

The Effect of Nursing Health Education on Medication Adherence in Diabetes Patients

Abdullah Salem Awwad Aldaqiqi¹, Abdulmohsen Saleh Al Amri², Mansour Basheer Fraih Albalawi³, Maher Marzouk Rased Albalawi⁴, Abeer Mufleh Zaal Albalawi⁵, Shorouq Mufleh Zaal Albalawi⁵, Riyaa Saleem Suliman Alhawiti⁶, Mutab Mohammad Murikhan Albalawy⁶, Shaheer Mahmoud Saleh Al-Balawi⁶, Sultan Saad Salem Al-Balawi⁶, Nader Abdauallah Alblawi⁶, Abdurhman Abdullah Mohammad Albalawi⁶

1. Senior Specialist - Nursing Administration, TabukHealth Cluster, Duba General Hospital.
2. Senior Specialist Psychological & Mental Health Nursing, Tabuk Health Cluster, Erada Complex for Mental Health.
3. Senior Specialist - Nursing Administration, TabukHealth Cluster, Maternity And Children Hospital.
4. Nursing Technician, Tabuk Health Cluster, Maternity And Children Hospital.
5. Nursing Specialist, Tabuk Health Cluster, Maternity And Children Hospital.
6. Nursing technician, Tabuk Health Cluster.

ABSTRACT

Based on a thorough examination of the literature, this critical review focuses on nursing interventions that improve medication compliance in diabetic patients. Diabetes management relies heavily on medication compliance, yet patients often struggle to adhere to recommended regimens due to obstacles. Nursing interventions include supportive, behavioral, educational, and technology-based strategies tailored to health outcomes and adherence promotion. Some of the best practices are also described in the review, including peer support groups, telehealth apps, motivational interviewing, and patient education initiatives. Socioeconomic disparities, limitations in the healthcare system, and obstacles to nursing practice are further difficulties.

KEYWORDS: Diabetes, medication adherence, nursing interventions, patient education, behavioral strategies.

1. Introduction

The hallmark of diabetes mellitus, a long-term metabolic disease, is hyperglycemia brought on by either decreased insulin action or secretion, or both. Millions of individuals worldwide are impacted by this global public health issue. Beyond its prevalence, diabetes has a substantial impact on morbidity, mortality, and healthcare costs, creating huge obstacles for people, families, healthcare systems, and economies around the world (Tan et al., 2019).

Adherence to prescribed medication is crucial for the control of diabetes. For diabetic patients, maintaining glucose control, avoiding complications, and

Abdullah Salem Awwad Aldaqiqi, Abdulmohsen Saleh Al Amri, Mansour Basheer Fraih Albalawi, Maher Marzouk Rased Albalawi, Abeer Mufleh Zaal Albalawi, Shorouq Mufleh Zaal Albalawi, Riyaa Saleem Suliman Alhawiti, Mutab Mohammad Murikhan Albalawy, Shaher Mahmoud Saleh Al-Balawi, Sultan Saad Salem Al-Balawi, Nader Abdauallah Alblawi, Abdurhman Abdullah Mohammad Albalawi

improving their general quality of life all depend on medication adherence. Medication adherence, however, can be hampered by a variety of variables, including the difficulty of treatment plans, adverse effects, forgetfulness, the expense of prescriptions, and a lack of knowledge about the illness and how to manage it (Tan et al., 2019).

Counseling and education conducted by nurses have become crucial parts of managing and caring for diabetes. As providers of patient-centered care, health promotion, and education, nurses are essential to the healthcare system. People with diabetes are empowered to actively participate in self-care and make educated decisions about their treatment plans thanks to their proficiency in disease management, therapeutic treatments, and patient engagement (Paul, 2023).

The effect of nurse-led education and counseling on diabetic patients' medication adherence has been the subject of numerous research throughout the years. The goal of these interventions is to educate patients about diabetes, its consequences, and the significance of following prescription guidelines. Nurses can assist patients in overcoming obstacles and cultivating good habits to enhance glycemic control and overall diabetes outcomes by addressing adherence hurdles and offering ongoing support (Paul, 2023).

Even though the amount of research on nurse-led counseling and education is increasing, the results are still a little mixed and unclear. In order to integrate the available data and give a better understanding of the efficacy of nurse-led interventions in improving medication adherence among patients with diabetes, a thorough systematic review and meta-analysis are necessary (Paul, 2023).

2. Literature review

Diabetes is a chronic illness that affects people and healthcare systems around the world and needs to be managed for the rest of one's life. It is a complex metabolic condition defined by excessive blood glucose levels arising from the body's inability to create or properly use insulin. Diabetes is becoming a major global health concern due to its rising prevalence, which places a significant strain on economies and healthcare resources (De La Fuente Coria et al., 2019).

