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Revitalization the Integrated Health Service and Promotions Post For Non - Communicable Disease in Boosting Visiting Rates and Blood Glucose Improvement to Diabetic Patient

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ABSTRACT

Introduction: *Non-communicable diseases (NCD) is a disease that commonly caused by the lifestyle which is also known as degenerative diseases. The number of the mortality rate of noninfectious diseases continues to rise throughout the world especially in developing and poor countries. More than two-thirds (70%) of the global population suffered from non communicable diseases such as cancer, heart disease, stroke, and diabetes. In Indonesia, to ensure community empowerment at the village level in health care, Posbindu PTM (NCD Health Service and Promotions Post) is introduced.*

Objective: *The study is to determine the impact of the revitalization of this post by providing service of diabetes gymnastic toward attendance rates and glucose levels for the patient suffering from diabetes mellitus.*

Methods: *The research design is analytical study by applying pre-experimental pre-post test design with the controlling group. The population is diabetes mellitus patients obtained through purposive sampling technique. Levels of glucose was measured before and after diabetic gymnastic exercise. Paired and independent t-test was performed to show the level of significant.*

Result: *The research proved that there was significant differences of glucose level before and after gymnastic diabetes exercise both in treatment and controlled groups. However, there is no significant relationship between the frequency of attending the integrated development program for non-communicable diseases toward glucose level of diabetes patients.*

Conclusion: *Revitalization of integrated non-communicable diseases post providing service of gymnastic diabetes exercise has a positive impact on lowering glucose level of diabetes patients.*

Keywords: *Diabetes Mellitus, Blood Glucose, Revitalization, Non-Communicable Disease, Integrated Health Service and Promotions Post.*

Introduction

One of the problems faced today in health development is the double burden of disease where on one side there are still many infectious diseases that must be handled while in the other hand it is found the increasing incidence of non-

communicable diseases (NCD). NCD is a disease that is not caused by infectious germs categorized in chronic degenerative diseases including Heart Disease and Blood Vessels, Diabetes Mellitus (DM), Cancer, Chronic Obstructive Pulmonary Disease (COPD) and disorders caused by accidents and acts of violence and which are main NCD groups. The mortality rate of NCD was increased from 41.7% in 1995 to 59.5% in 2007, (Kemenkes RI, 2012).

According to Center for Disease Control (2014), more than 220 million people worldwide suffer from Diabetes. WHO predicts that there will be a twofold increase in diabetes death between 2005-2030 where nearly half of diabetes sufferers are under the age of 70 and almost 80 % of diabetes death occur in middle and low-income populations such as Indonesia. Based on data from the International Diabetes Federation (IDF) in 2013, Indonesia is the 7th country with the highest number of diabetes sufferers in the world as many as 8.5 million people after China (98.4 million people), India (65.1 million people), USA (24.4 million people), Brazil (11.9 million people), Russia (10.9 million people) and Mexico (8.7 million people). This is certainly a crucial problem for Indonesia to immediately take action to prevent DM in order not to increase in the future.

Indonesia is one of the countries that has established a national program to tackle NCD problems through a revitalization program or a community-based NCS control model called *Posbindu* (Integrated Health Service and Promotions Post) PTM. Posbindu PTM is an activity of public participation in controlling NCD risk factors independently and sustainably. Posbindu PTM is conducted for all people aged 15 years and over with community implementers and assisted by local Community Health Center. Posbindu PTM requires public participation in conducting early detection and monitoring of main NCD risk factors implemented in an integrated, routine, and periodically (Kemenkes RI, 2013).

Districts /municipalities in Central Java Province, Indonesia reported non-communicable disease data in 2012 from 34 districts / municipalities of 97.14% which included Diabetes Mellitus 16.58%, COPD 1.16%, bronchial asthma 11.55%, and psychosis 2,8%. From the data of non-communicable diseases, the highest case is the group of heart and blood vessel disease (hypertension, CHD, stroke, weak heart) of 66,51% and Diabetes Mellitus is ranked the second. Though Posbindu PTM is a government-supported program possessing prospective activities for NCD control and prevention program, but for sustainability, those programs need the technical facility, partnership, and social support. The development of Posbindu PTM in Central Java Province according to Mardiyono et.al, (2014) is still in an early phase where the scope of monitoring obesity, blood pressure, blood sugar, cholesterol, uric acid, partnership, counseling, and community participation are still low. The majority of Posbindu PTM cadres are women (80%) and in possession of high school education (62.2%).

