

## Evaluation Of Perceived Stress and Depression Levels and Medication Adherence of Hypertension and Diabetes Patients

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### Abstract

**Objective:** The aim of this study was to determine the perceived stress and depression level of diabetes and hypertension patients who applied to the family medicine outpatient clinic and to investigate its relationship with the treatment compliance of the patients.

**Methods:** A total of 201 people over the age of 18 who were followed up in the family medicine outpatient clinic with the diagnosis of Hypertension and Diabetes were included in the study. The study consisted of three different groups of hypertension patients, diabetes patients and healthy volunteers. Beck Depression Scale, Perceived Stress Scale, Morisky Medication Adherence Scale-8 and sociodemographic data questionnaire were administered to the participants by face-to-face interview technique.

**Results:** In our study, depression and perceived stress scores were lower in the healthy group compared to the other groups ( $p<0.05$ ). Morisky medication adherence scale scores were  $5.7\pm 2.18$  and  $5.39\pm 2.29$  in the HT and DM patient groups, respectively, and 46.3% had a low compliance score. Factors such as education level, presence of additional disease, dietary compliance, physical activity status, and smoking were found to play an active role in medication compliance ( $p<0.05$ ). It was observed that patients with high depression and stress scores had low adherence to medication adherence ( $p<0.001$ ).

**Conclusion:** Hypertensive and diabetic patients with high depression and perceived stress scores were found to have low adherence to medication adherence.

**Key Words:** Diabetes Mellitus, Hypertension, Medication Adherence

### Hipertansiyon ve Diyabet Hastalarının Algılanan Stres ve Depresyon Düzeyleri ile İlaç Uyumlarının Değerlendirilmesi

#### Özet

**Amaç:** Bu çalışmada; aile hekimliği polikliniğine başvuran diyabet ve hipertansiyon hastalarının algılanan stres ve depresyon düzeyini belirleyerek, bunun hastaların tedavi uyumu ile olan ilişkisini araştırmak amaçlanmıştır.

**Metod:** Çalışma, Ekim-Aralık 2022 tarihleri arasında Aile Hekimliği polikliniğine başvuran 201 kişi ile gerçekleştirilmiştir. Hipertansif hastalar, diyabetik hastalar ve sağlıklı gönüllülerden oluşan üç farklı grup çalışmaya dahil edilmiştir. Katılımcılara Beck Depresyon Ölçeği, Algılanan Stres Ölçeği, Morisky İlaç Uyum Ölçeği-8 ve sosyodemografik veri anketi yüz yüze görüşme tekniği ile uygulanmıştır.

**Bulgular:** Çalışmamızda sağlıklı grupta depresyon ve algılanan stres skoru diğer gruplara göre düşük bulundu ( $p<0,05$ ). Morisky tedavi uyum ölçeği puanları HT ve DM hasta grubunda sırasıyla  $5,7\pm 2,18$  ve  $5,39\pm 2,29$  olup, %46,3'ünün uyum skoru düşük bulundu. Eğitim düzeyi, ek hastalık varlığı, diyet uyumu, fiziksel aktivite yapma durumu, sigara kullanımı gibi faktörlerin bireylerde tedavi uyumunda etkin rol aldığı saptandı ( $p<0,05$ ). Depresyon ve stres skoru yüksek olan hastaların ilaç tedavisine düşük uyum gösterdikleri görüldü ( $p<0,001$ ).

**Sonuç:** Depresyon ve algılanan stres skoru yüksek olan hipertansif ve diyabetik bireylerin ilaç tedavisine uyumunun düşük olduğu saptanmıştır. Bu nedenle özellikle birinci basamakta tedavi uyumunu etkileyebilecek olası depresyon, stres gibi durumların sorgulanması açısından ruhsal tarama ölçeklerinin kullanılması büyük önem arz etmektedir.

**Anahtar Kelimeler:** Diabetes Mellitus, Hipertansiyon, Depresyon, Algılanan Stres, Tedavi Uyumu

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## INTRODUCTION

Diabetes mellitus (DM) is a chronic disease that develops when the pancreas cannot secrete enough insulin or the insulin hormone it secretes cannot be used by the body (1). This causes the level of glucose in the blood to increase, and in the long run, high blood glucose causes damage to various organs and tissue (1). At the same time, diabetes causes some psychological, emotional and social problems in the patient (2).