The possibility of serious health problems if diabetes is not adequately managed is one of the main reasons why treatment is so important. A number of severe health issues, such as kidney damage, nerve damage (neuropathy), vision issues (retinopathy), foot ulcers, and cardiovascular disorders, can result from poorly managed diabetes. The quality of life for people with diabetes is greatly impacted by these complications, which can be fatal and result in permanent impairments (De La Fuente Coria et al., 2019).

For diabetic patients, self-care management education has emerged as the gold standard. Diabetes patients need daily education on diet, exercise, medication, and monitoring in order to achieve their self-care objectives. Research has demonstrated that those who possess a solid understanding of self-care are more capable of

managing their health. They are compatible with blood glucose monitoring and a healthy lifestyle, both of which enhance quality of life. Lack of information impairs blood glucose regulation and self-care, which contributes to the development of diabetes complications like blindness, renal failure, and amputation (Ahmad et al., 2020).

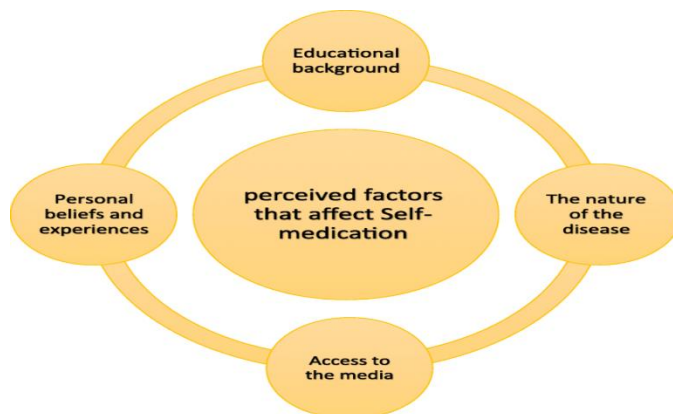


Figure 1. The Effect of Nursing Health Education on Medication Adherence (Ahmad et al., 2020).

Patient Education

As stated in the National Standards for Diabetes Self-Management Education and Support, diabetes nurse educators (DNEs) are crucial in providing patients with the information and self-assurance they need to meet metabolic control self-care goals. Healthy eating, exercise, medication compliance, glucose monitoring, problem resolution, risk reduction, and healthy coping are the seven pillars of successful self-care management (Sugiharto et al., 2017).

However, a person's acceptance of their illness has an impact on how effective health education initiatives are. Additionally, sociodemographic variables including the patient's educational attainment may have an impact on adherence to self-care management. Delivery tactics are also a crucial factor to take into account. For patients with low literacy, it is advised to employ visuals and teach back techniques. On the other hand, one-on-one consultation was found to be more successful than group consultation (Hunt et al., 2018).

In order to treat and manage diabetes, patient education is essential. Without the right guidance, individuals with type 2 diabetes may disregard their symptoms, lead to potentially fatal complications, and perpetuate this pattern in their peers and family. Hospitalization and major problems can be avoided with instruction. For the patient to have a fundamental comprehension of his illness and to feel comfortable managing it at home without the presence of a provider, the instruction must be tailored to the patient. To increase patients' understanding of diabetes, nurses have crucial educational tasks and obligations (Mikhael et al., 2020).

Continuous management through home visits and a personalized self-management

Abdullah Salem Awwad Aldaqiqi, Abdulmohsen Saleh Al Amri, Mansour Basheer Fraih Albalawi, Maher Marzouk Rased Albalawi, Abeer Mufleh Zaal Albalawi, Shorouq Mufleh Zaal Albalawi, Riyaa Saleem Suliman Alhawiti, Mutab Mohammad Murikhan Albalawy, Shaher Mahmoud Saleh Al-Balawi, Sultan Saad Salem Al-Balawi, Nader Abdoullah Alblawi, Abdurhman Abdullah Mohammad Albalawi

program should be a part of education. Although house visits were conducted in-person in certain instances and virtually in others, they were always successful regardless of the approach. This is in line with research demonstrating the effectiveness of reminder interventions in enhancing treatment adherence, regardless of the medium used (e.g., phone, text, mail, paging, interactive voice response systems, video, telephone, and programmed electronic audiovisual reminders, etc.). Stated differently, it might be argued that periodically reviewing and providing feedback on the situation aids in maintaining the altered way of life (Sikalidis & Karaboğa, 2020).

