

The Combination of Education and Hypnotherapy Optimizes Diabetes Self-Management and Fasting Blood Glucose in Type 2 Diabetes Mellitus Patients

Paulus Subiyanto ^{1*}, Muhamed Saifulaman ², Scholatica Alfrida Puspasari ³ and Emmelia Ratnawati ⁴

^{1, 3, 4} Departemen Keperawatan Medikal Bedah, Sekolah Tinggi Panti Rapih, l. Tantular 401 Pringwulung, CCD, Sleman, Yogyakarta, Indonesia, 55283.

² Appliend Science, Lincoln University College Malaysia.

Email: ¹paulus.subiyanto69@gmail.com (*Corresponding Author), ²drsaifulaman@yahoo.com, ³scholasticalf.ns@gmail.com, ⁴emmelia_ratnawati@stikespantirapih.ac.id

Abstract

Introduction: Diabetes is a metabolic disease with signs of hyperglycemia. Self-management education and support are key to successful complication control and prevention. Hypnotherapy, although limited, has promising potential in diabetes management. Purposes: This study aims to explore the effect of education and hypnotherapy on Diabetes Self-Management (DSM) and fasting blood glucose (FBG) of type 2 DM patients. Methods: The study was conducted with a quasi-experimental pre and post-test design. A total of 34 respondents participated based on inclusion and exclusion criteria, further divided into control and intervention groups. Results: A total of 88.2% of respondents were female, average age 57 years (50-64), 70.6% had a secondary school education, and 100% consumed OHO. In one week there were significant differences in mean DSM scores and FBG before and after the intervention that were greater than those of the control (+23.12 vs. +0.64; +42.41 vs. +21.76 mg/dL; $p = 0.000$). The difference between the two interventions had a significant effect on the mean DSM score ($p = 0.000$) but not on the mean FBG ($p = 0.645$). The decline in FBG was greater in the intervention group than in the control. Conclusions: A combination of education and hypnotherapy is effective for improving DSM and FBG in type 2 DM patients. Further research is needed with more respondents and a longer time to determine the results of the study.

Keywords: Education, Diabetes Self-management, hypnotherapy, fasting blood glucose, DM type 2.

INTRODUCTION

Type 2 Diabetes Mellitus (DM type 2) is one of the global health challenges whose prevalence continues to increase (1). Type 2 diabetes is a chronic metabolic disease characterized by hyperglycemia, which is high blood glucose levels, and often requires lifelong treatment (2). The high prevalence of type 2 diabetes and the long-term complications that may arise, such as heart disease, kidney failure, and eye disorders, make the management of this disease a public health priority (3). One critical approach to managing type 2 diabetes is Diabetes Self-Management (DSM), which includes lifestyle changes, glycemic monitoring, and an understanding of diabetes management (4,5).

Although education on type 2 diabetes and support in self-management have been important components of treatment, there are still major challenges in achieving good glycemic control. Psychological factors such as negative attitudes, anxiety, and stress can hinder a patient's adherence to their treatment and affect glycemic control (6). Hypnotherapy is one promising method for overcoming this psychological barrier. Hypnotherapy involves deep relaxation and positive

suggestions to change behavior and thought patterns and has been used effectively in a variety of medical and psychological conditions (7).

However, research on the effect of a combination of education about type 2 diabetes and hypnotherapy on DSM and fasting blood glucose levels is limited. Therefore, this study aims to fill this knowledge gap by exploring how a combination of education and hypnotherapy can influence DSM behavior and measuring its impact on fasting blood glucose levels in type 2 DM patients.

The results of this study are expected to provide valuable insights into the potential of this combination approach in improving type 2 DM management. With a better understanding of the influence of education and hypnotherapy, we can develop more effective interventions to improve the quality of life of type 2 DM patients and reduce the risk of long-term complications. In addition, this study may also open the door to new approaches in type 2 DM management that are more holistic and focus on the psychological aspects of patients.

