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THE RELATIONSHIP OF DIABETES MELLITUS MANAGEMENT COMPLIANCE WITH DIABETIC NEUROPATHY IN DIABETES MELLITUS PATIENTS

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ABSTRACT
The increase in cases of diabetes mellitus requires serious treatment, people with DM must comply with self-management so that other disease complications do not arise which will make the situation worse. Self-management is an individual's actions based on his desires with the aim of controlling his illness. Diabetes self-management is the patient's involvement and responsibility for the management of DM which affects several physical aspects, diet management, blood sugar control, and compliance with taking medication which greatly influences the survival of people with DM. Objective to determine the relationship between compliance with diabetes management and the incidence of diabetic neuropathy in diabetes mellitus sufferers at RSUD Dr. Soehadi Prijonegoro Sragen. This research uses quantitative methods with a cross sectional approach. The population in this study were all diabetes mellitus sufferers at RSUD Dr. Soehadi Prijonegoro Sragen in January-November 2023 with a total of 1565 patients. The sample in this study consisted of 66 diabetes mellitus patients who were selected using purposive sampling techniques. Data collection was carried out using the Diabetes Self-Management Questionnaire (DSMQ) and observation sheets. The data analysis test in this study used a univariate test and a bivariate test using the chi square test. The majority of diabetes mellitus sufferers who were respondents in this study were female with the majority aged > 60 years, had a high school education level and had suffered from diabetes mellitus for a period of between 6-10 years. The majority of respondents in this study had compliance with diabetes management. The number of diabetes mellitus sufferers who experience diabetic neuropathy is the same as the number of diabetes mellitus sufferers who do not experience diabetic neuropathy. There is a significant relationship between compliance with diabetes management and the incidence of diabetic neuropathy in diabetes mellitus sufferers at RSUD Dr. Soehadi Prijonegoro Sragen with a p-value of 0.000 (P<0.05). There is a significant relationship between diabetes management compliance and the incidence of diabetic neuropathy in diabetes mellitus sufferers at Dr. Soehadi Prijonegoro Hospital, Sragen.

Keywords: compliance; diabetes management; diabetes mellitus; diabetic neuropathy

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INTRODUCTION

Diabetes Mellitus is ranked sixth as the cause of death in the world, so this disease has become a priority health problem set by world leaders (WHO, 2021). Diabetes mellitus (DM) or diabetes itself is a heterogeneous group of disorders which is characterized by increased blood glucose levels or hyperglycemia (Nurlaela & Purwanti, 2020). The condition of blood sugar levels that exceed normal values is caused by the body not using the insulin hormone normally (Handayani & Suraya, 2020). Diabetes mellitus is a degenerative disease that is of important concern because it is part of the four priority non-communicable diseases which always increase every year and are a threat to world health in the current era (IDF, 2021).

In 2017, it was recorded that the prevalence of diabetes mellitus cases increased by 425,000,000 (8.8%) in the world (IDF, 2021). According to the World Health Organization (WHO) and the International Diabetes Federation (IDF), around 468 million people suffer from diabetes mellitus worldwide (Raafi, 2020). The prevalence of diabetes in Indonesia ranks fifth highest in the world after China, India, USA and Mexico. In 2021, the number of diabetes sufferers in Indonesia will reach 19.5 million people (IDF, 2021) and is predicted to increase to 21.3 million people in 2030 (Nasution & Siregar, 2021). The prevalence of diabetes mellitus has also increased in all provinces in Indonesia with the first place in 2018 being DKI Jakarta Province with a prevalence of 3.4% and the last place being occupied by NTT Province with a prevalence of 0.9%, and the prevalence of people with diabetes mellitus in Central Java Province in 2020 was 528,559 cases (13.67%), in 2021 it was 467,365 cases (11%), and in 2022 it was 163,751 (15.6%) (KemenkesRI, 2018). According to data from the Sragen District Health Service, Sragen City had varying incidences of diabetes in the past 5 years, diabetes increased by 5,223 cases in a year (Dinas Kesehatan Jawa Tengah, 2022).

