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Drug adherence and characteristics of diabetes mellitus patients with diabetic ulcer

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Abstract

Based on the 2013 Riskesdas data, the Yogyakarta Special Region Province has the highest prevalence rate of DM, therefore it is important to give attention to the management of DM patients in Yogyakarta. One of the complications experienced by diabetes mellitus patients is the occurrence of diabetic foot ulcers. Patient adherence to all aspects of DM therapy is very important to achieve optimal therapeutic results, especially if the patient has complications of diabetic ulcers. This study aims to see the relationship between adherence to drug use and characteristics in DM patients with diabetic ulcers. This research applied a correlative analytic with a cross-sectional design. The study was conducted at five wound care clinics in DIY Province. The number of respondents in the study was 31 people with the sampling technique using accidental sampling. Data were collected using an adherence questionnaire instrument in DM patients.

Respondents in this study were 48.4% male and 51.6% female. Most age groups are between 51-60 years (51.6%). The longest time span to suffer from diabetes was 10-15 years (45.2%). Respondents had the most injuries with ulcer degree 1 as much as 35.5% and 54.8% of respondents did not comply with the use of drugs. Based on the statistical tests conducted, it was found that there was a relationship between the length of suffering from diabetes and adherence to take medication ($p=0.000$) and there was a relationship between the length of suffering from diabetes and the degree of ulcers ($p=0.030$), there is no relationship between drug adherence to the degree of ulcers ($p=0.936$). There is a relationship between the length of suffering from DM with medication adherence and the degree of ulcers. There is no relationship between medication adherence and the degree of ulcers.

Keywords: diabetes mellitus, drug adherence, ulcus diabetic

Introduction

The results of the 2013 Basic Health Research (Riskesdas) found that one of the non-communicable diseases with a high prevalence rate in Indonesia is diabetes. People with higher education levels and increasing age are a group that has a higher tendency to suffer from Diabetes Mellitus (DM), but tends to decrease at the age of 65 years. The prevalence rate of DM diagnosed by doctors was 2.1%, where the highest prevalence rate was in the Province of D.I. Yogyakarta by 2.6%. This needs attention related to the management of DM patients in Yogyakarta. One of the complications that many patients with diabetes mellitus experience is the occurrence of diabetic foot ulcers. DM patients with these complications must be able to properly monitor and control blood sugar levels and must carry out wound care regularly so that the patient's therapeutic goals can be achieved properly and optimally (Ministry of Health, 2013).

Mortality and morbidity are events caused by complications in DM patients, not hyperglycaemia (Permana, 2000) [12]. Diabetes mellitus is often referred to as a deadly disease because it attacks all organs of the body and causes various complaints. DM sufferers often experience complaints caused by various things such as individual characteristics including gender, age, education level, type of work, income, number of family members, disease history and can also be influenced by treatment factors which include diet, physical activity, drug therapy, and blood glucose monitoring (Trisnawati and Setyorogo, 2013) [20].

DM as a chronic disease that requires continuous medical care with multifactor risk reduction strategies, not just controlling blood sugar levels. Diabetic patients need education and support in self-management to control blood sugar levels and reduce the risk of acute and chronic complications (American Diabetes Association, 2017) [1]. The care of diabetic patients is now starting to focus on the patient as a center for self-care. Patient compliance in all aspects of DM therapy management is very important to achieve optimal therapeutic results, especially if the patient has complications of diabetic ulcers.

The research to see the relationship between adherence to medication and adherence to wound care in DM patients with diabetic ulcers has not been done much. Patient compliance in taking medication and performing wound care is very important for DM patients with diabetic ulcers.

Pharmacological therapy has a role to keep blood sugar levels under control as long as patients undergo wound care so that the stages and processes of wound healing experienced by patients can run optimally.