MATERIAL AND METHOD

The research method used was quasi-experimental with pre and post-test with a time period of 7 days. The study involved 34 respondents, who were divided into two groups. The control group received conventional medical services while the intervention group received a combination of education and audio-hypnotherapy developed by the researchers. The provision of interventions and monitoring of fasting blood glucose levels is carried out directly by researchers.

This research was conducted at one of the Elderly Posbindu in Canan Village, Wedi, Klaten, Central Java. The inclusion criteria set were T2DM patients with fasting blood glucose levels > 126 mg/dL; not currently on insulin therapy; age < 65 years; willing to be a respondent and run an intervention program for 7 days; The exclusion criteria are having verbal and non-verbal communication disorders; have memory impairment or dementia; resign as a research respondent during the research process; undergoing steroid therapy, and is pregnant.

Analysis of pre and post-test differences in the control group and intervention group in achieving Diabetes Self-Management (DSM) behavior and fasting blood glucose levels was performed using paired t-test and Wilcoxon signed-rank test for abnormal data. To determine the difference in average scores in the two groups using an independent t-test.

RESULT AND DISCUSSION

Table 1: Characteristics of Respondents of DMT2 Patients Control Group and Intervention Group

Characteristics of Respondents		Frequency	%	n
Age	45 – 54 year	10	29.4	34
	55 – 64 year	23	67.6	
	65 – 74 year	1	2.9	
Gender	Male	4	11.8	34
	Female	30	88.2	
Education Level	SD	10	29.4	34
	SMP	13	38.2	
	SMA/SMK	11	32.4	
Oral Hypoglycemic Drugs Used	Metformin	13	38.2	34
	Acarbose	8	23.5	
	Glimepiride	13	38.2	

Source: Primary Data (2022)

The findings of Table I provide an important picture of the characteristics of respondents in this study. The characteristics of respondents with a majority of elderly women became important factors influencing the prevalence of diabetes and adherence to DSM behavior. Age > 40 years is one of the risk factors for diabetes (8). Aging factors that have an impact on decreasing body functions and hormonal factors in the female body play a role in this. Seniors in the age range of 50-64 years can influence how they manage their diabetes. Although increasing age affects diabetes management compliance, on the contrary, the female sex has the potential to negatively affect compliance. In addition, about 70.6% of respondents had a middle and high school education background, which could play a role in their understanding of diabetes management (9).

Although respondents who received insulin therapy were an exclusion criterion in this study, it was very easy for researchers to get respondents who only received oral hypoglycemic drugs in the elderly Posbindu community. Information about this pharmacological treatment is interesting. Oral hypoglycemic drug (OHO) administration is the most common pharmacological treatment option for the elderly with type 2 diabetes. This may reflect the early stages of type 2 diabetes in respondents, where glycemic management can be addressed through lifestyle and OHO. However, it should be noted that the treatment of diabetic patients is highly individualized, and the use of OHO without insulin is related to their level of glycemic control and understanding of diabetes management (8).

These characteristics provide a valuable initial understanding of the population studied in the study. Factors such as age, gender, education level, and type of treatment can influence the results of research on the effect of a combination of education and hypnotherapy on Diabetes Self-Management (DSM) and fasting blood glucose levels in patients with type 2 Diabetes Mellitus. It is important to consider how these characteristics may contribute to the interpretation of the results and how these results can be applied in the care and management of type 2 diabetes patients.

