



THE EFFECTS OF AUTOGENIC RELAXATION ON BLOOD GLUCOSE LEVELS OF PATIENTS WITH DIABATES MELLITUS TYPE 2

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ABSTRACT

BACKGROUND: Patients with diabetes mellitus type 2 (DMT2) diabetes have relative insulin deficiency so that blood glucose regulation becomes screwed, eventually causing hyperglycemia. When it is left untreated, it can lead to complications. Diabetic patients having these complications undergo hospitalization for management of blood glucose level. Such conditions often make the patients stressed, experiencing great anxiety that ultimately may increase blood glucose levels. Autogenic relaxation is a relaxation technique that comes from oneself in the form of words or short sentences or thoughts that can make the mind peaceful. Autogenic relaxation response can divert our bodies consciously by the command of ourselves; it can help fight the harmful effects of stress. Autogenic relaxation could be expected to control blood glucose levels. The purpose of this study was to determine the effects of autogenic relaxation on blood glucose levels in patients with DMT2 diabetes mellitus.

METHOD: Research design was quasi-experimental with pre- and post-tests with control group. Each sample group consisted of 31 people with consecutive sampling technique. Data were analyzed using univariate and bivariate. The statistical test used the Wilcoxon Sign-Range Test and Mann-Whitney Analysis which showed that there were effects of autogenic relaxation to decrease blood glucose levels ($p=0.001$).

RESULTS AND DISCUSSION: The use of autogenic relaxation is effective because it has simple instructions that can be done while the patient is lying down, sitting on a chair, or leaning over a chair, allowing the patient to do it anywhere, giving positive effects after three interventions for 15-20 minutes and has minimal side effects compared to other psychological therapies.

CONCLUSION: There is a significant result on the use of autogenic relaxation to decrease blood glucose levels in patients with type 2 diabetes mellitus. The results of this study can serve as an input for nursing services to make autogenic relaxation an independent nursing intervention program to provide nursing care to patients with DMT2.

KEYWORDS : Autogenic relaxation, blood glucose levels, diabetes type 2

INTRODUCTION

Glucose is the simplest form of carbohydrate that is absorbed into the bloodstream through the digestive system. Blood glucose concentration is very important to maintain at a fairly high and stable level of about 70-120 mg/dl to maintain optimal brain function and tissue supply. Blood glucose levels also need to be maintained so as not to increase too high considering that glucose also affects extracellular fluid osmotic pressure [1].

According to the International Diabetes Federation (IDF) [2], Indonesia is ranked third in the world having the most number of people with DM. IDF reported that DM prevalence for the United States was 8.3%, while in China it had 3.9%. Indonesia is one of the top countries in the world with high prevalence of DM. The latest data from World Health Organization survey results in 2011 indicated that Indonesia was the fourth largest country in the world with a high incidence of DM.

To prevent the occurrence of DM complications, therapeutic and regular controls are required through changes in lifestyle of right, firm, and permanent DMT2 patients. In the implementation of blood glucose control, there are several ways such as relaxation therapy, which consists of PMR, Benson, deep breath, and autogenic relaxation where all types of relaxation have been tested through various research [3]. Autogenic relaxation is the relaxation technique with simpler movements and instructions than other relaxation techniques and can be done in a reclining, sitting position or leaning over a chair that allows patients to do it anywhere without much time consumption [4]. Research on autogenic relaxation has been tested for the effectiveness of this relaxation technique in an effort to decrease anxiety in sleep problems and reduce pain among patients with DMT2 [7,8]. In Indonesia, autogenic relaxation research has also been conducted. Autogenic relaxation can decrease anxiety in children and adolescent [9], autogenic relaxation can lower blood glucose and blood pressure in patients with diabetes mellitus with hypertension [10].

Relaxation is a form of mind-body intervention in complementary and alternative medicine (CAM) in nursing settings [11]. The use of complementary therapies has been increasing in recent decades. CAM have been part of nursing care since Florence Nightingale period as indicated in her book [16]. Relaxation is thought to work with the

regulation of hormones cortisol and other stress hormones. This is reinforced [12] meditative effect on lowering blood sugar levels.

According to [13], there are three basic positions in autogenic relaxation: sitting on a chair, leaning over a chair, or lying on the floor. In lying down, the principle is the same as the one proposed in the National Safety Council in 2004 allowing gravity to support [20]. The sitting position has the advantage of being practical; it can be done anywhere. The hypothesis of this study is that there is an effect of autogenic relaxation on blood sugar levels in patients with DMT2 in Dr. Djasamen Saragih Hospital and Vita Insani Hospital in Pematangsiantar, Indonesia.

METHODS

Study design

This study used quasi ekaperiment pre and post test in the intervention and control groups. The identified variables were blood glucose levels and autogenic relaxation. This research was conducted at Dr. Djasamen Saragih Hospital which is a general hospital, while the other half came from Horas Insani Hospital which is a private hospital from February to March 2014.

