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DOI: [10.31965/infokes.Vol18.Iss1.295](https://doi.org/10.31965/infokes.Vol18.Iss1.295)Journal homepage: <http://jurnal.poltekeskupang.ac.id/index.php/infokes>**RESEARCH****Open Access****Kreasiki Gymnastics in Reducing the Stress Level of Diabetes Mellitus Patients****Dhina Widayati<sup>1a\*</sup>, Nian Afrian Nuari<sup>1b</sup>**<sup>1</sup> Nursing Study Program, STIKES Karya Husada Kediri, Indonesia<sup>a</sup> Email address: [budinawida@gmail.com](mailto:budinawida@gmail.com)<sup>b</sup> Email address: [nian.afrian@gmail.com](mailto:nian.afrian@gmail.com)

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**Abstract**

Diabetes mellitus is a chronic disease characterized by an increase in blood glucose levels due to a disruption of the pancreas in the production of the hormone insulin. One problem for people with diabetes is unstable glucose levels, which can trigger stress. One of the diseases' management can be done with exercise that can be packaged in the form of gymnastics by combining exercise and relaxation movements. This study's objective is to determine the effect of Kreasiki gymnastics (a combination of deep breathing relaxation and dhikr or pray) on stress levels in patients with type 2 diabetes mellitus. This study used a Pre-Experiment design with a one-group method of Pre-Post Test Design. The sample size in this study amounted to 27 respondents obtained by purposive sampling. Measurement of stress levels used the modified Depression Anxiety Stress Scale (DASS-42) questionnaire. The results of the analysis with the Wilcoxon Sign Rank Test showed a p-value of 0.008, which means that the Kreasiki gymnastics affected reducing the stress level of people with diabetes mellitus. Before the intervention, most respondents had moderate stress levels, and after the response, it showed all respondents with mild stress levels. Kreasiki gymnastics can reduce stress levels in patients with type 2 diabetes mellitus. It occurs through a mechanism with two pathways, which are psychologically and physically. Psychologically, stimulation of endorphin hormone secretion will result in a relaxed condition to activate insulin. Physically, the effect of contractile muscles will absorb glucose because the insulin works more actively so that it can reduce sugar levels.

**Keywords:** Kreasiki Gymnastics, Deep Breath Relaxation, *Dhikr*, Stress, Diabetes.**\*Corresponding Author:**

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## 1. INTRODUCTION

Life in the digitalized era, which is entirely modern with various facilities, also seems to have a negative impact, one of which is to rule out a healthy lifestyle (Widayati et al., 2018). At this time, the phenomenon is an increase in the prevalence of degenerative diseases related to healthy lifestyles, which is diabetes mellitus. This disease is characterized by the rise in glucose levels due to impaired pancreatic function in the secretion of the hormone insulin. When an individual is diagnosed with diabetes mellitus, the psychological response experienced is stress. It can happen because of anxiety and sadness about the future, feeling the rest of his life will be limited in terms of food and fear of complications that will occur. The instability of blood sugar is also a stressor for them. Stress itself has an influence on blood sugar levels for people with diabetes.

WHO data in 2003 showed that there are more than 200 million people with diabetes in the world and are predicted to increase to 333 million people in 2025. In 2013, the prevalence of people with diabetes mellitus was 2.650.340 people. At the provincial level shows East Java with 605.974 inhabitants (Kementerian Kesehatan R.I., 2013). In 2018, in Jombang, there were 23.676 inhabitants (Dinas Kesehatan Kabupaten Jombang, 2019).

