

## EFFECT OF BENSON RELAXATION EXERCISE ON BLOOD PRESSURE OF PATIENTS WITH TYPE II DM

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**Abstract:** *Hypertension is a condition that is often found in patients with Type II DM. This condition requires proper treatment because it can cause various complications experienced by patients. Benson relaxation exercises are an alternative therapy that can be applied to DM patients who have hypertension. Apart from being able to control blood glucose levels, several studies have shown that this relaxation exercise has a significant effect in lowering blood pressure. This study aims to see the effect of Benson relaxation exercises on the blood pressure of patients with Type II diabetes. This type of research is quantitative with a pre and post test quasi-experimental design. The population in this study were all type II DM patients who went to the Internal Medicine clinic of RSUD Dr. Soekardjo Tasikmalaya at the time of the research. The number of respondents in this study were 32 people. The results showed that there was a significant difference in the average diastolic blood pressure of respondents before and after exercise.*

**Keywords:** *Type II diabetes mellitus, blood pressure, benson relaxation.*

### INTRODUCTION

The American Diabetes association (ADA) in 2010, diabetes mellitus is defined (DM) as a metabolic disease characterized by Hyperglycemia due to abnormal insulin, action of insulin, or both. Diabetes Mellitus is characterized by elevated levels of blood glucose exceeds the normal (70 - 140 mg / dL). Other symptoms often felt by people with diabetes (often feel hungry), polydipsi (blood-thirsty), polyuria (frequent urination). If that happens, then it will take a long time. because of the lack of insulin production and type 2 diabetes, which is caused by actions that are not effective against Diabetes Mellitus(1).

Who explained that the DM is one of the four priorities for diseases of non-communicable diseases (PTM) and the main cause for blindness, heart attack, stroke, kidney failure and amputation of the feet. In the year 2015, the number of cases of DM reaches 415 million adults. It is estimated that this figure will increase in 2040 to 642 million. Much of this increase will occur in developing countries due to population growth, aging, unhealthy diet, obesity and sedentary life style. In the year 2025, while most people with diabetes in developed countries will be 65 or older, in developing countries most will be in the 45-64 age group and will be affected in the years of their most productive(2).

Like conditions in the world, diabetes is now one of the biggest causes of death in Indonesia. Basic health research data (riskesdas) in 2018 shows the prevalence of national DM is 8.5% or around 20.4 million Indonesians affected by DM. DM sufferers also often experience acute and chronic complications that end in death. The IDF (International Diabetes Federation) organization predicts that there will be an increasing increase in DM

cases in Indonesia. This must be responded to with a fast and structured handling involving various scientific disciplines. Preventive and curative efforts must continue to be carried out to support the healing of DM patients(1).

Diabetes requires proper care so as not to cause more severe complications. In principle, diabetes therapy aims to normalize insulin activity and blood glucose levels in an effort to reduce the occurrence of vascular complications and neuropathic. The goal of therapy for each type of diabetes is to achieve normal blood glucose levels without hypoglycemia and serious disturbances in the activity patterns of the patient. There are five components of diabetes management, diet, exercise, monitoring, therapy if necessary and education(3).

Hypertension is known as one of the factors that are associated with diabetes. Hypertension is defined as systolic blood pressure greater than or equal to 140 mmHg or increase in diastolic blood pressure greater than or equal to 90 mmHg(3). Abnormalities of glucose, insulin and lipoprotein metabolism play a role in the formation of primary hypertension and its complications. The high concentration of insulin in the blood stimulates activity of the sympathetic nervous system (SNS) and impairs nitric oxide-mediated vasodilation. The vascular endothelium is known to be the source of various vasoactive substances. In some people with hypertension, the vasodilatory response to nitric oxide is inhibited. Other inhibitory effects include vascular hypertrophy and increased renal salt reabsorption(4).

Hypertension that occurs in DM patients can aggravate the patient's condition, this is due to the emergence of long-term complications as a result of increasing blood pressure. To treat hypertension, a decrease in heart rate, volume volume or TPR (Total Peripheral Resistance) can be done. Pharmacological and non pharmacological interventions can help a person reduce their blood pressure(5). In some people, weight loss seems to reduce blood pressure, this is due to a reduction in the workload of the heart so that heart rate and stroke volume are also reduced. Exercise, especially when accompanied by weight loss, can also lower blood pressure by decreasing resting heart rate and possibly TPR. Exercise also increases levels of High density Lipoprotein (HDL) which can reduce the incidence of hypertension associated with atherosclerosis. Quitting smoking is important to reduce the long-term effects of hypertension because cigarette smoke is known to decrease blood flow to various organs and can increase the work of the heart. Relaxation techniques can also reduce heart rate and TPR by inhibiting the sympathetic nervous stress response(6).