Each group consisted of 31 samples with consecutive sampling technique. Data were analyzed through univariate and bivariate method. The statistical tests used were Wilcoxon sign range test and mann-whitney analysis [14].

Research subject

Sixty-two patients with DMT2 participated in the study. One half of these participants came from Dr. Djasamen Saragih Hospital which is a general hospital, while the other half came from Horas Insani Hospital which is a private hospital. Thus, each group consisted of 31 participants. Both of the hospitals are situated in Pematangsiantar, Indonesia. Those interested to participate in the study met with the researcher who provided them with an information sheet and explained the study in further detail. Inclusion criteria

The researcher assessed the patients to ensure that they met the following inclusion criteria: with DMT2 with or without coexisting

hospitalized disease; with blood glucose levels at the time of admission (pain – 200 mg/dl); willing to be the subject of research; had never done autogenic relaxation; got oral hyperglycemic medication, got permission from the treating doctor; willing to comply with the program being run; adhered to the hospital diet and ran oral hyperglycemic medication therapy under observation of the researcher or research assistant during the study.

Exclusion Criteria

Patients were not eligible for the intervention if they exhibited the following exclusion criteria: left the hospital before six treatments; refused to continue treatment before reaching six times autogenic relaxation exercise; experienced severe stress and anxiety; had an awareness disorder.

Intervention

In the intervention group, autogenic relaxation (AR) was performed in each patient's room. AR took place separately for each participant. Each participant was given six AR every morning and afternoon for three days. The AR was done at 11:00 a.m. and 5:00 p.m. AR walking duration lasted for 15-20 minutes. The researchers conducted measurements before and after AR was performed at each session along with the six treatments.

Ethical consideration

Regarding the rights of human subjects, this study received permission from the Ethics Committee of the University of North Sumatra, Indonesia. Nurses at the Hospital introducing researchers to patients who are potential subjects of this study. All subjects who participated in this study received oral and written explanations from the researchers. The consent form is given based on the interests of the subject. Approved consent or vocalization of the patient's desire to participate was used as a sign of their agreement. The researcher assured the subject that their participation was voluntary. All of them information is maintained with confidence. In addition, there are no risks associated with completing the questionnaire.

Data analysis

Data analysis in this study included univariate analysis and bivariate analysis. From the normality and homogeneity tests obtained, the test used is the non-parametric Wilcoxon Sign Rank Test for paired samples and Mann Whitney Test for unpaired samples.

RESULT

Data from 62 participants were analyzed. Sample characteristics are presented in Table 1. Distribution of respondents in the presence or absence of comorbidities showed that respondents with comorbidities were greater in the intervention group that was 77.4%, while in the control group it was 58.1%. Distribution based on the duration of DMT2 showed that respondents in the intervention group suffered DMT2 – 8 years at 64.5%, while the control group had 45.2%.

Table 2 shows that the mean of blood glucose level of the intervention group before was 350.19 mg/dl. After the intervention it was 170.13 mg/dl. The mean

TABLE 1. SAMPLE CHARACTERISTICS

		Intervention	Control
		N (%)	N (%)
Age	28-39	2 (6.5)	2 (6.5)
	40-65	29 (93.5)	29 (93.5)
Sex	Man	17 (54.8)	16 (51.6)
	Women	14 (45.2)	15 (48.4)
Comorbidities	None	7 (7.4)	18 (58.1)
	There	24 (2.6)	13 (41.9)
Hospitalizations in the past 8 years	≤ 8	11(17.7)	17 (54.8)
	≥ 8	20 (32.3)	14 (45.2)

TABLE 2 STATISTICAL TEST

	Group	Mean	SD	pValue
Blood glucose level	Intervention group			
	Before	350.19	64.99	0.001*
	After	170.13	15.34	
	Differential	180.06	49.65	
Control group	Before	287.71	87.59	0.001*
	After	213.73	54.74	
	Differential	73.98	32.85	

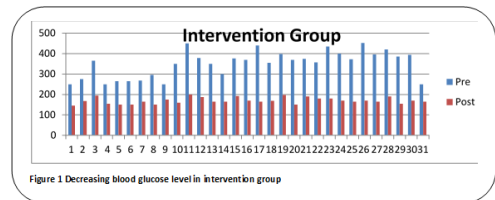
of blood glucose level of the control group before was 287.71 mg/dl and after the intervention, it was 213.73 mg/dl. Based on the data analysis, it can be concluded that the mean of blood glucose level in the intervention group tends to be higher than the control group before the intervention but lower after the intervention. By looking at the results of statistical tests, it was concluded that there was a significant difference between the intervention group and the control group with a p value of 0.001. The effect of autogenic relaxation on the patients showed changes in the blood glucose level of each respondent. The results are presented in Fig. 1 and Fig. 2.

