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The Application of Autogenic Relaxation Techniques in Elderly People with Type II Diabetes Mellitus to Stabilize Blood Glucose Levels

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ABSTRACT

Background & Objective: Diabetes (DM) is a type of metabolic disorder caused by abnormal insulin production, insulin performance, or a combination of both, characterized by elevated blood sugar levels. The objective of this study was to determine the effects of autogenic relaxation techniques on elderly people with type 2 diabetes. **Method:** This study employed a single-group pretest-posttest design in a quasi-experimental setting. The study included 15 participants with diabetes mellitus, selected using purposive sampling. The case study was conducted from April 25 to 27, 2025, over three sessions of 15 minutes each. Blood sugar levels were measured using a glucometer before and after the intervention. Data analysis was performed using a *paired t-test* to compare average blood sugar levels before and after the autogenic relaxation technique. **Result:** Before and after the intervention, the average blood sugar levels were 257 mg/dl and 234 mg/dl, respectively. The average age of the respondents was 70 years, and they had been living with diabetes mellitus for more than five years. Before and after the autogenic relaxation intervention, blood sugar levels changed with a p-value of 0.000 based on the *paired t-test*. **Conclusion:** Autogenic relaxation can lower blood glucose levels.

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Introduction

One type of metabolic disorder (DM) called diabetes is caused by abnormalities in insulin function or secretion, or both. High blood glucose levels are a characteristic feature of diabetes mellitus (Aji Kurniawan *et al*., 2020). One non-communicable disease that will cause this condition to become more widespread in the future is

diabetes. The prevalence of diabetes may also increase with age and changes in lifestyle. Approximately 25% of people with diabetes are over 65 years old. Type 2 diabetes is the most common type of the disease, characterized by reduced insulin production due to insulin resistance (Dm *et al*., 2023).

Environmental issues caused by nature and humans can lead to health problems. Degenerative diseases are health issues caused by unhealthy lifestyles, such as avoiding healthy foods, lack of exercise, and so on. The Indonesian population suffers from various degenerative diseases, including diabetes. Blood glucose levels in the body are above the normal range of 126 mg/dl or below the normal range of 200 mg/dl (Ratnawati & Hanani, 2020). Polyphagia, polyuria, polydipsia, weight loss, and numbness are indicators of gestational diabetes, type 1 diabetes, type 2 diabetes, and other causes, including several types of diabetes (Aprilani & Warsono, 2023).

The World Health Organization for Southeast Asia (WHO) estimates that 142 million people, or 8% of the population, are elderly. According to estimates, the number of elderly people will triple by 2050. The number of elderly individuals in the population increased from approximately 5.3 million (7.4%) in 2000 to around 24 million (9.77%) in 2010, and then to 28.8 million (11.3%) in 2020. However, it is projected that the number will reach around 80,000,000 in Indonesia by 2020 (Ningrum *et al*., 2021).

The *World Health Organization* (WHO) revealed that over the past three decades, the prevalence of type 2 diabetes has increased in countries of all income levels. Most of the 422 million people with diabetes worldwide live in low- and middle-income countries, and diabetes is associated with 1.5 million deaths each year. Over the past few decades, there has been an increase in the number of diabetes mellitus cases (Maria *et al*., 2024).

According to estimates by the *International Diabetes Federation* (IDF), the number of people with diabetes continues to rise. In Indonesia, 10.2 million people aged 20 to 79 were estimated to have diabetes in 2017, making it the sixth country with the highest prevalence of diabetes. By 2045, this number is projected to increase to 16.6 million. In a study (Aminuddin *et al*., 2023) based on blood sugar test results, the prevalence of diabetes mellitus in Indonesia increased from 6.9% in 2013 to 8.5% in 2018. Results from the Basic Health Research (Riskedas).

Doctors' diagnoses of diabetes in Indonesia are based on patients aged over 15 years. This graph shows an increase in prevalence, with 1.5% of people aged 15 and above suffering from diabetes according to Riskesdas (2013). The prevalence increased from 6.9% to 8.5%, indicating a rise in diabetes mellitus between 2013 and 2018. The proportion of diabetes patients in Lampung Province increased by more than 100% or approximately 129% (Abdul *et al*., 2024).