Diabetes Mellitus can be triggered by several risk factors, which are age, heredity, high sugar foods, unhealthy lifestyles, obesity, and distress (Romadoni et al., 2017). Stressors that cannot be managed properly can cause prolonged burnout (Nuari, N. A. et al., 2018). Distress that will cause the counter insulin hormone (which works opposite to insulin) is more active, so that blood glucose increases (Tandra, 2013). If you do not get the right treatment, boredom, or stress will also cause some problems (Nuari, N. A. et al., 2018). This disease can cause several complications ranging from macrovascular to microvascular, that occur both acute and chronic. Acute complications that can occur in the short term are hypoglycemia, diabetes ketoacidosis (DKA), and hyperglycemic hyperosmolar non-ketotic coma (HHNC). Meanwhile, chronic complications, which will occur long-term, are diabetic nephropathic, diabetic retinopathic, neuropathy, dyslipidemia, hypertension, and diabetic ulcers (Baradero et al., 2009).

Management of diabetes mellitus includes five pillars, which are management of the diet, consumption of antidiabetic drugs, exercising, monitoring blood sugar, and managing stress. The exercise, which is non-pharmacological management of diabetes mellitus, is currently chosen as an alternative with the assumption of minimal side effects and is easy to do (Nuari, N. A., 2014). Forms of physical activity or exercise can be done with Kreasiki gymnastics (a practice that combines physical activity, deep breathing relaxation, and dhikr). The renewal of this intervention is to combine the physical and psychological management of diabetes mellitus. Through this activity, two components are very influential in the regulation of glucose in the body, which are through mental and physical mechanisms. The psychological mechanism occurs because, in a calm and relaxed condition, the body's hormonal system will stimulate the secretion of endorphin hormone, which will reduce stress hormones or cortisol so that glucose will drop. Glucose levels tend to decrease or stabilize the sufferer more comfortable and no longer anxious so that they no longer experience stress conditions.

Meanwhile, the physical mechanism occurs through physical activity conducted with exercise, which will increase the body's metabolic processes and the breakdown of glucose so that blood sugar will drop and make the patient calm. The benefits of exercise for people with diabetes include increasing physical fitness, improving

emotional state, controlling weight, and increasing metabolism (Rondonuwu et al., 2016). Kreasiki gymnastics consists of several movements combined with a deep breath, concentration, and dhikr (spiritual) in each campaign. The objective of this study is to determine the effect of kreasiki gymnastics in reducing stress levels in patients with type 2 DM.

## 2. RESEARCH METHOD

The pre-experiment pre-post test became the design in this study. The population in this study was all people with DM in the working area of Bendo Primary Health Center. A large sample of 27 respondents was obtained through purposive sampling with inclusion criteria: Patients with type 2 diabetes mellitus did not consume drugs, were willing to be a respondent, and were diagnosed with type 2 diabetes mellitus for at least one year and were Muslims. The independent variable in this study was Kreasiki gymnastics conducted according to the SOP (Standard Operational Procedures), and the dependent variable was the stress level measured through the modified DASS 42 (Depression Anxiety Stress Scale). This research has been through the Ethical Feasibility Test with the Ethical Feasibility Statement No. 124/EC/LPPM/STIKES/KH/II/2019. Kreasiki gymnastics interventions were given three times a week (Monday-Wednesday-Friday), starting at 09.00 WIB (Western Indonesia Time) for three weeks, with a duration of 45 minutes. This exercise stage consists of 3 steps, including heating, core, and cooling. At the warm-up phase, sitting in a deep breathing relaxation with a duration of 5 minutes, the core stage includes ten movements with a period of 35 minutes accompanied by dhikr in each initiating the core movements. The last stage is cooling done by sitting while relaxing deep breath. Data on pre-post intervention stress levels were analyzed using the Wilcoxon Sign Rank Test.