The increase in cases of diabetes mellitus (DM) requires serious treatment. People with DM must comply with self-management so that other disease complications do not arise which will make the situation worse. Self-management is an individual's actions based on his desires with the aim of controlling his illness (Larasati & Puspitasari, 2020). Self-management can be done in various ways, namely education, medical nutrition therapy (TNM), physical exercise, and pharmacological therapy (PERKENI, 2021) Diabetes self-management is the patient's involvement and responsibility for the management of DM which affects several physical aspects, diet management, blood sugar control, and compliance with taking medication which greatly influences the survival of people with DM according to (Ningrum, 2019). If not controlled it can cause complications in the disease. Diabetes mellitus patients with low levels of compliance in self-management are the cause of the high incidence of diabetes mellitus. It is also written that self-management is the key to comprehensive management of chronic diseases (Handayani & Putra, 2019).

However, in implementing self-management, many people are still disobedient, poor self-management disobedience is the cause of diabetes mellitus complications such as nerve damage in the feet, increasing the risk of heart disease, and the occurrence of diabetic renopathy. Diabetes mellitus is a disease that can attack several organs in the body and cause complaints and complications if not managed properly (Romlah & Martapura, 2021). Complications from diabetes mellitus occur because blood sugar concentrations are not well controlled related to self-management of diabetes mellitus patients, and DM complications are divided into 2, namely macrovascular complications and microvascular complications, one of the complications is Neuropathy (Putri, 2021).

Neuropathy is one of the complications often encountered by people with DM (Simarmata, 2022). Neuropathy is one of the most common complications experienced by diabetes mellitus sufferers, both type 1 and type 2 (Schreiber, Nones, & Chichorro, 2015). Damage and abnormal function of nerve cells causes Diabetic Neuropathy. The locations that often experience neuropathy include the feet, hands, heart, gastrointestinal and genitals. Statistically, the prevalence of diabetic peripheral neuropathy (DPN) in diabetes sufferers reaches 50% (Juster-Switlyk & Smith, 2016). Diabetic neuropathy has an impact on the patient's physical activity being hampered so that work productivity will decrease (Bril, Breiner, & Perkins, 2018). This study aims to determine the relationship between diabetes management compliance and the incidence of diabetic neuropathy in diabetes mellitus sufferers at RSUD Dr. Soehadi Prijonegoro Sragen.

METHOD

This research was conducted at Dr. Soehadi Prijonegoro Hospital, Sragen in February 2024. The population in this study were all diabetes mellitus sufferers at Dr. Soehadi Prijonegoro Hospital, Sragen in January-November 2023 with a total of 1565 patients. The sample in this study was calculated using the sample formula for case control research. The number of samples in this study was 66 people who were selected using purposive sampling techniques. Data collection was carried out using observation sheets and the the Diabetes Self-Management Quesionnare (DSMQ) and observation sheets with a validity value of 0.444 and a validity value of 0.871 > 0.70. The data analysis test in this study used a univariate test and a bivariate test using the chi square test.

RESULTS

Table 1.
Respondent characteristics (n= 66)

Respondent characteristics	f	%
Gender		
– Male	17	25,8
– Female	49	74,2
Age		
– 18-40 years	1	1,5
– 41-60 years	35	53,0
– >60 years	30	45,5
Employment		
– Civil servants	5	7,6
– Self-employed	1	1,5
– Not Working	21	31,8
– Labor	6	9,1
– Housewife	3	4,5
Education		
– No school	6	9,1
– Elementary school	14	21,2
– Middle school	6	9,1
– high school	37	56,1
– College	3	4,5
Duration of DM		
– 0-5 years	10	15,2
– 6-10 years	43	65,2
– > 10 years	13	19,7

Based on the table 1, it is known that the majority of respondents in this study were female with a total of 49 people (74.2%). Based on age categories, it is known that the majority of respondents in this study were aged between 41-60 years with a total of 35 respondents (53.0%). Based on job category, it is known that the majority of respondents in this study work as housewives (IRT) with a total of 40 respondents (45.5%). Based on the education category, it is known that the majority of respondents had a high school education with a total of 37 (56.1%). Furthermore, based on the category of duration of suffering from DM, it is known that the majority of respondents in this study had suffered from DM for between 6-10 years with a total of 43 people (65.2%).

