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FAMILY SUPPORT AS A DETERMINANT OF FOOT CARE COMPLIANCE IN RECURRENT DIABETIC FOOT WOUNDS

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Abstract

As many as 15-25% of Diabetes Mellitus (DM) patients have the potential to experience diabetic foot ulcers and the rate of recurrence or recurrence of diabetic ulcers is 50% to 70% over 5 years. Recurrent diabetic ulcers have various impacts such as reduced quality of life, economic burden, and psychological, and social effects, even if not treated properly, they can lead to infection, amputation, and even death. The study aimed to analyze the relationship between family support and foot care compliance with the incidence of recurrent diabetic ulcers. The study design was a cross-sectional study, with a sample size of 50 diabetic ulcer patients and the family support measurement instrument was the Hensaring Diabetes Family Support Scale (HDFSS). The results of statistical analysis using the chi-square test obtained p value = 0.013. Patients who adhere to foot care experience recurrent wounds (12%) and those who do not comply with foot care experience recurrent wounds (34%). Statistical analysis using the chi-square test obtained p value = 0.039. It can be concluded that family support and compliance with foot care are related to the incidence of recurrent diabetic foot injuries.

Keywords: *Family Support; DM Patients; Foot Care; Foot Wounds; Repetitive Wounds.*

1. Introduction

The International Diabetes Federation (IDF) estimates that in 2019 there will be 463 million people suffering from diabetes mellitus (DM) aged 20-79 years in the world, or equivalent to a prevalence rate of 9.3% of the total population of the same age. The figure is predicted to continue to increase until it reaches 578 million in 2030 and also 700 million in 2045 (Nursa et al., 2022)**.** Data in Poso Regency shows Please remember the following text: "The number of complications related to diabetes mellitus." the form of diabetic ulcers has also increased, namely in 2021 there were 101 cases and 58% were recurrent diabetic ulcers. In the independent practice of nurses and home care, data was obtained that 62% of ulcer patients who received wound care were cases of recurrent diabetic ulcers. 15-25% of DM sufferers have the potential to experience diabetic foot ulcers during their lives, and the rate of recurrence or recurrence of diabetic ulcers is 50% to 70% over 5 years (Mitasari et al., 2019). This is because many DM sufferers do not understand how to prevent recurrent diabetic ulcers.

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Recurrent diabetic ulcers occur due to long suffering from DM, uncontrolled blood sugar levels, obesity, sensory neuropathy, diet patterns, physical activity, and foot care (Marissa & Ramadhan, 2017). Sensory neuropathy or loss of feeling in the feet is the

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most common and dangerous cause of recurrent diabetic ulcers, because the feet cannot feel sensations such as pain, so diabetic ulcers occur again. The incidence of recurrent ulcers in DM sufferers is very large, almost equal to that of patients suffering from diabetic ulcers for the first time, namely 51% who do not experience recurrent ulcers and 49% who experience recurrent ulcers. When accumulated, it can be observed that recurrent ulcers occur more frequently in DM sufferers < 10 years. It was even found that people who had suffered from DM for more than 6 years experienced recurrent ulcers up to 5 times. The frequency of recurrent ulcers in DM sufferers often occurs, especially in the first year of suffering, despite regular follow-up and health education (Marissa & Ramadhan, 2017).

Recurrent diabetic ulcers have various impacts such as decreasing the patient's quality of life, economic burden, psychological burden, social impact, and even repeated wounds that are not handled properly can lead to infection, amputation, and even death. Factors associated with the occurrence of recurrent foot ulcers are important for patients to know families can take preventive measures. One of the factors that influence healing from DM ulcers is compliance with foot care (Agung et al., 2021). Foot care compliance is the patient's obedience in behaving to the provisions given by health workers in preventing the recurrence of diabetic foot (M. Sari et al., 2020). As many as 23‑52% of DM patients do not adhere to foot care (Ui, 2012).

Foot care a preventive strategy to reduce the occurrence of wounds in people with diabetes mellitus is to take care of the feet to prevent ulcers on the legs. Preventive foot care includes washing your feet properly, drying them by oiling them and being careful not to get the gaps between your toes wet. Foot inspections or examinations should be done daily to check for symptoms of redness, fissures, calluses, or ulcers (Woo & Cui, 2023). Foot care is part of primary prevention efforts in the management of diabetic feet which aims to prevent initial injuries and even recurrent injuries (Shinta Arini, 2017). Foot care consists of foot examinations and daily foot care such as checking feet, using footwear, washing feet and cutting nails, and checking for signs of redness, bruising, wounds, fungal infections, or irritation of wounds. Foot wounds are not only seen from the compliance of diabetic ulcer sufferers in carrying out foot care, but many other factors can cause foot wounds such as poor control of blood sugar levels, irregular diet, smoking history, and history of previous injuries (Fatmawati et al., 2020). If DM sufferers who have foot ulcers do not receive immediate treatment, the wounds will have difficulty healing and are at risk of developing recurrent ulcers. Family support is one of the factors related to motivation to perform foot care (Ismonah & Octaviani, 2019).