Decreased blood sugar levels occurred in all participants in the intervention group. The decrease occurred after AR for three days. The six AR which were done twice daily showed a significant difference in the value of each 15-20 minute session. Fig. 2 also shows decreasing blood glucose level in the control group, but the change in the blood glucose level mean that occurred in the intervention group is greater than that in the control group.

Figure 1 shows that the difference in the mean of blood glucose levels in the intervention group is greater than the control group, with a mean difference of 180.06 mg/dl, whereas in the control group the mean difference was 73.98 mg/dl every morning and afternoon. After the Mann-Whitney test of the mean difference between the intervention group and the control group, the standard deviation of 39.80 was found, with the lowest blood glucose level of 133 mg/dl to 375 mg/dl. After a statistical test, p = 0.001, where p 0.05. From the statistical test results, it can be concluded that there is a significant difference between blood glucose levels mean in the intervention group and the control group after autogenic relaxation (p = 0.001).

TABLE 3 MANN-WHITNEY TEST

Variabel	Group	Differential mean	SD	Pvalue
Blood glucose level after AR	Intervention	180.06	39.80	0.001
	Control	73.98		



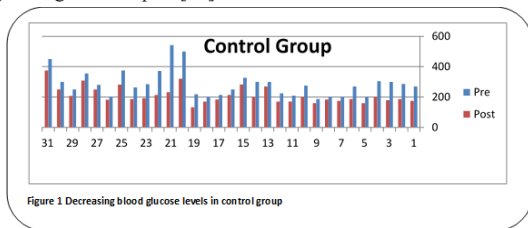
DISCUSSION

The results of this study showed that patients with type 2 diabetes mellitus who were given autogenic relaxation exercise twice daily for 3 days for 15 minutes showed a significant difference in the value of blood glucose levels before and after autogenic relaxation. The presence of the difference is apparent at different mean values between blood glucose levels before and after AR. The researchers conclude that the difference in the three-day intervention with exercise frequency of twice daily for 15-25 minutes occurred because autogenic relaxation was applied to the intervention group. There was also a significant difference in the mean between the intervention and the control group. A significant difference in blood glucose levels before and after AR in the intervention group had been present since the first autogenic relaxation and continued to affect the decrease until the sixth AR, whereas in the control group, mean differences were also met but not too large.

Autogenic relaxation, one of the classifications of CAM [15] is a form of mind and body therapy which uses the belief that the mind affects the body through the concept of self-healing [12]. The researchers found out that the benefits of autogenic relaxation could reassure the old concept application of mind-to-body relation in the nursing world written by Florence Nightingale in 1859 in her book Notes on Nursing to a new belief in nursing care in patients with endocrine diseases [16]. This autogenic relaxation works through the interaction of physiological and psychological responses. This relaxation lowers the level of the hormone [17].

Autogenic relaxation will have an effect after three times where each session is performed for 15-20 minutes. One of the advantages of this autogenic relaxation is that this relaxation can be performed by the patient once this way is taught. In addition, autogenic relaxation gives

a positive effect when performed on DM type 2 patients [5]. In accordance with 35 randomized control trials in psychologically-related psychiatric studies evaluation, it was found that autogenic relaxation had the least adverse effects compared to other psychological therapies [18].



More than 300 experts state the effectiveness of autogenic relaxation. In addition to being useful for lowering blood pressure and blood sugar levels, this relaxation is also beneficial to improve health-related quality of life, improve social quality, reduce pain, reduce depression, improve sleep parameter [21], improve mood, decrease pulse rate, respiratory rate and body temperature, improve heart and respiratory fitness, lower headache, insomnia and irritable bowel syndrome. Individual who practice daily autogenic relaxation on a regular basis once a day for 15-20 minutes report better health conditions and more balanced emotional states, better coping skills, improved sleep quality and decreased levels of anxiety [13,15].

To conclude this study showed a significant difference in mean blood glucose levels before and after autogenic relaxation in both the intervention group and the control group and there was a significant difference in mean difference of blood glucose levels between the intervention group and the control group, and no significant effect on age, genitals, comorbidities and duration of DMT2 with an average of blood glucose levels after autogenic relaxation.

SUGGESTION

Based on the results of this study it is suggested that autogenic relaxation be one form of self-nursing intervention in providing nursing care in patients with DM Type 2 and as a consideration in making decisions in a nursing management to make standard operational procedure [SOP] related with nursing care DMT2 patients.

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Abbreviation

AR: Autogenic relaxation
DM Type 2: Diabetes mellitus type 2
CAM: Complementary and alternative medicine
IDF: International Diabetes Federation
PMR: Progressive muscle relaxation
SOP: Standard operational procedure

Competing interest

The authors declare that they have no competing interest.

Author'contributions

ML contributed to database search; the review of literature; analysis and interpretation of data; drafting and revising of manuscript; PS contributed to the conception; selection of studies; design of review; management of the references; drafting and revising of the manuscript; organizer of team.

All authors read and approved the final manuscript.

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