

Research Article

Medication Compliance and Affecting Factors in Elderly Type 2 Diabetic Patients in Turkey

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Abstract

Objective: This research was conducted to determine medication compliance and factors affecting compliance with type 2 diabetes patients in public hospitals.

Method: This research is a descriptive type of research, which is one of the Quantitative research types. There was no sample selection in the study, and the study was conducted with 100 patients who met the Inclusion criteria. Research data was collected between December 2022 and June 2023.

Results: The patients' compliance with the medication appears to be at a moderate level. The difference in the Medication Compliance Reporting scale mean scores difference According to the patients' genders, whom they live with, marital status, diabetes duration, treatment method, and daily insulin application the status is not statistically significant.

Conclusion: In this study, it was determined that the medication compliance of elderly type 2 diabetic patients was at a moderate level. It is recommended That nurses organize awareness training on the factors affecting medication compliance of elderly type 2 diabetic patients and That the research be conducted with a larger sample group.

Introduction

Diabetes Mellitus is defined as a chronic disease that requires continuous care and treatment and causes hypoglycemia and disorders in the body's carbohydrate, fat, and protein metabolism due to insulin deficiency or insulin resistance [1,2]. Diabetes is a serious chronic disease that is constantly increasing in prevalence both in our country and in the world. It is thought that approximately 451 million people, most of whom live in low-income countries, have diabetes. Diabetes is also directly responsible for the deaths of approximately 1.6 million people per year. If the rate of diabetes continues to spread, it is predicted that approximately 693 million people will have diabetes by 2045 [3]. While the prevalence of diabetes is 9.3% globally, this rate is 13.7 in our country [4].

Diabetes is a health problem that has become more important with the aging of society. One in every four people over the age of 65 has diabetes, and one in every two people has prediabetes, and this rate is expected to increase over time [5]. The World Health Organization (WHO) defines medication compliance as "the extent to which an institution that provides health services to the public complies with

globally accepted recommendations on a matter that concerns the health of all people, whether they are sick or not [6]. In addition, medication compliance is defined as fully complying with the recommendations of institutions and individuals that provide health services, such as following a person's prescription, taking dietary recommendations into consideration, giving up harmful habits (such as quitting smoking and alcohol, quitting a sedentary lifestyle, and stopping unnecessary medication intake), and having check-ups without delay. As can be seen, compliance depends on many factors in addition to using medication [7].

People tend to adapt to the negative situations they experience. However, the disease negatively affects this adaptation process. The nature of the disease and its treatment play a very important role in adaptation [8]. In order to control diabetic values, it is very important for the person to be willingly and effectively involved in the treatment process. In order to establish glucose balance and ensure the continuity of this balance, the patient must adjust their social life according to the treatment of diabetes, and comply with the recommended nutrition, physical activities, and medications [9]. Treatment non-compliance is defined as the patient's willful and intentional failure to comply with

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the plans that the institution or persons providing health services have decided and created with the patient. This is the most important problem encountered in individuals with chronic diseases, especially in the newly diagnosed period. Non-compliant patients either come to their appointments on the specified day and time late or do not come at all, do not act in accordance with their disease condition, or do not comply with the applied treatment by overdosing or exceeding the time, and finally, they end their own treatment without consulting anyone [10].

Non-compliance with medication causes undesirable clinical presentations, continuation of the disease state, increase in mortality rate, and unnecessary health expenditures in these areas [11]. When looking at studies conducted worldwide on the compliance of diabetic individuals to treatment, it is seen that the prevalence of non-compliance varies. The situation in Turkey is as follows; 24.1% of individuals diagnosed with diabetes do not comply with the recommended medication use, in studies conducted with patients using insulin, 20.3% of individuals are non-compliant with insulin use, 29.7% of individuals do not comply with the recommended medication use, in another study conducted in the Black Sea region, compliance levels to medication treatment were low, and in another study, the treatment compliance rate of diabetic individuals was 60% [12,13].

Medication non-adherence is one of the most common problems in DM patients and makes it difficult to keep blood glucose levels under control. If the goal is to be achieved by following the treatment protocols created for diabetic patients, doctors and other health professionals should consider all factors that positively or negatively affect the person's medication adherence during the treatment [14]. Studies on medication adherence have shown that more than two hundred factors affect medication adherence. Considering that the large number of these factors would hinder the literature studies to be conducted, researchers have categorized all these factors in order to have a grasp on the subject [15].