Patients with Diabetic Foot Care who have healed are at risk of experiencing recurrent diabetic ulcers so it is important to prevent this. Family support and assistance will make it easier for patients in their daily lives because they will feel cared for so that good foot care can be achieved, and patients will avoid foot complications and wounds (Ismonah & Octaviani, 2019). To prevent recurrent injuries, the patient may no longer be able to carry it out independently, either due to complications from retinopathy, obesity, joint pain, or other physical problems, so the family needs to provide support. The family can be a reminder and provide material and non-material support for patients in preventing recurrent foot injuries (Sari et al., 2016). In this condition, the role of the family becomes very important in facilitating the patient to carry out the expected foot care. Family involvement in caring for sick family members will help reduce stress against disease, help control blood sugar, and help increase self-confidence (Munir, 2021). DM sufferers will have low self-esteem, despair, and be irritable so they need family help, both moral and spiritual support (Wardani & Isfandiari, 2014). As many as 56.1% of respondents always take foot care and 63.4% take medication regularly. As many as 39.0% of respondents said they had never received informational support. In terms of instrumental support, the majority of respondents, namely 53.7%, stated that they always get, as well as emotional support and appreciation which always get 65.9% (Nadya et al., 2024).

Research shows that most patients come alone to the puskesmas without being accompanied by other family members, and respondents said that other family members were busy with work. The results

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of the study conducted by (B. R. Sari, 2022) described that from the results of interviews conducted on 15 patients with Diabetes Mellitus (DM) who did not know the correct way to take care of their feet, DM patients only washed their feet every time they came home from traveling, cut their nails when they were long, used lotion if necessary, even 10 of them never used lotion because they considered it essential. It is not important, the use footwear is only used when leaving the house, and often forgets to use footwear, if there is a wound on the patient's leg, only apply red medicine without covering it with a standard bandage and do not carry out routine health checks with health services or Puskesmas.

Based on a preliminary study at the Poso District Hospital, there were many patients with recurrent injuries to the lower extremities, both with ulcers that had been injured for a long time and then re-injured and also with wounds in different places. The patient had received education regarding foot care but the patient who had been treated came back because of recurrent diabetic ulcers. Data shows that patients do not carry out proper foot care and lack family support after returning home. The purpose of the education is to make patients understand the importance of caring for their feet independently and consult regularly with medical personnel to prevent the recurrence of foot injuries so that they can improve their quality of life, reduce the risk of further complications, and maintain mobility. The expected outcome after the education is that patients and families can understand the causes of diabetic foot injuries and the associated risks, identify early signs of wounds and infections in the feet, perform proper independent foot care, check the feet daily for any discoloration, wounds, or abrasions and choose appropriate and safe footwear to use.

2. Method

The research design is a cross-sectional study. The population is all patients with diabetic ulcers who receive wound care at health facilities in the Poso Regency. Samples were taken using a purposive sampling technique. Inclusion criteria: willingness to be a respondent, presence of diabetic ulcers, and good general condition. The exclusion criteria are patients who cannot communicate well. The type of research is cross-sectional study. The population in this study is 219 people. The number of samples selected was 50 people using non-probability sampling, namely purposive sampling, where the population was selected non-randomly using inclusion criteria to describe the variation.

The independent variables are family support and foot care. Family support was measured using the Hensaring Diabetes Family Support Scale (HDFSS) questionnaire. Foot care was measured using a questionnaire consisting of 14 questions with the answer options "Yes & No". The measurement results are: "good" and "poor". Good if the respondent's score is 21-28 and poor if the respondent's score is 14-20. (M. Sari et al., 2020).

The dependent variable is the incidence of recurrent diabetic ulcers. Recurrent diabetic ulcers were measured using an observation sheet with the measurement results namely new ulcers and recurrent ulcers. New ulcers if the patient is experiencing a diabetic wound for the first time, recurrent ulcers if the current wound is the second or more wound or has previously been injured. Data analysis to analyze the relationship between the independent variable and the dependent variable using the chi-square statistical test at α = 0.05.

