Original Research

Investigating The Relationship Between Ability And Adherence To Medication Regimen Among Elderly Patients With Diabetes

Zahra Siah Mansour[1], Fatemeh Firoozi[2], Mehri Safari[3], Behnaz Shojaei[4], Niloofar Bagheri[5], Ermia Maghsoodloo[6*]

1. Master of Psychiatric Nursing, School of Nursing and Midwifery, Tehran University of Medical Science, Tehran, Iran. Orcid: 0000-0002-4630-219x

2. Msc of medical critical care nursing, Department of nursing, School of Nursing and Midwifery, Ardebil, Iran. Orcid: 0000-0002-4545-153x

3. Master of critical care nursing, Asadabad School of Medical Sciences, Asadabad, Iran. Orcid: 0000-0001-6762-078x

4. Lecturer, Midwifery Department, School of Nursing and Midwifery, Kerman Branch, Islamic Azad University, Kerman, Iran. Orcid: 0000-0001-9160-4640

5. Senior Pediatric Nursing Expert, Department of Nursing, Damavand Branch, Islamic Azad University, Damavand, Iran. Orcid: 0000-0003-4251-2656

6. Department of Nursing, Aliabad Katoul Branch, Islamic Azad University, Aliabad Katoul, Iran. Orcid: 0000-0003-0961-6533

Corresponding Author: Ermia Maghsoodloo. Msc Student of Geriatric Nursing, School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran. **Email:** e.maghsoodloo@gmail.com

Abstract

Background: Self-management and adherence to medication regimen are the main factors in diabetes control. Empowering patients and facilitating their participation in the care process plays an important role in the quality of nursing care.

Method: This descriptive correlational study was conducted on 113 diabetic elderly patients in 2022, using convenience sampling method. Data collection tools included Patient Empowerment Questionnaire (DES-SF) and Medication Adherence Questionnaire (MMAS-8). Data was analyzed by SPSS-21 statistical software, using descriptive (mean, standard deviation, table) and inferential statistics (Spearman correlation coefficient, Chi-square).

Results: The level of empowerment and adherence to medication regimen among elderly patients was found to be moderate. The statistical test showed a significant relationship between empowerment and adherence to medication regimen (P=0.004, r=0.27).

Conclusion: Increasing knowledge and awareness about care and follow-up plays an important role in the self-management and self-control of chronic diseases. Therefore, it is necessary for managers and healthcare professionals to empower patients and facilitate their participation in treatment processes, using educational and motivational programs.

Keywords: Empowerment, Adherence to medication regimen, Diabetes

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Introduction

Today, due to the advances made in health care and longer life expectancy, the world population is getting older (1). According to predictions, by 2050, one sixth of the world population will be over 65 years of age (2). The increase in chronic diseases, including diabetes, is directly related to aging (3). It is predicted that the number of people diagnosed with diabetes at the age range of 45-year will quadruple by 2050 (4). According to estimates, there will be about 6 million people with diabetes in Iran by 2030 (5). Diabetes has a chronic nature and imposes a heavy economic and social burden on the individual and health system (6). Every year in Iran, more than 4 billion Tomans from the budget of Ministry of Health are spent to control diabetes (7). Despite the lack of definitive treatment for diabetes, the progression of symptoms and complications of this disease can be controlled by changing lifestyle, and improving self-management and self-care, such as adherence to treatment and medication regimen (8). According to WHO's definition, adherence refers to behaviors such as taking medications, following treatment instructions, and following recommended diet (9). Various factors such as economic-social issues, health care team, disease status, and factors affecting treatment and patient influence patient adherence to medication regimen 10). Failure to follow medication regimen can exacerbate the disease and lead to acute and chronic complications, as well as frequent hospitalizations (11). Therefore, adherence to medication regimen and its continuation is effective in controlling blood sugar, reducing mortality and lowering the cost of diabetes (12).