The World Health Organization's categories regarding medication adherence include socio-economic, treatment-related, healthcare team and system-related, illness-related, and disease-related factors [16]. All of these factors are conditions that positively or negatively affect the medication adherence of elderly type 2 diabetic patients. Nurses have very important responsibilities in ensuring that elderly patients adhere to medication in this situation. Nurses should evaluate the medication adherence of elderly patients by taking into account their individual characteristics. Evaluating the medication compliance of elderly individuals and knowing the factors affecting medication compliance will be effective in increasing their medication compliance. This study was conducted to determine the adherence to

medication and the factors affecting it in elderly type 2 diabetic patients.

In this research, answers were sought to the following questions.

-What are the medication compliance levels in elderly type 2 diabetes patients?

-What are the factors affecting medication compliance in elderly type 2 diabetic patients?

Methods

Type of research

This research is a descriptive research of quantitative research types. The research data were collected in a public hospital between December 2022 and June 2023 between gathered.

Population and sample

The population of the study consists of patients over the age of 65 diagnosed with type 2 diabetes who are hospitalized in the internal medicine clinic and internal medicine intensive care unit of Diyarbakır Selahaddin Eyyubi State Hospital. The study was conducted with 100 patients who met the inclusion criteria without sample selection. Before starting data collection, permission was obtained by writing a petition to the institution.

Data collection

The data of the study was collected by the researcher through face-to-face interviews. The researcher had the participants read the "Personal Information Form", and the patients who agreed to participate were given the Your harmony Notification The scale questionnaire form was distributed. It took an average of 10 minutes for patients to fill out the data collection forms during working hours.

Data collection tools

Research data are collected through the "Personal Information Form" and "Drug Your harmony Notification Scale" was used.

Personal information form: It is a form consisting of 16 questions regarding the sociodemographic characteristics of the patients (age, gender, education level, occupation, income level, marital status), and the characteristics affecting the disease and medication compliance (disease duration, whether there is a chronic disease, treatment type, insulin application status, blood sugar measurement, etc.).

Medication Adherence Report Scale (MARS): by Horne and Hankins (2001) medicine harmony to evaluate for Medication Adherence Report Scale (MARS) generic developed. One scale is the illness to its type according to

can be customized. This scale can be customized for blood pressure, diabetes, rheumatoid arthritis, asthma, chronic obstructive lung disease, mood disorder, inflammatory bowel disease, hyperlipidemia, and chronic pain. A lot of disease-oriented adaptations in literature are placed. Each of the 5 statements is taken from the participants. In themselves, seeing their frequency, their specifications are desired. Scale 5 = never, 4 = rarely, 3 = sometimes, 2 = often chic, and 1 = will always be with a 5-point Likert type as shown being evaluated. From the items in hand, said points by gathering the total test score in hand is taken from the scale. Taken scores range from 5 to 25 varies. The obtained points raise compatibility, scores fall whereas incompatibility sign. The IUBÖ only factor structure with criterion and distinguish impressive validity with a good level of reliability (Cronbach Alpha = 0.85) [17]. It was found that the scale to Turkish Adaptation by Temeloğlu -Şen et al. was made. Turkish form drink consistency coefficient (Cronbach α = 0.78) and total article correlations (between 0.35 and 0.71) with version similar psychometric features owner [18]. In this study, it was supported that of scale drink consistency coefficient as 0.81 has been determined.

Evaluation of data

While evaluating the data, the SPSS 22.0 (Statistical Package for the Social Sciences Inc., Chicago, IL, USA) package program was used. Whether the data showed normal distribution was evaluated with Skewness and Kurtosis coefficient analyses. In the analysis of the data, “numbers, percentages, minimum and maximum values, average and standard deviations as well as Mann Whitney U, Kruskal Wallis and Spearman Correlation analyses” were used [19]. The research results were evaluated at a 95% confidence interval and a significance level of $p < 0.05$.

Ethical aspects of the research

In order to conduct the research, approval was obtained from the “Erzincan Binali Yıldırım University Human Research Health and Sports Sciences Ethics Committee” (25/03/2022 Protocol No: 03/08), and written permission was obtained from the “Diyarbakır Provincial Health Directorate”. The purpose, duration, and implementation phase of the study were explained to the participants and the principle of informed consent was adhered to. In addition, verbal consents of the participants were obtained and volunteers were included in the study.

