



Proceeding

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INTERNATIONAL SEMINAR **On Psychology**

*"Individual and Multi - Cultural Social Empowerment
for Achieving Social Harmony"*

Faculty of Psychology
Universitas Muhammadiyah Purwokerto



**INTERNATIONAL SEMINAR ON PSYCHOLOGY 2017 PROCEEDING
"INDIVIDUAL AND MULTI-CULTURAL SOCIAL EMPOWERMENT FOR
ACHIEVING SOCIAL HARMONY"**

AUGUST 12TH 2017

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INTRODUCTION

Assalamualaikum warahmatullahi wabarakatuh.

All the worship and praise of Allah Almighty for all his grace and blessings so that the international seminar with the theme "**Individual and Multi-cultural Social Empowerment for Achieving Social Harmony**" can be held. This International Seminar is a manifestation of the role of Psychology Faculty of Muhammadiyah University of Purwokerto in developing the repertoire of Psychology, especially the application of psychology in individual and community empowerment, in line with the intended vision. Through this International seminar is also expected be a medium for sharing ideas related to psychology in particular, and social harmony in general. The sharing of this idea is expected to be a link in increasing social harmonization towards better society.

Our thanks to the Rector of Muhammadiyah University of Purwokerto for all support in the implementation of this international seminar. Our greatest thanks to all the International Seminar organizers who have worked hard for the realization of this seminar. To all stakeholders we thank you for the positive contribution. To all the participants of this seminar, we thank you for the participation, accompanied by apology if there is a shortage in the implementation.

May AllahSWT bestow all His blessings on all our toil. Amen.

Wassalamualaikum warahmatullahi wabarakatuh

Purwokerto, August 7th 2017

Dean,

Retno Dwiyantri, S.Psi., M.Si

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The Effect Progressive Muscle Relaxation Exercise on Blood Sugar Levels

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ABSTRACT

Indonesia was ranked the ten most prevalent diseases diabetes mellitus. One treatment of diabetes is through exercise. Progressive Muscle Relaxation is a form of mind-body therapy based on the sympathetic and parasympathetic nervous system. The research to determine the effect of progressive muscle relaxation exercises on blood sugar levels. This study is a quasi eksperimen with pre and post with the control group. Number of respondents overall 30 who were divided into intervention and control groups. This research was conducted on people at risk of diabetes in Purwojati part of Central Java. Analysis of the results of research using frequency distribution and Wilcoxon test. There were significant differences in pre and post workout with p value in the intervention group p: 0.001. There is no significant difference in the pre and post in the control group, with p: 0.291. Progressive muscle relaxation exercise will produce muscle becomes more active and increased permeability of the membrane and consequently an increase in blood flow capillary membrane more open. Insulin receptors are more active in the use of energy by muscles derived from the use of glucose and fatty acids into muscle glycogen. Progressive muscle relaxation exercise using 15 movement and at least 15 minutes for three days can increase muscle activity and thus improve blood sugar metabolism effect blood glucose levels will decrease significantly.

Keywords ; *Diabetes mellitus, Progressive Muscle Relaxation, Blood Sugar Levels*

INTRODUCTION

The main pillar in the management diabetes Mellitus is education, regulation of diet, exercise, medication, blood sugar control (ADA 2015). A nurse is obliged to provide nursing care independently so that patients with diabetes can live a normal life and not experience complications resulting from high blood sugar levels. Intervention in patients with type 2 diabetes through exercise progressive muscle relaxation (PMR) is a form of mind-body therapy in the management based on the sympathetic and parasympathetic nervous system. PMR is a muscle relaxant which consists of 15 movements that aim to get relaxation in the muscles. PMR will relax the muscles, inhibiting feedback pathways stressor and reinforce positive attitude.

Roberts et al (2013) says that physical activity greatly affect the metabolic system, including the production of insulin that affect blood sugar levels. The opinion was strengthened by the results of Chauduri et al (2014) Progressive muscle exercises can improve the stress and improve the quality of life that will make pancreas produce more insulin. Mashudi study (2011) showed that patients with diabetes mellitus by PMR exercise three times a week has a significant influence on the decrease in blood glucose levels of patients with diabetes mellitus.