One of the important factors in improving diabetes control is patient's ability, because the ability of patient postpones the problems caused by diabetes while preventing complications (13). Empowerment is based on self-management, self-monitoring, and self-care, and makes people to understand their situation and problem (14). Empowerment is considered as the dominant approach in supporting patients with chronic diseases, including diabetes (15). Empowerment of diabetic patients plays an important role in preventing disease complications (16). Empowerment improves the quality of life, self-efficacy and self-care and also, has a positive effect on patient's general health, self-esteem and hope (17). The number of symptoms, age, gender, duration of illness, perceived family support, and education level are among factors that affect empowerment (18). Most of the conducted studies show that improving ability improves self-management behaviors and blood sugar control, and also reduces complications (19). Considering that empowerment is one of the main factors in diabetes control and improves various aspects of patient's life, including self-efficacy and self-care, and since there have not been enough studies to examine the relationship between empowerment and adherence to medication regimen among elderly people with diabetes, this study was conducted to determine the relationship between patient empowerment and adherence to medication regimen among elderly people with diabetes.

Method

This descriptive correlational study was conducted among elderly people with diabetes in Gorgan city in 2022. The research environment was the Diabetes Clinic of Hakim Jurjani Hospital in Gorgan. The criteria for entering the study included; being over 60 years of age and having a history of diabetes with a medical diagnosis and record. Exclusion criteria were; suffering from another chronic disease at the time of the study, willing to participate in the study, and not completing the questionnaires. Sampling was done with convenience method. The sample size was calculated to be 113 people by G*Power statistical software based on the study of Afkhami et al. (2022), considering the correlation coefficient of r=0.26 and the test power of the 80%. The significance level of 0.05 was considered for all tests.

The data collection tools in this study included a demographic questionnaire from (age, sex,

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marriage, education, occupation), the Diabetes Empowerment Scale-Short Form (DES-SF) and the 8-item Morisky Medication Adherence Scale (MMAS-8). The DES-SF was designed by the University of Michigan Education and Research Center in 2000 in English language. It consists of 8 questions based on a 5-point Likert scale, ranging from 1 completely agree to 5 completely disagree. The scores in this scale range from 8 to 40, with a lower score indicating higher empowerment (20, 21). The reliability of this scale was calculated to be 0.86 by the Alpha Cronbach test method in the study of Rooyani and colleagues (22). The face and content validity of this scale was also confirmed in the present study by 10 faculty members of Mazandaran University of Medical Sciences and Shahed School of Nursing and Midwifery in Tehran. The reliability of this scale was also confirmed in this study by 20 people, using the test retest method with a correlation coefficient of 0.91. The Medication Adherence Scale (MMAS-8) includes 8 questions with yes and no answers. A yes is given a score of 0 and no is given a score of 1. In the last question, which contains 3 options, the option “never” is given a score of 1 and points “sometimes” or “always” are given a score of 0. The range of scores in this scale is from 0 to 8 (23). The score of 8 indicates that patient has high level of adherence, score of 6-8 shows that patient has moderate level of adherence and the score of 0-5 indicates that patient has low level of adherence (24, 25). The validity of this scale was confirmed in similar articles and also in this study by 10 faculty members of Islamic Azad University. The reliability of this scale was also confirmed by the test retest method (0.85), (25). In this study, after approving the project in the research council and obtaining the code of ethics with the number: IR.IAU.AK.REC.1402.002, the researcher referred to the diabetes clinic and explained the study method and objectives. Maintaining anonymity and confidentiality, allowing withdrawal from the study at any time without any consequences and obtaining informed consent were among other ethical considerations in this study. The questionnaires took about 20 minutes to complete and the researcher was present to answer the participants’ questions. After collecting the data, it was entered into SPSS-21 statistical software to be analyzed by descriptive (table, mean and standard deviation), and inferential statistics (Spearman's correlation coefficient, Chi-square test and ANOVA test) at a significance level of 0.05.

