The Correlation between Lifestyle and the Severity of Diabetic Peripheral Neuropathy

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ABSTRACT

Diabetic peripheral neuropathy (DPN) is a significant complication of diabetes mellitus (DM), whose incidence is consistently increasing from year to year. Lifestyle is a considerable risk factor for increasing DM complications. To prevent the occurrence of DPN, it is necessary to carry out a more in-depth analysis of the correlation between lifestyle and DPN. The purpose of this study was to determine the correlation between lifestyle and the severity of diabetic peripheral neuropathy. The research design was a case-control study. The sampling technique used was sequential sampling. Respondents in this study were 94 people divided into two groups: 47 as the case group and 47 as the control group. Based on the Chi-Square test of the correlation between lifestyle with the severity of diabetic peripheral neuropathy, p-value = $0.000 < (0.05)$ OR=10.084; 95% CI=3.712-27.395). It could be concluded that there was a correlation between lifestyle and the severity of diabetic peripheral neuropathy. This research could be a learning material and additional knowledge for respondents regarding the importance of improving a healthy lifestyle in every nursing intervention to prevent an increase in the number of degenerative diseases, especially DM, and reduce the incidence of diabetic peripheral neuropathy.

Keywords: diabetes mellitus, lifestyle, diabetic peripheral neuropathy

INTRODUCTION

Diabetes Mellitus (DM) is a non-communicable disease that receives special attention at the global level. This happens because the prevalence of DM increases consistently from year to year(Stino & Smith, 2017; WHO, 2016). According to data from the International Diabetes Federation (IDF), in 2019, the number of DM cases was 463 million; this number increased from 10.4 million in 2010 (International Diabetes Federation, 2021).

In 2019, Indonesia was in seventh place based on the prevalence of DM sufferers, with a total of around 10.7 million cases. (International Diabetes Federation, 2019). Almost the same data was also released by RISKESDAS in 2018, stating that the number of DM sufferers has now reached 10.9% (Indonesian Ministry of Health, 2018).

The high number of Diabetes Mellitus sufferers is always accompanied by an increase in the number of complications that occur. There are 2 complications from DM, namely macrovascular and microvascular. The highest case of DM complications is peripheral

neuropathy (Kumari et al., 2018). Peripheral neuropathy is a disturbance in sensory, motor, and autonomic nerve function caused by hyperglycemia at the edges of the body, such as the tips of the feet or hands (Young, 2017).

Diabetic Peripheral Neuropathy (DPN) is the leading cause of disability and the most dangerous reduction in quality of life, among other complications of diabetes mellitus. These complications cause sensory loss, pain, gait disturbances, injuries, ulcers on the feet, and even amputation (Malik et al., 2020; Stino & Smith, 2017).

This DPN will continue to get worse if it is not handled correctly. Peripheral neuropathy is a complication of diabetes mellitus, which results in decreased quality of life for sufferers. The same happens with other complications, such as impaired heart and kidney function (Al Sadrah, 2019; Sothornwit et al., 2018). Not only that, peripheral neuropathy will also hurt all aspects of the sufferer's life, apart from hurting physical, psychological, and social aspects. Diabetes mellitus and its complications can also affect other aspects, such as financial aspects and aspects of family resilience.

Lifestyle is a collection of behavior patterns a person chooses according to their opportunities (Cockerham, 2017). In other references, it is stated that lifestyle is the way and characteristics of a person or population in their daily lives. Lifestyle consists of a person's behavior and functioning in work, entertainment, diet, and other activities. This lifestyle is formed according to the unique characteristics of geographical conditions, economic status, politics, culture, and religion (Farhud, 2015).

Pinzon et al. (2017) also state that the factors causing DPN, which involve all of these incidents, further worsen the condition of DM sufferers, namely obesity and high cholesterol. This is in line with the research conducted (Qureshi et al., 2017; Ghavami et al., 2018), which states that there is a relationship between lifestyle and the incidence of DM. At the same time, it is related to complications of DM with the dominant influence of lifestyle, which will increase the severity of complications from DM. However, research regarding the relationship between lifestyle and the severity of DPN is still scarce. The general aim of this research is to determine the correlation between lifestyle and the severity of diabetic peripheral neuropathy.

METHODS

The research design used in this research is a case-control design. The respondents were divided into two groups: the case group of 47 people and the control group of 47 people. So, the total number of respondents involved in this research was 94 people. This research was carried out in Padangsidimpuan City for three months, from January to March 2021.

The sampling technique used is sequential sampling, where samples are taken based on consideration of existing criteria. The research instruments used consisted of 2, namely the Fantastic Lifestyle Score to assess the respondent's lifestyle and the Diabetic Neuropathy Score to assess the severity of diabetic peripheral neuropathy.

Researchers distributed questionnaires to the case group and control group. Each respondent filled in the Fantastic Lifestyle Score instrument themselves, and then the researcher checked again whether all the questions had been filled in. In the Diabetic Neuropathy Score instrument, researchers asked respondents directly, and researchers filled in according to the answers from each respondent. This research has met the ethical criteria of the Aufa Royhan University research commission.

The data that has been collected will then be analyzed using a computer program. There were 2 data analyses carried out, namely Univariate and Bivariate, with the Chi-Square Test.

RESULTS

The following are the results of research conducted on 94 respondents consisting of 47 people in the case group and 47 people in the control group.

