Pubsains

OPEN ACCESS

Journal of Pubnursing Sciences, 2024, 02 (04): 114-118
eISSN 2988-4330; pISSN 3025-3330; DOI: 10.69606/jps.v2i04.160

[Original Research]

Journal of Pubnursing Sciences

Effectiveness of Implementation of Nursing Intervention with Innovation "DEKADEE" in Controlling Blood Sugar in Elderly Diabetes Patients in the Community

Safaruddin[1]*, Etty Rekawati[2], Juniati Sahar[2]

[1]Community Nursing Specialist Program Student, Faculty of Nursing, Universitas Indonesia.
[2]Community Nursing Specialist Program, Faculty of Nursing, Universitas Indonesia.
* *Corresponding author:* safarradit47@gmail.com

Article Info:

Received:
(2024-10-03)

Revised:
(2024-11-07)

Approved:
(2024-12-10)

Published:
(2024-12-26)

Abstract

Introduction: Diabetes Mellitus (DM) is one of the major non-communicable diseases in Indonesia and the sixth leading cause of death. To mitigate its increasing impact, an innovative nursing intervention called "DEKADEE" (Diet, Foot Exercise, and Benson Relaxation) was developed. **Aims:** to evaluate the effect of the DEKADEE nursing intervention on reducing blood sugar levels in elderly diabetes patients. **Methods:** A community case study design with a pre-experimental approach was used to evaluate the effect of the DEKADEE intervention (Diet, Foot Exercise, Benson Relaxation) on the behavior and blood sugar levels of 44 elderly individuals with diabetes in Jatijajar, Depok. Pre- and post-intervention data were measured using the Easy Touch device and a behavior assessment instrument, analyzed with a paired T-test ($p < 0.05$). **Results:** Significant improvements were observed in elderly behavior, with knowledge increasing by 3.95 points, attitudes by 2.53 points, skills by 3.66 points, and a reduction in blood sugar levels by 61.045 mg/dL. A paired T-test on behavior variables and blood sugar levels showed significant results, with a p-value of 0.000 ($p < 0.05$). **Conclusion:** The DEKADEE Nursing Intervention significantly influenced behavior and had a profound impact on controlling random blood sugar levels in elderly individuals in Jatijajar Subdistrict, Depok City.

Keywords: *Diabetes Mellitus; DEKADEE; Elderly; Temporary Blood Sugar*

Info Artikel:

Diterima:
(03-10-2024)

Direvisi:
(07-11-2024)

Disetujui:
(10-12-2024)

Diterbitkan:
(26-12-2024)

Abstrak

Pendahuluan: Diabetes Mellitus (DM) adalah salah satu penyakit tidak menular utama di Indonesia dan penyebab kematian keenam tertinggi. Untuk mengurangi dampaknya yang semakin meningkat, dikembangkan intervensi keperawatan inovatif "DEKADEE" (Diet, Foot Exercise, dan Benson Relaxation). **Tujuan:** untuk mengevaluasi pengaruh intervensi keperawatan DEKADEE dalam menurunkan kadar gula darah pada pasien diabetes lanjut usia. **Metode:** Penelitian ini menggunakan desain studi kasus komunitas dengan pendekatan pre-eksperimental untuk mengevaluasi pengaruh intervensi DEKADEE (Diet, Senam Kaki, Relaksasi Benson) terhadap perilaku dan kadar gula darah pada 44 lansia diabetes di Jatijajar, Depok. Data pre- dan post-intervensi diukur menggunakan perangkat Easy Touch dan instrumen evaluasi perilaku, kemudian dianalisis dengan *paired T-test* ($p < 0,05$). **Hasil:** Perbaikan signifikan terlihat pada perilaku lansia, dengan peningkatan pengetahuan sebesar 3,95 poin, sikap sebesar 2,53 poin, keterampilan sebesar 3,66 poin, dan penurunan kadar gula darah sebesar 61,045 mg/dL. Uji *paired T-test* pada variabel perilaku dan kadar gula darah menunjukkan hasil yang signifikan dengan p-value 0,000 ($p < 0,05$). **Kesimpulan:** Intervensi Keperawatan DEKADEE secara signifikan memengaruhi perilaku dan memberikan dampak besar dalam mengendalikan kadar gula darah sewaktu pada lansia di Kelurahan Jatijajar, Kota Depok.