Two risk factors contributing to the increase in diabetes cases are modifiable and non-modifiable risk factors. Smoking, physical activity, alcohol consumption, and education are modifiable risk factors, while other factors, such as age, gender, race, ethnicity, genetics, and gender, are non-modifiable. Generally, complications that often occur when diabetes is not treated promptly can lead to the development of various associated diseases in different organs of the body (Nuraisyah, 2020). To prevent diabetes complications, regular control is necessary through therapeutic interventions and lifestyle modifications for patients with type 2 diabetes. When monitoring blood sugar levels, there are several options available, including PMR

(progressive muscle relaxation), Benson, deep breathing, and autogenic relaxation therapy.

One of these is autogenic therapy. Compared to other relaxation techniques, autogenic relaxation uses simpler movements that only require 15 to 20 minutes and can be performed while lying down, sitting in a chair, or leaning back, and can be practiced anywhere (Permata Syafni & Yanti, 2024). Both the body and mind can benefit from autogenic relaxation. This therapy aims to reduce stress and automatically lower blood glucose levels by increasing cortisol levels. The therapy is based on mental self-control by expressing short-term motivation levels with the goal of relaxing the mind and body (Permata Syafni & Yanti, 2024).

According to research findings, this can lower blood glucose levels in the elderly. According to a study by (Ardiansyah *et al.*, 2023), a total of 28 participants were divided into intervention and control groups. The intervention group had a standard deviation of 13.6 ± 4.7, while the control group had a standard deviation of 3.2 = 26.4. The application of autogenic therapy had a p-value of 0.02 in individuals with type II diabetes, indicating its influence on blood glucose levels. Results from another study by (Kusuma & Surakarta, 2025) After six sessions of autogenic therapy, 15 respondents reported a decrease in blood glucose levels. Supported by research by (Pramono, 2024) In this study, using pre- and post-autogenic methods, participants' blood sugar levels decreased significantly after being given autogenic relaxation techniques for type 2 diabetes patients. In patients with type 2 diabetes, autogenic relaxation therapy over three days, with six sessions of 15–20 minutes each, can effectively reduce blood glucose levels.

Based on a survey and interviews with 15 elderly individuals at the Natar Nursing Home on Tuesday, April 22, 2025, regarding the use of autogenic relaxation in type 2 diabetes patients, it was found that it can help lower blood glucose levels. However, 11 out of 15 elderly individuals stated that they have diabetes mellitus but have never used autogenic relaxation because they were unaware of the benefits of the technique. 4 elderly individuals stated that they only take medication and regulate their daily diet to help manage blood sugar levels.

One technique that can lower blood sugar is autogenic relaxation. In an effort to manage blood glucose levels, the author is interested in researching the impact of autogenic relaxation techniques on patients with type II diabetes mellitus.

Objective

The purpose of this study was to measure blood sugar levels before and after autogenic relaxation. Therefore, data measurements were taken before the autogenic relaxation intervention (pre-test) and after the autogenic relaxation (post-test).

Method

This study used a one-group pretest-posttest design and was quasi-experimental in nature. According to Notoatmodjo (2012), quasi-experimental research is pseudo-experimental because it lacks the quality of an authentic experimental design, as it is difficult to control or manipulate the necessary variables. Both the experimental and control groups are assessed in this design, both before and after exposure to or treatment with the experiment. However, only the experimental group receives the experimental therapy; the control group is not exposed (Saryono, 2011).

Fifteen elderly individuals over the age of 60 were the population of this study, which was conducted at the Panti Tresna Werdha Natar nursing home in Lampung in April 2025.

Results

TABLE 1. Distribution of Respondents Based on Age, Gender, Religion, and Duration of Diabetes Mellitus

Age	Frequency (f)	Percentage (%)
60-74	9	60.0
75-90	6	40.0
Total	15	100
Gender	**Frequency (f)**	**Percentage (%)**
Male	5	33.3
Female	10	66.7
Total	15	100
Religion	**Frequency (f)**	**Percentage (%)**
Islam	15	100
Total	15	100
Duration of DM	**Frequency (f)**	**Percentage (%)**
>5 Thn	11	73.3
<5 Thn	4	26.7
Total	15	100

Nine respondents (60.0%) were aged between 60 and 74 years, and six respondents (40.0%) were aged between 75 and 90 years, according to the table above. Five (33.3%) respondents were male, 10 (66.7%) were female, and 15 (100%) were Muslim. Eleven respondents (73.3%) had been living with diabetes mellitus for more than five years, and 4 (26.7%) had been living with it for less than five years.