Methods

This study is a correlative analytic study using a cross-sectional design with the aim of knowing the relationship between the degree of ulcer with medication adherence and duration of diabetes mellitus, as well as seeing the relationship between length of suffering and adherence to medication. This research permit was obtained from the Health Research Ethics Committee (KEPK) STIKES Surya Global Yogyakarta No. 1.31/KEPK/SG/III/2020 dated 31 May 2020.

This study collaborated with five wound care homes in DIY Province. The sampling technique used is accidental sampling, namely sampling by taking subjects who happen to exist or are available with the number of samples obtained as many as 31 samples. The instrument used to collect data was in the form of a compliance questionnaire.

Results and Discussion

Table 1: Characteristics of Respondents by Gender, Age, Length of Suffering, Degree of Ulcer and Level of Drug Adherence

Variable	Total	Percentage
Gender		
Male	15	48.4
Female	16	51.6
Age		
30-40 years	3	9.7
41-50 years	5	16.1
51-60 years	16	51.6
>60 years	7	22.6
DM duration		
<10 years	7	22.6
10-15 years	14	45.2
15-20 years	4	12.9
>20 years	6	19.4
Ulcus wound degree		
0	2	6.5
1	11	35.5
2	10	32.3
3	4	12.9
4	4	12.9
Level of drug adherence		
Yes	14	45.2
No	17	54.8

The subjects in this study were 31 respondents who were wound care patients at five wound care clinics in the DIY area. Data collection was done by using a questionnaire. Based on the characteristics of the patients, the data obtained were mostly female with a total of 16 people (51.6%). The patient's age was mostly in the 51-60 years age group, which amounted to 16 people (51.6%). The length of time suffering from DM was mostly in the 10-15 years group, namely 14 people (45.2%). The most common ulcers suffered in the first-degree group were 11 people (35.5%). Respondents in this study as many as 17 people (54.8%) were not obedient in using drugs for DM therapy.

Table 2: The Relationship of Long Suffering with DM with Ulcer Degree and Drug Adherence

	Correlation coefficient	p value
The relationship of long suffering from DM with the degree of ulcer	0.390	0.030
Long-standing relationship with DM with drug adherence	-0.623	0.000
Relationship between ulcer degree and medication adherence kepatuhan	-0.015	0.936

The relationship of long suffering from DM with the degree of ulcer

The longer a person has diabetes, the more complications will occur. One of the complications that can occur in DM patients is diabetic neuropathy. Diabetic neuropathy is a major factor in the occurrence of diabetic ulcers, where approximately 45-60% of all diabetic ulcer patients are caused by neuropathy (Frykberg *et al.*, 2006) [4]. Complications of this neuropathy can be a factor in the incidence of diabetic ulcers (Mitasari *et al.*, 2014) [10].

People who suffer from DM 10 years have a risk of developing diabetic ulcers by 6.0 times compared to the duration of suffering from DM < 5 years (Hastuti, 2008). A previous study conducted in a community reported that 1.93% of diabetic ulcers occurred after 1 year of diabetes mellitus (Crawford *et al.*, 2011) [3], while another study reported the incidence of diabetic ulcers to be 5.8% over 3 years (Ramsey *et al.*, 1999) [13].

Based on the length of suffering from DM in this study, it was found that the most respondents suffered from DM in the range of 10-15 years, namely 45.2%. Patients treated with insulin were more likely to develop foot ulcers than patients whose diabetes was managed with oral glycemic agents or with lifestyle modifications alone. This may be because when patients are acquired to start insulin, they may have had diabetes for a long time with greater complications (Yazdanpanah *et al.*, 2018) [22].

Based on the researcher's assumptions, long suffering from DM causes a risk of peripheral neuropathy. Peripheral neuropathy is a condition in which DM patients lose sensation in the foot area. This causes DM sufferers not to know if there is an injury. So that the wound is not treated immediately and over time it turns into an ulcer. On the other hand, patients who have recently suffered from DM will always be aware of complications that can occur in the feet, and they immediately treat small wounds on the feet and avoid ulcers.