Results

The descriptive characteristics of the elderly type 2 diabetic patients included in the study are presented in Table 1.

As seen in Table 1, 65% of the patients were women, and 90% were married and lived with their spouses and children. It was determined that 87% of the elderly type 2 diabetic

Table 1: Distribution of Descriptive Characteristics of Elderly Type 2 Diabetic Patients ($n = 100$).

Introductory Features		n	%		
Gender	Woman	65	65.0		
	Male	35	35.0		
Who Does He/She Live With?	Lives alone	2	2.0		
	With his wife and children	90	90.0		
	With his children	1	1.0		
	With relatives	4	4.0		
	Other	3	3.0		
Marital status	Married	90	90.0		
	Single	10	10.0		
Diabetes Duration	5-10 years	13	13.0		
	11 years and above	87	87.0		
Treatment Method	Insulin	52	52.0		
	Insulin + Oral Antidiabetic Drugs	48	48.0		
Insulin Usage Duration	2-4 years	10	10.0		
	5-10 years	18	18.0		
	11 years and above	72	72.0		
Who Administers Insulin?	Own	54	54.0		
	His wife	4	4.0		
	The child	42	42.0		
How Many Times a Day Does He Administer Insulin?	1 time	2	2.0		
	2 times	17	17.0		
	4 times	81	81.0		
Frequency of Check-ups	Every 3 months	9	9.0		
	Every 6 months	45	45.0		
	Once a year	41	41.0		
	I don't go for check-ups	5	5.0		
BMI	18.5 < and 24.9	20	20.0		
	Between 25.0 and 29.9	41	41.0		
	30 and above	39	39.0		
	n	Min.	Max.	Mean	SD.
Age	100	65.00	83.00	70.06	3.43

BMI: Body Mass Index; Min: Minimum; Max: Maximum; SS: Standard Deviation

patients had diabetes for 11 years or more, 52% used insulin only as a treatment method, 72% used insulin for 10 years or more, and 54% applied insulin themselves. It was seen that 81% of the patients applied insulin 4 times a day, 45% went for check-ups every 6 months, and 41 % had a BMI between 25.0 and 29.9. The mean age of the patients was determined as 70.06 ± 3.43 .

As seen in Table 2, elderly patients Medication Adherence Report Scale received a score of 15.81 ± 2.73 . It is seen that the patients' compliance with the medication is at a moderate level.

As seen in Table 3, drug use was determined according to gender, the person living with, marital status, duration of diabetes, treatment type, and daily insulin application status. Medication Adherence Report shows that the difference in scale score averages is not statistically significant ($p > 0.05$).

Medication according to the duration of insulin use in elderly patients Medication Adherence Report shows that the difference in the mean scale score is statistically significant ($p < 0.05$). In the advanced analysis (LSD) conducted to determine which group caused the difference according to



Table 2: Medication Use of Elderly Type 2 Diabetic Patients Medication Adherence Report of Scores Obtained from the Scale.

Scale	n	Min.	Max.	Mean	SD.
Medication Adherence Report Scale	100	10.00	21.00	15.81	2.73

Min: Minimum; Max: Maximum; SS: Standard Deviation

Table 3: Elderly Medication According to the Characteristics of Patients with Type 2 Diabetes Medication Adherence Report Scale Score Averages Comparison (n = 100).