Arterial blood pressure greater than 140/90 mmHg on repeated measurements is defined as hypertension. Hypertension (HT) is an important health problem due to the fact that it is a systemic disease with constant high blood pressure, it causes serious complications and is frequently seen in the community (3).

Since chronic diseases such as diabetes and hypertension cause various organ and tissue damage in the long term, they also cause some psychological diseases. The most common psychiatric disorders accompanying chronic physical diseases are depression, anxiety and

stress (4). It is important to recognize and treat depression accompanying chronic physical illness, as it may affect the course of the disease (4).

In addition, inadequate adherence to treatment in chronic diseases is an increasing problem worldwide. Psychological problems such as depression and stress also affect adherence to treatment. Due to insufficient adherence, effective efficiency cannot be obtained from drugs, and this causes biopsychosocial complications, a decrease in the quality of life of the patient, an increase in the possibility of drug resistance, and a waste of health resources (5).

Human is a biopsychosocial being with both biological, psychological and social aspects, and all these complete the human being as a whole. These factors are in an ongoing interaction and change within themselves. In order to speak of a healthy individual, these factors must be in balance with each other (6). In this direction, family medicine, with its unique core competencies, should approach patients in a holistic and patient-centered manner, provide comprehensive care, and address patients not only biologically but also psychologically and socially (6).

In this study, we aimed to determine the perceived stress and depression level of diabetes

and hypertension patients who applied to the family medicine outpatient clinic, and to determine its relationship with the treatment compliance of the patients.

## METHODS

The study protocol was approved by the Ordu University Faculty of Medicine Clinical Research Ethics Committee (14.10.2022 - 2022/223), Giresun Provincial Health Directorate gave approval on 24.11.2022 with decision number E- 53593568-8818 and the study complied with the principles of the Declaration of Helsinki.

The study was conducted with 201 participants who applied to the Family Medicine outpatient clinic between October and December 2022. In the study, there are 3 groups consisting of 67 people each, diabetes patients, hypertension patients and healthy volunteers. Among the people who applied to the polyclinic, the first 67 people who met the criteria for inclusion in the groups were included in the study, respectively, and the research was conducted. The research was conducted by face-to-face interview method.

### *Beck Depression Inventory (BDI)*

It is a self-assessment scale in terms of depression that can be applied to healthy individuals and psychiatric patient groups and is used to determine the level of depression risk and to measure the severity of depressive symptoms. Each item of this form, which consists of 21

questions in total, is scored between 0-3 according to the intensity of attitudes (7).

### *Perceived Stress Scale (PSS14)*

PSS-14 is designed to measure the level of stress perceived by individuals in certain situations in their lives. Individuals evaluate each item on a 5-point Likert-type scale ranging from "Never (0)" to "Very often (4)". The scores of PSS-14 are between 0 and 56, and a high score indicates the excess of stress perceived by the individual (8).

### *Morisky Medication Adherence Scale-8 (MMAS-8)*

The scale consists of 8 questions in total, and the patient's compliance with the treatment is evaluated with the answers given to these questions. The total score obtained from the scale questions is calculated and treatment compliance is evaluated. 8 points indicate high compliance, 6 or 7 points indicate medium compliance, and <6 points indicate low compliance (9).

### *Statistical analysis*

The IBM SPSS-29 (Statistical Package for Social Sciences, Chicago, IL, USA) package program was used for statistical analysis. Compliance of numerical data with normal distribution was examined by Kolmogorov-Smirnov and Shapiro Wilk tests. Numerical data, on the other hand, were specified with median (minimum-maximum) values, since they did not provide the assumption of normality. The data were analyzed using the Chi-Square ( $\chi^2$ ) test to

compare categorical data, the Mann-Whitney U test in case of two independent groups, the Kruskal-Wallis test in the comparison of more than two independent groups, and the Pearson Chi-Square Correlation Test to look at the relationship between numerical variables. In cases where more than two independent variables were compared, necessary post-hoc analyzes were performed in order to determine which variable was the source of the difference in results that were found to be statistically significant. The statistical significance level for all tests was accepted as  $p < 0.05$