Research on the effects of relaxation on reducing the blood glucose level in patients of DM has also been performed widely. The results show that there is a significant decrease, so it is recommended that diabetic patients can relax. Relaxation Benson is a therapy complementation and modalities which is good for diabetic patients. Benson relaxation will cause a decrease in physical and psychological stress which in concept can reduce epinephrine, reduce cortisol, reduce glucagon and reduce thyroid hormone. All of this has a positive effect in lowering blood glucose levels(7). Reducing stress levels and achieving a relaxed condition in DM patients has a good effect in reducing blood sugar levels. Therefore, various attempts were made to make DM patients in a relaxed condition. This relaxation can also reduce the patient's blood pressure significantly.

## LITERATURE REVIEW

According to Balck and Hawk(5), diabetes is a chronic and progressive disease characterized by the body's inability to metabolize carbohydrates, fats and protein resulting in increased blood glucose levels (hyperglycemia). Type 2 Diabetes, generally occurs at the age of more than 30 years with obesity. Because it is associated with patients with glucose slow, impaired glucose progressive, type 2 diabetes is sometimes not detected for many years. When symptoms are experienced, they often complain of fatigue, irritabilitas, polyuria, polydipsy, difficult to heal skin wounds, skin Infections vagina, or the vision bleak (when blood sugar is very high)(3). In type 2 diabetes patients, about 75% are detected incidentally when routine laboratory tests done. As a result, if acute diabetes is not detected in the long term, complications (eye disease, nerve disease peripheral, vascular disease) will continue to evolve before the actual diagnosis has been confirmed(3).

Insulin resistance is associated with obesity, the main treatment for type 2 diabetes is weight loss. Exercise is also important in increasing the effectiveness of insulin. Oral hypoglycemic drugs (OHO) are given when diet and exercise fail to control blood sugar levels. If the maximum dose has not succeeded in lowering blood glucose, additional oral medications may be given. Insulin may be added to oral drug therapy, or the patient may switch to insulin therapy. There is continuous insulin therapy that is continuous, some is temporary (used at certain times, for example when acute physical stress is sick or undergoing surgery)(3).

One of the conditions that often accompanies Type II DM patients is an increase in blood pressure as a result of high blood glucose levels. This condition requires serious handling. Apart from controlling blood glucose levels, this hypertensive condition can be overcome with complementary measures such as Benson relaxation exercises. This relaxation technique was first proposed by Dr. Herbert Benson in 1976. He has found that meditation will lead to the regulation of physiological changes in the response to fight-or-flight, including decreased oxygen consumption, heart rate, respiratory rate and blood lactate. Nursing treatment with this technique will reduce the endocrine effect of chronic stress(8).

Endocrine effects due to stress, diabetes patients will trigger the release of some hormones which causes an increase in blood sugar levels, glucagon, growth hormone and glukortikoid. Glucagon acts against insulin. Glucagon is the main hormone to increase blood sugar by stimulating the glikogenesis, lipolysis and gluconeogenesis. Epinephrine exert glucose through glikogenesis, the effect of which will increase the circulation of fatty acids free. Growth hormone, decrease glucose uptake by the tissues of the body, probably through a decrease in insulin receptors. And the last is the glucocorticoids, especially cortisol, which will support the actions of glucagon. In addition, the glucagon will also reduce the use of insulin peripheral, improve glikogenesis and gluconeogenesis.

Relaxation is a nursing intervention with the intention of being able to independently the patient, because relaxation can be done by the patient himself after being given learning. The concept of relaxation techniques is part of the self-care theory put forward by Dorothee Orem. This self-care theory assumes that 1) humans need input for themselves and their environment; 2) the power to do something that needs to be trained in nursing care for himself and others; 3) adults also sometimes experience limitations to care for themselves and others; 4) humans are born, develop and are able to take care of themselves and others; 5)

human relations and duty to provide self-care. So relaxation is a self-care activity after being given an explanation by the provider.