Introductory Features		n	Medication Adherence Report Scale			
			Mean	SD.	Test	p
Gender	Woman	65	38.74	7.81	U=1048.500	0.516
	Male	35	41.80	7.5		
Who Does He/She Live With?	Lives alone	2	18.00	0.00	$\chi^2_{kw} = 4.869$	0.301
	With his wife and children	90	15.67	2.78		
	With his children	1	14.00	0.00		
	With relatives	4	16.75	2.5		
	Other	3	18.00	0.00		
Marital status	Married	90	17.10	1.91	U=307,000	0.097
	Single	10	15.67	2.78		
Diabetes Duration	5-10 years	13	16.31	2.50	U=494,000	0.459
	11 years and above	87	15.74	2.77		
Treatment Method	Insulin	52	16.06	2.89	U=1138.000	0.443
	Insulin + Oral Antidiabetic Drugs	48	15.54	2.55		
Insulin Usage Duration	2-4 years	10	17.90	2.64	$\chi^2_{kw} = 6.477$	0.039
	5-10 years	18	16.22	2.73		
	11 years and above	72	15.42	2.63		
Who Administers Insulin?	Own	54	16.56	2.46	$\chi^2_{kw} = 10.900$	0.004
	His wife	4	17.25	3.77		
	The child	42	14.71	2.64		
How Many Times a Day Does He Administer Insulin?	1 time	2	13.00	0.00	$\chi^2_{kw} = 4.659$	0.097
	2 times	17	16.65	2.4		
	4 times	81	15.70	2.78		
Frequency of Check-ups	Every 3 months	9	18.89	2.09	$\chi^2_{kw} = 26.423$	0.000
	Every 6 months	45	16.24	2.61		
	Once a year	41	15.24	2.12		
	I don't go for check-ups	5	11.00	0.71		
BMI	18.5 < and 24.9	20	17.8	2.28	$\chi^2_{kw} = 14.047$	0.001
		41	15.00	2.43		
	Between 25.0 and 29.9	39	15.64	2.80		
	30 and above					

BMI: Body Mass Index; Min: Minimum; Max: Maximum; SS: Standard Deviation; U: Mann Whitney U; χ^2_{kw} : Kruskal Wallis

the duration of insulin use, it was determined that the scores of those with a duration of 2-4 years were higher than those with a duration of 5-10 years and 11 years and above.

Depending on who is administering insulin, the Medication Adherence Report determined that there was a significant difference between the mean scale scores ($p < 0.05$). In the advanced analysis (LSD) conducted to determine which group caused the difference according to who administered insulin; it was determined that the scores of those whose spouses administered insulin were higher than those whose spouses administered insulin to themselves and their children.

Drug according to the frequency of patients going for check-ups, the Medication Adherence Report shows that the difference in the mean scale score is statistically significant ($p < 0.05$). In the advanced analysis (LSD) conducted to determine which group caused the difference according to the frequency of going to check-ups, it was determined that those who went to check-ups every 3 months were higher than the other groups.

Medication according to BMI status of elderly patients Medication Adherence Report determined that there was a significant difference between the mean scale scores ($p < 0.05$). In the advanced analysis (LSD) conducted to determine which group caused the difference according to the BMI status of the patients, it was determined that those with a BMI between 18.5 < and 24.9 were higher than the other groups.

Medication with age Medication Adherence Report and examining the relationship between scales is presented in Table 4.

Table 4: Medication with Age Medication Adherence Report Examining the Relationship Between Scale.

Age Variable		Medication Adherence Report Scale
Age	r*	-0.120
	p	0.235
	n	100

*r: Spearman correlation analysis.

As seen in Table 4, age and Medication Adherence Report there is no significant relationship between the scale scores ($p > 0.05$).

Discussion

Today, diabetes has become a health problem that increasingly burdens health systems on a global scale [20]. The main purpose of the care and treatment of diabetic patients is to ensure the balance of the metabolic system, to prevent the negative situations that may occur due to diabetes, and to increase the standard of living. The most important rule to reach the desired level of care and treatment is that the patient complies with the treatment regimen [21,22]. Type 2 diabetic patients, for various reasons, are often reluctant to follow the recommended treatment at the beginning. It is observed that in the early days, they tend to reject the prescribed treatment [23]. Elderly type 2 diabetic patients, to the medicine rapport and affecting factors determination for done, this research relating to literature with has been discussed.

Research within the scope of the taken elderly type 2 diabetic patients to the medicine harmony middle at level has shown that treatment compliance of diabetic patients has not reached the desired level [21,24]. In a study conducted by Özkaptan, et al. (2019), it was reported that medication compliance of patients with type 2 diabetes was at a moderate level, similar to this research finding [25]. In the study conducted by Baykal and Kapucu (2015), it was observed that 66.2% of individuals with type 2 diabetes were compliant with medication, 29.3% were moderately compliant, and 4.5% were not compliant with medication [9]. Studies have shown that the medication compliance levels of individuals with diabetes vary. It can be said that the personal characteristics and regional differences of individuals are effective in this situation.

