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MEDICATION ADHERENCE AND SELF-EFFICACY IN PATIENTS ON POLYPHARMACY

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Abstract

Objectives: Polypharmacy is defined as the use of multiple medications or the use of more medications than medically necessary, though there is no consensus on a precise definition. This study aimed to identify self-efficacy, treatment adherence, and the most influential factors affecting treatment adherence in patients with polypharmacy.

Materials and Methods: Patients using at least two medications were included in the study. A questionnaire, prepared based on a literature review, and the Medication Adherence Self-Efficacy Scale Short Form (MASES-SF) were administered to determine the patient's sociodemographic characteristics, disease status, types of medications used, and self-efficacy.

Results: The mean age of the 414 patients participating in the study was 59.9±11.8 years. Of the patients, 58.5% (n: 242) were female and 41.5% were male. There were significant differences in the mean scores of the Medication Adherence Self-Efficacy Scale based on the number of medications used and the number of chronic diseases. Patients using 2 medications had higher self-efficacy levels in medication adherence compared to those using 4 or more medications, and patients with 1 chronic disease had higher self-efficacy levels compared to those with 3 or more chronic diseases. Additionally, treatment adherence and self-efficacy were higher in males, patients with primary education, and those who visited doctors more frequently.

Conclusion: Identifying the factors that complicate treatment adherence in patients with multiple chronic diseases and high medication use, developing solutions to these problems, and increasing awareness among physicians can slow the progression of the disease and reduce the economic costs of adverse outcomes in our country.

Keywords: Chronic disease, polypharmacy, treatment adherence, self-efficacy.

Introduction

Polypharmacy, or the use of multiple medications, affects both the health and economic aspects of our country as it does globally. Polypharmacy is defined, though not universally agreed upon, as the use of multiple medications or the use of more medications than medically necessary.[1] The prevalence of polypharmacy reported in the literature varies between 10% and 90%, depending on age group, diagnostic criteria, healthcare services, and the geographic location of the study.[2] A study by Midao et al. across 17 European countries and Israel reported a polypharmacy rate of 39.9%.[3]

In academic literature, "chronic diseases" encompasses many different definitions. According to the World Health Organization (WHO), chronic diseases are non-communicable, slow, and long-lasting conditions generally categorized into four main groups: cardiovascular diseases, cancers, chronic obstructive pulmonary disease (COPD), and respiratory diseases like asthma, and diabetes.[4]

Factors such as sedentary lifestyles, fast food consumption, stress, and radiation exposure have become more prevalent compared to the past. This increase in chronic diseases consequently leads to greater medication use.[5]

Treatment adherence is one of the most crucial factors determining the success of chronic disease management. Treatment adherence encompasses whether patients take their medications at the correct dose, at the correct time, and with the appropriate frequency. It also includes adherence to lifestyle changes and recommendations from healthcare professionals. Studies have shown that treatment adherence can vary based on the form of treatment, specific characteristics of the disease, and the patient's socio-demographic characteristics. Polypharmacy has become an increasingly significant issue worldwide.[6] Studies indicate that adherence rates for patients with chronic diseases are around 40-50% in developed countries, while in developing countries, these rates are much lower. Numerous factors contribute to poor treatment adherence, including low socioeconomic status, lack of awareness of the disease, and inadequate communication between patient and physician. Medication-related factors such as dosage regimen, administration method, side effects, and cost also complicate adherence.[7]

The requirement for multiple medications can complicate medication adherence and lead to inappropriate medication use. Inappropriate medication use can prevent patients from deriving sufficient benefits from their medications and may even cause harm.[8]

Various methods, including self-reports and counting medications from prescriptions, are used to evaluate treatment adherence. Self-reporting is considered an easy and suitable method for assessing adherence. Several questionnaires and scales have been developed to determine adherence.[9]

Self-efficacy is the individual's confidence in their abilities, knowledge, and skills. It is the belief in one's capability to complete a specific task or manage a particular situation. Individuals with strong self-efficacy are more likely to adhere to prescribed treatments and follow recommendations.[10]

This study aims to identify the self-efficacy of patients on polypharmacy, their medication adherence, and the factors most affecting their treatment adherence. Consequently, identifying and addressing these issues will be more feasible. Increased awareness of these problems among all physicians, starting from primary care providers, and implementing preventive measures will enhance medication adherence and self-efficacy among patients.