3. Result and Discussion

Table 1. Frequency Distribution of Respondents

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Characteristics	Frequency	Percentage
Age		
31-45 Years	16	32.0
46-60 Year	20	40.0
≥61 Years	14	28.0
Gender		
Man	23	46.0
Female	27	54.0
Education		
Elementary School	6	12.0
Middle School	8	16.0
SMA	22	44.0
College	14	28.0
Work		
Civil Servant	13	26.0
Enterpreneur	5	10.0
Farmer	13	26.0
IRT	14	28.0
Not Working	5	10.0
Suffering From DM for a long time		
1-3 Tahun	22	44.0
4-6 Tahun	15	30.0
7-9 Tahun	7	14.0
>10 Tahun	6	12.0
Long Wound		
1 Week	3	6.0
2-4 Week	14	28.0
1-3 Months	24	48.0
4-6 Months	9	18.0
Total	50	100.0

Table 1 shows that the majority of respondents were aged 46-60 years (40.0%), the largest gender was female (54.0%), the highest education was high school (44.0%) and the largest occupation was a housewife (28.0%). The longest duration of suffering from DM is 1-3 years (44.0%), 4-6 years (30%) and the length of injury currently experienced is around 1-3 months (48.0%).

Table 2. Description of family support, compliance with foot care, and the incidence of recurrent injuries

Variable	Frequency	Percentage
Family support		
Height	30	60
Low	20	40
Total	50	100
Foot Care Compliance		
Obedient	22	44
Disobedient	28	56
Total	50	100
Diabetic Foot Wounds		
Just	27	54
Recurring	23	46
Total	50	100

Table 2 shows that the most family support is high family support (60%), those who adhere to foot care (44%), and the most respondents who have recently experienced injuries (54.0%).

Table 3. Relationship between family support and recurrent injuries

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Family Support	Diabetic Foot Wounds				Total		*P*
	Just		Repeated				
	F	%	F	%	F	%	
Height	21	42	9	18	30	60	
Low	6	12	14	28	20	40	0.013
Total	27	54	23	46	50	100	

Table 3 shows that respondents who received high family support suffered from new injuries (42%) and recurrent injuries (18%) while those who received low family support experienced new injuries (12%) and recurrent injuries (28%). Based on the results of statistical analysis, the OR value was 7.908, which means that those with low family support are at risk of experiencing recurrent foot injuries 7.9 times greater than those with high family support. Based on the chi-square test, p-value = 0.013, it can be concluded that there is a significant relationship between family support and the incidence of recurrent injuries.

Table 4. Relationship between foot care compliance and recurrent wounds

Foot Care	Recurrent Wounds				Total		*P*
	Just First wound		Repeated				
	F	%	F	%	F	%	
Compliant	16	32	6	12	22	44	
Not Compliant	11	22	17	34	28	56	0.039
Jumlah	27	54	23	46	50	100	

Table 4 shows that 16 respondents (32%) who adhered to foot care diabetic Foot care experienced injuries and 6 respondents (12%) experienced repeated injuries. Respondents who did not comply with foot care experienced new wounds, 11 respondents (22%), and 17 respondents (34%) experienced repeated wounds. Based on the results of statistical analysis, an OR value of 5.692 was obtained, which means that respondents who did not comply with foot care were at risk of experiencing recurrent injuries 5.6 times, and the results of the chi-square test p-value = 0.039 so it can be concluded that there is a significant relationship between family support and recurrent injuries.

In this study, it was proven that there is a relationship between family support and the incidence of recurrent injuries. Family support is very influential on the incidence of recurrent wounds in DM ulcer patients because the family can provide support in the form of informative, emotional, appreciative, and instrumental so that patients can undergo and comply with treatment and prevent recurrent wounds. Family support for patients with diabetic ulcers is needed by patients in the wound care and treatment process because the treatment is long term so the treatment process takes a long time. Diabetic ulcer sufferers experience limited physical mobility which can hinder the fulfillment of daily activities so patients need family assistance in fulfilling their activities.

In this study, patients received high levels of family support and never experienced repeated injuries because their families provided support in the form of information, such as telling them they should go to the doctor and advising them to treat wounds well. Emotional support for patients means the family understands, does not distance themselves, listens, and gives solutions to patient problems. Appreciative support such as helping to order medication, encouraging you to see a doctor, and reminding you to schedule check-ups. Instrumental support is supporting patients to be able to focus on undergoing treatment and avoid recurring injuries, such as not allowing the family to work before the wound heals, accompanying them to wound care, control, and helping with medical costs. Even though you have high family support, recurrent injuries can occur because recurrent injuries cannot be prevented only with

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family support but you will also need to take preventive measures such as blood sugar control, foot care, using the right footwear, diet management, and stress management.