**RESULTS**

It was observed that 106 (52.7%) of the 201 people included in the study were female, 95 (47.3%) were male, and the mean age was  $55.5 \pm 10.05$ . In our study, the scores obtained from the depression and perceived stress scale were  $10.78 \pm 7.64$  and  $22.19 \pm 12.12$  in the hypertensive group,  $13.51 \pm 8.42$  and  $26.66 \pm 12.18$  in the diabetic group,  $7.63 \pm 6.61$  and  $18.82 \pm 9.99$  in the healthy group. Depression and perceived stress scores were lower in the healthy group compared to the other groups ( $p < 0.05$ ). A significant difference was found between the DM patient group and the HT patient group in terms of perceived stress scale. ( $p < 0.05$ ) The perceived stress scale score was found to be higher in the DM patient group. When the medication adherence scores were examined, no significant difference was found between the two groups. It

was observed that 43.3% of the DM patient group and 49.3% of the HT patient group had low compliance. (Table 1)

The MMAS-8 score was found to be low in both hypertensive and diabetic groups with poor dietary adherence, no physical activity, smokers and those with comorbidities ( $p < 0.05$ ). It was observed that the medication adherence score decreased as the disease year increased in both groups ( $p < 0.05$ ). The medication adherence score was found to be low in diabetic patients who used oral antidiabetic drugs and insulin together. It was observed that the medication adherence score increased as the education level increased in hypertensive patients. ( $p < 0.05$ ).

**Table 1.** The Relationship Between Disease Type and Scores from Beck Depression Scale, Perceived Stress Scale and Morisky Medication Adherence Scale-8.

	Healthy Group (ort±ss)	Diabetes Patients (ort±ss)	Hypertension Patients (ort±ss)	p value
<b>BDI</b>	7,63±6,61 5(0-38)	13,51±8,42 10(2-32)	10,78±7,64 11(0-38)	<0,0001
<b>PSS-14</b>	18,82±9,99 15(5-39)	26,66±12,18 32(6-43)	22,19±12,12 18(6-46)	0,001
<b>MMAS-8</b>	-	5,39±2,29 5(2-8)	5,7±2,18 5(2-8)	0,406
<b>MMAS-8</b> <b>Categorical</b>	• Low Adherence	-	29 (43,3)	0,685
	• Medium Adherence	-	18 (26,9)	
	• High Adherence	-	20 (29,9)	

A highly positive correlation was found between BDI and PSS ( $p < 0.001$ ). It was observed that as the scores obtained from the depression scale increased, the scores obtained from the stress scale also increased. When the relationship between BDI, PSS and MMAS-8 was examined, a moderate negative relationship was found ( $p < 0.001$ ). It was observed that as both the depression score and the stress scale score increased, the score obtained from the medication adherence scale decreased. (Table 2)

**Table 2.** Correlation Results of the Relationship Between the Perceived Stress Scale and the Beck Depression Scale and Morisky Medication Adherence Scale-8

		BDI	PSS-14	MMAS-8
BDI	Correlation Coefficient	1	,728**	-,614**
	p value		<.001	<.001
PSS-14	Correlation Coefficient	,728**	1	-,539**
	p value	<.001		<.001
MMAS-8	Correlation Coefficient	-,614**	-,539**	1
	p value	<.001	<.001	

## DISCUSSION

It has been reported that many mental disorders, especially depression, are more common in people with certain chronic diseases such as hypertension and diabetes compared to healthy people. The increase in the patient's depression and stress also negatively affects the patient's compliance with treatment and

recommendations, response to treatment, and ultimately the prognosis of the disease (10).

In this study using Morisky Medication Adherence Scale (MMAS-8); Compliance with medication was high in 29.9% of the DM patient group, moderate in 26.9%, and low in 43.3%. In the HT patient group, 29.9% had high adherence to medication, 20.9% had moderate, 49.3% had low compliance, and no significant difference was found between the two groups. Olmez et al. In the study that investigated drug compliance in diabetes patients, it was found that 24% of the patients had high drug compliance, 31.3% of them moderate and 44.7% of them low (11). The rate of adherence to antihypertensive medication shown in our review of the literature ranged from 26.9% to 88.1% and was found to be consistent with our findings (12,13).