TABLE 2. Average Blood Glucose Levels Before and After Intervention

Blood Glucose Level	Mean	N	SD	Std. Error Mean
Before	234.00	15	23.250	6.003
After	207.46	15	33.055	8.535

Table 2 shows that the mean value of the group before the intervention was 234.00 (SD: 23.250), and after the intervention it was 207.46 (SD: 33.055).

TABLE 3. Results of Normality Test Using Shapiro-Wilk

Variable/Group	Statistic	df	Sig
Before	.885	15	.212
After	.880	15	.187

From Table 3 above, this study will use a paired test because the result obtained is $p > 0.05$, which indicates that the data is normally distributed.

TABLE 4. Results of Autogenic Relaxation Techniques on Blood Glucose Levels in Type II Diabetes Patients

Blood Glucose Level	Mean	Selisih	95% CI		P Value
			Lower	Upper	
Before	234.00	27	18.475	34.590	0,000
After	207.46				

Using a paired t-test, the p-value in Table 4 is 0.000 ($p < 0.05$), indicating that the autogenic relaxation method affects blood sugar levels in individuals with type II diabetes. According to the study findings, the average blood glucose level of type II diabetes patients was 257 mg/dl before autogenic therapy intervention, with the lowest and highest levels being 240 and 280 mg/dl, respectively. After autogenic relaxation therapy, the average value was 234 mg/dl.

Discussion

The majority of diabetes mellitus patients are over 60 years old, according to research findings. Based on research and literature collected by experts, the most likely age range for diabetes mellitus is late adulthood to old age. This occurs because the body undergoes physiological, biochemical, and anatomical changes with age, causing glucose intolerance, which gradually alters blood sugar levels.

From the research findings obtained, it is known that the duration of diabetes affects the increase in blood sugar levels of respondents. By the time they reach 60 years of age, the average respondent has diabetes. The causes influencing the onset of type 2 diabetes include age, along with insulin resistance, which tends to increase with age, and glucose intolerance develops gradually over the years. Although insulin is available and its receptors exist, insulin resistance (low-quality insulin) occurs when cellular irregularities prevent cells from entering the cell for digestion, leading to elevated blood glucose levels as glucose remains outside the cell.

According to researchers, women are more likely to develop type 2 diabetes due to increased body mass index, postmenopausal symptoms, menstrual cycle syndrome, and minimal body fat accumulation resulting from hormonal processes. Based on the duration of the condition, respondents were found to have had diabetes for more than five years on average. According to this study, insulin sensitivity decreases over time as someone lives with diabetes, making blood sugar levels more likely to rise.

According to the Journal of Nursing and Midwifery 2016, the purpose of autogenic relaxation is to teach diabetes patients how to relax their body muscles to alleviate stress and anxiety. The term "self-regulation" can mean self-management or self-education, or it can also be interpreted as a challenge you have taken on yourself (National Safety Council, 2003 in Pokhrel, et al. 2024). Autogenic relaxation is relaxation that arises from words and thoughts in the form of short phrases or sentences that can bring peace to the mind (Pokhrel, 2024).

According to research (Futri *et al*., 2024), it has been proven that autogenic relaxation differs from other relaxation methods because it can affect blood pressure and heart rate after therapy. Thus, it can lower glucose levels in patients. The main suggestion in autogenic relaxation is to focus on oneself and allow your arms, hands, legs, and feet to feel warm and heavy. Changes in blood flow (from the body's core to the desired body location) cause a sensation of warmth and heaviness. This serves as an internal signal, cooling and relaxing the surrounding muscles.

Based on the findings, it was concluded that autogenic relaxation techniques can lower blood glucose levels. The research findings are consistent with a study conducted by (Mochartini, 2022) titled "Efforts to Lower Blood Glucose Levels in Type 2 Diabetes Patients Using Autogenic Relaxation," which found that after a three-day intervention, there was a decrease in blood sugar levels in individuals with type 2 diabetes. The results of the study (Natasya & Alini, 2021) also showed that after three days of application, subjective client data indicated that blood glucose levels had

decreased and clients no longer experienced dizziness, weakness, or blurred vision, all of which are associated with unstable blood glucose levels related to hyperglycemia. Clients reported feeling more comfortable and calm after practicing autogenic relaxation.

Conclusion

Before autogenic therapy, the average blood glucose level was 257 mg/dl. After autogenic therapy, the average level was 234 mg/dl. Autogenic relaxation can lower blood sugar levels in patients with type 2 diabetes mellitus.

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