



Implementation electrical acupressure toward fasting blood sugar levels in type II diabetes mellitus patients in the working area jepon community health center blora district

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ABSTRACT

Background

Diabetes mellitus is one of the non-communicable diseases that can attack several organs, and causes several complaints and complications that are dangerous and can cause death. Various innovative approaches have been carried out to prevent and treat DM such as the four pillars in managing DM, namely diet, exercise, pharmacological therapy, education. Electrical acupressure is one of the complementary therapies which is also useful for treating diabetic patients, handling complementary therapies which are additional therapies recommended by nursing staff listed in the Nursing Interventions Classification (NIC).

Method

The type of research used is Quasy Eexperimental with a research pre-test - post test control group designed. This study compiled two groups, namely the intervention group and control group. Technique Non probability sampling with method purposive sampling was used to get 30 respondents divided into 2 groups.

Results

Test results Independent test shows p value 0.321 which means there is no significant difference between the intervention and control groups, but the mean value of fasting blood sugar levels in the intervention group is smaller than the control group.

Conclusion

The results of the study after being given complementary therapy decreased the fasting blood sugar levels of patients who received therapy acupressure electrical, so that the complementary therapy was effectively implemented for patients who had increased blood sugar levels, especially those who experienced type 2 diabetes mellitus.

Keywords: Electrical Acupressure, Fasting Blood Sugar Levels, Type 2 Diabetes Mellitus.

INTRODUCTION

Diabetes mellitus is one of the non-communicable diseases but is very attention-grabbing in Indonesia. Diabetes can attack several organs, and cause several complaints and complications that are dangerous and can cause death.

According to the World Health Organization (WHO) diabetes patients in the world have doubled in 2030. In 2000 there were 8.4% and increased by 21.3% in 2030. [1] Data International on diabetes federation (IDF) in 2017 was 425 million people suffer from diabetes. Indonesia ranks 6th with 10.3 million people and in 2030 it becomes 21.3 million. [2] Data on riskesdas 2013 diabetes mellitus was 6.9%, while in 2018 it increased to 10.9%. [3] According to the health profile of Central Java, diabetes ranks the second disease with a total of 110,702 residents [4].

The incidence of diabetes mellitus surged to a record high with a large majority of patients with type 2 diabetes mellitus. The incidence of diabetes 90% to 95% was patients from diabetes mellitus type 2. [3] In Boora district diabetes from 2014 to 2017 ranked second in 5 big disease. In the work area of the Jepson sub-district health center Blora district DM Type 2 as many as 545 patients in 2014, 2015 as many as 656 patients, 2016 as many as 889 patients, 2017 as many as 902 patients, 2018 as many as 984 patients. And the last 3 months in January-March as many as 225 patients. [5]

Problems that often arise in diabetes mellitus are the instability of blood sugar. With normal limits between 100-126 mg/dl. Blood sugar above standard or below standard can affect the metabolism of nutrients, fats, proteins. Many problems arise in maintaining blood sugar stability. To prevent and deal with before it has an impact on complications and death, a strategy for handling symptoms and stability of blood sugar is needed, if blood sugar is stable then the nervous system is also stable [6].

Various innovative approaches have been made to prevent and treat DM as found in the 5 pillars of DM management, namely diet, exercise, pharmacological therapy, education. Electrical acupuncture is one of the complementary therapies which is also useful for treating diabetic patients, handling complementary therapies which are

additional therapies recommended by nursing staff listed in the Nursing Interventions Classification (NIC).

During this time, from a number of previous studies many measures have been carried out acupuncture for patients with diabetes mellitus, both used as an effort to reduce blood glucose or be used as a level of foot sensitivity. [7] Acupuncture is one of complementary therapies that combines various techniques of emphasis on the points concerned. But in this handling electrical acupuncture research has never been done before, here researchers are interested in using therapy electrical devices that aim to reduce blood glucose levels, which can be useful for the field of nursing because it is a new intervention that is different from acupuncture manual. The use of electrical acupuncture makes it easier for patients and nurses to use, the emphasis between one point to another can be done simultaneously, and the duration is set according to needs. Differences with acupuncture manual between one point to another point cannot be done simultaneously, and duration cannot be effective.

A nurse is expected to be able to provide the latest innovations related to nursing intervention to patients, especially in patients with type 2 diabetes mellitus who are expected to be useful in the field of nursing. Here the researcher is interested in examining the application of electrical acupuncture to fasting blood glucose levels in diabetes type 2 diabetes patients.

METHODS

This type of research uses research Quasy Experimental with a pre test - post test with control group design. The researcher arranged two groups, namely the intervention group that was given pharmacological therapy with therapy electrical acupuncture and the control group was only given pharmacological therapy. Giving pharmacological therapy and therapy electrical acupuncture given 10 times for 10 days given once a day. Fasting blood glucose level measurements of respondents using the glucose meter instrument brand Accu Check that was produced by Germany with high accurate values were equipped with storage of blood sugar check data as much as 500 mb. Examination of

blood sugar levels is carried out before and after the therapeutic action.