Table 2 shows that the majority of respondents in this study adhere to diabetes management with a total of 35 respondents (53%). Based on the incidence of diabetic neuropathy, it is known that the number of diabetes mellitus patients who experienced diabetic neuropathy

who were respondents to this study was the same as the number of diabetes mellitus patients who did not experience diabetic neuropathy with a total of 33 patients (50.0%) each.

Table 2.
Variable description (n= 66)

Variable	f	%
DM Management Compliance		
– Obedient	35	53,0
– Disobedient	31	47,0
Diabetic Neuropathy		
– Diabetic Neuropathy	33	50,0
– No Diabetic Neuropathy	33	50,0

Table 3.
The relationship between DM management compliance and diabetic neuropathy (n=66)

DM Management Compliance	Diabetic ulcers				*P-value*
	No diabetic neuropathy		diabetic neuropathy		
	f	%	f	%	
Obedient	32	48,5	3	4,5	0,000
Disobedient	1	1,5	30	45,5	
Total	33	50,0	33	50,0	

Based on the results of the Chi square test, it is known that the number of respondents who adhere to diabetes management and do not experience diabetic neuropathy is 32 people (48.5%). Meanwhile, the number of respondents who adhered to diabetes management but experienced diabetic neuropathy was 3 people (4.5%). The number of respondents who did not comply with diabetes management but did not experience diabetic neuropathy was 1 person (1.5%). Meanwhile, the number of respondents who did not comply with diabetes management and experienced diabetic neuropathy was 30 people (45.5%). Then, based on the results of the analysis, it is known that the p-value in the chi-square test is 0.000 (P<0.05). So it can be concluded that there is a significant relationship between compliance with diabetes management and the incidence of diabetic neuropathy in diabetes mellitus sufferers at Dr. Soehadi Prijonegoro Hospital, Sragen.

DISCUSSION

Based on the research results, it is known that the majority of diabetes mellitus sufferers at RSUD Dr. Soehadi Prijonegoro Sragen who were respondents in this study were female. The majority of diabetes cases in Indonesia are experienced by women, where the prevalence of women experiencing diabetes mellitus reaches 11.5% while for men it reaches 8.7% (Azizah, 2022). Several factors that influence the high prevalence in women are associated with decreasing levels of the hormone estrogen and body metabolism as age increases. Women are at risk of developing DM because physically women experience an increase in body mass index caused by monthly cycle syndrome. Fat in the body can easily accumulate due to hormonal processes, putting women at risk of developing type 2 DM (Ciarambino, Crispino, Leto, Mastrolorenzo, & Giordano, 2022).

Based on the research results, it is also known that the majority of diabetes mellitus sufferers at RSUD Dr. Soehadi Prijonegoro Sragen who were respondents in this study were aged between 41-60 years. The majority of people suffering from type 2 DM are mostly people aged 40 years and over (Denggos, 2023). Increasing blood glucose levels are closely related to increasing age, so it increases as age increases, the prevalence of diabetes and impaired glucose tolerance increases (Cahyono & Purwanti, 2019). This is because at the age of 40 years and over insulin retention in type 2 DM will increase in addition to a history of heredity

and obesity. In addition, as a person's age increases, there are changes in carbohydrate metabolism and changes in insulin release which are influenced by glucose in the blood (Susilawati & Rahmawati, 2021). This can cause blood sugar levels in the body to become unstable, thereby increasing the risk of diabetes mellitus (Isnaini & Ratnasari, 2018).

Based on job characteristics, it is known that the majority of diabetes mellitus sufferers at RSUD Dr. Soehadi Prijonegoro Sragen who were respondents in this study work as housewives (housewives). Someone who works as a housewife (IRT) is more susceptible to diabetes mellitus due to lack of physical activity, and there are several housewives who, even though they stay at home, do a lot of physical activity such as sweeping, gardening and other activities. which is conducted (Mawan & Muflihatin, 2021). However, there are some who do not do physical activities that are rarely done by housewives who are more susceptible to diabetes mellitus so that fat accumulation can occur. The results of this research are in line with the results of research conducted by (Milda, 2019) with 42 respondents. The results showed that the majority of DM sufferers who were respondents had jobs as housewives (housewives).