Results

The mean age of the participants was 69.5 + 6.18 years. The highest percentage of participants (n=78, 69%) were women, (n=61, 54%) married, and (n=45, 39.8%) employees. Also, 42 of them (37.2%) had secondary school education and 65 (57.5%) were living in the city (Table 1). The mean score of empowerment was 4.46 + 20.13, and the mean score of adherence to medication regimen was 4.72+1.4. The results of Spearman's correlation coefficient showed a significant relationship between the empowerment and adherence to medication regimen (P=0.004, r=0.27). Also, with the increase in empowerment, the score of adherence to medication regimen also increased (Table 2). Chi-square test showed no significant relationship between empowerment and variables of gender (P=0.27), marital status (P=0.43), occupation (P=0.07), education (P=0.46), and place of residence (p=0.41). Spearman's correlation coefficient did not show a significant relationship between empowerment and age (P=0.09). Chi-square test showed no significant relationship between empowerment and variables of gender (P=0.5), marital status (P=0.48), occupation (P=0.3), education (P=0.06), and place of residence (P=0.24). Spearman's correlation coefficient also did not show a significant relationship between empowerment and age (P=0.63).

Discussion

The results of this study showed that the ability of elderly people with diabetes and their adherence to medication regimen were at moderate level. The statistical test showed that with the increase

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in the empowerment of diabetic patients, their adherence to drug regimen also increased. As shown in this study, the empowerment of elderly diabetic patients was at moderate level. This is despite the fact that the purpose of empowerment is to build-up capacity in patients, so that they become or remain active in the process of self-care. Individuals should participate in their own clinical decision-makings and be widely active in their health care process (15). By increasing the empowerment of diabetic patients, it is possible to improve their quality of life and treatment motives (26, 27). Therefore, diabetic patients who have more knowledge and awareness have a higher level of adherence and self-efficacy (27, 28). In this study, the level of adherence to medication regimen was found to be moderate among diabetic elderly patients. The studies of Parsaei et al. (2020) and Tajari et al. (2019) showed low level of adherence to medication regimen in diabetic patients (29, 30). Unfortunately, poor self-control and low adherence to medication regimen are among the main challenges of chronic patients, especially diabetic patients (31). One of the reasons for the lack of success in the treatment and control of diabetes complications is the lifelong nature of diabetes and the lack of patient participation in the treatment process (32). This is while one of the principles of diabetes control is the patient's adherence to treatment recommendations, which ultimately leads to better blood sugar control (33). Continuous compliance with treatment orders is vital in disease control, and failure to follow treatment regimen increases the possibility of complications, exacerbation of the disease, and disease recurrence (34, 35). Unfortunately, despite the advances that have been made in the field of disease treatment, the level of adherence to treatment is still low (36). Therefore, it is necessary for health care managers to prepare and formulate programs that aim to empower diabetic patients in order to improve their health and control diabetes-related complications (13, 37). The results of this study showed that with the increase of patients' empowerment, their adherence to medication regimen also increases. Ebrahimi (2023) believed that empowering diabetic patients is particularly important in increasing their self-care and quality of life (14). Díaz (2023) stated that, teaching self-empowerment skills is effective in controlling inappropriate health behaviors in diabetic patients (19). Weitgasser (2023) argued that designing educational programs plays an important role in adherence to medication and diet regimen in diabetic patients (16). Steybe (2023) stated that nursing consultations and trainings are especially important in increasing adherence to drug regimen in diabetic patients (30). Understanding the importance of medication adherence is considered the most important pillar of self-management in diabetic patients (38). Improving patients' knowledge increases their self-care ability, which in turn improves their clinical indicators and quality of life (39,40). Empowerment is one of the important and useful approaches in the treatment of diabetes. It also leads to better diabetes control by providing awareness about diabetes and helping to acquire necessary skills (21, 29). By identifying problems, empowerment-based interventions help patients to discover and maximum their ability in overcoming and managing their disease (15, 41). In this study, no significant relationship was found between empowerment, adherence to medication regimen, and any of the demographic variables. This lack of relationship can be related to the sampling method and sample size of this study. Therefore, since one of the most important limitations of this study was the number of samples and the sampling method, we suggest another study to be conducted on a larger statistical population, using a random sampling method.

