

**RESEARCH  
ARTICLE**

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## Adherence Levels of Hypertensive Elderly Individuals and Associated Factors: A Cross-Sectional Study

### ABSTRACT

**Objective:** Patient adherence, particularly in the management of chronic diseases, is an often overlooked but crucial aspect that is more important than medication treatment itself. It is also one of the major problems contributing to treatment failures. Our study aims to evaluate the adherence levels of elderly hypertensive individuals residing in the city center of Edirne, as well as the factors influencing adherence levels.

**Methods:** The study sample consists of 421 elderly hypertensive individuals registered with 52 primary healthcare units in the city center of Edirne. Data were collected using a questionnaire comprising 75 questions. The questionnaire included socio-demographic characteristics, factors that may affect patient adherence, and the Adaptation to Chronic Illness Scale consisting of 25 questions.

**Results:** Of the participants, 226 (53.7%) were female and 195 (46.3%) were male. The participants had an average adaptation score of  $87.04 \pm 9.77$ , with a minimum score of 62 and a maximum score of 116. Younger elderly individuals had higher adaptation scores. Adaptation scores were lower for widowed individuals, illiterate individuals, and those living alone. Participants who were informed about their illness and treatment, involved their families, and had family support had higher adaptation scores.

**Conclusions:** The adherence levels of the elderly participants in our study were found to be below the expected level. Existing studies in the literature predominantly focus on medication adherence. Conducting studies that specifically target disease adaptation would enable a better understanding of patients and the development of new strategies to improve adherence levels.

**Keywords:** Patient Adherence, Hypertension, Elderly, Primary care.

## Hipertansif Yaşlı Bireylerin Uyum Düzeyleri ve İlişkili Faktörler: Kesitsel Bir Çalışma

### ÖZET

**Amaç:** Hasta uyumu, özellikle kronik hastalık yönetiminde göz ardı edilen, ancak ilaç tedavisinden çok daha önemli olan bir konudur. Tedavinin başarısız olmasının da en büyük sorunlarından biridir. Çalışmamızda Edirne il merkezinde yaşayan hipertansif yaşlıların hastalığa uyum düzeyleri ve uyum düzeyini etkileyen faktörlerin değerlendirilmesi amaçlanmıştır.

**Gereç ve Yöntem:** Çalışmanın örneklemini Edirne il merkezindeki 52 aile hekimliği birimine kayıtlı, 421 yaşlı hipertansif birey oluşturmaktadır. Veriler 75 sorudan oluşan bir anketle toplanmıştır. Anket içerisinde sosyodemografik özellikler, hasta uyumunu etkileyebilecek faktörler ve 25 sorudan oluşan Kronik Hastalıklara Uyum Ölçeği bulunmaktadır.

**Bulgular:** Katılımcıların 226'sı (% 53,7) kadın, 195'i (% 46,3) erkektir. Katılımcıların ölçekten aldıkları ortalama puan  $87,04 \pm 9,77$  olup minimum puan 62, maksimum puan 116'dır. Genç-yaşlıların uyum puanı daha yüksektir. Dul bireylerin, okuryazar olmayan bireylerin ve yalnız yaşayanların uyum puanı daha düşüktür. Hastalığı ve tedavisi ile ilgili, ailesi de bilgilendirilen, aile desteği olan katılımcıların uyum puanı daha yüksektir.

**Sonuç:** Çalışmamızda yaşlıların hastalığa uyum düzeyleri beklenen seviyenin altında bulunmuştur. Literatürdeki çalışmalar çoğunlukla ilaç uyumuna odaklanmaktadır. Hastalık uyumuna odaklanan çalışmalar ile hastayı daha iyi anlamak ve uyumlarını arttırabilmek için yeni stratejiler belirlemek mümkün olacaktır.

**Anahtar Kelimeler:** Hasta Uyumu, Hipertansiyon, Yaşlı, Birinci Basamak.

## INTRODUCTION

The worldwide increase in life expectancy and decline in mortality rates have resulted in a significant rise in the elderly population (1). It is estimated that by 2050, the population aged 65 and over will nearly triple. Considering these universal demographic trends, issues related to the elderly become increasingly important in all societies (2). Hypertension, one of the most common chronic diseases, stands out among the elderly population due to its high mortality and morbidity rates.

Hypertension is a prevalent health problem worldwide, not only elderly, leading to significant complications (3). In 2015, the prevalence of hypertension in adults was around 30-45%, estimating that 1.12 billion individuals globally and over 150 million people in Central and Eastern Europe were hypertensive. It is projected that the number of hypertensive individuals will increase by 15-20% by 2025, reaching close to 1.5 billion (4). In Turkey, according to the Patent2 (Prevalence, awareness and treatment of hypertension in Turkey 2) study conducted in 2012, the prevalence of hypertension was found to be 30.3%, and it was reported that the prevalence increases with advancing age (5). Despite the availability of various effective antihypertensive treatments, a significant number of patients worldwide still have inadequately controlled blood pressure. A recent multicenter study revealed that only 60% of treated hypertensive patients had their blood pressure under control (6). Various factors, including poor patient adherence to treatment, prescription errors, overly complex guidelines, and unsupportive healthcare systems, can explain the failure in hypertension management (4,7). Poor adherence poses a significant challenge since hypertension is mostly asymptomatic (8).