Previous research shows that there is a relationship between family support and the incidence of repeated injuries (Ismonah & Octaviani, 2019). The positive impact of family support in carrying out treatment is being able to control what is recommended by health workers in carrying out treatment, being able to remind each other, and motivating each other between family members, especially for families who have experienced injuries so that they are motivated and willing to maintain or improve their quality of life. (Bangun et al., 2020). Another study conducted by (Pamungkas et al., 2017) reported that the impact of family support is cost-effective and reduces the risk of DM2 complications. Family support includes effective communication and support skills, which are also important in influencing diabetes management behavior and promoting effective day-to-day management. Family members are needed to help and support patients in self-management practices by assisting patients in strategic planning, goal setting, and problem-solving. Effective feedback regarding negative perceptions of diabetes is used to exchange health information, reduce treatment resistance, and build self-efficacy emphasized by family members. A comparison of diabetic management with and without family involvement found that patients who enrolled with informal caregivers had higher engagement rates and were more likely to lower blood glucose levels and check blood glucose regularly. The practical and emotional support received by family members has a positive influence on the global measure of disease management in diabetic patients.

In this study, it was proven that there was a relationship between compliance with foot care and the incidence of recurrent injuries. Recurrent injuries can be caused by non-compliance with foot care, such as not always checking your feet, washing your feet with warm water and drying them gently between the feet, not applying moisturizer, always crossing your feet, not regularly checking your feet at a health facility, always wear narrow and uncovered footwear, do not clean the inside of the shoe which can cause friction which can cause injuries, rarely dry the feet down to the toes. Problems that often arise on the feet include calluses, corns, blisters, ingrown toenails (nails that go in), cracked skin on the feet, wounds caused by athlete's foot, warts on the soles of the feet, inflammation of the big toe (hammer-like fingers). Foot care must be carried out regularly and correctly to prevent recurring foot injuries (Alkendhy et al., 2018). Efforts to prevent recurrent diabetic ulcers include patients needing to carry out preventive foot care, in addition to carrying out control of blood glucose through diet adjustments, exercise, and pharmacological therapy (Waluya, 2019).

Various factors can cause recurrent diabetic ulcers, such as uncontrolled blood sugar, lack of physical activity, not maintaining a diet, long-term diabetes, poor foot care compliance, and lack of family support. Foot care is very important to prevent recurring injuries. Previous research has proven that there is a relationship between foot care and the incidence of recurrent injuries in DM patients (Arianti et al., 2020). Patients who receive foot care and regularly perform foot care such as monitoring foot temperature, wearing footwear, and washing their feet have much better results than those who do not perform foot care (Armstrong et al., 2017) . It is also important to provide health education about DM foot care which must be started from the beginning of suffering as an effort to prevent the occurrence of recurrent diabetic ulcers, especially in routine foot checkups, foot hygiene and the selection of (Prabawati & Ratnasari, 2023). Providing in-depth information to patients and families about diabetes prevention is one of the successes of diabetes mellitus therapy, for example by providing leaflets about diabetes mellitus and its complications (Rohmah, 2019). Diabetic foot wounds are a compilation of diabetes mellitus and experience a complexity of problems so that the wound is difficult or has a delay in wound healing, prevention with education and foot care is very helpful to avoid these conditions, especially in reducing the risk of injury prevention (Hidayat et al., 2022).

Not taking all diabetes ulcer patients in Poso district as research respondents and limited research variables have not revealed other factors related to the incidence of recurrent wounds such as the possibility of local habits or culture related to self-care that have an impact on recurrent wounds.

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4. Conclusion and Suggestion

The reason for choosing this study is that as many as 62% of diabetic ulcer patients treated in the nurse's independent practice are patients who have recurrent wounds, patients experience recurrent wounds in 6-12 months after the previous wound has healed. Supporting factors related to the recurrence of diabetic foot injuries are important to be identified so that patients and families can take preventive measures. The family is the closest support system for patients in preventing injuries so the family must provide positive support. Foot care is an important factor in injury prevention. The data showed that patients did not take proper foot care and lacked family support after returning home.

Further, explore research related to family involvement in treating patients with diabetic ulcers so that complications do not occur that can affect the health of diabetic ulcer patients. It is recommended that families be actively involved in providing support to DM patients who experience recurrent diabetic ulcers so that pain treatment can run optimally.

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