Conclusion

The results of this study showed that increasing the level of empowerment in diabetic patients increases their adherence to medication regimen and treatment. Therefore, it is necessary for managers and healthcare workers, especially nurses, to use educational programs that aim to

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increase the self-care and participation of patients in the treatment process.

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Conflict of interest

No conflicts or interests were observed in the implementation of this research.

References:

1. Hekmati Pour N, Hojjati H. Effects of Exercise on Mental Health of Elderly. Journal title. 2016;26(4):36-42.
2. Cai Y, Song W, Li J, Jing Y, Liang C, Zhang L, et al. The landscape of aging. Science China Life Sciences. 2022:1-101.
3. Longo M, Bellastella G, Maiorino MI, Meier JJ, Esposito K, Giugliano D. Diabetes and aging: from treatment goals to pharmacologic therapy. Frontiers in Endocrinology. 2019;10:45.
4. Corriere M, Rooparinesingh N, Kalyani RR. Epidemiology of diabetes and diabetes complications in the elderly: an emerging public health burden. Current diabetes reports. 2013;13:805-13.
5. Zamani K, Akhoundzadeh G, Hojjati H. Effect of Extended Parallel Process Model on Self-efficacy of Diabetic Adolescents in Golestan Province, Iran. Journal of Diabetes Nursing. 2020;8(4):1260-9.
6. Rafiezadeh Gharrehtapeh S, Tabarsy B, Hassanjani S, Razavi M, Amjadi M, Hojjati H. The Relationship between Health Literacy and Self-efficacy in Patients with Type II Diabetes Admitted to Gorgan Diabetes Clinic in 2014. Journal of Diabetes Nursing. 2015;3(2):30-42.
7. Parsaee M, Sahbaei F, Hojjati H. Effect of Extended Parallel Process Pattern on Diet Adherence in Type II Diabetic Patients. Journal of Diabetes Nursing. 2019;7(4):958-67.
8. Parsai M, Sahbaei F, Hojjati H. Effect of implementing an extended parallel process model on adherence to a medication regimen of the type 2 diabetic elderly. Quarterly Journal of Caspian Health and Aging. 2020;5(2):56-65.
9. Waari G, Mutai J, Gikunju J. Medication adherence and factors associated with poor adherence among type 2 diabetes mellitus patients on follow-up at Kenyatta National Hospital, Kenya. Pan African Medical Journal. 2018;29(1):1-15.
10. Gholamaliei B, Karimi-Shahanjarini A, Roshanaei G, Rezapour-Shahkolaei F. Medication adherence and its related factors in patients with type II diabetes. Journal of Education and Community Health. 2016;2(4):3-12.
11. zamani K, Akhoundzadeh G, Hojjati H. THE EFFECT OF THE PARALLEL PROCESS PATTERN DEVELOPED ON COMPLIANCE WITH THE DIET OF DIABETIC ADOLESCENTS IN GOLESTAN PROVINCE IN 2019. Nursing and Midwifery Journal. 2020;18(6):479-85.
12. Kennedy-Martin T, Boye KS, Peng X. Cost of medication adherence and persistence in type 2 diabetes mellitus: a literature review. Patient preference and adherence. 2017:1103-17.
13. Khowaja MA, Rozi S, Sawani S, Ahmed A. Factors associated with Diabetes Empowerment among patients with type 2 diabetes, at OPD setting, Karachi, Pakistan. Sci Rep. 2023;13(1):7165.
14. Ebrahimi H, Sadeghi M, Esmaeili SM, Janmohammadi F, Bahonar E. Effect of Empowerment Model-Based Program on Quality of Life in Patients with Type 2 Diabetes: A Randomized Controlled Trial. Iran J Nurs Midwifery Res. 2023;28(1):99-104.
15. Taheri Z, Khorsandi M, Taheri Z, Ghafari M, Amiri M. Empowerment-Based Interventions in Patients with Diabetes: A Review Study. RUMS_JOURNAL. 2016;15(5):453-68.
16. Weitgasser R, Ciardi C, Traub J, Barta