In this study, there was no significant difference between medication adherence scores in both HT and DM patient groups in terms of gender and marital status. When we examined the literature, no significant effect of gender and marital status on medication adherence was found in patients with HT and DM, and the findings we found in the study were similar to these studies (14,15).

In this study, when the relationship between the education status of the patients and the MMAS-8 score was examined, it was observed that medication adherence increased as the education level increased in hypertensive

patients, while education did not affect medication adherence in diabetic patients. Studies in diabetic patients in the literature also show that education level does not affect medication adherence, which is consistent with our study (16). Many studies conducted in hypertensive patients have found results that support our research (17).

In this study, when the duration of the disease and medication adherence were evaluated, it was found that medication adherence was statistically higher in the first years of the disease. Arulmozhi et al. In his study with DM patients, it was shown that medication adherence was better in the first years of the disease (18). Al-Mehza et al. In their study, it was found that the duration of treatment did not significantly affect medication adherence (19). In the study conducted by Gün et al. in hypertensive patients, it was shown that compliance increased as the treatment period extended (20). When we examined the literature, different results were found regarding the relationship between the year of illness and drug compliance. In our study, we thought that the decrease in medication adherence as the disease year increased may be due to the complications that occur in the later disease stages and the increase in the number of drugs used due to additional diseases.

In this study, when MMAS-8 score and comorbid disease status were examined, it was seen that medication adherence was lower in

patients with comorbidity in both HT and DM patient groups. In a study conducted by Sweileh et al. on diabetic patients, medication adherence was found to be lower in individuals with comorbidities (16). In a study conducted by Shaya et al. on hypertensive patients, similar to our study, it was found that people who do not have an additional disease had higher medication adherence, and as the number of additional diseases increased, adherence decreased (21).

In this study, we found statistically significant results when we compared the MMAS-8 score with the diet compliance, physical activity and smoking status of the patients. Sahin et al. in his study on hypertension patients, similar to our study, it was found that those who exhibited behaviors in accordance with their nutritional habits had good drug compliance (15). In the study of Görürgöz et al., the compliance scores of the patients who were fed appropriately for diabetes and who regularly went to their controls were found to be high (22). In studies in the literature, unlike our study, it was observed that the habit of exercising was not effective on medication adherence (15,23). In our study, medication adherence was found to be low in those who did not do physical activity. In studies in the literature, similar to our study, it is stated that smoking makes it difficult to comply with medication adherence (24). From these studies, we can conclude that patients who adapt to



lifestyle changes have better medication adherence.

In this study, it was determined that patients with high depression and stress scores showed low compliance with medication adherence. When we examine the literature, it has been observed that depression is associated with medication non-adherence in many studies conducted in chronic patients such as HT and DM, similar to our study, and medication adherence decreases as the level of depression increases (4,10,14). Although there are not many studies in the literature comparing perceived stress and medication adherence, some studies have found similar results to our study, and it has been observed that as stress increases, medication adherence decreases (10,25).

### CONCLUSION

Based on a biopsychosocial approach, family medicine practitioners play a particularly important role in chronic disease management. Family medicine practitioners take an active role in the disease management platform. In this regard, chronic disease management can be strengthened with motivational interviewing technique.

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In our study, not using laboratory tests, not evaluating the blood pressure of hypertensive patients, not including HbA1c and plasma glucose levels in diabetic patients can be counted among the limitations.

**Ethics Committee Approval:** Approval was obtained from Ordu University clinical research ethics committee (14.10.2022 /223).

**Peer-review:** Externally peer-reviewed.

### Authors' Contributions

Concept: AA, Design: AA, MG, Literature Search: AA, MG, Data Collection and Processing: AA, MG, Analysis and interpretation: AA, MG, Writing: AA, MG,

**Conflict of Interest:** The authors declared no conflict of interest.

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