Materials and Methods

This descriptive, cross-sectional study was conducted with individuals who visited the Internal Medicine Clinic of Karabük University Training and Research Hospital between December 1, 2023, and December 30, 2023, who were using at least two medications and agreed to participate (n = 414). Once the participants had been made aware of the subject matter and scope of the study, the questionnaire was administered to those who had consented to participate in the study utilizing a face-to-face interview. A consent form was then completed. It should be noted that patients were at liberty to withdraw from the study at any time. A questionnaire prepared by the researchers, based on a review of the literature, and the Medication Adherence Self-Efficacy Scale Short Form (MASES-SF) were used to determine the sociodemographic characteristics of the patients, their disease status, the types of medications they used, and their self-efficacy. Individuals who were not mentally capable of understanding and answering the questionnaire, those who refused to participate, and patients using fewer than two medications during the study period were excluded from the study. The study commenced after obtaining approval from the Karabük University Training and Research Hospital Ethics Committee with approval number 2023/ 1577.

The Medication Adherence Self-Efficacy Scale Short Form (MASES-SF) is a straightforward questionnaire designed to assess patients' self-efficacy levels regarding adherence to medication regimens and provides detailed information about the patient. The reliability coefficient of the scale is 0.94. It was developed by Ogedegbe et al. in 2003 and revised by Fernandez et al. in 2008. The Turkish version was adapted by Hacıhasanoğlu et al. in 2012, and its validity and reliability were established. This scale evaluates patients' medication adherence, factors affecting adherence and the individual's self-efficacy (confidence) level. Scores

on this scale range from a minimum of 13 to a maximum of 52, with higher scores indicating better medication adherence.

Statistical analysis was performed using the SPSS (Statistical Package for Social Sciences) for Windows 20.0 program. Mean, median, standard deviation, minimum, and maximum values were calculated. The Chi-Square test was used for comparing qualitative data. Results were presented as frequencies, percentages, and mean±standard deviation. The non-parametric Mann-Whitney U test was used for comparing data. Statistical significance was accepted at $p<0.05$ with a 95% confidence interval.

Results

The mean age of the 414 patients participating in the study was 59.9±11.8 years. Of the patients, 58.5% (n=242) were female and 41.5% were male. Sixty-five percent of the patients had completed primary education, and more than half of them (58.5%) had an income equal to their expenses. Sixty-four point seven percent of the patients lived in urban centers. It was found that 38.4% of the patients visited a doctor every three months, 41.8% had three or more chronic diseases, and 49.0% used four or more medications. Thirty-seven percent of the patients reported that they had not received education about their disease, while 56.5% indicated that they had received education from healthcare professionals. 69% of the patients (n=286) were diagnosed with Diabetes Mellitus, 63.5% (n=263) with Hypertension, and 25.8% (n=107) with Coronary Artery Disease. 22.8% of the patients had one chronic disease, 35.5% had two chronic diseases, and 41.8% had three or more chronic diseases. The distribution of chronic diseases among the patients and the sociodemographic characteristics of the patients are presented in Table 1a, Table 1b, and Table 2.