The population in this study was that the entire study subjects to be studied in this study were all type 2 diabetes mellitus patients in the Jepon health center in Blora district. Determination of the minimum number of samples using a technique sampling non probability with purposive sampling method and based on inclusion and exclusion criteria as many as 30 respondents divided into two groups with each of the 15 respondents in the

intervention group and 15 respondents in the control group.

In this study researchers conducted data collection by observing, identifying, interviewing and filling out the questionnaire. The collected data was analyzed through the IBM SPSS program version 24.0, and continued with a different test namely parametric test (Paired t test and Independent t test). The processed data is used as the basis for discussing problem statements, which are then presented in table form so conclusions can be drawn.

RESULTS

Table 1 Frequency distribution respondents based on age, gender and physical activity

Variables	Group				Total		p-value
	Intervention		Control				
	F	%	F	%	F	%	
Gender:							
Male	5	1	6	20.0	11	36.7	0.144 *
Female	10	6.7	9	30.0	19	63.3	
		33.3					
Age:							
45 - 50 years	0	0.0	1	3.3	1	3.3	2.800 *
51 - 55 years	3	10.0	6	20.0	9	30.0	
56 - 60 years	12	40.0	8	26.7	20	66.7	
Physical Activity							
Does Not Impose	6	20.0	7	23.3	13	43.3	0.136 *
Doing	9	30.0	8	26.7	17	56.7	

Data on the frequency distribution of the characteristics of the respondents shown in table 1 above, that the characteristics of respondents from the initial data between the intervention group and the control group were not different. The sex of the respondents was mostly female as many as 19 people (64.4%) and the smallest was male sex as many as 11 people (36.7%), in the age variable the respondents mostly had the age of 56-60 years as many as 20 people (66.7%) and a small percentage

between the ages of 45-50 years as many as 1 person (3.3%). As for the characteristics based on physical activity, most of them did physical activities, namely as many as 17 people (56.7%) and a small number did not do physical activity as many as 13 people (43.3%). The value of p-value in the test for all variables of age, sex and physical activity was greater than 0.05, which meant there was no difference between the intervention and control groups in the study.

Table 2 Differences fasting blood glucose levels in type 2 diabetes mellitus patients in the intervention group and control group

Group		Pre test	Post test	Mean difference	P
Intervention	Mean	216.87	138.53	78.34	0.000
	SD	79.99	47.73		
Control	Mean	207.40	157.27	50.13	0.001
	SD	70.01	53.67		

*Paired t test

From the table above, the results of the study showed that in the intervention and control groups both showed p value <0.05. But there are differences when viewed from the difference value or mean difference that the intervention value is

greater than the value of the control group, which means that the intervention group is more effective with additional electrical measures compared to the control group who only get pharmacology without obtaining additional electrical support therapy.

Table 3 Analysis differences in the mean fasting blood sugar levels between the intervention group and control group

Variable	Group	Mean	Std	ΔMean	p-value
Fasting Blood Glucose post test	Interventions	138.53	47.192	18.74	0.321
	Control	157.27	53.665		

***Independent t test**

Table 3 above, shows that there is a difference in the average blood glucose level between the intervention groups (giving electrical acupressure for 10 days) with the control group after giving pharmacological therapy for 10 days, in the intervention group with an average value of 138.53 whose value smaller than the control group with an average value of 157.27. It was shown that the decrease in fasting blood glucose levels was higher in the intervention group even though the values of the two sig groups. 0.321 or no significant difference.

DISCUSSION

Differences fasting blood sugar levels in type 2 diabetes mellitus patients in the intervention group

Based on the results of the study it was found that there was a decrease in fasting blood sugar levels in the intervention group before and after giving electrical acupuncture with a duration of 10x (1x/day) in patients with type 2 diabetes mellitus. Where the value of blood glucose levels before the intervention amounted to 216.87 greater than the average blood glucose level after being given an intervention that is 138.53.

In the treatment of diabetes mellitus, the chosen therapy should have minimal side effects. In this era of globalization, acupressure can be applied and chosen as an alternative / complementary coronation for DM, due to minimal side effects and has been in great demand by people in other countries including Indonesia. Management of diabetes mellitus includes education, diet regulation, physical exercise, medicine and acupuncture. The mechanism or system of

acupressure work for NIDDM through hemodynamic repair and enhances the regulatory effect of the immune neuroendocrine system. Treatment of DM with drugs will cause several side effects, therefore the addition of therapy for diabetes mellitus with acupressure in this case is the provision of electrical acupressure with a duration of 10x in 10 days in patients with type 2 diabetes mellitus can help reduce blood sugar levels, so the drug dose can be reduced and side effects will decrease.

This is evidenced by the results of test analysis, it is known that the value of p-value is 0.000, which value is less than 0.05, this means that there is an effect of giving electrical pressure to changes in fasting blood sugar levels in type 2 diabetes mellitus patients in the Jepon Health Center Working Area, Blora.

This is in line with the research conducted by Masithoh, et al (2016) which explains that there is a significant relationship between whether or not the previous acupressure therapy has been carried out with blood sugar levels after acupressure therapy. The previous acupressure therapy meant that acupressure therapy was carried out by respondents regularly about 3-4 weeks before the time of this study until the time from the letter of approval to the respondent was signed by the respondent. If the client has done acupressure actions regularly within 3-4 weeks of the implementation of this study, according to the researchers, it is likely that the therapy will affect the results of this study so that the previous absence of acupressure therapy has become a confounding variable in this study [8].