Benson relaxation combines deep breath relaxation techniques with involvement beliefs held. This matter causes the acceleration of occurrence relax state and multiply benefit from the relaxation response. Benson's relaxation therapy is a relaxation therapy combines breath relaxation techniques deep and relaxation of religion or belief provide multiple benefits double in awakening serenity in humans. If human already in a calm state, the parasympathetic nerves are stimulated while the sympathetic nerves will inhibited stimulation, so it will come a sense of comfort

## **METHODOLOGY**

This type of research is quantitative with a pre and post test quasi-experimental design. This study was intended to analyze the effect of Benson relaxation on the blood pressure of DM patients. This research was conducted at RSUD Dr. Soekardjo Tasikmalaya. The sample size was 32 respondents who were selected using purposive sampling. Inclusion criteria for this study were Type II DM patients, minimum age 35 years and maximum 65 years, received relatively the same antihypertensive therapy, routinely went to the hospital, and were willing to become respondents. The exclusion criteria of this study were metabolically unstable conditions.

The research instruments used to see the characteristics of the respondents included initials, age, gender, education level, occupation, marital status, initial and late systolic blood pressures and initial and late diastolic blood pressures. Blood pressure is measured using an electric tensimeter, the results are recorded in the form of systolic and diastolic pressures in mmHg. Data collection activities were carried out by training the respondents to do the Benson relaxation exercises, then doing them at home for 2 weeks. Blood pressure was measured the first time before exercise and two weeks after exercise. This study only involved respondents who were willing to be involved consciously and without coercion. Before the research was carried out, the researcher explained the objectives, benefits and research procedures to respondents. Furthermore, the researcher asked the respondent's consent to be involved in the research. After the respondent agrees, the respondent is asked to sign a letter of approval to become the respondent. The researcher applied ethical principles in conducting this research and has received a letter of ethical review from the Health Research Ethics Commission (KEPK) of the Health Polytechnic of the Ministry of Health of Tasikmalaya No. 2019 / KEPK / PE / VII / 0014. Data processing is done by editing, coding, data entry and cleaning. Data that has been processed will then be analyzed.

The analysis used in this study univariate analysis to describe each variable, age, gender, education, profession, marital status, the initial and the end of systematic blood pressure and the diastolic blood pressure. To determine the relationship between two variables (dependent and independent variables) using an analysis of the bivariate. The analysis of the bivariat used in this research is t-test dependent (paired t-test) to test the difference in blood pressure before and after Benson's relaxation.

## RESULT AND DISCUSSION

### Result

**Table 1: Distribution of Respondents by Age, Initial Systolic Blood Pressure, End Systolic Blood Pressure, Initial Diastolic Blood Pressure and End Diastolic Blood Pressure at RSUD Dr. SoekardjoTasikmalaya**

Variable	Mean	SD	Min - Max	95% CI
Age	53.97	7.84	35-65	51.14-56.80
Initial Systolic	143.34	16.21	110-168	137.50-149.19
End Systolic	142.41	17.57	112-177	136.07-148.74
Initial Diastolic	143.38	18.85	109-189	136.58-150.17
End Diastolic	85.41	9.44	88-104	82-88.81

Based on table 1 above, it can be seen that the mean age of the respondents was 53.97, the average initial systolic pressure was 143.34, the average end systolic pressure was 142.41, the average initial diastolic pressure was 143.38 and the average end diastolic pressure was 85.41.

**Table 2: Distribution of Respondents by Gender, Education Level, Profession and Marital Status at RSUD Dr. SoekardjoTasikmalaya**

VARIABLES	TOTAL	%
<b>Gender</b>		
1. Male	10	31.20
2. Women	22	68.80
<b>Education</b>		
1. Basic	7	21.90
2. Intermediate	15	46.90
3. High	10	31.20
<b>Profession</b>		
1. Work	12	37.50
2. Does not work	20	62.50
<b>Marital status</b>		
1. Married	27	84.40
2. Not Married	5	15.60
<b>TOTAL</b>	<b>32</b>	<b>100</b>

Based on the data in table 2 above, it can be seen that most of the respondents are women (68.80%), most of the respondents have middle education (46.90%), most of the respondents are not working (62.50%) and most of the respondents (84.4%) are married.