Table 1a. Demographic Characteristics of Patients (n=414)

	Number (n)	Percentage (%)
Gender		
Female	242	58.5
Male	172	41.5
Educational Background		
Illiterate	46	11.1
Primary School	269	65.0
High School and Above	99	23.9
Income Level		
Income Less Than Expenses	148	35.7
Income Equal to Expenses	242	58.5
Income Greater Than Expenses	24	5.8
Place of Residence		
City Center	268	64.7
District	77	18.6
Village	69	16.7

Table 1b. Demographic Characteristics of Patients (n=414)

	Number (n)	Percentage (%)
Frequency of Doctor Visits		
Frequently	92	22.2
Every 3 months	159	38.4
Every 6 months	110	26.6
Annually	53	12.8
Status of Receiving Education About Your Disease		
Did not receive education	153	37.0
Received from a healthcare professional	234	56.5
Heard from a neighbor	11	2.7
Heard from social media	16	3.8
Number of Medications Used		
2	111	26.8
3	100	24.2
4 or More	203	49.0
Number of Chronic Diseases		
1	94	22.7
2	147	35.5
3 or More	173	41.8
Total	**414**	**100**

When examining the Medication Adherence Self-Efficacy Scale scores based on the types of medications used by the patients, the mean total score of all patients on the Medication Adherence Self-Efficacy Scale was found to be 38.5±8.8. The mean scores on the Medication Adherence Self-Efficacy Scale according to chronic diseases and types of medications used are shown in Table 2. The mean score for patients with diabetes was 38.3±8.9, whereas the mean score for patients with chronic respiratory diseases such as asthma-COPD was 39.4±8.4. The lowest mean score on the Medication Adherence Self-Efficacy Scale was for vitamin medications (34.7±8.9), while the highest mean score was for inhaler medications (39.6±8.6).

Table 2. Mean Scores on the Medication Adherence Self-Efficacy Scale for Patients and Types of Medications Used

Diseases	Mean	Standard deviation	Medications	Mean	Standard deviation
Diabetes Mellitus (n=286)	38.3	8.9	Vitamin (n=80)	34.7	8.9
Heart disease (n=107)	39.3	8.7	Analgesics (n=152)	38.4	8.3
Thyroid Disorders (n=96)	38.4	8.5	Diabetic Medications (n=280)	38.3	8.7
Psychiatric Disorders (n=46)	37.0	8.4	Anticoagulants (n=186)	39.4	8.5
Chronic respiratory	39.4	8.4	Thyroid Medications (n=96)	38.5	8.5
			Psychiatric Medications (n=49)	37.1	8.5
			Inhaler Medications (n=174)	39.6	8.6
Total	**38.5**	**8.8**			

The mean scores on the Medication Adherence Self-Efficacy Scale were significantly higher for male patients compared to female patients (t=25.95; p=0.01). A significant difference in the mean scores on the Medication Adherence Self-Efficacy Scale was found based on educational level; patients with primary education had higher medication adherence self-efficacy compared to patients with secondary or higher education (p=0.04). There was a significant difference in the mean scores on the Medication Adherence Self-Efficacy Scale based on the frequency of doctor visits; patients who visited the doctor every three months had higher medication adherence self-efficacy compared to those who visited every six months (p=0.07). A significant difference in the mean scores on the Medication Adherence Self-Efficacy Scale was found based on the number of medications used; patients using two medications had higher medication adherence self-efficacy compared to those using four or more medications (p=0.036). A significant difference in the mean scores on Medication Adherence

Self-Efficacy Scale was observed based on the number of chronic diseases; patients with one chronic disease had higher medication adherence self-efficacy compared to those with three or more chronic diseases (p=0.039). The comparison of the average scores of patients on the medication adherence/self-efficacy scale according to different variables is detailed in Table 3.

Table 3. Comparison of Mean Scores on the Medication Adherence Self-Efficacy Scale by Various Variables

Variables	Mean±sd	Test Statistics	P value
Gender			
Female	37.5±8.6	t=25.96	0.010
Male	39.8±8.9		
Educational Background			
Illiterate	36.7±7.5	F=4.169	0.016
Primary School	39.4±9.1*		
High School and Above	36.8±8.1*		
Frequency of Doctor Visits			
Frequently	37.5±9.5	F=4.151	0.006
Every 3 months	40.2±8.1*		
Every 6 months	36.6±8.4*		
Annually	39.0±9.3		
Number of Medications Used			
2 units	36.8±9.0*	F=3.181	0.43
3 units	38.4±9.4		
4 and above	39.4±8.2*		
Number of Chronic Diseases			
1 unit	36.6±8.8*	F=3.127	0.45
2 units	38.6±8.9		
3 and above	**39.4±8.6***		

*Indicates a statistically significant difference between groups.

