's knowledge include education level, age, and gender. Higher educated individuals usually have better health knowledge, including about DM, so they are more likely to obtain information about DM prevention. As age increases, body functions

decline, so older age groups require more education to ensure a good understanding of DM. Men tend to be less concerned about their health than women, so increased awareness is needed in the prevention of recurrent DFU complications.

Table 6. Results of Spearman Rank Correlation Test of Foot Care Implementation with Recurrent Occurrence of Diabetic Foot Ulcers

Foot Care	Incidence of Diabetic Foot Ulcers						*p*	*r*
	First		Recurring		Total			
	f	%	f	%	f	%		
Good	8	15,7	1	2	9	17,6	0,000	0,713
Moderate	4	7,8	38	74,5	42	82,4		
Total	12	23,5	39	76,5	51	100		

Sumber: Data Primer, 2024

The analysis of this study showed a p-value of 0.000 ($p<0.05$) which means that there is a significant relationship between the implementation of foot care and the incidence of diabetic foot ulcers (DFU). The correlation coefficient (r) is 0.713, indicating that the level of correlation is relatively strong.

This study found that good foot care practice has a significant impact in reducing the incidence of diabetic foot ulcers, especially in the incidence of recurrent ulcers. Respondents who performed foot care well tended to have fewer recurrent ulcers compared to respondents whose foot care implementation was adequate. Factors that influence the implementation of foot care, such as duration of DM, education level, age, and gender, were also found to have an influence on the risk of developing diabetic foot ulcers.

This study is in line with previous studies that have shown that good foot care does not always guarantee effective prevention of diabetic foot ulcers. Therefore, it is necessary to take appropriate preventive measures, such as selecting appropriate footwear and checking the feet regularly for wounds or irritation.

The results of this study also showed that the better the foot care, the better the risk of diabetic foot ulcers. Factors such as difficulty controlling blood sugar that can increase the risk of diabetic foot ulcers were also found to have an influence on the risk of diabetic foot ulcers. This study emphasizes the importance of good foot care to prevent the occurrence of diabetic foot ulcers, as well as the need for more education to individuals, especially men, to increase awareness and implementation of good foot care.

4. Conclusion

Based on the results of research with questionnaires related to the Relationship between Knowledge and Foot Care on the Recurrence of Diabetic Foot Ulcers in Type 2 DM Patients at Ulin Banjarmasin Hospital, the following conclusions are concluded knowledge about diabetic foot ulcers among respondents was categorized as moderate as many as 38 people (74.5%). The implementation of foot care for respondents was categorized as moderate as 42 people (82.4%). The incidence of diabetic foot ulcers was

found that most respondents experienced recurrent foot ulcers as many as 39 people (76.5%). The Spearman rank test results show the relationship of knowledge to the incidence of recurrent diabetic foot ulcers with a p-value of 0.007 and r 0.371 (moderate correlation), as well as the relationship of foot care to the incidence of recurrent diabetic foot ulcers with a p-value of 0.000 and r 0.713 (strong correlation).

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Conflict of Interest

No conflict of interest and agree with the content of the manuscript.

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