

# Hypnotherapy Reduces Anxiety and Blood Glucose in Diabetic

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**Abstract.** Hypnotherapy is a natural condition for the brain to change habits and lifestyle to be healthy to reduce stress levels and non-fasting blood glucose in type 2 diabetes mellitus patients. The aim of this study was to determine the effectiveness of hypnotherapy on stress (anxiety) levels and non-fasting blood glucose levels and to assess the reduction in stress (anxiety) levels and non-fasting blood glucose levels in type 2 diabetes mellitus patients. The type of research used was true experimental research with a randomized pre-test-post-test control group design. Twenty subjects were taken randomly with the experimental group given action and the control group not given action, measurements were carried out using pre and post-tests. The research results can be concluded that there is the effectiveness of hypnotherapy in reducing non-fasting blood glucose levels with a  $p = 0.018$  ( $p < 0.05$ ).

## 1 Introduction

Diabetes mellitus is a complicated metabolic disease with variable clinical and genetic aspects. It is linked to a reduction in the ability to tolerate carbs, which is noticeable after the illness has fully developed clinically. Atherosclerosis, microangiopathic vascular disease, neuropathy, and high blood sugar levels during and after meals are characteristics of diabetes mellitus[1,2,3].

Globally, there is an increase in the prevalence of type 1 and type 2 diabetes. Particularly in developing countries, the prevalence of type 2 diabetes mellitus is rising at a faster rate than both obesity rates and levels of physical inactivity. In terms of diabetes incidence worldwide, six Asian nations rank among the top 10. Fourth place worldwide goes to Indonesia [4,5,6].

Stress plays a major role in the development of diabetes in those who already have the disease. Stress can raise the risk of developing diabetes mellitus, according to a number of earlier research. In people with diabetes mellitus, the development of stress levels can also be influenced by other psychosocial factors. Through the natural mental state of hypnosis

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brought on by hypnotherapy, people with diabetes mellitus can subconsciously adopt healthier lifestyles and make meaningful, long-lasting changes to their daily routines. Patients with diabetes mellitus can be taught new, healthy, and optimistic thought patterns using this therapeutic approach. The goal of this program is to instill a sense of confidence or belief that upholds and sustains their health. Patients' emotional and physical well-being can significantly improve by gaining a deeper awareness of themselves and effectively altering their harmful thought patterns. People with diabetes mellitus who are under stress may be less motivated to control their diabetes[7,8,9].

An important factor contributing to Indonesia's high rate of diabetes mellitus is the country's high stress level. For this reason, the author is curious to find out how well stress management works to lower blood sugar in people with diabetes mellitus.

## 2 Methods

The present investigation employed the randomised pre-test-post-test control group design research approach. A random selection procedure was used to pick the respondents. While the control group received no treatment at all, the treatment group underwent hypnosis. A pretest was used prior to therapy, and a posttest was used following treatment, for the purpose of conducting measurements. The Muhammadiyah University of Yogyakarta's Faculty of Medicine and Health Sciences Ethics Committee gave its approval for this project (No. EC/FKIK UMY/122).

Hypnotherapy was the independent variable in this research. The study measured anxiety and glucose levels as the dependent variables. The patient's mental health and intake of diabetes mellitus medication are confounding variables, whereas age is the controlled variable. Diet and medicine use are uncontrolled variables. This study employs many tools, including respondent questionnaires as outlined in the attached document, a glucometer for monitoring glucose levels, a hypnotherapy, informed consent, and research authorization. Hypnotherapy was given for 10 days. The duration of hypnotherapy was 1 hour/day.

This research uses a variety of instruments, such as the Taylor Manifest Anxiety Scale (TMAS) questionnaire, hypnotherapy, a glucometer for testing blood sugar, informed consent, and research authorisation letters. This research was carried out in multiple stages, with preparatory tasks including giving participants a sample questionnaire, getting informed consent, choosing samples at random, completing the TMAS questionnaire, and taking blood glucose readings being among the preparation tasks. The cohort of 20 participants included both male and female individuals ranging in age from 30 to 65. The individuals were divided into two groups, each consisting of 15 research subjects and 5 control subjects who did not receive any treatment. Concurrently, the study entailed conducting one to four hypnotherapy sessions, with a duration of thirty to one hour per session. Following the completion of the initial questionnaire and blood glucose measurement, this was carried out. After the hypnotherapy session, participants assessed their blood glucose levels and filled out the questionnaire again on the fourth day. The paired t-test was employed for data analysis.

## 3 Results

Participants in this study were people with type 2 diabetes, of both genders, who did not experience any complications or communication issues associated with their condition. There

was no indication of the participants' age range. The inquiry has a sample size of 20 respondents. All participants in the study remained engaged until its completion, resulting in a dropout rate of 0%. Four intense hypnosis sessions were conducted with the treatment group, and their attendance record was 100%.