Research by Kaviani (2014) of the 58 patients with gestational diabetes interventions exercise PMR for 3 times the exercise for 45 minutes there are differences in the levels of fasting blood sugar, 2-hour postprandial blood sugar, blood pressure systolic and diastolic compared to the control group with p

<0.001. Based on this background researchers interested in conducting research effectiveness of progressive muscle relaxation exercises to decrease blood sugar levels.

METHOD

The Research quasi eksperimen with pre and post with the control group. The research method to compare two groups of intervention and control. Measurement of blood sugar levels performed before exercise and after exercise (Notoatmojo, 2005). Inclusion criteria for this study are members muhammadiyah purwojati region with a body mass index above normal. Sampling was done by consecutive techniques. According Sastroasmoro (2006) concecutif sampling is a type of non-sampling probabilitis the nicest and most often performed in clinical studies

Samples taken in this study is based on inclusion and exclusion criteria were to be the subject of research. Total counting a sample of 30 respondents were divided into two for the control group and the intervention group. Univariate data presentation to describe the characteristics of each respondent either intervention or control group. Numerical data (age and Blood glucose levels) used the mean, median, standard deviation, min, max. Categorical data (gender, long-suffering) will be described with percentages. Bivariate analysis using non-parametric test for normality test results data obtained $P < 0.05$ using the Mann Whitney test to discern changes in blood sugar levels between the intervention group and the control group.

RESULTS

The results of this study prove that progressive muscle relaxation exercises effect on blood sugar levels drop. On the table are described in the intervention group $p = 0.001$. in the control group p value: 0.291.

Table 1. The frequency distribution

Variable	Intervention	%	Control	%	Total
Gender					
Male	8	53.3	6	40	14
Female	7	46.7	9	60	16
Total	15	100	15	100	30
Age					
30-40	1	6.7	3	20	4
41-50	2	13.3	2	13.3	4
51-60	8	53.3	9	60	17
61-70	3	20	-	-	3
71-80	1	6.7	1	6.7	2
Total	15	100	15	100	30
Education					
PS	10	66.7	9	60	19
JHS	2	13.3	2	13.3	4
SHS	1	6.7	2	13.3	3
College	1	6.7	-	-	1
no education	1	6.7	2	13.3	3

Total	15	100	15	100	30
Work					
retired	1	6.7	-	-	1
farmer	9	60	6	40	15
entrepreneur	3	20	4	26.7	7
no job	2	13.3	5	33.3	7
Total	15	100	15	100	30

Table 2. Blood Sugar Levels before and after given a progressive muscle relaxation exercise

Kel	N	Variabel	Mean	SD	Min-Max	CI
Intv	15	BSLpre	154.80	53.675	90-264	125.08-184.52
		BSL post	137.40	46.289	87-210	117.19-158.81
Control	15	BSL pre	137	40.315	72-239	114.67-159.33
		BSLpost	138	37.573	80-230	117.19-158.81

Table 3. Differences in blood sugar levels before and after exercise

	Total	Variabel	Mean	Z	P value
Intervention	15	BSL pre dan post	8	-3.412 ^a	.001*
Control	15	BSL pre dan post	8.30	-1.056 ^a	.291

Described in Table 1 note that the characteristics of respondents by sex Most were female (53.3%) and respondents aged over half are in the range of 51-60 years as many as 17 people (56.66%). Elementary education most of the respondents (63.33%), half the respondents work is a farmer by (50%).

The average blood sugar levels in Table 2 in the intervention group before practice with value SD 53 675 154.80 while the average GDS after practice with value SD 46 289 137.40. Average blood sugar during the first day of the control group with a value of SD 40 315 138 and on the third day 138 with a value of 37 573 SD. Very clear on table 3 random blood sugar levels in the intervension group p value: 0.001. Random blood sugar levels in the control group p value: 0.291.

DISCUSSION

Increased incidence of diabetes with age, especially at the age of 40 years because at that age Began an increase of intolenrance glucose. Their aging process causes reduced ability of β cells in the pancreas to produce insulin (Sunjaya, 2009). In older people there is a decrease in the activity of mitochondria in muscle cells by 35% and is associated with increased levels of fat in the muscle by 30% and lead to insulin resistance.