However, results of research conducted by Parinduri (2015) on the use of DM clinics showed that the attitude of respondents about DM patients in attending programs provided by Diabetes Mellitus clinic showed positive trends. This indicates that respondents' attitude toward the use of Diabetes Mellitus clinics is supportive in achieving the main goal of DM clinic which is patients can be self-sufficient or can manage their own diet to control blood sugar levels. The results of the study by Karinda (2013) also showed that there were significant differences in lipid profile (total cholesterol and LDL) of type II DM patients before and after the intervention of healthy diabetes mellitus gymnastics, total cholesterol (p-value = 0,000) and LDL (p-value = 0.000). Based on the results of this study, healthy diabetes mellitus gymnastics can be applied in health services to prevent the occurrence of complications in type II DM clients. Diabetes gymnastics is a movement of gymnastics that

emphasis on rhythmic movements of muscles, joints, vascular and nerves in the form of stretching and relaxation which, if done successfully, can regularly improve blood glucose controlling, lose weight, and increase HDL levels. Thus, the following hypotheses are formulated.

1. There is a significant difference value of blood sugar in DM respondents treated with diabetes exercise and those who are not.
2. There is a significant difference value of blood sugar in DM respondents treated with light jogging and those who are not.
3. There is a significant difference value of blood sugar in DM respondents treated with diabetes exercise and light jogging simultaneously and those who are not.
4. There is a significant difference value of blood sugar in DM respondents who frequently visit *Posbindu* NCD and those who are not.

Materials and Methods

This research is "pre-experimental pre-post test design with a control group. The researcher determined Health Community Center or *Puskesmas* Purwokerto Timur 2 as the control group and Puskesmas Sumbang I as the treatment group. Types of treatment given to the respondents were Diabetes Exercise Gymnastics for 2 times in 3 months while the controlled group was given a light jogging exercise. The following, the researchers measured blood glucose levels in the treatment group and the controlled group. The population in this study were all patients who suffered from Diabetes Mellitus (DM) visiting Posbindu PTM in Puskesmas Sumbang I and Purwokerto Timur 2 within 3 months with the criteria: suffering from Type II, DM willing to become informants, aging > 15 years, not experiencing diabetic ulcer and having no complications in mental disorders. With Purposive Sampling, data were analyzed by using *t-test*. The research was conducted for 3 months from September to November 2016. The sample for the treatment group were 52 respondents and the controlled group were 50 respondents.

Results and Discussion

The majority of respondents in the treatment group were 56 to 75 years old: 24 people (46.2%) and 22 people (44.0%) in the controlled group. The results of this study in accordance with research of Jelantik (2013) showed that the age of diabetes sufferers was ≥ 60 years old, 3 times more than the younger age of < 55 years. Age of ≥ 60 years is associated with the occurrence of diabetes because, in old age, the body functions are physiologically decreased due to the decreased secretion or insulin resistance so that the body's ability to control high blood glucose is less than optimal.

The majority of respondents' gender in the treatment group were 45 women (86.5%) and 39 women (78.0%) in the controlled group. The results of this study in accordance with research conducted by Jelantik et.al, (2014), showed that the disease of Diabetes Mellitus is mostly found in women than men. This due to the fact that women have LDL or bad cholesterol known as triglyceride is higher compared to men. The amount of fat in the average adult male is ranged from 15-20% out of the total body weight, and in women, it is about 20-25%. So the increase of lipid level (fat blood) in women is higher than in men making the risk factor of Diabetes Mellitus in women is 3-7 times higher than in men that are usually 2-3 times.

The majority of respondents in the treatment group, 19 people had an elementary education level (36.5%) and in the control group, 14 people was graduated from high school (28.0%). The majority of respondents in the treatment group were 16 housewives (30,8%) and in control group, 14 people were self-employed (28,0%). This is in line with Azhara (2014), that in Indonesia most respondents in the case and control group for Diabetes Mellitus mostly worked as housewives. For the case group was 14 people (35%), while in the controlled group was 12 people (30%). Only a

few respondents who worked as civil servants or employees of state-owned companies that are 1 person (2.5%) in the case group, as well as in the control group that is 1 person (2.5%). The visiting rates in Non-Communicable Diseases Posbindu at Puskesmas Sumbang I and Puskesmas Purwokerto Timur 2 are presented in Table 2.