## 3. RESULTS AND DISCUSSION

**Table 1.** Characteristics of Respondents Based on general data

Respondents' Characteristics	Frequency	Percentage (%)
<b>Sex</b>		
Male	6	22.2
Female	21	77.8
<b>Age</b>		
26-35 years	3	11.1
36-45 years	3	11.1
46-55 years	15	55.6
>55 years	6	22.2
<b>Occupation</b>		
Housewife	18	66.7
Farmer	0	0
Private worker	0	0
Others	9	33.3

<b>Marital Status</b>		
Single	0	0
Married	27	100
Widow/Widower	0	0
<b>Relationship with Families</b>		
Good	24	88.9
Very good	0	0
Normal	3	11.1
Less normal	0	0
<b>Living environment</b>		
Crowded	9	33.3
Calm	18	66.7
<b>The length suffering from Diabetes Mellitus</b>		
1-5 years	21	77.8
6-10 years	3	11.1
11-15 years	0	0
>15 years	3	11.1
<b>Body weight</b>		
40-50 kg	6	22.2
51-60 kg	15	55.6
61-70 kg	3	11.1
>70 kg	3	11.1
<b>Diabetes Heredity Factor</b>		
There is	15	55.6
Nothing	12	44.4
<b>House member</b>		
Alone	0	0
Nuclear family	27	100
Big family	0	0
Others	0	0
<b>Other disease history</b>		
There is	0	0
Nothing	27	100
<b>Performing nutrient treatment of diabetes</b>		
Yes	0	0
No	27	100

Based on table 1, most respondents were female (77.8%) with ages 46-55 (55.6%), working status as housewives (66.7%), had good family relations (88.9%), lived in an environment that was calm (66.7%), had a history of suffering from diabetes mellitus 1-5 years (77.8%), weight 51-60 kg (55.6%), and had a history of hereditary diabetes mellitus (55.6%). All respondents lived in the same family as their nuclear family, had no history of illness other than diabetes and did not undergo diabetes nutrition therapy, and were married.

**Table 2.** Tabulate stress levels before and after the intervention.

Interpretation of Stress Level	Before intervention		After intervention	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Mild	12	44.4	27	100
Moderate	15	55.6	0	0
High	0	0	0	0
Total	27	100	27	100
<i>Wilcoxon Test</i>	$p=0.008$	$\alpha=0.05$		

Based on table 2, it is known that the majority of respondents (55.6%) experienced moderate stress before doing Kreasiki gymnastics, and almost half of the respondents (44.4%) experienced mild stress. In contrast, after doing Kreasiki gymnastics, all respondents (100%) were in the soft stress category. Statistical test results with the Wilcoxon Sign Rank Test showed p-value = 0.008 at a significant level ( $\alpha$ ) = 0.05, which means that there is an effect of Kreasiki gymnastics on reducing stress levels in patients with type 2 diabetes mellitus in the working area of Primary Health Centers of Bendo, Pare, Kediri.

The results of stress level measurements carried out before the Kreasiki Gymnastics showed that most (55.6%) experienced moderate stress. The verdict of chronic illness on someone will be bad news that can be a stressor for someone. A person's response to a stressor can be in the form of eustress (when a person has an excellent coping mechanism). It can become distressed if responded by the adaptive coping mechanism. The phenomenon that occurs is the majority of individuals at the start of being diagnosed will respond in an adaptive manner resulting in stress. It happened because of fears for his life in the future.

Definitively, stress is an unpleasant condition where humans see the demands of a situation as a burden or outside the limits of their ability to meet these demands. Sources of stress, or commonly known as stressors, are obtained from internal factors (individual) and external factors (family, community, and environment). There are also triggering factors, which are physical and biological: case history, illness, psychological factors: perception, emotions, mental situation, environmental factors: physical environment, social environment. Stress is a body's response that is not specific to any needs of the body that are disturbed. It is a universal phenomenon that occurs in everyday life and can not be avoided; everyone experiences it. Stress gives a total impact on the individual that is physical, psychological, intellectual, social, and spiritual, and stress also threatens the physiological balance (Pratiwi et al., 2016).

The results of measurements of stress levels before the intervention showed that most respondents experienced moderate stress. These respondents' stressors came from a disease that was suffered in this case related to the instability of blood sugar levels.