Behavioral Strategies

Nurses believed that the primary barrier preventing patients from accepting their situation and, thus, from adhering to self-care management was psychological preparedness. Similar research has also shown that people in the denial stage had made bad lifestyle choices, especially when it came to their eating. Therefore, it was suggested by MacDonald et al. that health education and counseling be carried out concurrently and continuously throughout the course of managing a patient with diabetes. It takes a lot of experience to be adaptable and react to patients' psychological problems and moods (Reyes et al., 2017).

It has been demonstrated that offering psychological support through active listening and empathy both at the start of the session and throughout following ones can persuade individuals to alter their way of life. Additionally, the patient was more motivated to cope with self-care and psychological readiness when family members or carers participated in the health education session (Reyes et al., 2017).

Individualized teaching plans and patient-centered education sessions that adhered to conventional curriculum were shown to be more successful. In diabetes education, a number of instructional techniques and resources were also more beneficial, including practical and hands-on demonstrations, as well as the use of illustrations, pamphlets, and photos. In the long term, nurses could decrease diabetic complications by increasing patients' comprehension and capacity for self-care by assisting them in visualizing, practicing, and evaluating their competency, especially with insulin injection (Bingham et al., 2020).

According to earlier research, nurses stressed how crucial it is to ascertain patients' educational and knowledge levels while planning a session. This is crucial when taking into account that diabetic self-care health education is packed with intricate, multifaceted lesson plans that target deficiencies in any of the cognitive, emotional, or psychomotor domains. Finding strategies to alter health attitudes, boost self-efficacy, and alter cultural norms around behavior change is also crucial to ensuring its success. Family members and caregivers must support the implementation and maintenance of positive habits (Bingham et al., 2020).

The goal of cognitive-behavioral techniques is to help the patient identify and alter the unfavorable attitudes and actions that hinder adherence. Training in coping mechanisms, stress management, and problem-solving techniques can also help overcome psychological obstacles. These tactics can improve diabetic results and

long-term compliance (Bingham et al., 2020).

Support Systems: Providing social support through nurse case managers and regular follow-ups can promote adherence to diet, medications, and self-monitoring of blood glucose levels.

One of the most important aspects of diabetes care is nurse-led diabetes self-management education (DSME). In low-resource settings, where it is known to have positive benefits on behavioral outcomes, glycemic control, and diabetes knowledge, it provides good glycemic and metabolic management, which is crucial for minimizing long-term problems. In the treatment of diabetes mellitus (DM), nurse-led diabetes self-management education is crucial because it increases knowledge and practice of diabetic self-care, which in turn improves quality of life and clinical and psychosocial results. The American diabetic Association (ADA) advises all DM patients to undergo diabetic self-management education at diagnosis and as needed after that, in addition to medical care (Tamiru et al., 2023).

Patients can talk about diabetes-related problems, achievements, setbacks, and coping strategies in diabetes self-management support groups. These support groups offer inspiration, ideas, and encouragement, all of which can significantly increase the likelihood that patients will take their prescription drugs as directed. Involving family members and caregivers in diabetes care can improve adherence because the patient will have additional persons to remind them of their responsibilities. Families may support patients, assist with drug administration, and make sure they follow their recommended regimens. The degree of compliance and the patient's overall health are also found to positively correlate with the family's involvement (Herrero et al., 2020).

Patients with diabetes can receive care in their communities through diabetes community health programs. These initiatives could take the kind of community outreach initiatives, health fairs, or instructional workshops. Therefore, it can be said that community initiatives that focus on social determinants of health can enhance diabetes care and medication adherence (Herrero et al., 2020).

Pharmacological Interventions

Reducing the complexity of treatment plans, such as combining medications or limiting the number of times a patient must take them in a day, can simplify pharmaceutical regimens. Patients find it challenging to adhere to complicated regimens, but simpler ones can significantly increase compliance. In order to determine the appropriate dosage to provide at the appropriate time, patients' medications must be evaluated and coordinated as part of medication management and medication reconciliation. Nurses can give patients advice on when and how to take their medications, as well as clarify any potential interactions between two or more medications. Medication management increases compliance and reduces the likelihood of errors (Bussell et al., 2017).

