

Application of Autogenic Relaxation Therapy to Reduce Blood Glucose Levels in Clients with Diabetes Mellitus

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ABSTRACT

Diabetes mellitus is a chronic disease characterized by hyperglycemia due to the body's inability to metabolize carbohydrates, fats, and proteins. High blood glucose levels are a major cause of diabetes mellitus-related complications. Diabetes mellitus can be controlled through non-pharmacological therapies, including autogenic relaxation therapy. Autogenic relaxation therapy is one intervention that may help reduce blood glucose levels. Objective: To implement family nursing care with autogenic relaxation therapy in patients with diabetes mellitus. Method: This study used a descriptive design with a case study approach, including pretest and posttest measurements of blood glucose levels. Data were collected through interviews, observation, physical examination, and documentation review. Results: The intervention resulted in decreased blood glucose levels in both clients after autogenic relaxation therapy was administered for 3 days, twice daily (morning and evening), for 15 minutes per session. In Case Study Subject I, blood glucose decreased from 228 mg/dL to 174 mg/dL, while in Case Study Subject II it decreased from 376 mg/dL to 200 mg/dL. Conclusion: The application of autogenic relaxation therapy was associated with a reduction in blood glucose levels.

Keywords: Diabetes mellitus; blood glucose levels; autogenic relaxation therapy



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INTRODUCTION

Non-communicable diseases (NCDs) are diseases that cannot be transmitted from one person to another and generally develop slowly over a long period of time (chronic). NCDs, also known as chronic diseases, tend to persist for long periods and result from a combination of genetic, physiological, environmental, and behavioral factors (1). The main types of NCDs include cardiovascular diseases (such as heart attack and stroke), cancer, respiratory diseases (such as chronic obstructive pulmonary disease and asthma), and diabetes mellitus. Diabetes is one of the four priority NCDs and is a leading cause of blindness, heart attack, stroke, kidney failure, and lower-limb amputation; approximately 80% of diabetes cases can be prevented (2). Diabetes is widely experienced by the population and represents a global public health problem; consequently, it has become a priority for world leaders in addressing health problems (3).

Diabetes mellitus is a chronic disease that occurs because the pancreas does not produce sufficient insulin, a hormone that regulates blood glucose, or because the body cannot effectively use the insulin it produces (4). The pancreas produces insulin, which enables glucose in the blood to enter body cells and subsequently be converted into energy required by muscles and tissues (5). Diabetes mellitus (DM) is a heterogeneous group of disorders characterized by elevated blood glucose levels or hyperglycemia (6). Glucose is the simplest form of carbohydrate and is absorbed into the bloodstream through the digestive system. Blood glucose concentration must be maintained at a sufficiently high and stable level, approximately 70–120 mg/dL, to support optimal brain function and tissue supply. Blood glucose must also be prevented from becoming excessively high because glucose affects the osmotic pressure of extracellular fluid (7). Diabetes mellitus is a chronic disease that requires long-term care (8).

Diabetes mellitus may occur due to several factors, including inadequate insulin production, which may be related to genetic factors, and reduced sensitivity of body tissues to insulin (9). Diabetes mellitus (DM), commonly known as diabetes, is a chronic disease characterized by hyperglycemia due to the body's inability to metabolize carbohydrates, fats, and proteins; high blood glucose levels are a major cause of DM-related complications (10). DM should be suspected when classic symptoms are present, including polyuria, polydipsia, polyphagia, and unexplained weight loss (11). Complications of diabetes mellitus include diabetic ketoacidosis, hyperglycemia, hypoglycemia, cardiovascular disorders, stroke, visual impairment (retinopathy), kidney impairment due to diabetic nephropathy, peripheral nerve disorders (neuropathy), tissue damage caused by neuropathy, and non-healing wounds of the lower extremities, which may also cause anxiety (12).