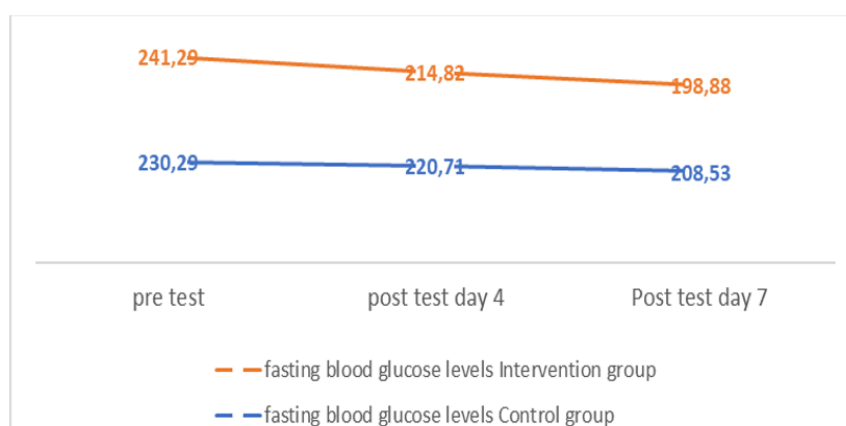


Figure 1: Difference in Mean fasting blood glucose Between the Intervention Group and Control Group

Diagram 1, which illustrates a comparison of the results of monitoring average fasting blood glucose levels before and after the intervention, provides an interesting insight into the effects of combined education and hypnotherapy on the management of type 2 diabetes. In this diagram, it is seen that the intervention group experienced a more significant decrease in fasting blood glucose levels compared to the control group during the 7-day monitoring period.

The average decrease in fasting blood glucose levels before and after the intervention in the intervention group was 42.41 mg / dL, while in the control group, the average decrease was only 21.76 mg / dL. These results indicate that the combination of education and hypnotherapy has the potential to have a positive impact on glycemic control in type 2 diabetes patients. Keep in mind that

a significant drop in blood glucose levels like this can play an important role in preventing the long-term complications associated with diabetes (2).

These results are also in line with previous findings in studies on interventions in diabetic patients. Education on diabetes management (10) and behavioral therapy has been shown to be effective in improving patient understanding and improving glycemic control (5,11–14). The addition of hypnotherapy as an intervention component adds a positive dimension to this effort by helping to overcome negative attitudes and anxieties that can affect self-management behavior (7,15,16). Thus an interdisciplinary and holistic approach to diabetes management is required for better clinical, psychosocial, and behavioral outcomes (17, 18).

Table 2: Distribution of Average DSM Scores and FBG Levels by Type of Intervention within Seven Days

Group	Variable	Mean DSM	Mean FBG	Mean Diff.	SD	SE	p-value	N
Control	Pre-test	44,18			7,46856	1,81139	0,000	17
	Post-test	44,82		+0,64	6,70108	1,62525		17
Intervention	Pre-test	42,41			6,70108	1,64732	0,000	17
	Post-test	65,53		+23,12	10,06925	2,44215		17
Control	Pre-test		230,29		59,54490	14,44176	0,000	17
	Post-test		208,53	-21,76	51,85089	12,57569		17
Intervention	Pre-test		241,29		71,17739	17,26305	0,000	17
	Post-test		198,88	-42,41	88,12753	16,52335		17
Control	Post-test	44,82			6,70108	1,62525	0,000	17
Intervention	Post-test	65,53		+20,71	10,6925	2,44215		17
Control	Post-test		208,53		51,85089	12,57569	0,645	17
Intervention	Post-test		198,88	-9,65	68,12753	16,52335		17

*FBG: Fasting blood glucose

Through Table II analysis in this study, it can be concluded that the initial condition of the respondents, consisting of elderly people with type 2 diabetes, showed a very inadequate level of glycemic control. The fact that all respondents had fasting blood glucose levels above 200 mg/dL before the intervention highlighted the seriousness of glycemic problems in this group. This indicates that effective glycemic control had not been achieved prior to the intervention, and most patients in the study had uncontrolled blood glucose levels.

The findings have significant clinical implications as they highlight the importance of interventions to improve glycemic control in elderly populations with type 2 diabetes. High fasting blood glucose levels such as these are significant risk factors for serious diabetes complications such as heart disease, eye disorders, kidney disorders, and others (2,8). Therefore, this study provides a solid basis for prioritizing more effective education and management efforts in this population, in hopes of preventing the development of unwanted complications and improving the quality of life of patients.