Use of Technology

The American Telemedicine Association defines telehealth interventions as those that use information technologies and telecommunications to provide medical

Abdullah Salem Awwad Aldaqiqi, Abdulmohsen Saleh Al Amri, Mansour Basheer Fraih Albalawi, Maher Marzouk Rased Albalawi, Abeer Mufleh Zaal Albalawi, Shorouq Mufleh Zaal Albalawi, Riyaa Saleem Suliman Alhawiti, Mutab Mohammad Murikhan Albalawy, Shaher Mahmoud Saleh Al-Balawi, Sultan Saad Salem Al-Balawi, Nader Abdoullah Alblawi, Abdurhman Abdullah Mohammad Albalawi

services. According to a prior analysis, patients with severe mental illness frequently employed text message and telephone treatments to increase drug adherence. For some chronic conditions, text messaging systems can greatly increase drug adherence, according to another meta-analysis. There are currently no studies identifying and evaluating the use of telemedicine therapies to address type 2 diabetes patients' noncompliance with their prescription regimens (Bingham et al., 2020).

Among the contemporary strategies that assist patients in sticking to their drug regimen are smartphone apps and electronic alerts. These technologies can include teaching materials, reminders about when to take medications, and notifications about when to take them. Additionally, studies indicate that the usage of digital reminders improves diabetic patients' adherence to their treatment schedules (Or et al., 2020).



Figure 2. Electronic Health Records (EHR) (Or et al., 2020).

Governments and societies around the world are very concerned about the economic and social implications of obesity. Care delivery can be improved by coordinating Electronic Health Records (EHR) and drug management. Nurses can monitor a patient's drug profile, identify non-compliance, and take appropriate action with the aid of electronic health records. Through better information management, this integration enhances compliance and facilitates the delivery of tailored care (Or et al., 2020).

Outcomes and the effect of nursing health education and interventions

Both immediate and long-term consequences may result from nursing treatments used to manage medication adherence. Short-term alterations like these are seen, for example, following lengthy teaching sessions or the introduction of equipment. Patients who utilize smartphone applications to remind them to take their prescriptions, for example, report increases in adherence rates as soon as they start

using the apps (Cho & Kim, 2021).

However, only with a long-term intervention and follow-up are long-term results achievable. Because they promote self-motivation and give people sustainable resources, behavioral and supportive interventions are typically more successful and long-lasting. These long-term studies of frequent counseling sessions and peer support groups demonstrate sustained improvements in adherence and health status over a number of years (Cho & Kim, 2021).

Since it equips patients with the necessary knowledge on medication compliance and diabetic self-management, teaching has been recognized as the most essential component of patient treatment. Goal-setting and motivational interviewing are two behavioral strategies that help educational interventions since they focus on psychological aspects and guarantee sustained behavioral change. However, new technologies like mobile health platforms and telehealth apps offer chances for remote monitoring, feedback, and real-time assistance, which would improve patient involvement and adherence. Nevertheless, there are still several obstacles in the way of applying the research findings to physicians' day-to-day work. Additional patient-related obstacles include the patient's financial situation and psychological issues that impair their degree of compliance with the recommended dosage (Cho & Kim, 2021).

3. Conclusion

To sum up, diabetic nurse educators are essential in helping patients with diabetes become competent and adhere to long-term self-care management guidelines. When creating tailored health education sessions, nurses must make sure that patients are psychologically prepared and that their literacy is assessed. To guarantee the efficacy of the treatment plan and enhance the quality of life, each patient's major obstacles should be identified and addressed. In order to better inform policymakers and enhance organizational and national guidelines for the management of patients with diabetes, further study is still required to examine the innovative solutions and experiences of nurses around the globe.

References

- Paul, M. (2023). IMPACT OF NURSE-LED EDUCATION AND COUNSELING ON MEDICATION ADHERENCE IN PATIENTS WITH DIABETES: A SYSTEMATIC REVIEW AND META-ANALYSIS. *THE GENESIS*, 10(1), 56–63. <https://doi.org/10.47211/tg.2023.v10i01.015>
- Tan, J. P., Cheng, K. K. F., & Siah, R. C. (2019). A systematic review and meta-analysis on the effectiveness of education on medication adherence for patients with hypertension, hyperlipidaemia and diabetes. *Journal of Advanced Nursing*, 75(11), 2478–2494. <https://doi.org/10.1111/jan.14025>
- Ahmad, N. a. A., Sallehuddin, M. a. A., Teo, Y. C., & Rahman, H. A. (2020). Self-Care Management of Patients with diabetes: nurses' perspectives. *Journal of Diabetes & Metabolic Disorders*, 19(2), 1537–1542. <https://doi.org/10.1007/s40200-020-00688-w>
- Hunt, T., Wilson, C. J., Woodward, A., Caputi, P., & Wilson, I. (2018). Intervention among Suicidal Men: Future Directions for Telephone Crisis Support Research. *Frontiers in*