Discussion

Chronic diseases are typically slow-progressing, long-term health issues that often persist for a lifetime and lack definitive cures. These conditions impact the quality of life and require ongoing medical intervention. If untreated, they can lead to more severe health problems. Chronic diseases do not appear suddenly; they develop over time, which is why the prevalence of many chronic conditions increases with age. Consequently, a significant proportion of the elderly population suffers from one or more chronic diseases. Multiple chronic conditions affect not only adults but also adolescents and children. For instance, 13% of young individuals and 95% of older adults have at least two chronic conditions.[11,12]

Factors such as sedentary lifestyle, fast food consumption, stress, and radiation exposure have become more prevalent compared to the past. This has led to an increase in chronic diseases and, consequently, greater medication use. The need for multiple medications can complicate treatment adherence. Therefore, for patients with multiple chronic conditions who use many medications, it is crucial to be very careful when adding extra medications to their regimen. In a study conducted by Kara et al. in 2017, an increase in the number of medications used daily was associated with decreased medication adherence. Dezii et al. compared patients with hypertension on a single medication regimen to those on a combination of molecules using two separate medications and found higher adherence with fewer medications.[13] Our study also observed that medication adherence decreased with an increase in the number of medications and the number of chronic conditions. Although many studies in the literature show a decrease in adherence with an increasing number of medications, some studies suggest that medication adherence is not necessarily related to the number of medications used.[14-16]

In our study, the mean total score on the Medication Adherence Self-Efficacy Scale for all participants was found to be 38.5±8.8. Hacıhasanoğlu et al. found a mean score of 37.38±11.06 in their Turkish adaptation study of the scale in 2012, while Kankaya et al. reported a score of 38.99±1.17 in their study.[17,18] Factors such as age, gender, marital status, education level, income level, daily medication use, and frequency of doctor visits significantly affect treatment adherence. In a study by Mollaoğlu et al., medication adherence and self-efficacy scores were lower in men.[19] Kankaya et al. also reported lower adherence in men.[18] In another study by Demirbas et al., patients with education beyond primary school and those with an income greater than their expenses had higher adherence scores.[20] Turhan et al. (2014) showed that gender, marital status, and education level influenced medication adherence in geriatric patients, noting higher adherence in those with higher education levels, married individuals, and men.[14] However, Özdemir et al. found that age, marital status, and education level did not affect medication adherence self-efficacy scores.[21] Contrary to most literature, our study found higher adherence self-efficacy scores in men, patients with primary education, and those who visited the doctor more frequently. This might be due to women performing more household duties and visiting doctors less

frequently. Since a significant portion of our study participants had only primary education, it is suggested that individuals with lower education levels have higher medication adherence self-efficacy due to more frequent doctor visits.

In our study, the lowest mean score on the Medication Adherence Self-Efficacy Scale was found for vitamin medications, while the highest adherence was associated with inhaler medications. In a study by Sönmez et al. in 2014, the highest adherence was reported for thyroid medications, osteoporosis medications, and cardiovascular medications.[22] The higher adherence to inhaler medications in our study is thought to be due to the rapid onset of disease symptoms if the medication is not used. The lower scores for vitamin medications are believed to be due to the slower resolution of symptoms and the less severe symptoms upon discontinuation compared to other medications.

In conclusion, It is essential to assess medication adherence in patients using multiple medications and with multiple comorbidities and to increase awareness of this assessment among physicians. If physicians can identify the reasons for poor adherence in patients with multiple chronic diseases and multiple medications, and find solutions to these problems, this will both slow the progression of disease and reduce the economic cost of ill health to our country.

Ethical Considerations: The study was approved by Karabük University, Health Sciences Ethics Committee with the date and approval number 07.12.2023-1577.

Conflict of Interest: The authors declare no conflict of interest.

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