[Downloaded from mail.intjmi.com on 2026-11-20]

M, Riedl M, Clodi M, et al. [Diabetes education and counseling in adult patients with diabetes (Update 2023)]. Wien Klin Wochenschr. 2023;135(Suppl 1):137-42.
17. Sadeghi M, Ebrahimi H, Bazghaleh M. Relationship between empowerment with dimensions of quality of life and some related factors in patients with type 2 diabetes in the Shahroud city, 2013. Journal of Clinical Nursing and Midwifery. 2015;3(4):29-38.
18. Arda Sürücü H, Büyükkaya Besen D. Predictors of empowerment in individuals with type 2 diabetes mellitus. Journal of Transcultural Nursing. 2018;29(6):506-13.
19. Duarte-Díaz A, Perestelo-Pérez L, Rivero-Santana A, Peñate W, Álvarez-Pérez Y, Ramos-García V, et al. The relationship between patient empowerment and related constructs, affective symptoms and quality of life in patients with type 2 diabetes: a systematic review and meta-analysis. Front Public Health. 2023;11:1118324.
20. Anderson RM, Fitzgerald JT, Gruppen LD, Funnell MM, Oh MS. The Diabetes Empowerment Scale-Short Form (DES-SF). Diabetes Care. 2003;26(5):1641.
21. Sadeghigolafshanl M, Rejeh N, Heravi-Karimooi M, Tadrisi SD. The Effect of a 5A-Based Self-Management Program on Empowering the Elderly with Diabetes. ijrn. 2021;7(2):1-9.
22. Royani Z, Rayyani M, Vatanparast M, M. M, Goleij J. The relationship between self-care and self - efficacy with empowerment in patients undergoing hemodialysis. ajaums-mcs. 2015;1(2):116-22.
23. Mahdavi R, Askarpour A, Heydari B, Morovati A, Delshad Z, Maghsoodloo E. The Effect Of Training Based On Extended Parallel Process Model On Adherence To Medication Regimen Among Diabetic Elderly. intjmi. 2022;11(4):100-8.
24. Maleki L, Azami M, Sadeghigolafshanl M, Yousefzadeh S, Yousefzadeh R, Nafise HP, et al. The effect of SMS reminder system training and cyberspace on adherence to medication regimen in patients with a diabetic foot ulcer in Golestan province in 2019. Pakistan Journal of Medical and Health Sciences. 2020;14:1449-52.
25. Tajari M, Mashhadi M, Akhound-Zadeh G, Hojjati H. The effect of SMS and telegram reminder system education on adherence to medication regimen in teenager with Type 1 Diabetes in Gorgan, 2019. ndhj. 2020;11(1):46-56.
26. Mahdavi R, Askarpour A, Heydari B, Morovati A, Delshad Z, Maghsoodloo E. The Effect Of Training Based On Extended Parallel Process Model On Adherence To Medication Regimen Among Diabetic Elderly. Int J Med Invest 2022; 11 (4) :100-108
27. Morovati A, Rustaee S, Moayedi S, Askarpour Kabir A, Shahraki M, Maghsoodloo E, et al. The Effect of the Extended Parallel Process Model on Self-efficacy of Type 2 Diabetic Patients. J Health Rep Technol. 2023;9(2):e136287.
28. Zamani K, Akhoundzadeh G, Hojjati H. Effect of Extended Parallel Process Model on Self-efficacy of Diabetic Adolescents in Golestan Province, Iran. zbmu-jdn. 2020;8(4):1260-9.
29. Parsai M, Sahbaei F, Hojjati H. Effect of implementing an extended parallel process model on adherence to a medication regimen of the type 2 diabetic elderly. mubabol-cjhaa. 2020;5(2):56-65.
30. Tajari M, akhoundzadeh G, Hojjati H. Educational Effect of Short Message Service and Telegram Reminders on Adherence to the Diet in Teenagers with Type I Diabetes in Gorgan 2018. zbmu-jdn. 2019;7(2):764-74.
31. Keogh KM, White P, Smith SM, McGilloway S, O'Dowd T, Gibney J.