Diabetes mellitus is classified into three types according to its cause: type 1 diabetes, type 2 diabetes, and gestational diabetes. The disease may occur because of insulin resistance, in which body cells cannot respond appropriately to insulin. Consequently, insulin cannot regulate blood glucose effectively, resulting in unstable blood glucose levels (13). Common complications that may occur when diabetes is not managed promptly include comorbid diseases affecting various organs. Diabetes mellitus can cause a range of life-threatening complications (14).

According to the Indonesian Health Survey, the prevalence of physician-diagnosed diabetes mellitus by province was recorded at 877,531 cases across 34 provinces. The increasing number of people with diabetes has become a serious global problem, particularly in developing countries such as Indonesia. Based on the 2023 Basic Health Research, the prevalence of physician-diagnosed diabetes mellitus reached 1.7%. The highest prevalence was found in DKI Jakarta (3.1%), Special Region of Yogyakarta (2.9%), East Kalimantan (2.3%), and North Sulawesi (2.1%), while the lowest was found in Highland Papua (0.2%). A report from the East Nusa Tenggara Provincial Health Office in 2023 recorded a prevalence of 0.7% (17,550 people) of the total number of people with diabetes mellitus in Indonesia. In Sikka Regency, the number of people with diabetes mellitus increased from 2,347 in 2018 to 4,136 in 2022, an increase of 89.8% (15). At Kopeta Community Health Center, 338 people with diabetes mellitus were recorded in 2023, with an achievement percentage of 245.1%; in 2024, the number increased to 756 people, with an achievement percentage of 259%.

According to the consensus on diabetes mellitus management and prevention in Indonesia, diabetes management focuses on four main pillars: education, medical nutrition therapy, physical exercise, and pharmacological intervention. Diabetes mellitus can be

managed through pharmacological and non-pharmacological approaches. Pharmacological therapy involves taking blood glucose-lowering medication. Long-term use of pharmacological therapy may cause adverse effects, including gastrointestinal disturbances such as nausea and diarrhea, an increased risk of hypoglycemia, liver damage, or cardiovascular problems (16).

Management also includes physical exercise, one form of which is body relaxation. Relaxation may help people with diabetes reduce sugar cravings and allow hormones regulating body systems to function optimally, including through autogenic relaxation (17). Relaxation is a state in which a person feels mentally and physically free from tension and stress. Relaxation techniques aim to enable individuals to control themselves when experiencing tension and stress that causes discomfort (18).

Autogenic relaxation is a simple mental exercise involving repeated phrases during a period of quiet, either while sitting or lying comfortably. Research indicates that autogenic relaxation may help reduce blood glucose levels in patients with diabetes mellitus. The method is thought to work partly by regulating cortisol, a hormone with metabolic effects that can increase blood glucose concentration by mobilizing protein and fat stores and suppressing the immune system. In addition to cortisol, glucagon and insulin are also involved in the stress response. The primary stimulus for insulin secretion is an increase in blood glucose, while the main effect of insulin is to lower blood glucose. If insulin is not inhibited during the stress response, stress-induced hyperglycemia stimulates insulin secretion to reduce glucose levels. As a result, the increase in blood glucose cannot be sustained and may contribute to bodily tension (19). Insulin secretion is largely stimulated by high blood glucose, and the primary function of insulin is to lower blood glucose. During the stress response, insulin stimulation may be inhibited in the process of reducing stress-induced hyperglycemia. A decrease in blood glucose may occur as an effect of hormones released during relaxation (10).

Autogenic relaxation uses simpler controlled movements than other relaxation techniques and can be performed for 15–20 minutes while lying down, sitting in a chair, or reclining, depending on the patient's condition, allowing the client to perform it almost anywhere (20). Autogenic relaxation therapy focuses on heart rate and breathing regulation (21). The purpose of autogenic relaxation is to produce sensations of calmness, lightness, and warmth that spread throughout the body and create a feeling of warmth experienced by the patient (22). The imagined sensations may include warmth, lightness, or relaxation in particular body parts, as well as relief resulting from slow, deep breathing (13). Research on the benefits of autogenic relaxation in patients with diabetes mellitus has also been conducted in Indonesia (17).