This is consistent with the study of Nugroho and Purwanti (2010), showing that there is a significant relationship between stress levels and blood sugar levels in Diabetes Mellitus patients more massive the stress level, the worse the sugar levels. Furthermore, internal factors that affect stress levels are negative feelings or excessive anxiety. Diabetes mellitus sufferers often experience feelings of sadness, disappointment, anxiety, and depression. Other factors that influence stress levels are the physical environment (noise), and social considerations from families that make them vulnerable to stress.

Based on occupation, most respondents (66.7%) have jobs as housewives. It means that it is also related to the intensity of fewer activities, and they will feel more easily saturated and stressed due to lack of activity, which is monotonous. One of the risk factors for type 2 diabetes mellitus is a relaxed lifestyle and stressful conditions.

Based on the family's environment, all respondents (100%) live with the nuclear family. It can sometimes be stressful because one of the family members has difficulty or disobeying what he has ordered or wanted. If this happens often, it will cause irritation and irritability. Anger and irritation can trigger stress.

The living environment will also affect a person's psychological condition because it can trigger stress. Respondents' residences tend to be crowded (33.3%), such as houses that are close to the highway and close to furniture shops. The situation that sometimes makes them disturbed because of the sound of chainsaws and noisy vehicles.

After Kreasiki gymnastics was performed, there was a change in stress level, which was initially a category of moderate stress (55.6%) to all respondents (100%) included in the category of mild stress levels. It can happen because all respondents are enthusiastic about doing the Kreasiki gymnastics movement properly. Setting a group of fellow sufferers was also influential in increasing the enthusiasm of respondents in doing gymnastics. In the Kreasiki gymnastics movements, there are deep breathing techniques and dhikr that can activate the neurotransmitter, endorphins. The pituitary releases Endorphine hormone, if the endorphins hormone is active, it will cause feelings of relaxation and happiness so that it makes the respondent feel comfortable, and anxiety or worries will be reduced.

The results of the analysis showed that most respondents were married (100%). In the opinion of researchers, if someone is married, he will have someone in his life to share stories and complain to his partner. Hence, the person will feel supported, and his life will feel more energetic and avoid anxiety.

Based on the relationships with family, most respondents' relations with family were in the right category, and there will be mutual support and positive encouragement for people with diabetes mellitus. Family support acts immediately as a buffer against stress and its relation to bodily damage. Family support can help to prevent stress and something dangerous or to threaten to reduce stress. Family support and family acceptance correlate with patient stress levels, especially in patients with chronic illness (Widayati, 2018). Moreover, when the study was conducted, respondents were collected in groups with fellow group members (peer groups). When the exercise time arrived, they could chat with each other and exchange opinions so that they would feel that they were not alone; eventually, anxiety would decrease. It is in line with research conducted by Nuari, N. A. et al., 2018, which stated that peers are one of the factors that influence the self-efficacy of DM sufferers in implementing treatment programs.

Analysis of the effect of kreasiki gymnastics against stress levels of type 2 diabetes mellitus patients. Statistical test results used the Wilcoxon sign rank test, which

was obtained that  $p\text{-value} = 0.008$  insignificant level ( $\alpha$ ) = 0.05. Thus, there was an effect of Kreasiki gymnastics on the stress level of diabetes mellitus patients type 2.

The stress response (physiological response, cognitive response, and emotional response) results in the body's response to release the natural steroid hormone, which is cortisol. Early release of stress hormones begins with the secretion of corticotrophin-releasing factor (CRF). CRF is first released from the hypothalamus in the brain into the bloodstream, thus reaching the pituitary gland located just below the hypothalamus. In this place, CRF stimulates the release of pituitary adrenocorticotrophin hormone (ACTH), which in turn stimulates the adrenal glands to release various hormones. One of them is cortisol (Lisdiana, 2012).