Kata kunci: *Diabetes Melitus*; DEKADEE; Lansia; Gula Darah Sewaktu

Introduction

Diabetes Mellitus is a leading non-communicable disease in Indonesia, ranking as the sixth leading cause of death (Kemenkes RI, 2020). Riskesdas 2018 reported the highest prevalence in age groups 55-64 years (9.0%), 65-74 years (9.6%), and over 75 years (17.0%) %) (Jawed et al., 2019; Megawati et al., 2020) In 2020, West Java recorded 178,857 cases, while Depok saw an increase from 48,899 cases in 2019 to 50,631 in 2020, with Jatijajar Village being the second-highest contributor (DinKes Kota Depok, 2020). During the 2022 Community Residency practice in Jatijajar Village, it was found that 59.1% of elderly residents lacked knowledge, 65.91% had inadequate attitudes, and 63.64% had poor skills in diabetes management, indicating suboptimal diabetes management in the area.

Aging significantly impacts the endocrine system in the elderly, causing pancreatic changes that lead to insulin resistance, damage, production deficiency, and disruption of insulin function, resulting in DM. These risk factors burden elderly individuals, raising blood sugar levels, as explained by the functional consequence theory, which links actions, risks, and aging to quality of life (Carol A. Miller, 2012). This theory helps analyze elderly issues in detail and was applied by researchers to assess changes in elderly attitudes toward controlling diabetes risks in Jatijajar Village.

Community nurses play a dual role in providing care and acting as case finders, monitoring and addressing health issues, including those among the elderly (Nies & McEwen, 2019). Researchers applied the "Community as Partner" (CAP) theory and Roy's model, where CAP emphasizes community collaboration in managing diabetes in the elderly, aligning with community nursing principles principles (Nies & McEwen, 2019). Blood sugar control in elderly DM patients involves interventions based on Indonesia's 2019 DM management guidelines, which focus on diet, medication, education, blood sugar monitoring, and exercise (Soelistijo, 2019). Effective management of diet, exercise, and stress has been shown to significantly reduce blood sugar levels (Safaruddin & Permatasari, 2022).

Diet, physical exercise, and stress management are essential non-pharmacological treatments for diabetes, helping control blood sugar, prevent obesity, and reduce complications like arteriosclerosis, hypertension, and anxiety (Andriyanto *et al.*, 2020; Prabowo *et al.*, 2021). Effective management involves education, nutrition, physical activity, therapies, and regular blood sugar monitoring (Owusu et al., 2020), with family, personal, and community factors playing a key role. While diabetes cannot be cured, regular management can normalize blood sugar levels and ensure treatment adherence (Saeedi et al., 2019). Programs like *Program Indonesia Sehat dengan Pendekatan Keluarga* (PIS-PK) support early detection and management. This study builds on these principles, focusing on diet, physical activity, and stress management to develop an innovative nursing intervention in Jatijajar Village, Depok.

Long-term blood sugar control will affect the physical and mental condition of elderly patients. Therefore, the interventions focus on the health of the elderly through Diet, DM Foot Exercises, and Benson Relaxation (DEKADEE) as an innovation to prevent blood sugar increases. Based on this, the author chose the research title: "Application of Nursing Interventions with the "DEKADEE" Innovation in Blood Sugar Control for Elderly Diabetes Patients in the Community".

Methods

This study uses a community group case study design with a pre-experimental quantitative approach, involving pre- and post-intervention measurements on the same group to evaluate the effect of the innovative DEKADEE intervention (Diet, Foot Exercise, and Benson Relaxation) on blood sugar levels and elderly behavior. The respondents involved in this study were 44 elderly individuals with diabetes mellitus, located in Jatijajar Village, Depok City. The intervention was implemented in nine stages over 16 sessions, with blood sugar levels measured using the Easy Touch digital device before and after the intervention, and behavioral assessments (knowledge, attitudes, and skills) conducted using a valid and reliable behavioral evaluation instrument. Data were analyzed using a paired T-test to measure significant differences between pre- and post-intervention data, with results considered significant if the p-value < 0.05.