The findings of this study, as reflected in Table I, provide very important insights into efforts to improve the management of type 2 diabetes through a combined approach of education and hypnotherapy. Comparisons between the intervention group and the control group showed a significant difference in the increase in mean DSM scores after the intervention. The intervention group experienced a significantly greater increase in DSM scores compared to the control group (23.12 vs. 0.64; $p=0.000$). These results illustrate that the combination of education and hypnotherapy effectively influences the understanding and practice of self-management in type 2 DM patients. Increasing the DSM is an important first step in improving diabetes control and reducing the risk of long-term complications (Davis et al., 2022; Othman et al., 2021; Sherifali et al., 2018).

The study also confirmed that the difference between the two interventions had a significant effect on improving the mean DSM score after the intervention ($p = 0.000$). In other words, neither education nor hypnotherapy alone or a combination of the two has a positive impact on understanding and behavioral diabetes management in type 2 DM patients. This is an exciting finding because it underscores that hypnotherapy, despite its limitations in the medical literature, can be a valuable addition in diabetes management.

The role of education in hypnotic relaxation is thought to be able to produce long-term memories related to information stored in the subconscious mind (21) which results in more consistent behavior change. The decrease in blood glucose levels after hypnotherapy is also thought to be due to relaxation conditions and decreased sympathetic nerve activity, as well as decreased levels of stress hormones (11) which inhibits the breakdown of glycogen into glucose by the liver. Related research that is almost the same as the intervention in this study in the form of coaching and self-hypnosis has been shown to also reduce blood glucose levels through intervention for 4 weeks (22). Thus, education, coaching, and hypnotherapy are important in modifying the lifestyle of diabetic patients.

The basic principle of hypnotherapy is to create a state of deep relaxation called trance, where the conscious mind becomes more open to suggestions and suggestions given by the therapist. Hypnotherapy techniques include hypnotherapy induction, which involves the use of words and suggestions designed to focus attention and induce trance states, as well as the use of visualization, perceptual change, and mind control techniques to achieve desired behavior changes and defined therapeutic goals (21,23). Although this study used audio-hypnotherapy, the stages and content of the therapy process are in accordance with the specified protocols and standards so that they still meet the principles that have been explained.

Experts have used the consensus that the influence of the conscious mind on us is 12% while the subconscious mind in influencing and controlling our lives is approximately nine times (88%) stronger than the conscious mind. More up-to-date research published by Szegedy-Maszak states that cognitive neuroscientists found that the subconscious mind is responsible, influencing, and determining the processes of 95% to 99% of thinking activities, and thus determines almost all human decisions, actions, emotions, and behaviors (21).

Although the difference in interventions did not reach a certain level of statistical significance ($p = 0.645$) with the mean decrease in fasting blood glucose levels before and after the intervention, it should be noted that the intervention group showed a greater downward trend compared to the control group (42.41 vs. 21.76 mg/dL). These findings suggest that a combination of education and hypnotherapy may have the potential to better control glycemic in type 2 DM patients, which needs to be explored further in follow-up research.

CONCLUSION

The combination of education and hypnotherapy has proven effective and can be a valuable strategy in improving DSM understanding and behavior as well as better glycemic control in the elderly group with type 2 diabetes. Increased attention to education, glycemic management, and special support for type 2 diabetes patients is urgently needed, especially in the elderly group. These efforts can help patients achieve their desired glycemic targets, reduce their risk of long-term complications, and improve their quality of life. The findings in this study are an exciting first step, however, further research with larger sample numbers and longer intervention periods is needed to validate and deepen these findings.

Acknowledgment

Conflicts of interest: None declared.