Differences fasting blood sugar levels in type 2 diabetes mellitus patients in the control group

Comparison of the average fasting blood glucose levels before and after administration of pharmacological therapy and the effect of giving treatment in the control group showed that there was a decrease in fasting blood sugar levels in the control group before and after pharmacological therapy in 10 days in patients with type 2 diabetes mellitus, where the average blood glucose level before pharmacological therapy was 207.40 greater than the average fasting blood glucose level after being given pharmacological therapy which was 157.27.

In the control group here only pharmacological therapy was given for 10 days. In this study calorie intake and carbohydrate intake in both groups were not examined. This could be affected so that fasting blood glucose levels in the control group decreased. The mechanism of action of the drug in reducing blood glucose levels includes stimulating the pancreas gland to increase insulin production, reducing glucose production in the liver, inhibiting carbohydrate digestion so that it can reduce glucose absorption and stimulate receptors. Insulin given earlier and more aggressively shows better clinical results, especially related to the problem of glucotoxicity which is shown by the improvement of pancreatic beta cell function [9].

Based on the results of the analysis, it is known that the p-value of 0.001 is less than 0.05, this means that there is an effect of pharmacological therapy on changes in fasting blood sugar levels in type 2 diabetes mellitus patients at the Jupon Health Center, Blora.

Another factor that can affect reducing fasting blood glucose levels in patients with type 2 diabetes mellitus is physical activity. In this control group it is known that the majority of respondents have physical activity. Poor physical activity can cause an increase in blood glucose levels. Physical activity is a movement produced by contraction of skeletal muscles that requires energy beyond energy expenditure during rest. During the exercise the muscles become more active and there is an increase in membrane permeability and an increase in blood flow as a result of more open capillary membranes and more active insulin receptors and a shift in energy use by muscles from fatty acid sources to the use of glucose and muscle glycogen. Physical activity increases glucose transport

through Glucose Transporter-4 (GLUT-4) into the cell membrane. [10].

Analysis differences in the mean fasting blood sugar levels between intervention and control groups

Comparison of mean fasting blood glucose levels and the effect of treatment in the intervention and control groups showed that there were differences in the average blood glucose levels between the intervention group electrical acupressure with 10x duration in 10 days with the control group after giving pharmacological therapy alone for 10 days, where the average intervention group experienced a decrease of an average of 186.87 whose value was smaller than the control group which had an average value of 224.67. Shows that the decrease in fasting blood glucose levels was higher in the control group even though the values of the two groups were sig. 0.321 or no significant difference. So with the absence of significant differences between the intervention group and the control group on the value of blood sugar levels before and after electrical acupressure therapy, according to researchers, acupressure therapy can also be one of nursing interventions for type II DM clients, especially those related to blood sugar levels.

Electrical acupressure as a tool for acupressure therapy, as well as being a method of efforts to improve health naturally. Acupressure based on the theory and facts that occur, certainly has a role in every process of changes in the human body, which changes are made by stimulating the human body line (meridians) that have energy (chi) that connects one network to another that has harmonization rather than the networks themselves.

Action Acupressure electrical massaging or reflection on the area of the pancreas in the feet and hands were conducted in patients with type 2 diabetes mellitus showed a decrease in blood glucose levels significantly compared with reflexology outside area of the pancreas in patients with NIDDM control. The reflexology method can be used as a complementary treatment in controlled NIDDM patients, in addition to the standard treatment given [11].

Acupuncture stimulation at the point of Zusanli Greater improve secretion function insulin inpatients with non-insulin dependent diabetes mellitus and significantly reduced sugar levels. Hypoglycemic effects were found in stimulating St

36 mice with electro stimulators rather than stimulation not at acupuncture points. Plasma insulin and endorphin levels significantly increased after stimulation at both St 36 points [12].

This was confirmed by the study of Masithoh (2017) who concluded that there were differences in blood sugar levels in the intervention group and the control group before and after acupressure therapy. The statistical test obtained $p = 0,000$ with $\alpha = 0,005$ proves the alternative hypothesis (H_a) researchers who stated that there was an effect of acupressure therapy on blood sugar levels in clients of type II DM. The truth of the theory about the theory of acupressure is that acupressure therapy can stimulate the pancreas and liver to be able to help maintain blood sugar within normal limits, and reduce the rise and fall of blood sugar proven in this study [8].

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CONCLUSION

Based on the results of research on the application of electrical acupressure to fasting blood glucose levels in patients with type 2 diabetes mellitus, the following conclusions can be drawn:

1. The creation of electrical acupressure for patients with diabetes mellitus type 2.
2. There is an effect of electrical acupressure on fasting blood glucose levels with a value significance or $p\text{-value} < 0.05$.
3. Electrical acupressure has an effect on fasting blood glucose levels in patients with type 2 diabetes mellitus. It was found that the reduction in blood glucose levels in the intervention group was more effective than the control group.

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