The DEKADEE innovation was implemented in a community setting with group support to ensure sustainability post-intervention. The intervention consisted of three parts: diet management, conducted in separate sessions by designing meal plans tailored to the conditions of diabetic patients' families; and DM foot exercises combined with Benson relaxation, carried out simultaneously. Each part was divided into several sessions, systematically designed by the researcher to ensure a structured and effective implementation.

The stages of the DEKADEE nursing intervention are: (1) The researcher introduces themselves and explains the intervention procedure; (2) Measure blood sugar levels before the intervention; (3) Teach the DM diet, its objectives, and principles; (4) Explain the DM foot exercises through the DEKADEE application; (5) Demonstrate the DM foot exercises with 10 steps according to the procedure taught; (6) Lead Benson

relaxation for 15-30 minutes with 5 stages; (7) Play the Benson relaxation recording; (8) Ask about feelings after the intervention; (9) Set the time for blood sugar measurement according to the intervention flow established by the researcher, with each stage of the intervention performed step by step; (10) Measure changes in blood sugar levels before and after the intervention.

Results

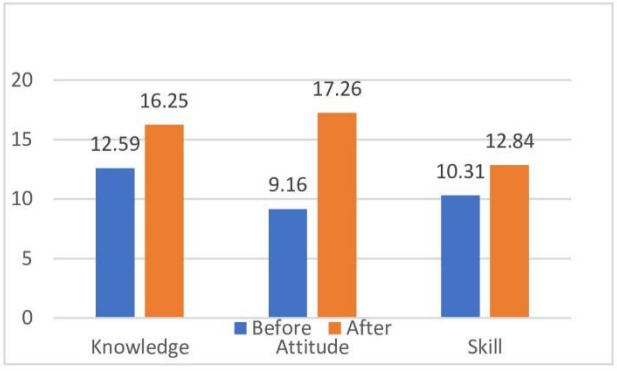
The results will be graphically presented, illustrating random blood sugar changes pre- and post-intervention, highlighting DEKADEE's effectiveness in managing diabetes in the elderly. Based Table 1 illustrates that most elderly participants in this study were aged 60-74 years, with a total of 36 respondents. The majority were female (24 respondents), married (32 respondents), and had a low level of education (37 respondents).

Tabel 1. Distribusi Karakteristik Lansia Diabetes (n=44)

Characteristics	n	%
Age		
60-74 years	36	81,8
75-90 years	8	18,2
Gender		
Male	20	45.5
Female	24	54.5
Marital Status		
Married.	32	72.7
Unmarried.	0	00.0
Widow/Widower.	12	27.3
Education		
Low.	37	84.1
High.	7	15.9
Employment Status		
Unemployed.	28	63.6
Employed.	16	36.4

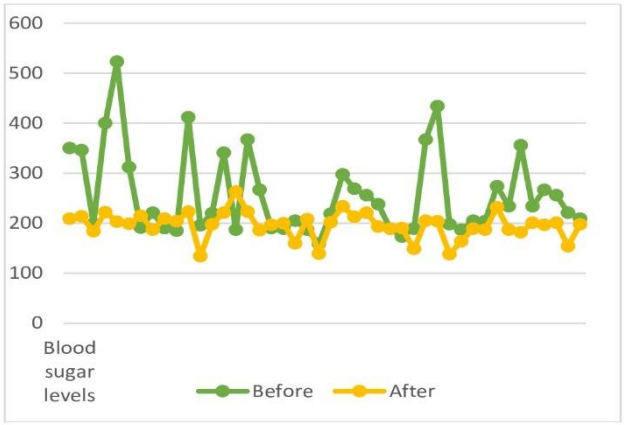
Graph 1.1 on the DEKADEE intervention shows significant changes in elderly behavior before and after the intervention. The details of the changes are: knowledge increased from 12.59 to 16.25, attitude increased from 9.16 to 17.26, and skills increased from 10.31 to 12.84.

Graph 1.1 Changes in Elderly Diabetes Behavior in Jatijajar Village, Depok City 2022-2023 (n=44).