Based on the background described above, the authors were interested in examining the management of autogenic relaxation therapy as an effort to reduce blood glucose levels in patients with diabetes mellitus in a final scientific paper entitled *Application of Autogenic Relaxation Therapy to Reduce Blood Glucose Levels in Clients with Diabetes Mellitus at Kopeta Community Health Center*.

METHODS

This study used a descriptive research design with a case study approach. The case study aimed to explore family nursing care problems in two clients with diabetes mellitus through the application of autogenic relaxation therapy to reduce blood glucose levels for 3 days (morning and evening), with each session lasting 15 minutes. Assessment and

intervention for each client were conducted in the family home. The instruments used were the Standard Operating Procedure (SOP) for autogenic relaxation therapy and a blood glucose measurement device (glucometer). Data analysis involved collecting subjective and objective data. Based on the collected data, the researchers established nursing diagnoses, developed nursing interventions or plans, implemented the nursing care, and evaluated the care provided to the clients.

RESULTS

This study focused on the application of autogenic relaxation therapy to reduce blood glucose levels in patients with diabetes mellitus for 3 days (morning and evening), with a duration of 15 minutes per session, conducted from January 15 to 17, 2025. The researchers observed blood glucose levels before and after autogenic relaxation therapy, with the following results:

Table 1. Changes in blood glucose levels before and after the application of autogenic relaxation therapy.

Date	Client I – Before	Client I – After	Client II – Before	Client II – After
15/01/25	228 mg/dL	197 mg/dL	376 mg/dL	294 mg/dL
16/01/25	196 mg/dL	194 mg/dL	270 mg/dL	268 mg/dL
17/01/25	197 mg/dL	174 mg/dL	260 mg/dL	200 mg/dL

Based on the assessment, the researchers found the following subjective data. Client I was 61 years old, had completed senior high school, and worked as a fisherman. Client I reported having diabetes mellitus for approximately 2 months. The client also stated that he had checked his blood glucose level at the community health center only once, frequently consumed sweet foods, had no dietary restrictions, and did not maintain a proper diet. The random blood glucose (RBG) level was 228 mg/dL. Client II was 63 years old, had completed elementary school, and worked as a farmer. He reported having checked his blood glucose level four times at the community health center. Client II also frequently consumed sweet foods, had no dietary restrictions, and did not maintain a proper diet. He complained of blurred vision and cramps in his legs and arms. His RBG level was 376 mg/dL.

DISCUSSION

These findings are consistent who reported that two respondents with diabetes mellitus had difficulty controlling their lifestyles, resulting in impaired metabolism and uncontrolled blood glucose levels. Lack of discipline in following dietary recommendations also contributed to elevated blood glucose levels (23).

Based on the assessment, the researchers considered the high blood glucose levels in both clients to be related to the family's inability to maintain a healthy lifestyle, irregular dietary patterns, and limited family knowledge about diabetes. This is consistent who reported that respondents with diabetes mellitus experienced similar problems due to inadequate understanding of healthy dietary patterns and limited knowledge (24).

Data analysis also showed that the families of both Client I and Client II consisted of three members, all of whom were healthy. Their homes and surrounding environments were also clean and healthy. Client I and Client II were middle-aged/older couples living alone because their children had established their own households. This finding is consistent with

Friedman's family concept theory, concerning the family health care function. The theory explains the extent to which families provide basic needs such as food, clothing, and protection and care for sick family members. It also encompasses the family's knowledge of health and disease and efforts to maintain and improve the health status of each family member so that daily activities can be carried out without obstacles (25).