The factor that influences one's knowledge is experience. The experience gained will be able to expand one's knowledge about something. From this it is known that the more experience a person has, the higher his knowledge will be. With the knowledge possessed by DM patients, the patient is able to control the risk factors that affect the healing of diabetic ulcers (Notoatmodjo, 2012) [11].

Long-standing relationship with DM with drug adherence

Diabetes mellitus is a chronic disease that requires patients to use drugs for long periods of time. This is one of the factors that causes high patient non-compliance to take medication. Research conducted at the Banjarbaru Hospital found that

only 39.6% of type 2 DM patients were obedient to using and routinely taking drugs with the highest reason being that they had not redeemed their drugs and forgot (Srikartika *et al.*, 2015) ^[18].

Respondents in this study had the longest duration of suffering from DM at 10-15 years, this indicates that respondents have used DM drugs for a long period of time. The level of adherence to taking medication was obtained from 31 people as many as 54.8% of respondents did not comply. The results of statistical tests showed a relationship between the length of suffering from DM with the level of drug adherence. The long duration of the disease and the frequency of many drugs will affect the level of adherence to drug use and there is a significant effect between the length of suffering from DM and the level of drug adherence (Jasmine *et al.*, 2020) ^[6].

Drug adherence has barriers that can be caused by complex treatment regimens, duration of treatment, multiple therapies, drug side effects and lack of information provided by health care providers. The duration of the disease can affect the level of drug adherence (Rasdianah *et al.*, 2016) ^[14].

Relationship between ulcer degree and medication adherence

Diabetic ulcers, also called diabetic neuropathic ulcers, can occur in individuals with diabetes mellitus, partly as a result of circulatory disorders. Individuals with diabetes are often difficult to heal and these wounds may be difficult to treat (Rosdhal and Kowalski, 2015) ^[16].

Patients with diabetic peripheral neuropathy who experience decreased foot sensation can result in diabetic wounds (Suyanto, 2017) ^[19]. Most patients with a history of diabetes mellitus do not know about foot care and are at risk for foot ulcers, amputation sepsis and death. This certainly increases the health burden because diabetes complications can actually be prevented. Therefore, the importance of foot care should be communicated to patients as early as possible (Kishore *et al.*, 2015) ^[8].

Respondents' non-compliance in taking DM drugs in this study was 54.8%. This can be due to a longtime span in taking the drug while the ulcer degree does not improve. The presence of these ulcers is a sign of non-compliance in prevention, foot examination, inappropriate patient activity, overweight and using inappropriate footwear (Liu *et al.*, 2012) ^[9].

The results of statistical tests, which can be seen in Table 2, show that there is no significant correlation or relationship between the degree of ulcers and the compliance of DM patients in taking medication and vice versa. Previous research conducted at a hospital in Padang showed that the causes of ulcers in DM patients were the long duration of suffering from DM, the presence of neuropathy, foot care conditions, and the incidence of trauma (Roza *et al.*, 2015) ^[17]. Several previous studies have shown that the causal factors associated with the ulcer healing process of DM patients include the age of the patient, management of wound care, nutrition consumed and the incidence of wound infection (Ratna and Hasan, 2014) ^[15]. Foot care behavior is an important component in the prevention of diabetic foot (Windani *et al.*, 2016) ^[21]. Research conducted at the DM Polyclinic, a hospital in Makassar, found a relationship between foot care compliance and the risk of ulcers (Ardi *et al.*, 2014) ^[2]. A diabetic patient needs to know how to take good care of diabetic feet to prevent ulcers and even

amputation. Knowledge is needed to shape one's attitudes and actions (Notoatmodjo, 2012) ^[11].

Conclusion

There is a correlation between the length of suffering with medication adherence and the degree of ulcer. There is no correlation between medication adherence and ulcer grade. Further research is needed to look at the compliance and characteristics of DM patients with other types of complications.

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