Table 1. Visiting Rates to NCD Posbindu

Visiting Rates	Treatment Groups		Controlled Group	
	Frequency	%	Frequency	%
Active (3 times)	18	34.6	21	42
Non-Active (< 3 times)	34	65.4	29	58
Total	52	100	50	100

The table shows that most of the respondent's visit to Posbindu PTM in the treatment group is inactive that is counted 34 people (65,4%) and level of the respondent visit in control group mostly inactive that is 29 people (58,0%). The effect of diabetes gymnastics on blood sugar levels before and after exercise in treatment group is presented in Table. 2

Table 2. Blood Sugar Level after Treatment

Variables	n	Mean	SD	*t*	df	p	α
Before	52	149.42	62.43	6.154	51	0.000	0.005
After	52	123.42	73.62				

The table above shows that the mean value of blood sugar levels of respondents in the treatment group before and after being given diabetes gymnastics training was decreased by 25 mg/dl from 149.42 to 123.42. Based on the statistical test, it is obtained p = 0,000 is < α = 0.005 so that the hypothesis 1 is accepted meaning there is a significant influence on diabetes exercise and the value of blood sugar in respondents with Diabetes Mellitus in Puskesmas Sumbang I. This study is also in line with Fikasari (2012), that someone who regularly exercise / in the medium category can reduce the risk of type II DM disease by 0.422 times compared to the irregular ones as exercise can lose weight and improve insulin sensitivity to improve the control of glucose in the blood. Someone who has less exercise has a risk of 4.5 times suffering from type II DM than those who are doing enough exercise.

The effect of light Jogging on blood sugar levels before and after exercise in the controlled group is presented in Table 3.

Table 3. Blood sugar level at Controlled Group

Variables	n	Mean	SD	*t*	*df*	p	α
Before	52	161.60	65.78	0.331	49	0.742	0.005
After	52	160.50	70.30				

The table shows that the mean value of blood sugar levels of respondents in the control group before and after being given mild jogging exercise is decreased by 1.1 mg/dl from 161.60 to 160.50. Based on the statistical test, p = 0,742 is > α = 0,005 indicating that hypothesis 2 is rejected meaning there is no significant influence of light jogging to blood sugar level value on respondent with Diabetes Mellitus at Puskesmas Purwokerto Timur 2. The differences value of blood sugar level on treatment group and the controlled group is presented in Table 4.

Table 4. The differences value of blood sugar level on treatment group and controlled group

Treatment	n	Mean	*t*	df	p	α
Diabetic Gymnastics	52	26.000	- 4.609	100	0.000	0.005
Light Jogging	50	1.1000				

The table above shows that there is a significant difference between blood sugar levels in the treatment group using diabetes gymnastics and control group using light jogging with p = 0.000 value which is smaller than α = 0.005 indicating hypothesis 3 is accepted. The difference between the decrease in blood glucose levels and the exercise of diabetes gymnastics was greater (26.000) than control groups using light jogging (1.1000).

Research by Salindeho (2016) about the influence of Diabetes Mellitus gymnastics on blood sugar level showed independent t-test obtained p-value = 0.001 < alpha value (0.005) INDICATING that there is a significant difference between the mean blood sugar levels of the treatment group and the control group after the intervention of the Diabetes Mellitus gymnastics. Furthermore, research by Manan (2013) showed the effect of diabetic gymnastics on blood sugar level of Diabetes Mellitus type II patients showing the decrease of blood sugar level with an average of 13.385 and supported with p-value 0.047 < α 0,05. The movement of diabetes gymnastics leads to muscle contractility which results in GLUT4 translocation to the cell surface making it easier for the transport of glucose in the blood into the muscle. The study by Karim (2015), showed that blood sugar levels before the intervention of gymnastics with mean values of 198.67 and SD 28.987 while blood sugar levels after the intervention of gymnastics with a mean of 163.27 and std. Deviation 32.575.

The difference of visiting rates in the treatment and controlled group toward blood glucose level is presented in Table 5.

Tabel 5. The differences of visiting rates toward value of blood sugar level

Variables	n	p	α
Visiting Rates	102	0.336	0.005
Blood sugar level	102		

The table shows that there is no significant difference between visitation rate with blood sugar value in treatment group and control group as p = 0.336 is > α = 0.005 indicating the rejection of hypothesis 4.

Conclusions

Control of NCD in Indonesia is stipulated in the law about the efforts made in terms of preventing, controlling, handling, and the consequences of the non communicable disease. One effort to control the risk factors for the diseases is through the establishment of NCS control model called *Posbindu* (Integrated Health Service and Promotions Post) *PTM*. With the low visiting rate to this post, revitalization of the function which is mainly to deliver information on a non-communicable disease to providing real services like diabetic gymnastic exercise and light jogging is necessary to attract the community to drop by mainly for the patients of Diabetes Mellitus. Other relevant services might be extended not only to the patients of Diabetes Mellitus but also other non-communicable diseases do that this post can become the main agent in supporting the government of Indonesia program in empowering society to fight non-communicable diseases.

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