The results are consistent with research conducted by Figueira et al (2013) on patients with type 2 diabetes aged 56 years by doing aerobic exercises for 3 days. Results of measurement of fasting glycemia baseline was 139 ± 05 mg / dL and $7.9 \pm 0.7\%$ HbA1c glucose levels decreased immediately after aerobic by 16% and last for approximately 3 hours. These results are comparable with studies Retno (2012), which uses exercises with gymnastic diabetes that results can improve insulin sensitivity in the muscles

and liver that can lead to a decrease in the dose of drugs hypoglycaemic oral or insulin required the person, lipid profiles also tended improved if the physical exercise.

Research by Rynders et al (2014) mentions that in adults prediabetic, regular exercise has an immediate effect and intensity depending on the improvement of postprandial glycemia and insulin sensitivity. Comparable to research Mikus et al (2011) on patients with type 2 diabetes by doing exercises for 7 days with a treadmill and exercise bike (60 minutes / day), although the results of fasting glucose and insulin did not differ significantly after 7 days of practice but the entire body's sensitivity insulin (insulin sensitivity index) increased ($p < 0.05$). The conclusion of this research is exercise on a treadmill and cycling for 7 days not only improves insulin sensitivity but also increase the blood flow of an artery in patients with type 2 diabetes.

Other research supports is research Widia (2013) who studied the effect of exercise on diabetic patient's blood sugar level drops diabetes mellitus. The results showed an average blood sugar level is 272.4mg / dL and after gymnastics diabetes decreased by an average of blood sugar levels 257.04mg / dL. Yardley et al (2012) also conducted a study of twelve people with type 1 diabetes ($HbA1c 7.1 \pm 1.0\%$) interventions for aerobic exercise for 45 minutes before 45 minutes of endurance exercise (three sets of eight, seven drills different) plasma glucose were measured during exercise and 60 minutes after exercise. interstitial glucose was measured by continuous glucose monitoring 24 hours before, during, and 24 hours after exercise. The results showed a significant decrease in blood glucose levels with $p = 0.006$ after 45 minutes of exercise.

During doing gymnastics diabetes, exercise and practice progressive muscle relaxation on a regular basis would result in muscles become more active and an increase in membrane permeability and an increase in blood flow consequently capillary membrane more open and more insulin receptor is activated and a shift in energy use by muscle derived from fatty acids to glucose and muscle glycogen utilization (Soegondo, 2009). Exercise also useful in controlling blood glucose levels can lose weight and diabetes mellitus type 2. While doing gymnastics muscles will be more active so that usage will also increase blood sugar and cause a reduction in insulin requirements.

Smeltzer & Bare (2010) said the purpose of relaxation exercises is to generate a response that can combat stress. Thus. when doing progressive muscle relaxation calm, relaxed and full of concentration (relaxation in) the tension and relaxation of muscles are trained for 30 minutes then the secretion of CRH (corticotropin releasing hormone) and ACTH (adrenocorticotrophic hormone) in the hypothalamus decreased. The second decline in secretion of these hormones cause the sympathetic nerve activity decrease and expenses decreased adrenaline and noradrenaline. Relaxation produced will result in a decrease in cortisol hormone that stimulates pancreatic automatically to produce insulin, so blood sugar levels decreased (Sherwood, 2011).

CONCLUSION

Progressive muscle relaxation exercises are performed regularly with minimal exercise for 15 minutes can increase muscle activity and improves blood sugar metabolism in the body. The benefits of exercise progressive muscle relaxation (PMR) is lowered anxiety, oxygen consumption of the body, speed metabolism, including metabolism of sugar in the blood, respiratory rate, muscle tension, blood pressure systole and diastole, premature ventricular contraction and an increase in alpha wave brain. The authors found that relaxation exercises done regularly will be able to increase insulin secretion in the pancreas

and can lower blood sugar levels. The author recommended in patients with diabetes mellitus to always do physical exercise.

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