Source of support in the form of grants: None

References

- 1) IDF. Five questions on the IDF Diabetes Atlas [Internet]. 10th ed. Boyko, Edward J; Magliano, Dianna J; Karuranga, Suvi; Piemonte, Lorenzo; Riley, Phil; Saeedi, Edward J Boyko, Dianna J Magliano Suvi Karuranga, Lorenzo Piemonte, Riley, Phil; Saeedi, Pouya; Hong S, editor. Vol. 102, IDF Diabetes Atlas. IDF; 2021. 147–148 p. Available from: <https://linkinghub.elsevier.com/retrieve/pii/S0168822713003550>
- 2) WHO. Diagnosis and management of type 2 diabetes (HEARTS-D) [Internet]. WHO. Geneva; 2020. Available from: <https://www.who.int/publications/i/item/who-ucn-ncd-20.1>
- 3) ADA. 5. Facilitating Behavior Change and Well-being to Improve Health Outcomes: Standards of Medical Care in Diabetes—2020. Diabetes Care [Internet]. 2020 Jan 1;43(Supplement_1):S48–65. Available from: https://diabetesjournals.org/care/article/43/Supplement_1/S48/30785/5-Facilitating-Behavior-Change-and-Well-being-to
- 4) Enricho Nkhoma D, Jenya Soko C, Joseph Banda K, Greenfield D, Li YC (Jack), Iqbal U. Impact of DSMES app interventions on medication adherence in type 2 diabetes mellitus: systematic review and meta-analysis. BMJ Health Care Inform [Internet]. 2021 Apr 14;28(1):e100291. Available from: <https://informatics.bmj.com/lookup/doi/10.1136/bmjhci-2020-100291>
- 5) Sherifali D, Berard LD, Gucciardi E, MacDonald B, MacNeill G. Self-Management Education and Support. Can J Diabetes [Internet]. 2018 Apr;42:S36–41. Available from: <https://doi.org/10.1016/j.cjcd.2017.10.006>
- 6) Kolb L. An Effective Model of Diabetes Care and Education: The ADCES7 Self-Care Behaviors™. Science of Diabetes Self-Management and Care [Internet]. 2021 Feb 11;47(1):30–53. Available from: <http://journals.sagepub.com/doi/10.1177/0145721720978154>
- 7) Pereira M da G. Changing the mind: hypnosis and diabetes. Rev Lat Am Enfermagem [Internet]. 2017 Dec 4;25. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-11692017000100204&lng=en&tlng=en
- 8) Soelistijo S. Pedoman Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 Dewasa di Indonesia 2021. Global Initiative for Asthma [Internet]. 2021;46. Available from: www.ginasthma.org
- 9) Alexandre, Ketia et al 2021. Factors influencing diabetes self-management in adults: an umbrella review of systematic reviews. JBI Evidence Synthesis [Internet]. 2021;19(5):1003–118. Available from: <https://pubmed.ncbi.nlm.nih.gov/33741836/>
- 10) Wang J, Zhao Y, Xie F. Study on the Nursing Effect of Diabetes Health Education Nursing Methods Applied to Diabetes Patients in the Endocrinology Department. M.A B, editor. J Healthc Eng [Internet]. 2022 Jan 4;2022:1–5. Available from: <https://www.hindawi.com/journals/jhe/2022/3363096/>