The overall effect of the cortisol effect on metabolism is an increase in blood glucose concentration at the expense of fat and protein stores. Cortisol stimulates gluconeogenesis in the liver. Cortisol inhibits the absorption and use of glucose by many tissues, except the brain, so glucose is available for the brain, which requires this material as a metabolic material. Significant increases in plasma cortisol concentrations are generally equivalent to stress stimulation; a more substantial increase in cortisol secretion occurs in response to severe stress than mild stress (Sherwood, 2014). A relaxed condition can reverse the stress regulation of stress hormones and allow the body to use insulin more effectively.

Kreasiki gymnastics is one type of sport that combines various movements combined with concentration, deep breathing, and dhikr. The benefits of this exercise can solve a life problem related to physical, spiritual, and mental health problems (Supriyadi et al., 2017).

Deep breath and dhikr that are found in the Kreasiki gymnastics can make the body relaxed. When breathing deeply, there is an effort for inspiration and expiration to affect the cardiopulmonary stretch. The stretch will trigger an increase in baroreceptor reflexes, stimulating parasympathetic nerves, and inhibiting the sympathetic center—the parasympathetic nerve functions to control the role of the heart rate so that the body relaxes. The human body has endorphins. Endorphins are neurohormones that are associated with pleasant sensations. The pituitary releases endorphins; practicing relaxation can stimulate the appearance of endorphins at any time. The emergence of endorphins in the body can be triggered through various activities, such as deep breathing, relaxation, and mediation (Aryani et al., 2015).

Recitation of dhikr contained in the Kreasiki gymnastics can calm, awaken confidence, strength, feeling safe, peaceful, and happy. Medically, it is known that people who are accustomed to dhikr by remembering Allah SWT will automatically respond to endorphin expenditure that can cause feelings of happiness and comfort (Romadhoni et al., 2017). Thinking and dhikr can increase relaxation optimally so that it activates the parasympathetic nerves that positively influence the body's neurohormone balance where stimulation of the hypothalamus-pituitary-adrenal axis can reduce cortisol levels, so that blood sugar levels decrease (Karsuita, 2016). In individuals with stress conditions, neurohormonal changes occur, increasing the hormone cortisol, which will affect blood sugar regulation (Pratiwi, 2014). It is in line with Derek's research, 2017, which stated that there is a correlation between stress levels and blood sugar levels in Diabetes Mellitus (DM) patients.

Kreasiki gymnastics can reduce stress provided that the respondent must be concentrated, calm or relaxed, as well as the surrounding environment must be calm to make it easier to focus so that they can reach or do exercises optimally. These changes

lead to a reduction in the level of stress from moderate to mild. The reduced stress level in Diabetes Mellitus patients can also support the achievement of good quality of life in DM patients (Nuari, N. A., & Kartikasari, M., 2015). Quality of life is closely related to a person's stress (Nuari, N. A., 2016). An indicator of the quality of life in people with DM is the fulfillment of their needs for sleeping well. Sleep quality is also one of the factors associated with regulating blood sugar levels in people with Diabetes (Zahroh, 2018). Kreasiki gymnastics intervention is stress management in patients with Diabetes Mellitus Stress management, which is one of the pillars of controlling Diabetes Mellitus that can affect blood sugar levels (Worang, 2013). Physical exercise or exercise contained in the kreasiki gymnastics also can provide muscle contractility effects that will absorb glucose so that insulin can work more actively in reducing blood sugar levels. It is in line with the research conducted. It was attended by Hutabarat et al., 2018, which stated that there was an effect of low impact aerobic exercise on blood sugar levels of DM patients.

#### 4. CONCLUSION

Kreasiki gymnastics can reduce stress levels in patients with type 2 diabetes mellitus. Stress levels of people with Type 2 diabetes can decrease through two mechanisms: physiologically and psychologically. Psychologically is through stimulation of endorphins hormone secretion, which will result in a relaxed condition so that it can activate insulin. Physically is the effect of contractile muscles, which will absorb glucose because insulin works more actively so that it can reduce sugar levels. For further research, stress levels measurement can be modified using cortisol examination as a physiological indicator of stress.

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