Table 1. Blood glucose level and anxiety		
Variables	Control Group	Treatment Group
Blood glucose Level:		
a. Pre-examination	216.6 mg/dl	185.8 mg/dl
b. Post-examination	214.6 mg/dl	160.8 mg/dl
c.		
Anxiety:		
d. Pre-examination	high	high
e. Post-examination	high	moderate

Table 1 shows that blood sugar levels in the control group decreased on average, going from 216.6 mg/dl pre-test to 214.6 mg/dl post-test. Furthermore, the highest level of anxiousness was discovered. In the therapy group, the mean difference in sugar levels was 160.8 mg/dl and 185.8 mg/dl between the pre- and post-examinations, respectively. Furthermore, the average anxiety level changed both before and after the therapy. After the hypnotherapy treatment was administered, the criteria were adjusted.

Table 2. Independent sample t-test statistical test		
Characteristics	Blood glucose	Anxiety
Control	p=0.018	p=0.003
Treatment	(p<0.05)	(p<0.05)

The t-test analysis demonstrated statistically significant disparities in the average blood sugar and anxiety levels between the control and treatment groups. The average blood sugar levels and anxiety levels exhibited significant differences between the control and treatment groups (p=0.018; p=0.003) (Table 2).

4 Discussion

The paired t-test was used to determine the blood glucose levels in the control group. A p-value of 0.582 ( $p>0.05$ ) was found in the research, indicating that there was no statistically significant difference in anxiety levels between the control group at the pre- and post-test. An independent sample t-test was employed in the ensuing statistical analysis to assess the variation in blood glucose levels between the treatment and control groups during the data collection process ( $p=0.018$ ). This suggests that the blood glucose levels of the treatment group and the control group decreased statistically significantly. Comparing the findings of this study to those of earlier research that looked at the blood glucose variations in individuals with type 2 diabetes mellitus before and after relaxation therapy, little differences were found. Comparing people with type 2 diabetes mellitus to those who did not practice relaxation, the study's findings demonstrated that relaxation techniques had a significant impact in lowering

average blood glucose levels. Still, given the lack of statistical significance, it is likely that the respondents' differing treatments are what caused the observed variance [10,11,12].

Statistics confirm this study's findings, which show that blood glucose levels and stress (anxiety) levels significantly and meaningfully reduce after hypnotherapy treatment. This has to do with the accepted theory that a life marked by a lot of stress may have an effect on fluctuations in blood sugar. Increased levels of catecholamines (especially adrenaline), growth hormone, and glucocorticoid hormones (particularly cortisol) are responsible for this. A person experiencing hypnotherapy experiences a condition of calm and relaxation as a result of the hormones' suppression and regulation [13,14,15]. Diabetes mellitus patients' stress and worry can physiologically affect the hypothalamus-pituitary system, which can cause changes in endocrine function. Increased cortisol levels may follow, which may have detrimental effects on insulin action and general glycaemic management. Stress, especially anxiety, can affect blood glucose levels, which in turn can affect how people with diabetes mellitus live. The research showed that hypnotherapy was an excellent way to reduce stress, namely anxiety [16,17,18].

Two neuroendocrine systems that are controlled by the hypothalamus are activated when the body is under stress, which causes physiological changes in the body. The sympathetic and adrenal cortex systems are these systems. The hypothalamus' primary job is to activate the autonomic nervous system and the sympathetic branch. It does this by sending nerve impulses to the brain stem nuclei, which control how the autonomic nervous system functions [19,20,21]. Smooth muscles and internal organs are immediately impacted by the sympathetic division of the autonomic nervous system, which leads to a variety of physiological changes. This involves an accelerated heart rate and higher blood pressure. The adrenal medulla releases adrenal hormones (epinephrine and norepinephrine) into the bloodstream when the sympathetic nervous system stimulates it. Furthermore, norepinephrine indirectly affects the pituitary gland to promote the liver's release of glucose [22,23,24].

The hypothalamus releases CRH (corticotropin-releasing hormone), which stimulates the anterior pituitary gland to release ACTH (adrenocorticotrophic hormone). ACTH stimulates the adrenal cortex to release cortisol [25,26]. Cortisol then initiates the process of gluconeogenesis in the liver. Cortisol has the ability to enhance gluconeogenesis by a factor of 6-10, while simultaneously decreasing glucose utilization by cells in the body. As a result, there is a rise in blood glucose levels and a surge in stress levels [27,28,29,30].

## 5 Conclusion

Diabetes patients who use hypnotherapy can see significant reductions in blood sugar and anxiety. People with diabetes mellitus may benefit from hypnotherapy in terms of their overall health.

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