**Table 3: Distribution of Average Blood Pressure Before and After Intervention at RSUD Dr. Soekardjo Tasikmalaya (n = 32)**

Variable		Mean	SD	SE	<i>p-Value</i>
Systolic Blood Pressure	Before	143.34	16.21	2.87	0.745
	After	142.41	17.57	3.11	
Diastolic Blood Pressure	Before	143.38	18.85	3.33	0.0005
	After	85.41	9.44	1.67	

Table 3 displays the average blood pressure systematically before intervention 143.34 mmHg, while blood pressure systematic the average after the intervention is 142.41 mmHg. The results of the test statistics reach *p-value*.745, it could be concluded that there is no significant difference between the blood pressure systematic the average before and after the intervention.

The average diastolic blood pressure the mean before intervention is 143.38 mmHg, while the average diastolic blood pressure which means after the intervention it 85.41 mmHg. The results of the test statistics reach *p-value* 0.0005, it can be concluded that there is a significant difference between the average blood pressure diastolic before and after the intervention.

To further clarify the comparison of the average blood pressure before and after the intervention is described in table 4 below:

**Table 4: Comparison of Changes in Average Blood Pressure Before and After Intervention at RSUD Dr. Soekardjo Tasikmalaya (n = 32)**

Variable	Mean Before	Mean After	Change	Mean
Systolic Blood Pressure	143.34	142.41	Down by 0.93	The systolic blood pressure decreases
Diastolic Blood Pressure	143.38	83.41	Down 59.97	Decreased diastolic blood pressure

Table 4 above clearly shows that the average systolic blood pressure which means before the intervention is 143.34 mmHg and diastolic blood pressure average is 143.38 mmHg, after the intervention blood pressure systematically turned into 142.41 and diastolic blood pressure become 8341, means that there is a change. the value of is 0.93 mmHg for blood pressure a systematic and 59.97 on Tuesday mmHg for diastolic blood pressure, so it can be concluded that systematic and diastolic blood pressure has decreased after the intervention relaxation Benson relaxation.

## DISCUSSION

### Respondent Characteristics

The results showed that the mean age of the respondents was 53.97 years. This is in line with the theoretical concept put forward by Black and Hawk(5), it explains lifespan is one of the factors that leads to hypertension. Increasing blood pressure with increasing age. It is often associated with changes in the stiffness of arteries and in arteriolar, while large arteries are generally caused by changes in the structure of arthiosklu, changes in the structure and calcium. This increase is initially seen from the pressure wave of the artery to the heart during deployment of the blood pressure and the wave-this wave is back for a systematic cause an increase in systolic blood pressure and increase puls(4).

According to Pinto in Rosdiana(6)It is stated that the increase in vascular resistance in the small blood vessels also causes diastolic blood pressure to increase at the age of more than 50 years and despite the increase in the resistance of blood vascular, increased systematically also cause blood pressure systematically leads to increased blood pressure. Other causes that affect the increase in blood pressure in the elderly reduces the sensitivity of the baroreceptor, the increase in response to stimulation of the sympathetic nerve, changes in metabolism and sodium and changes in relationship to the renin aldosterone (9).

The results showed that on average the respondents were female. Research results from Song, JJ., Ma, Z., Wang, J. et al(10)showed gender differences in risk factors and awareness, treatment, and control of hypertension. There are significant differences in the epidemiology and clinical characteristics of hypertension between men and women. In addition, sex differences have been associated with certain types of hypertension, including postmenopausal hypertension, and hypertensive disorders of pregnancy. Sex differences have been seen in the prevalence and determinants of hypertension and prehypertension. This study summarizes gender differences in the clinical features and determinants of hypertension and the mechanisms underlying the causes of hypertension. However, the awareness to control for increased blood pressure is greater in women than in men, the prevalence of hypertension is higher in men than women until after menopause, and although the American College of Cardiology / American Heart Association Guidelines recommend similar treatments for men and women. From several studies it can be concluded that different interventions are needed in the efforts to prevent and treat hypertension in men and women(11).

Hypertension is more common in the population diabetic elderly (age65 years) than in the general population and showed the prevalence of which increases with age. Mellitus and hypertension are independent risk factors for morbidity and cardiovascular deaths. Blood pressure target that is optimal have not yet been identified in patients with diabetes and hypertension. Diabetic patients with hypertension require specific treatment. A blood pressure target less than 130/80 mmHg should be achieved for all elderly patients with hypertension and DM, especially those at risk of cardiovascular high. When the drugs necessary to control blood pressure optimally as an aide to lifestyle measures, both diuretics thiazide, angiotensin converting enzyme enzyme inhibitors, or blocking the calcium channels, should be considered as initial therapy. The combination of drugs is usually necessary in these patients because blood pressure control is difficult to achieve in patients with diabetes than those without diabetes (11).