The nursing diagnoses for both clients were knowledge deficit related to the family's inability to recognize health problems (D.00126) and ineffective/at-risk health behavior caused by the family's inability to identify health problems (D.00188). This is consistent with nursing diagnosis theory in basic concept of family nursing care, which states that family nursing diagnoses are formulated based on assessment data. These data include nursing problems and their etiologies identified through assessment of family health care functions. Nursing diagnoses serve as concise labels describing observed patient conditions, which may represent actual problems, risks, or potential problems.

Based on the nursing diagnoses identified in the case study of Clients I and II, the intervention provided was Action Process Education (I.12442), namely autogenic relaxation therapy. The goal was that after nursing care consisting of three sessions of 45 minutes each, conducted twice daily for 3 days (morning and evening), health behavior would improve. Expected outcomes included greater acceptance of health status, improved ability to perform preventive health actions, and the ability of clients and families to demonstrate autogenic relaxation therapy.

This is consistent who found that the mean blood glucose level before autogenic relaxation therapy in patients with diabetes mellitus was 214.4 mg/dL, decreasing to 205 mg/dL after therapy. These findings suggest that autogenic relaxation therapy affects blood glucose reduction. This is also supported by Yogi Mursito and Budi Artini (25), who reported that before intervention all 23 respondents (100%) in the intervention group had high blood glucose levels, whereas after autogenic relaxation therapy, most respondents, 14 (60.9%) of 23, had moderate blood glucose levels. The mean blood glucose level decreased from 234.78 mg/dL before therapy to 202.91 mg/dL after therapy.

Autogenic relaxation has a distinctive effect compared with other relaxation techniques because it may influence blood pressure and pulse rate immediately after the intervention. It may therefore contribute to reducing glucose levels in patients. A central principle of autogenic relaxation is surrendering oneself to the process, allowing different body areas, including the arms, hands, legs, and feet, to become warm and heavy (24).

Relaxation is a method, process, procedure, or activity that can help a person become relaxed, increase calmness, and reduce anxiety, stress, or anger. Autogenic refers to self-regulation or self-generated control (23). Autogenic relaxation consists of a series of simple mental exercises involving repeated phrases during a period of quiet, either while sitting or lying in a comfortable position. The therapy is believed to help lower blood glucose and blood pressure in patients with diabetes mellitus. In this study, the intervention was implemented for 3 consecutive days, twice daily (morning and evening), from January 15 to 17, 2025, at the homes of Clients I and II. Before therapy, both clients were first given an explanation of the procedure and blood glucose measurement. The initial RBG levels were 228 mg/dL for Client I and 376 mg/dL for Client II. Autogenic relaxation therapy was performed for 15 minutes per session. Each client followed seven therapy steps for 3 consecutive days, twice a day, in the morning and evening.

This is consistent with theory of family nursing implementation, which states that nursing actions for families include five family health tasks. One task is encouraging the family to provide appropriate care by identifying the effects of each action and building confidence in caring for sick family members. This can be achieved by demonstrating care procedures, utilizing equipment and facilities available at home, and supervising the family while care is provided.

Evaluation was conducted in two stages: process evaluation and outcome evaluation. Process evaluation involved asking both clients to perform autogenic relaxation therapy independently, while outcome evaluation involved measuring blood glucose using a glucometer. The results showed that both Client I and Client II successfully performed autogenic relaxation therapy according to the taught steps. RBG measurements showed that Client I had a blood glucose level of 174 mg/dL and Client II had 200 mg/dL. These findings demonstrate a reduction in blood glucose levels in both clients after applying autogenic relaxation therapy for 3 days (morning and evening), as both clients were able to perform the therapy independently and optimally.

These results are consistent with Syafni and Yanti (1), who reported that the pre-intervention RBG levels were 226 mg/dL in Client I and 504 mg/dL in Client II. After autogenic relaxation therapy was administered for 3 consecutive days, RBG decreased to 112 mg/dL in Client I and 100 mg/dL in Client II. Post-intervention RBG measurements demonstrated reduced blood glucose levels in both subjects.