Graph 1.1 on the DEKADEE intervention shows a significant change in blood glucose levels across three stages: before (green), mid (blue), and after (yellow). The details are as follows: before (green) shows very high blood glucose levels, mid (blue) indicates the beginning of a decrease in blood glucose levels, and after (yellow) shows a significant reduction in blood glucose levels.

Graph 1.2 Blood Sugar Levels in Elderly Diabetes Group Before and After the Innovation Implementation (n=44)



Based Table 1.2 on the DEKADEE intervention showed improvements in elderly knowledge by 3.95, attitudes by 2.53, and skills by 3.66. The average blood sugar level decreased from 257.14 to 196.09, with a difference of -61.045. The paired T-test results were significant (p=0.000), indicating that the DEKADEE intervention significantly impacted improvements in knowledge, attitudes, skills, and a reduction in blood sugar levels among the elderly in Jatijajar Village, Depok.

Table 1.2 Results of Behavior and Blood Sugar Levels in the Elderly Diabetic Group Before and After the Intervention (n=44)

Variable	Mean		SD**	Mean Difference	*P *Value*
	Pre-test	*Post Test*			
Knowledge	12,59	16.25	3.09	3.95	0,000
Attitude	9.16	17.26	3,13	2.53	0,000
Skills	10,31	12.84	1.65	3.66	0,000
Blood Sugar Levels	257.14	196.09	77.426	-61.045	0,000

Discussion

The results of the DEKADEE innovation intervention showed that the average knowledge of the

elderly increased after the intervention, while blood sugar levels showed a significant decrease before and after the intervention. The T-test on blood sugar levels indicated a significance value of 0.000 (p-value < 0.05), leading to the conclusion that the DEKADEE innovation intervention had a significant impact on knowledge, attitudes, skills, and blood sugar reduction in the elderly in Kelurahan Jatijajar, Depok.

The results of blood sugar level measurements in elderly diabetics before, during, and after the DEKADEE innovation intervention showed that 44 respondents experienced a significant decrease due to the impact of the education provided in the DEKADEE intervention. This intervention should be applied gradually with explanations of its benefits to the elderly. Blood sugar control is crucial to preventing diabetes risks. Research by (Abdelkareem & Suleiman, 2020) shows that diabetes education helps elderly patients understand their condition, including its causes, symptoms, and complications. This knowledge empowers patients to make decisions regarding lifestyle, diet, and medication management. Education programs teach self-care skills, such as glucose monitoring, medication adherence, healthy living, and regular physical activity (Al-Qahtani, 2020), enabling the elderly to manage their diabetes more effectively.

The results of the DEKADEE intervention are consistent with the study by (Witna Hastiti et al., 2023), which showed a significant impact of diet and diabetes exercise on lowering blood sugar in 45 respondents. (Sahwa et al., 2023) also found that the 3J diet (quantity, type, schedule) reduced blood sugar in type 2 diabetes patients. (Kwak et al., 2021) concluded that family support plays a role in maintaining a healthy lifestyle among 76 respondents, demonstrating a link between family support, motivation for following a diet, and blood sugar reduction in diabetic patients.

The study by (Nuraeni & Arjita, 2019) involving 26 respondents showed that DM foot exercise can stabilize blood sugar levels in elderly diabetics. found that DM foot exercise, performed for 30-60 minutes, 3-5 times a week, effectively reduced blood sugar levels in 30 respondents. In conclusion, regular DM foot exercise improves blood circulation, strengthens leg muscles, enhances circulation, facilitates joint movement, and stabilizes blood sugar levels in diabetes patients (Raja et al., 2019).

Research by (Puspita Sari et al., 2022) with 50 respondents shows that Benson relaxation therapy significantly reduces blood sugar levels. (Lumu et al., 2023) with 72 respondents also concluded that Benson relaxation is effective in controlling blood sugar in elderly diabetes patients. (Zega et al., 2021) with 56 respondents found a relationship between Benson relaxation techniques and reduced blood sugar levels in type 2 diabetes patients.

