

## **REDUCING STRESS (CORTISOL HORMONE LEVELS) WITH STRESS MANAJEMEN OF DIABATES MELLITUS PATIENTS**

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### **Abstract**

Stress is characterized by an increase of cortisol hormone, greatly affecting control and blood glucose levels. The purpose of this study was to identify the Effect of Stress Management on Reduction of cortisol levels of Diabetes Mellitus Patients. The study design was quasy experiment. The number of respondents in this study as many as 16 people divided into two groups which of intervention group and control group, the sampling technique using purposive sampling technique. The instrument used in the study is a questionnaire modification by researchers. After Being Given Stress Management, levels of cortisol of intervention group has decrease, but in the control group the cortisol levels has increase. The mean value of cortisol content for treatment group was  $-18,16 \pm 19,18$ , while in control group the mean value of cortisol was  $10,56 \pm 22,18$ . The result of statistic analysis using independet t test obtained  $\rho=0,015$  where  $\rho<0,05$  indicated that there was significant difference between cortisol content between control group and treatment group given by stress management. Management of DM patients is expected to be used for individuals to learn what stress is and how to identify stressors in their own lives, acquire and practice stress coping skills and practice stress management techniques, so that patients are expected to change the behavior of maladaptive stress into adaptive.

**Keywords.** Stress Management, Cortisol, hormones, diabetes mellitus.

### **Introduction**

Diabetes Mellitus in Indonesia poses a serious threat to health development and national economic growth. World Health Organization (WHO) estimates that by 2030 diabetics in Indonesia as many as 21.3 million people. This condition will make Indonesia the fourth place after the United States, China, and India among countries that have the largest diabetics, with the largest population in the world (Ministry of Health Republic of Indonesia, 2012). Uncontrolled diabetes will cause other complications, including coronary heart disease, cerebrovascular disease, kidney disease, eye disease, and many other complications caused by uncontrolled diabetes mellitus (Fauzi, 2013).

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World Health Organization (WHO) in 2014 reported that 9.2% of the world's population aged 25 years or older experienced fasting blood glucose levels (WHO, 2014). The prevalence of Diabetes mellitus in Indonesia in 2013 is 1.5% and in East Java 2.1% (Ministry of Health Republic of Indonesia, 2012).

Research conducted mentioned that stress has long been one of the factors that appear in diabetics. Stress is very influential on diabetes because it will affect the control and blood glucose levels. When a person faces a stressful situation

then the stress response can be an increase in the adrenal hormone that can eventually change the glycogen reserves in the liver into glucose. Continuous high blood glucose levels can lead to complications of diabetes. Groups given the technique of stress control showed a decrease in blood sugar levels compared to the control group (Heisler, 2010).

Long lasting stress can disrupt the performance of an entire immune system that involves natural immunity, humoral immunity and cellular immunity. The stress experienced will modulate the immune system through the HPA (Hypothalamic-Pituitary Adrenocortical) axis and limbic systems (regulating emotions and learning processes). Stress conditions will stimulate the hypothalamus to secrete neuropeptides that will activate ANS (Autonomic Nerve System) and hypofisis to release corticosteroids and catecholamines which are hormones that react to stress conditions. Increased levels of glucocorticoids will disrupt the immune system. The pleiotropic effects of cortisol that are distributed to various receptors will cause a person to be more susceptible to infection. When stress conditions can be controlled then the immune system modulation becomes better. Long and prolonged stress will have an impact on the immune system's decline and accelerate the progression of the disease (Gunawan & Suwadiono, 2007 in Heisler 2010).

People with diabetes often have psychological problems in managing their disease. Treatments and treatments that they have to take a lifetime cost a lot and are often regarded as an unpleasant experience (Rosalina, 2000). Diabetics should be able to adapt to dietary changes, physical activity, treatment therapy and stress management. Diabetes Mellitus (DM) type 2 patient who is able to adapt to his illness is expected to improve self-empowerment in handling the illness he suffered (Anderson, 2000). According to Fisher et al (1982) diabetes and stress are two things that affect each other directly or indirectly. Control of the lack of blood glucose will cause a feeling of stress and vice versa as well. Improving patient cognition and improving behavior is one way to help improve the management of care in DM (Snoek & Skinner, 2000).