Based on the evaluation, the authors concluded that regular and consistent application of autogenic relaxation therapy, supported by adequate family support, can substantially reduce blood glucose levels. Clients and families can also perform autogenic relaxation therapy independently as an effort to control high blood glucose, accompanied by the adoption of a healthy lifestyle.

CONCLUSION

Autogenic relaxation therapy can help reduce blood glucose levels in patients with diabetes mellitus. This therapy is thought to work partly by regulating cortisol and other stress-related hormones.

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REFERENCES

1. Syafni, A. P., & Yanti, N. Relaksasi Autogenik Pada Pasien Diabetes Mellitus Type 2 Dengan Ketidakstabilan Kadar Glukosa Darah. 01(01), 6–14. 2024.
2. Rizky, W., Insani, A., & Widiastuti, A. Pengaruh Relaksasi Autogenik Terhadap Gula Darah Pada Pasien DM Tipe 2. 2(2), 137–144. 2020.
3. Fitriani Nasution, Andidala, A. A. S. Faktor Risiko Kejadian Diabetes Melitus. 9(2), 94–102. 2021.

4. Savitri Gemini, W. N. Penerapan Relaksasi Autogenik Mengatasi Masalah Keperawatan Ketidakstabilan Kadar Glukosa Darah Pada Lansia Penderita Diabetes Mellitus Tipe 2: Studi Kasus. 2(3), 113–117. 2022.
5. Hartono, S. E. Hubungan Tingkat Pendidikan, Lama Menderita Sakit Dengan Tingkat Pengetahuan 5 Pilar Penatalaksanaan Diabetes Melitus Di Wilayah Kerja Puskesmas Sungai Durian Kabupaten KBU Raya Kalimantan Barat. 9(1), 2018–2022. 2024.
6. Mustofa, E. E., Purwono, J., Keperawatan, A., Wacana, D., Kunci, K., & Darah, K. G. Penerapan Senam Kaki Terhadap Kadar Glukosa Darah Pada Pasien Diabetes Melitus Di Wilayah Kerja Puskesmas Purwosari Kecamatan Metro Utara Tahun 2021. 2, 78–86. 2022.
7. Martalina Limbong, Ridha Darma Jaya, Y. A. Pengaruh relaksasi autogenik terhadap kadar glukosa darah pada pasien diabetes melitus tipe 2. 1(1), 21–28. 2015.
8. Arini, H. N., Anggorowati, A., Sri, R., & Pujiastuti, E. Dukungan keluarga pada lansia dengan Diabetes Melitus Tipe II : Literature review. 7(2), 172–180. 2021.
9. Nento, S. E. Efektivitas Terapi Relaksasi Autogenik Untuk Menurunkan Kecemasan Pada Pasien Diabetes Melitus Di Wilayah Kerja Puskesmas Telaga. 10(1), 39–44. 2025.
10. Aji, W., Saradevi, A., Widyastuti, D., & Nurjannah, M. Implementasi Relaksasi Autogenik terhadap Penurunan Kadar Gula Darah pada Pasien Diabetes Melitus Tipe II. 5(2), 368–373. 2024.
11. Silvia, K. B. TEkhnik Relaksasi Autogenik Pada Pasien Diabetes Melitus Tipe II Dengan Masalah Ketidakstabilan Kadar Glukosa Darah Di Rumah Sakit TK II Putri Hijau Medan. 1(September), 264–269. 2021.
12. Isnay Nurhayati, Sri Puguh K, S. E. C. P. (n.d.). Efektivitas Hipnoterapi Dan Relaksasi Autogenik Terhadap Penurunan Tingkat Kecemasan Pasien Diabetes Melitus Tipe 2 Dengan KOMplikasi Di RSUD Dr.H.Soewondo Kendal. 1–12.
13. R.A. Alma Murti Cipta Ningrum, Uswatun Hasanah, L. Penerapan Relaksasi Autogenik Terhadap Kadar Glukosa Darah Pada Pasien Diabetes Melitus Tipe 2. 1, 549–553. 2021.
14. Abdul, R. H., Kota, M., Studi, P., Ners, P., Kedokteran, F., Jambi, U., Letjen, J., No, S., Pura, T., & Jambi, K. Penerapan Terapi Relaksasi Autogenik Untuk Menurunkan Kadar Glukosa Darah Pada Pasien Diabetes Mellitus (DM) Tipe 2 RSUD H. Abdul Manap Kota Jambi Ambarwati1. 8(3), 312–321. 2024.
15. Mukin, F. A., Susana, M., & Nona, I. Upaya Untuk Menurunkan Kadar Glukosa Darah Melalui Hydrotherapy Pada Pasien Diabetes Melitus Tipe II. 28(1), 290–294. 2024. <https://doi.org/10.46984/sebatik.v28i1.2454>
16. Rahma, A., Sopiah, P., Rosyda, R., Indonesia, U. P., & Sumedang, K. D. The Effect Of Autogenic Relaxation On Blood Glucose Levels In Type 2 Diabetes Mellitus: Systematic Review. 158. 2024.
17. Fanshuri, T. Pengaruh Relaksasi Autogenik dalam Menurunkan Kadar Gula Darah pada Pasien DM Tipe II di Desa Kajhu The Effect of Autogenic Relaxation in Reduce Blood Sugar Levels in Type II DM Patients in Kajhu Village. 9(1), 438–446. 2023.
18. Subiyakto, A. Pengaruh Terapi Relaksasi Autogenik Terhadap Tingkat Kecemasan Dan Tekanan Darah Pasien Pre-Operasi Di Ruang Mawar 3 RSUD DR.Moewardi Surakarta. 15(2), 83–90. 2024.
19. Fourni Ardiansyah, Nunu Harison, Shinta, Dita Amita, A. H. Pengaruh Tehnik Relaksasi Autogenik Terhadap Kadar Gula Darah Pada Penderita Diabetes Melitus Tipe 2. 3, 3002–3011. 2023.