Diabetes foot exercises and Benson relaxation techniques are effective in lowering and stabilizing blood sugar levels by reducing stress, which causes excessive release of hormones such as epinephrine, cortisol, glucagon, ACTH, and corticosteroids (Yulita et al., 2019; Zega et al., 2021). Benson relaxation decreases epinephrine output and inhibits the conversion of glycogen to glucose, leading to the accumulation of amino acids, lactate, and pyruvate, which are stored as glycogen in the liver, thus helping to maintain blood sugar levels within normal ranges. Combining diabetes foot exercises, Benson relaxation techniques, and diet together has a better impact on lowering blood sugar levels in diabetes patients. The DEKADEE intervention study demonstrates that the combination of diet, foot exercises, and Benson relaxation techniques is significantly effective in lowering blood sugar levels in elderly diabetics. With 44 more controlled respondents in each session, this intervention proves to be better than previous studies. Additionally, this intervention also includes meal menu management and proper meal scheduling, making it a comprehensive package for preventing increases in blood sugar levels in elderly diabetics.

Conclusion

After the implementation of the DEKADEE innovation intervention, there was a significant improvement in behavior (knowledge, attitudes, and skills) and a decrease in blood sugar levels among elderly diabetics in Jatijajar Village, Depok City. This study can serve as a reference for the development of nursing interventions in providing nursing care.

References

Abdelkareem, N., & Suleiman, H. (2020). Effect of Diabetes Education at Primary Health Care Level in Type 2 Diabetes Patients in Khartoum State. *American Journal of Public Health Research*, *8*(1), 1–6. https://doi.org/10.12691/ajphr-8-1-1

Al-Qahtani, A. M. (2020). Frequency and factors associated with inadequate self-care behaviors in patients with type 2 diabetes mellitus in Najran, Saudi Arabia. *Saudi Medical Journal*, *41*(9), 955–964. https://doi.org/10.15537/smj.2020.9.25339

Carol A. Miller. (2012). *Nursing for Wellness in Older Adults* (Elizabeth Nieginski (ed.); Sixth Edit). Wolters Kluwer Health | Lippincott Williams & Wilkins.

Dinas Kesehatan Kota Depok. (2020). *Jumlah penderita diabetes melitus berdasarkan kabupaten/kota di Provinsi Jawa Barat dari tahun 2019 s.d. 2020.*

Jawed, K., Nisar, N., Hussain, M., & Nawab, F. (2019). A

study based on use of Complementary and Alternative Medicine among Diabetic Patients in Karachi, Pakistan. *Journal of the Dow University of Health Sciences*, *13*(1), 10–16. https://doi.org/10.36570/jduhs.2019.1.626

Kwak, G., Gardner, K., Bolaji, B., Franklin, S., Aung, M., & Jolly, P. E. (2021). Knowledge, attitudes and practices among healthcare professionals regarding complementary alternative medicine use by patients with hypertension and type 2 diabetes mellitus in Western Jamaica. *Complementary Therapies in Medicine*, *57*(June 2020), 102666. https://doi.org/10.1016/j.ctim.2021.102666

Lumu, W., Bahendeka, S., Wesonga, R., Kibirige, D., Kasoma, R. M., & Ssendikwanawa, E. (2023). Atherogenic index of plasma and its cardiovascular risk factor correlates among patients with type 2 diabetes in Uganda. *African Health Sciences*, *23*(1), 515–527. https://doi.org/10.4314/ahs.v23i1.54

Megawati, F., Agustini, N. P. D., & Krismayanti, N. L. P. D. (2020). Studi Retrospektif Terapi Antidiabetik Pada Penderita Diabetes Melitus Rawat Inap Di Rumah Sakit Umum Ari Canti Periode 2018. *Jurnal Ilmiah Medicamento*, *6*(1), 28–32. https://doi.org/10.36733/medicamento.v6i1.718

Nies, M. A., & McEwen, M. (2019). *Keperawatan Kesehatan Komunitas dan Keluarga* (J. Sahar, A. Setiawan, & M. Riasmini, N (eds.); Edisi Indo). Elsevier Ltd.