- 11) Rodrigues F. Psychotherapy Intervention With Hypnosis In Patients With Type 1 Diabetes Mellitus. In: The European Proceedings [Internet]. UK: Cognitive-crcs; 2017. p. 76–88. Available from: <https://www.europeanproceedings.com/article/10.15405/epsbs.2017.05.10>
- 12) Batalha APDB, Ponciano IC, Chaves G, Felício DC, Britto RR, da Silva LP. Behavior change interventions in patients with type 2 diabetes: a systematic review of the effects on self-management and A1c. *J Diabetes Metab Disord* [Internet]. 2021 Dec 15;20(2):1815–36. Available from: <https://link.springer.com/10.1007/s40200-021-00846-8>
- 13) Yang X, Li Z, Sun J. Effects of Cognitive Behavioral Therapy–Based Intervention on Improving Glycaemic, Psychological, and Physiological Outcomes in Adult Patients With Diabetes Mellitus: A Meta-Analysis of Randomized Controlled Trials. *Front Psychiatry* [Internet]. 2020 Jul 28;11(July):1–18. Available from: <https://www.frontiersin.org/article/10.3389/fpsy.2020.00711/full>
- 14) Powers MA, Bardsley JK, Cypress M, Funnell MM, Harms D, Hess-Fischl A, et al. Diabetes Self-management Education and Support in Adults With Type 2 Diabetes: A Consensus Report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Acad. Diabetes Care [Internet]. 2020 Jul 1;43(7):1636–49. Available from: <https://diabetesjournals.org/care/article/43/7/1636/35565/Diabetes-Self-management-Education-and-Support-in>
- 15) Ramondo N, Gignac GE, Pestell CF, Byrne SM, Ramondo N, Gignac GE, et al. Clinical Hypnosis as an Adjunct to Cognitive Behavior Therapy: An Updated Meta-Analysis. *International Journal of Clinical and Experimental Hypnosis* [Internet]. 2021;69(2):169–202. Available from: <https://doi.org/10.1080/00207144.2021.1877549>
- 16) Gupta A, Sidana A. Clinical Hypnotherapy in Grief Resolution - A Case Report. *Indian J Psychol Med* [Internet]. 2020 Mar 1;42(2):193–7. Available from: http://journals.sagepub.com/doi/10.4103/IJPSYM.IJPSYM_476_19
- 17) I. Gede Juanamasta, Aungsuroch Y, Gunawan J, Suniyadewi NW, Wati NMN. Holistic Care Management of Diabetes Mellitus: An Integrative Review. *Int J Prev Med* [Internet]. 2021;12(69):1–7. Available from: 10.4103/ijpvm.IJPVM_402_20
- 18) Whitley HP, Smith WD, Hanson C, Parton JM. Interdisciplinary speed dating augments diabetes self-management education and support to improve health outcomes. *Patient Educ Couns* [Internet]. 2020 Nov;103(11):2305–11. Available from: <https://doi.org/10.1016/j.pec.2020.05.015>
- 19) Davis J, Fischl AH, Beck J, Browning L, Carter A, Condon JE, et al. 2022 National Standards for Diabetes Self-Management Education and Support. *The Science of Diabetes Self-Management and Care* [Internet]. 2022 Feb 20;48(1):44–59. Available from: <http://journals.sagepub.com/doi/10.1177/26350106211072203>
- 20) Othman MM, Khudadad H, Dughmash R, Syed A, Clark J, Furuya-Kanamori L, et al. Towards a better understanding of self-management interventions in type 2 diabetes: A meta-regression analysis. *Prim Care Diabetes* [Internet]. 2021 Dec;15(6):985–94. Available from: <https://doi.org/10.1016/j.pcd.2021.06.006>
- 21) Gunawan, Adi W. *The Miracle of Mindbody Medicine: How to Use Your Mind for Better Health*. Cetakan 2. Jakarta: PT Gramedia Pustaka Utama; 2018. 1–624 p.

- 22) Deswita D, Sahar J, Mulyono S. Impact of coaching and self-hypnosis intervention on blood glucose levels of older adults in Indonesia. *Enferm Clin* [Internet]. 2019 Sep;29(Insc 2018):146–50. Available from: <https://doi.org/10.1016/j.enfcli.2019.04.022>
- 23) Olendzki N, Elkins GR, Slonena E, Hung J, Rhodes JR. Mindful Hypnotherapy to Reduce Stress and Increase Mindfulness: A Randomized Controlled Pilot Study. *International Journal of Clinical and Experimental Hypnosis* [Internet]. 2020 Apr 2;68(2):151–66. Available from: <https://doi.org/10.1080/00207144.2020.1722028>