20. Bides Indra Cahya, Zahra Maulidi Septimar, Meynur Rohmah, R. S. Asuhan Keperawatan Pada Pasien Diabetes Melitus Tipe II Dengan Intervensi Terapi RELaksasi Autogenik Untuk Menurunkan Kadar Glukosa Darah Di Ruang Mawar RSUD Kabupaten Tangerang. 7(4). 2024. <https://doi.org/10.5455/mnj.v1i2.644xa>
21. Tyas Aulia Hanani, D. R. Efek Kombinasi Relaksasi Autogenik dan Aromaterapi Lavender Terhadap Kadar Glukosa Darah pada Pasien DM Tipe 2. 5, 67–74. 2020.
22. Yulia Nur Hayati, E. P. S. Penerapan Relaksasi Autogenik Untuk Mengurangi Kecemasan Pada Pasien Diabetes Melitus. 3(2). 2019.
23. Rizky Wahyu Mahendra, Sri Nurhayati, J. P. Penerapan Relaksasi Autogenik Untuk Menurunkan Tekanan Darah Penderita Hipertensi DI UPTD Rawat Inap Banjarsari Kecamatan Metro Utara. 2(September), 399–406. 2022.
24. Putri, M., Sumartyawati, N. M., Marvia, E., Ramli, R., Astuti, F., Tinggi, S., & Kesehatan, I. Efektivitas Relaksasi Autogenik dan Hidroterapi terhadap Kadar Glukosa Darah pada Pasien Diabetes Melitus Tipe II Keywords : Diabetes Mellitus Type II , Hydrotherapy, Autogenic Relaxation. 10(1). 2024.
25. Yogi Mursito, Budi Artini, H. J. Pengaruh Relaksasi Autogenik Terhadap Kadar Gula Darah Pada Penderita Diabetes Melitus Tipe 2 Di Wilayah Lebak Timur RW 10 Surabaya. 2024.