Nuraeni, N., & Arjita, I. P. D. (2019). Pengaruh Senam Kaki Diabet Terhadap Penurunan Kadar Gula Darah Pada Penderita Diabetes Mellitus Type Ii. *Jurnal Kedokteran*, *3*(2), 618. https://doi.org/10.36679/kedokteran.v3i2.80

Owusu, S., Gaye, Y. E., Hall, S., Junkins, A., Sohail, M., Franklin, S., Aung, M., & Jolly, P. E. (2020). Factors associated with the use of complementary and alternative therapies among patients with hypertension and type 2 diabetes mellitus in Western Jamaica: a cross-sectional study. *BMC Complementary Medicine and Therapies*, *20*(1), 1–11. https://doi.org/10.1186/s12906-020-03109-w

Puspita Sari, N., Harmanto, D., Kurniawan, Y., Studi Keperawatan, P., Tinggi Ilmu Kesehatan Sapta Bakti, S., Studi Rekam Medis dan Informasi Kesehatan, P., & Studi DIII Keperawatan, P. (2022). Implementasi Manajememen Relaksasi Benson terhadap Kadar Glukosa Darah dan Ankle Brachial Index Diabetes Melitus II. *Jurnal Ilmu Kesehatan Indonesia (JIKSI)*, *3*(1), 2745–8555. http://jurnal.umitra.ac.id/index.php/JIKSI/article/view/821

Raja, R., Kumar, V., Khan, M. A., Sayeed, K. A., Hussain, S. Z. M., & Rizwan, A. (2019). Knowledge, Attitude, and Practices of Complementary and Alternative Medication Usage in Patients of Type II Diabetes Mellitus. *Cureus*, *11*(8). https://doi.org/10.7759/cureus.5357

Saeedi, P., Petersohn, I., Salpea, P., Malanda, B., Karuranga, S., Unwin, N., Colagiuri, S., Guariguata, L., Motala, A. A., Ogurtsova, K., Shaw, J. E., Bright, D., & Williams, R. (2019). Global and regional diabetes prevalence estimates for 2019 and projections for 2030 and 2045: Results from the International Diabetes Federation Diabetes Atlas, 9th edition. *Diabetes Research and Clinical Practice*, *157*, 107843. https://doi.org/10.1016/j.diabres.2019.107843

Safaruddin, & Permatasari, H. (2022). *Dukungan Keluarga Dengan Manajemen Diri Diabetes Pada Pasien Diabetes Melitus Tipe 2 : Tinjauan Sistematik Family Support with Diabetes Self-Management in Type 2 Diabetes Mellitus Patients : A Systematic Review*. *8*(2), 195–204. https://www.cabidigitallibrary.org/doi/full/10.5555/20220428356

Sahwa, A. D., Supriyanti, E., Keperawatan, A., & Husada, W. (2023). Penerapan Diet 3J Untuk Mengatasi Ketidakstabilan Kadar Glukosa Darah Pada Pasien DM Tipe 2. *Manajemen Asuhan Keperawatan*, *7*(1), 22–26. https://jurnal-d3per.uwhs.ac.id/index.php/mak/article/view/156

Soelistijo Soebagijo Adi, et all. (2019). Pengelolaan Dan Pencegahan Diabetes Melitus Tipe 2 Dewasa di Indonesia. *Perkumpulan Endokrinologi Indonesia*, 133.

Witna Hastiti, Tina Muzaenah, & Nur Khasanah. (2023). *Pengaruh Senam Diabetes Dan Diet Karbohidrat Terhadap Penurunan Kadar Gula Darah Pada Pasien Diabetes Melitus.pdf*. jurnal kesehatan. https://jurnal.stikesbethesda.ac.id/index.php/jurnalkesehatan/article/view/255

Yulita, R. F., Waluyo, A., & Azzam, R. (2019). Pengaruh Senam Kaki terhadap Penurunan Skor Neuropati dan Kadar Gula Darah pada Pasien DM Tipe 2 di Persadia RS. TK. II. Dustira Cimahi. *Journal of Telenursing (JOTING)*, *1*(1), 80–95. https://doi.org/10.31539/joting.v1i1.498

Zega, B. W., Sembiring, L. P. A. B., Laoli, D. S. A., Silaban, H. T. T., Ginting, & Novalinda, C. (2021). Hubungan Teknik Relaksasi Benson Terhadap Kadar Gula Darah Pasien Penderita Diabetes Militus Tipe 2. *Jurnal Penelitian Perawat Profesional*, *3*(1), 153–158. https://jurnal.globalhealthsciencegroup.com/index.php/JPPP/article/view/1696