[Downloaded from mail.intjmi.com on 2026-11-20]

Changing illness perceptions in patients with poorly controlled type 2 diabetes, a randomised controlled trial of a family-based intervention: protocol and pilot study. BMC family practice. 2007;8:36.

32. Shabibi p, mansourian m, abedzadeh ms, sayehmiri k. The Status of Self-Care Behaviors in Patients with Type 2 Diabetes in the City of Ilam in 2014. Ilam-University-of-Medical-Sciences. 2016;24(2):63-71.
33. Hashemi SM, Bouya S. Treatment Adherence in Diabetic Patients: An Important but Forgotten Issue. Journal of Diabetes Nursing. 2018;6(1):341-51.
34. Zamani K, Akhoundzadeh G, Hojjati H. THE EFFECT OF THE PARALLEL PROCESS PATTERN DEVELOPED ON COMPLIANCE WITH THE DIET OF DIABETIC ADOLESCENTS IN GOLESTAN PROVINCE IN 2019. UNMF. 2020;18(6):479-85.
35. Mehrangiz G, Fatemeh M, Maryam Z, Raziye M, Maryam K, Aminreza A, et al. The Effect of Implementing Pain Control Guidelines on the Pain of Patients Admitted to the Intensive Care Unit. Journal of Pharmaceutical Negative Results. 2022:344-8.
36. Motahari niya H, Hojjati H. The influence of education on anxiety in mothers of children with surgery. JPEN 2019; 5 (4) :49-55
37. Parsaee M, Sahbaei F, Hojjati H. Effect of Extended Parallel Process Pattern on Diet Adherence in Type II Diabetic Patients. zbmu-jdn. 2019;7(4):958-67.
38. Garrison TA, Schwartz JK, Moore ES. Effect of Occupational Therapy in Promoting Medication Adherence in Primary Care: A Randomized Controlled Trial. Am J Occup Ther. 2023;77(3).
39. Ebrahimi H, Sadeghi M, Ashrafi R. The relationship between empowerment with knowledge related to disease and indicators of metabolic control in type 2 diabetic patients. J-Nurs-Edu. 2015;4(1):23-30.
40. Hanieh Sajadi GAHH. The Effect of Empowerment Program on Participation of Mothers with Premature Infants Hospitalized in Neonatal Intensive Care Unit of Sayyed Shirazi Hospital in Gorgan, in 2018. Indian Journal of Forensic Medicine & Toxicology. 2020;14(2):1269-76
41. Rajabloo M, Gharehsoflou S, Mamashli L, Hojjati H, Hekmatipour N. The Effect of Recommended Recitals on Blood Pressure and Pulse Rate in Patients Admitted to the Cardiac Care Unit. Jundishapur J Chronic Dis Care. 2019;8(4):e90676. https://doi.org/10.5812/jjcdc.90676.

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Table & Figure:

Table 1: Comparison of demographic characteristics among the samples

Demographic variable		Frequency (%)
Gender	Female	78 (69)
	Male	35 (31)
Marital status	Male	61 (54)
	Female	52 (46)
Occupation	Housewife	19 (6.8)
	Employee	45 (39.8)
	Retired	20 (17.7)
	Self-employed	20 (17.7)
	Farmer	9 (8)
Education	Primary school	20 (17.7)
	Secondary school	42 (37.2)
	High school	16 (14.2)
	Diploma	27 (24.9)
	University	8 (7.1)
Place of residence	City	65 (75.5)
	Village	48 (42.7)

Table 2: The relationship between empowerment and adherence to medication regimen

Variable	Mean (SD)	P-value
Empowerment	20.13 ± 4.46	P=0.004 r=0.27
Adherence to medication regimen	4.72 ± 1.4	

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