Stress management is one effort to control the stress of the individual. Stress management can

vary depending on the abilities and characteristics of each individual. Through individual stress management is expected to change the wrong perception of cognition that can affect the level of stress and blood sugar levels of people with diabetes mellitus.

### Method

The research design used was Quasy Experiment, with the design that is nonequivalent control group design in the form of research result report, population in this research is all patient of Diabetes Mellitus in Sumbertebu Village of Working Area of Bangsal Health Center. The sample size was 16 people, divided into control group and treatment group. Sampling technique in this research is purposive sampling that is sample selection by specifying subject that fulfill research criteria. The study was conducted by dividing the respondents into 2 groups. Group I (intervention group) is the respondent who get intervention of management of stress management. While group II (control group) that is responder used as control group without given intervention. Group selection is done randomly. Hypothesis test used is independent test t test.

### Result

Table Blood Sugar Levels Treatment Groups Before and After Given Stress Management

Variabel	n	Pre test	Post test	Delta	Nilai p
Cortisol	8	93,37 ± 25,52	75,21 ± 13,51	- 18,16	0,032

The mean of cortisol level before treatment (pre test) was 93,37 ± 25,52 while after treatment (post test) 75,21 ± 13,51. Levels of cortisol owned respondents in the treatment group decreased is indicated by the value of delta = - 18.16. Based on the results of statistical tests (Paired t test) in the treatment group obtained  $p = 0.032$  where  $p < 0.05$ , which means stress management can reduce cortisol levels in DM patients..

Table Cortisol Before and After levels in the control group

Variabel	n	Pre test	Post test	Delta	Nilai $p$
Cortisol	8	103,83 ± 47,57	114,39 ± 39,32	10,56	0,220

The mean of cortisol level before (pre test) was 103,83 ± 47,57 while after (post test) 114,39 ± 39,32. Levels of cortisol owned respondents in the control group experienced an increase is indicated by the value of delta = 10.56. Based on the results of statistical tests (Paired t test) obtained  $p = 0.220$  where  $p > 0.05$ , which means no decrease in cortisol levels before (pre test) and after (post test) in the control group.

Table Effect of stress management on cortisol levels in DM patients

Variabel	n	Rerata	SB	<i>Independent t test</i>
Intervention	8	- 18,16	19,18	$p = 0,015$
Control	8	10,56	22,18	

Based on the results of the study, cortisol levels in the intervention group after stress management were given a decrease, but in the control group increased cortisol levels. The mean values of cortisol levels for the treatment group were - 18.16 ± 19.18, while in the control group the mean value of cortisol content was 10.56 ± 22.18. The result of statistical analysis using independent t test obtained  $p = 0,015$  where  $p < 0,05$  indicated that there was a significant difference between cortisol content between control group and treatment group given the guidance of stress management.

People with diabetes often have psychological problems in managing their disease. Treatments and treatments that they have to take a lifetime cost a lot and are often regarded as an unpleasant experience (Rosalina, 2000).

Lahey (2007) in Mulyani (2011) says that one that can be a source of stress is a factor of frustration or frustration when a goal or motive is not fulfilled or satisfied. DM patients who have attempted to control their diabetes by diet and exercise but their blood sugar levels do not show improvement can be frustrating. This is supported by some opinions of respondents who stated not want to do diet and physical activity is recommended because it always fails to control

blood sugar levels despite trying hard to do the behavior suggested by health personnel.

Information about complications that can be caused by DM disease is another form of stressors for DM patients. Information that the offspring of a DM patient is at higher risk for developing DM too often increases the anxiety of the patient. This anxiety is also felt by one of the respondents. The respondent was worried that her child would also be exposed to DM because of the information she obtained that DM was a disease that could be lowered, so she had checked her child's blood sugar level still in elementary school.

Factors that are likely to be changed in the respondent are stress factors. Provision of stress management in DM patients with individual or group approach is expected to change lower stress levels. Stress management is a program to control or regulate stress which aims to recognize the causes of stress and know the techniques of managing stress, so that people are better at mastering stress in life rather than squeezed by stress itself (Schafer, 2000). Giving management to uncontrolled DM respondents is expected to be used for individuals to learn what stress is and how to identify stressors in their own lives, acquire and practice stress coping skills and practice stress management techniques, so patients are expected to change the behavior of stress From maladaptive to adaptive.

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