For elderly patients with type 2 diabetes, their gender medicine rapport levels not affected have been determined. For diabetic patients differences in countries were done a lot in the study of this research to find similar aspects of patients' gender medicine harmony, in their situation it was found that it did not affect medication adherence [26-31]. It can be said that some of the patients' personal characteristics do not affect medication compliance.

It was determined that the people with whom the elderly type 2 diabetic patients included in the study lived and their marital status did not affect their medication compliance levels. The people with whom the patients lived had great importance in the problems they experienced in controlling their diabetes [32,33]. Unlike the findings of this research In the studies conducted by Hançerlioğlu, et al. (2020) and Arı and Özdelikara (2022), it was observed that the support of the family members and the individuals with whom diabetic

individuals live affected their medication compliance [31,34]. Similar to the research finding, Sweileh et al. In the studies conducted by al. (2014) and Aloudah, et al. (2018) with patients with type 2 diabetes, it was determined that marital status did not affect patients' compliance with medication [26,28]. It is thought that the difference in the study results is due to regional culture, education, and customs.

It was determined that the duration of diabetes and treatment type of elderly type 2 diabetic patients included in the study did not affect their medication compliance. The studies conducted by Aloudah, et al. (2018) and Lee et al. (2013) support the findings of this study [26,30]. In the study results of Arulmozhi, et al. (2014) and Fadare et al. (2015), unlike the findings of this study, no significant relationship was found between diabetes duration and medication compliance [35,36]. In addition, the study by Arı and Özdelikara (2022) and the study by Kara and Kara (2019) also found a significant relationship between treatment type and medication compliance [1,31]. It is thought that this difference is due to the difference in the number of patients who inject and those who do not.

There was no significant difference between the number of times a day that elderly type 2 diabetic patients included in the study used insulin and their medication compliance. The literature study also found that newly diagnosed diabetic patients initially experienced treatment non-compliance with insulin injections [23]. This situation is thought to be an indication that elderly individuals are afraid of insulin injections and therefore they perform their treatments regularly and completely.

It has been found that the duration of insulin use in elderly type 2 diabetic patients affects their medication compliance. A study in the literature found no significant relationship between treatment compliance and duration of insulin use [37]. It is thought that the reason for this difference is that after a while, people get used to using insulin and the effect of the injection is faster.

It has been determined that the situation of who administers insulin to elderly type 2 diabetic patients included in the study affects medication compliance levels. It is thought that type 2 diabetic individuals who use insulin have more responsibilities such as medical nutrition, blood sugar measurement, insulin dose adjustment, and regular physical activity, so their medication compliance is higher. In this study, it is thought that the fact that more than half of the patients (54.0%) administer insulin injections themselves has an effect on this result.

It has been found that the frequency of elderly type 2 diabetic patients going for check-ups affects their medication compliance. When the literature is examined, it is seen that the study conducted by Dağdelen, et al. (2022) also found

results that support this research finding [38]. It is thought that the frequency of visits to check-ups creates a stimulus for patients and thus affects their medication compliance.

That BMI affected the medication compliance status of elderly type 2 diabetic patients was included in the study. The study conducted by Görürgöz and Özcan (2018) also supports this research finding, and the treatment compliance scores of individuals who had a diabetic diet and were systematically examined were found to be high [39]. Regular weight monitoring of diabetic patients also positively affects their medication compliance.

Elderly patients with type 2 diabetes age and medicine harmony between significant one's relationship was not found. Made one in the study age with treatment rapport between significant, a difference was found [40]. The reason why this research finding differs from the other study results is thought to be due to the sample size of the study, the socio-cultural structure of the city where the study was conducted, or the inclusion criteria in the study.

Limitations of the study

This study only includes patients with type 2 diabetes aged 65 and over. The data obtained in the study are limited to the scale and research group used. In addition, the scales used in the study are based on self-reporting, and the analyses are based on cross-sectional data. This study is also limited.

Conclusion

In this study, it was determined that the medication compliance of elderly type 2 diabetic patients was at a moderate level. Factors affecting the medication compliance of patients include the duration of insulin use, who administers insulin to patients, the frequency of patients going for check-ups, and BMI. In line with these results, it is recommended that nurses organize awareness training on the factors affecting the medication compliance of elderly type 2 diabetic patients and that the study be conducted with a larger sample group. Since single-factor analyses affecting medication adherence were used in this study, it is suggested that further studies should be conducted as single-factor analyses alone are not effective and do not explain the relationship between the results well.

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