The results of this study indicate other characteristics of the respondents, where the majority of the respondents have secondary education, not work and get married. Hypertension known to be caused by multi-plant, could be due to genetic factors, lifestyle or other damage such as diabetes. Sedentary lifestyle and stress are important risk factors for hypertension. The psychological condition known to have a close relationship with hypertension the pressure is high, work load, the condition of marital status, including factors which often trigger psychological stress, so it is expected to have a close relationship with hypertension hypertension(12).

A study was conducted to study the prevalence and risk Factors of hypertension among bank employees in Maharashtra in January 2014 to assess the prevalence and risk Factors of hypertension among bank employees in Maharashtra in the West. Using the sampling method was multi stage, a total of 340 bank employees from 40 branches of which met the inclusion criteria included in the study. The results show that the prevalence of hypertension is of 39.7% and pre-hypertension is of 41.8% among the population studied. Social factors-demographic such as age, Male gender, family History of hypertension, mode of Travel, physical activity, Excess weight, annual service, coffee intake and Smoking have shown the association of hypertension significant hypertension hypertension(13).

Correspondingly, there is a high prevalence of hypertension and prehypertensi in highland work for the Chinese population, but with very low levels of awareness, treatment and control. Monitoring hypertension in the workplace and intervention program that aims to change risk factors such as body mass index is high, the use of tobacco, alcohol and the improper use of the drug antihypertensi necessary(14). in addition thathypertensi occurs mostly at the level of sosioekonomik low. Work, social class, economic, and personal characteristics can lead to stress. Stress will increase peripheral vascular resistance and cardiac output so that it will stimulate the activity of the sympathetic nervous(6).

### **Effect of Benson Relaxation on Blood Pressure in DM Patients**

The results of this study show that there is no difference in the blood pressure which means systematic patient after the relaxation of Benson, but there are very significant differences in diastolic blood pressure of patients with DM after the relaxation of Benson. Although statistically there was no difference in systolic blood pressure, there are changes in blood pressure, which means systematic, although not by change in diastolic blood pressure.

Habert Benson (2008) states that the combination of relaxation techniques and the strength of good belief is a success factor in relaxation. The element of belief that will be used in the intervention is the element of religious belief. The element of belief that is entered is the recitation of words or sentences that are in accordance with the respective religious beliefs, accompanied by an attitude of resignation (15),(16). Relaxation conditions will have a good impact on DM patients, because during relaxation stress hormones that trigger an increase in blood sugar levels and trigger an increase in blood pressure will not be released by the body.

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are stimulated while the sympathetic nerves will inhibit stimulation, so it will come a sense of comfort. Benson relaxation exercises are known to provide a relaxed feeling and provide calm. If this condition is maintained for a long time, DM patients will be able to maintain a more stable blood sugar and be able to control blood pressure within normal limits. This is in line with research conducted by Ratnawati(7) which showed that modified Benson relaxation exercises could reduce anxiety and control patients' blood sugar levels more effectively.

In relation to the hypertensive conditions experienced by DM patients, this Benson relaxation is very beneficial because it can control blood pressure better. This is in line with Atmojo's research results(17), Simandalahi(18) which states that Benson relaxation exercises performed by hypertensive patients can significantly reduce blood pressure. By developing the results of research on alternative methods of lowering blood pressure with relaxation therapy, various alternative methods of relaxation were developed which are known to be successful in reducing the increase in blood pressure of hypertensive patients. Autogenic relaxation technique which is the result of Sumantrie's research(19) used as an alternative therapy in overcoming blood pressure problems in the elderly or the elderly in addition to medical therapy. Likewise, the yoga relaxation method has a good effect on lowering blood pressure(20). The results of this study are in line with those of other researchers who concluded that relaxation exercises, especially Benson relaxation, can significantly reduce blood pressure in patients with Type II diabetes.

## CONCLUSION

The results of this study indicate that the average age of the respondents is 53.97 years, the average systolic blood pressure before exercise was 143.34 mmHg and after exercise 142.41, the average diastolic blood pressure before exercise was 143.38 mmHg and after exercise 83.41 mmHg. Most of the respondents are women with secondary education and not working. The results of further analysis showed a significant difference in diastolic blood pressure before and after doing Benson relaxation exercises. Researchers recommend implementing this relaxation exercise as an alternative effort in controlling blood pressure in Type II DM patients.

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