Based on educational characteristics, it is known that the majority of respondents in this study had a high school education. Educational attainment is an indicator of a person's formal education in a particular field, but is not an indicator of mastery of a particular field of knowledge (Ningrum, 2019). The higher a person's level of education, the easier it will be for that person to receive information, so that they generally have a good understanding of the importance of 70 self-care behaviors and have self-management skills to use diabetes care information obtained through various media compared to lower education levels (Abbasi & See, 2018). There is an association between higher levels of education in accepting themselves as sick people if they experience symptoms related to an illness compared to groups with lower education (Pahlawati & Nugroho, 2019). Groups with higher levels of education are also indicated to have better awareness of maintaining their health and seek health services more quickly compared to groups with lower education.

Based on the category of duration of suffering from diabetes mellitus (DM), it is known that the majority of respondents in this study had a duration of suffering from diabetes mellitus between 6-10 years. The longer a person suffers from DM, the greater the chance of suffering from chronic hyperglycemia which will ultimately cause DM complications in the form of retinopathy, nephropathy and diabetic ulcers (Muhdar, 2018). (Rahmi, 2022) found that there was a significant relationship between the duration of suffering from T2DM and diabetic neuropathy. Where, the majority of patients who experience diabetic neuropathy have suffered from T2DM for ≥ 5 years. The results of another study conducted by (Sendi, 2020) also found that DM sufferers with a duration of more than 5 years had an increased risk of diabetic neuropathy by 4-5 times compared to those with a DM duration of less than 5 years.

The results of this study also found that the majority of respondents in this study adhered to diabetes management. Diabetes Mellitus is a metabolic disease that is increasingly becoming a global health problem. Therefore, patient compliance with the treatment plan and self-management plays a crucial role in controlling this condition (Suratman, 2023). Compliance with diabetes management is the extent to which people with diabetes are able to comply with diabetes management (Saibi, 2020). Diabetes self-management is the patient's involvement and responsibility for the management of DM which affects several physical aspects, diet management, blood sugar control, and compliance with taking medication which greatly influences the survival of people with DM (Ningrum, 2019).

Based on the research results, the p-value obtained in the chi-square test was 0.000 (P<0.05). So it can be concluded that there is a significant relationship between compliance with diabetes management and the incidence of diabetic neuropathy in diabetes mellitus sufferers at Dr. Soehadi Prijonegoro Hospital, Sragen. Diabetic neuropathy is one of the complications of diabetes mellitus, which is caused by the capillaries that provide nutrition to the nerves experiencing damage and weakness, thus showing symptoms of numbness, sensory loss, decreased or loss of prickling sensation, burning pain in the hands or feet which can ultimately cause Serious consequences include foot ulceration, gangrene, amputation and neuropathic pain which can cause high rates of morbidity and death (Martiningsih & Prasetyani, 2019).

One way to prevent diabetic neuropathy is by controlling blood sugar levels and taking medication (KemenkesRI, 2018). To prevent diabetic neuropathy, it is also important to take the following steps to help prevent diabetes-related nerve damage, namely regular physical activity, eating healthy and nutritious foods, not smoking, not drinking alcohol, and taking prescription medications recommended by your doctor. Therefore, patient compliance with the treatment plan and self-management plays a crucial role in controlling this condition (Suratman, 2023). Compliance with diabetes management is the extent to which people with diabetes are able to comply with diabetes management (Saibi, 2020). Compliance with diabetes management itself can affect several physical aspects, diet management, blood sugar control, and compliance with taking medication which greatly influences the survival of people with DM (Ningrum, 2019). The results of this study are in line with the results of research conducted by (Ramadona, 2021) which found that there was a relationship between the level of adherence to taking medication and the appearance of neuropathy symptoms in type 2 diabetes mellitus patients at the Andalas Padang Community Health Center.

CONCLUSION

Based on the results of the analysis and discussion, it can be concluded that: The majority of diabetes mellitus sufferers who were respondents in this study were female with the majority age > 60 years, had a high school education level and had suffered from diabetes mellitus for a period of between 6-10 years. The majority of respondents in this study had compliance with diabetes management. The number of diabetes mellitus sufferers who experience diabetic neuropathy is the same as the number of diabetes mellitus sufferers who do not experience diabetic neuropathy. There is a significant relationship between compliance with diabetes management and the incidence of diabetic neuropathy in diabetes mellitus sufferers at Dr. Soehadi Prijonegoro Hospital, Sragen.

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