Table 1. Frequency Distribution Based on Respondent Characteristics

Respondent Characteristics	Case		Control	
	f	%	f	%
Age				
37-54 years old	12	25.5	29	61.7
55-87 years old	35	74.5	18	38.3
Gender				
Female	35	74.5	29	61.7
Male	12	25.5	18	38.3
Education				
Elementary School	21	44.7	5	10.6
Middle School/Equivalent	13	27.7	15	31.9
High School/Equivalent	12	25.5	21	44.7
College/Equivalent	1	2.1	6	12.8

Respondent Characteristics	Case		Control	
	f	%	f	%
Work				
Farmer/Housewife	35	74.5	25	53.2
Private Employees	2	4.3	1	2.1
Self-Employed	10	21.3	19	40.4
Civil Servants	0	0.0	2	4.3
Suffering from DM for a Long Time				
Last 1-5 years	9	19.1	9	19.1
Last 6-10 years	38	80.9	38	80.9

Based on Table 1, the frequency distribution based on the characteristics of the respondents above shows that the majority of respondents in the case group were aged 55-85 years at 74.5% (35 people), while in the control group, the majority of respondents were aged 37-54 years at 61.7% (29 people). Person). Based on gender, most respondents were female, both in the case group 74.5% (35 people) and in the control group 61.7% (29 people). Based on the level of education in the case group, the majority of respondents' last education was elementary school, 44.7% (21 people). In the control group, most respondents' last education was high school/equivalent, 44.7% (21 people). Based on their occupation, most respondents worked as farmers/housewives in the case group, 74.5% (35 people), and also in the control group, 53.2% (25 people). Based on the 1:1 matching process, respondents in the case group must match the control group. To ensure confounding variables are distributed evenly in each group and obtain a balanced data set. It can be seen in the table above that based on the duration of suffering from DM in the last 1-5 years, the results in the case group and control group are the same.

Table 2. Frequency Distribution of Respondents' Lifestyles

Lifestyle	Case		Control		OR (95% CI)	P-Value
	f	%	f	%		
Bad	30	63.8	7	14.9	10,084	0,000
Good	17	36.2	40	85.1		
Total	47	100.0	47	100.0		

Based on Table 2, the frequency distribution of respondents' lifestyles above a p-value of 0.000 is smaller than 0.05, so it can be concluded that there is a significant relationship between lifestyle and the severity of DPN. Apart from that, the odd ratio value was also obtained at 10,084, where DM sufferers who have a terrible lifestyle have a tenfold risk of experiencing more severe DPN compared to DM sufferers with a good lifestyle.

DISCUSSION

Based on the results of this study, it was found that there was a significant relationship between lifestyle and the severity of diabetic peripheral neuropathy, where DM sufferers with a lousy lifestyle have a 10 times risk of experiencing it *Diabetic Peripheral Neuropathy* compared to DM sufferers with a healthy lifestyle.

Lifestyle is behavior that is chosen deliberately according to the opportunities available. Lifestyle is formed through the interaction between life choices and life opportunities. The interaction between these two components will form a perception through a list of plans a person will carry out to form the chosen lifestyle (Cockerham, 2017). The behavior resulting from these choices can have positive or negative consequences for a person's health, aiming to form an overall health pattern of practices that constitute a lifestyle.

The results of this research align with research conducted by(Qureshi et al., 2017), which states that there is a correlation between the severity of Diabetic Peripheral Neuropathy and lifestyle. Ghavami et al. (2018) said that avoiding bad lifestyles by emphasizing strategies to lower blood sugar, increase physical activity, promote weight loss, have a wise diet, and practice foot care contribute to reducing the severity of DPN. Ghavami et al. (2018) also added that there is a significant relationship between poor lifestyle and the severity of Diabetic peripheral neuropathy.

Poor lifestyle habits, such as smoking, poor diet, lack of physical activity, and inadequate reduction of chronic stress, are major contributors to the development of preventable chronic diseases, including diabetes mellitus. The results of this study also found that DM sufferers with a lousy lifestyle without complications of Diabetic peripheral neuropathy had 10 times the risk compared to DM sufferers without complications with a healthy lifestyle.

Lifestyle management is part of risk factor management in type 2 DM sufferers with peripheral neuropathy. Type 2 DM sufferers with peripheral neuropathy must change their lifestyle so that the progression of this disease can be slowed. According to Smith et al. (2022), there are 3 efforts to prevent the worsening of DM conditions with peripheral neuropathy. This prevention effort consists of controlling blood sugar levels and lifestyle modifications such as diet-structured exercise and foot care.

Lifestyle changes to a lifestyle that is healthier and more appropriate to the disease condition are a necessity. Even though there has been a lifestyle change, this lifestyle needs to be implemented consistently. This is to the statement that lifestyle changes in diabetes mellitus

sufferers only last for a while, and many of these lifestyles will return to their previous lifestyle (Chong et al., 2017).

Therefore, it is essential to emphasize the strategy of having someone to exchange ideas with, increasing physical activity, consuming balanced nutrition, not smoking or drinking alcohol, and doing valuable things while feeling comfortable, sleeping on time, taking care of emotions, and relaxing to enjoy time. Being free and having optimistic thoughts without feeling stressed or tense, then feeling satisfied with the work and role without feeling angry or hostile.

However, if you currently fall into the lousy lifestyle category, there is always an opportunity to change your lifestyle from now on. Do not try to keep everything the same; it will be too hard. Note down what changes you find and target this to help you succeed. Make changes in small steps towards overall achievement. Ask someone to help make the changes you want according to your targets, and congratulate yourself because you have passed this period. Give yourself the reward you deserve. Ask professionals, doctors, nurses, or health departments about lifestyle issues.

CONCLUSION

Based on the results of this research, it can be concluded that a relationship exists between lifestyle and the severity of DPN.DM sufferers with a lousy lifestyle have a 10 times risk of experiencing more severe DPN compared to DM sufferers with a good lifestyle.
Based on these results, it is hoped that it can encourage DM sufferers to adopt a good lifestyle to help prevent or treat various complications of DM, such as DPN.

LIMITATIONS

This research uses a case-control design, so it cannot assess future conditions and changes in the respondent's status.

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