Abdullah Salem Awwad Aldaqiqi, Abdulmohsen Saleh Al Amri, Mansour Basheer Fraih Albalawi, Maher Marzouk Rased Albalawi, Abeer Mufleh Zaal Albalawi, Shorouq Mufleh Zaal Albalawi, Riyaa Saleem Suliman Alhawiti, Mutab Mohammad Murikhan Albalawy, Shaher Mahmoud Saleh Al-Balawi, Sultan Saad Salem Al-Balawi, Nader Abdoullah Alblawi, Abdurhman Abdullah Mohammad Albalawi

- Public Health, 6. <https://doi.org/10.3389/fpubh.2018.00001>
- Sugiharto, S., Stephenson, M., Hsu, Y., & Fajriyah, N. N. (2017). Diabetes self-management education training for community health center nurses in Indonesia: a best practice implementation project. *The JBI Database of Systematic Reviews and Implementation Reports*, 15(9), 2390–2397. <https://doi.org/10.11124/jbisrir-2016-003329>
- Reyes, J., Tripp-Reimer, T., Parker, E., Muller, B., & Laroche, H. (2017). Factors influencing Diabetes Self-Management among medically underserved patients with type II Diabetes. *Global Qualitative Nursing Research*, 4, 233339361771309. <https://doi.org/10.1177/2333393617713097>
- De La Fuente Coria, M., Cruz-Cobo, C., & Santi-Cano, M. (2019). Effectiveness of a primary care nurse delivered educational intervention for patients with type 2 diabetes mellitus in promoting metabolic control and compliance with long-term therapeutic targets: Randomised controlled trial. *International Journal of Nursing Studies*, 101, 103417. <https://doi.org/10.1016/j.ijnurstu.2019.103417>
- Bingham, J. M., Black, M., Anderson, E. J., Li, Y., Toselli, N., Fox, S., Martin, J. R., Axon, D. R., & Silva-Almodóvar, A. (2020). Impact of telehealth interventions on medication adherence for patients with type 2 diabetes, hypertension, and/or dyslipidemia: a systematic review. *Annals of Pharmacotherapy*, 55(5), 637–649. <https://doi.org/10.1177/1060028020950726>
- Sikalidis, A. K., & Karaboğa, E. (2020). Healthy diet and self-care activities adherence improved life-quality and type 2 diabetes mellitus management in Turkish adults. *Gazzetta Medica Italiana Archivio per Le Scienze Mediche*, 179(9). <https://doi.org/10.23736/s0393-3660.19.04159-7>
- Mikhael, E. M., Hassali, M. A., & Hussain, S. A. (2020). <p>Effectiveness of Diabetes Self-Management Educational Programs For Type 2 Diabetes Mellitus Patients In Middle East Countries: A Systematic Review</p> *Diabetes Metabolic Syndrome and Obesity*, Volume 13, 117–138. <https://doi.org/10.2147/dms.o.s232958>
- Herrero, N., Guerrero-Solé, F., & Mas-Manchón, L. (2020). Participation of Patients With Type 2 Diabetes in Online Support Groups is Correlated to Lower Levels of Diabetes Self-Management. *Journal of Diabetes Science and Technology*, 15(1), 121–126. <https://doi.org/10.1177/1932296820909830>
- Tamiru, S., Dugassa, M., Amsalu, B., Bidira, K., Bacha, L., & Tsegaye, D. (2023). Effects of Nurse-Led diabetes Self-Management education on Self-Care knowledge and Self-Care behavior among adult patients with type 2 diabetes mellitus attending diabetes follow up clinic: A Quasi-Experimental study design. *International Journal of Africa Nursing Sciences*, 18, 100548. <https://doi.org/10.1016/j.ijans.2023.100548>
- Or, C. K., Liu, K., So, M. K. P., Cheung, B., Yam, L. Y. C., Tiwari, A., Lau, Y. F. E., Lau, T., Hui, P. S. G., Cheng, H. C., Tan, J., & Cheung, M. T. (2020). Improving Self-Care in patients with coexisting Type 2 diabetes and hypertension by technological surrogate nursing: randomized controlled trial. *Journal of Medical Internet Research*, 22(3), e16769. <https://doi.org/10.2196/16769>
- Bussell, J. K., Cha, E., Grant, Y. E., Schwartz, D. D., & Young, L. A. (2017). Ways health care providers can promote better medication adherence. *Clinical Diabetes*, 35(3), 171–177. <https://doi.org/10.2337/cd016-0029>
- Cho, M., & Kim, M. Y. (2021). Self-Management Nursing Intervention for Controlling Glucose among Diabetes: A Systematic Review and Meta-Analysis. *International Journal of Environmental Research and Public Health*, 18(23), 12750. <https://doi.org/10.3390/ijerph182312750>