Adherence is defined by the World Health Organization as "the extent to which a person's behavior—taking medication, following a diet, and/or executing lifestyle changes—corresponds with agreed recommendations from a healthcare provider" (9). Adherence is recognized as a multidimensional phenomenon influenced by complex interactions among socioeconomic status, healthcare system, medical condition, treatment, and patient-related factors (8, 10). Patient-related factors affecting the adherence can include forgetfulness, the asymptomatic nature of the disease, and the presence of comorbid conditions. The initiatives aimed at improving patient adherence have shown that better weight control and blood pressure management have been achieved, reducing the economic burden and resulting in a 53.2% decrease in hypertension-related deaths and 57.3% decrease in all-cause life mortality rate. In another study where an educational program was implemented for hypertensive patients, a 39.7% improvement in blood pressure control and significant reductions in

cardiovascular disease-related mortality rates were observed over a 5-year period, despite advancing age (9).

Clinicians' communication skills, the complexity of treatment regimens, polypharmacy, accessibility to healthcare, healthcare costs, and factors associated with the healthcare system and treatment also contribute to adherence. Identifying factors leading to inadaptability in patients and developing interventions to improve adherence can be facilitated by physicians (8). Accordingly, our study aims to assess the level of adherence to hypertension management among the elderly hypertensive population aged 65 and above residing in the city center of Edirne and provide recommendations to enhance their adherence.

## MATERIAL AND METHODS

Our cross-sectional study includes a population of 19,731 individuals aged 65 and above registered at 52 family health centers in the city center of Edirne. To calculate the minimum sample size for the study, it was determined that 319 individuals needed to be included to achieve statistical significance with a prevalence of 30.3%, a 5% margin of error, and a 95% confidence level among the population of individuals aged 65 years and above. The population was categorized into three groups according to age: 65-74 (young-old), 75-84 (old), and 85 years and above (oldest-old) (11). Stratification was performed based on gender and age groups, ensuring that each family health center had at least one individual from each gender and age group. A total of 421 individuals were selected by random sampling between December 1, 2019, and March 15, 2020.

The research was conducted with the approval of the Trakya University Faculty of Medicine Scientific Research Ethics Committee (no:2019/349) and the Edirne Directorate of Public Health Primary Care Research Commission (no: 2019/10). Verbal consent was obtained from the participants, and the surveys were administered through face-to-face interviews.

The inclusion criteria for participation in the study were being registered at the family health centers in the city center of Edirne, being aged 65 and above, and having a diagnosis of hypertension. The criteria for exclusion from the study were having communication barriers.

The data was collected using a questionnaire created by the researchers through a literature review. The questionnaire consisted of 50 questions, which assessed the participants' sociodemographic and medical characteristics, their family's knowledge about hypertension, and the presence of family support. A 25-item Adaptation to Chronic Illness Scale (ACIS) was included to assess individuals' adherence to chronic diseases. The participant's blood pressure measurements were taken by the same researcher using a clinically validated digital

arm cuff blood pressure monitor (Omron M6 Comfort®).

**Adaptation to Chronic Illness Scale (ACIS):** The Adaptation to Chronic Illness Scale was developed by Atık and Karatepe (12) in 2015. It is a 5-point Likert-type scale consisting of 25 questions. The scale aims to assess the overall level of adaptation of individuals with chronic diseases. The scale includes three subscales: physical adaptation, social adaptation, and psychological adaptation. Questions 1, 9, 10, 13, 14, 15, 16, 18, 22, 23, and 24 assess physical adaptation (minimum 11, maximum 55 points), questions 2, 3, 5, 7, 17, 19, and 25 assess social adaptation (minimum 7, maximum 35 points), and questions 4, 6, 8, 11, 12, 20, and 21 assess psychological adaptation (minimum 7, maximum 35 points). Items 5, 6, 12, 17, 19, 20, 24, and 25 are reverse-scored (5, 4, 3, 2, 1). The maximum score that can be obtained from the scale is 125, and higher scores indicate better adaptation to the disease. The Cronbach's alpha internal consistency coefficient of the scale was found to be 0.88.

Statistical analyses of the data obtained in the study were performed using SPSS v.19.0 Statistics software version (IBM Corp., Armonk, NY, USA). Parametric tests were used for scale data that followed a normal distribution, while non-parametric tests were used for data that did not meet the assumptions of normality. Descriptive statistics, independent samples t-test, Mann-Whitney U test, Kruskal-Wallis test, and Spearman correlation test were used as statistical methods. The level of statistical significance ( $p$ ) was reported along with the respective tests and  $p < 0.05$  was considered as statistically significant.

## RESULTS

Of the participants in our study, 53.7% were female ( $n=226$ ) and 46.3% ( $n=195$ ) were male, with a mean age of  $75.21 \pm 7.68$ . Among the participants, 48.9% ( $n=206$ ) were in the age range of 65-74, 26.6% ( $n=112$ ) were in the age range of 75-84, and 24.5% ( $n=103$ ) were 85 years and older. A total of 65.5% of the participants ( $n=276$ ) were married, while 16.9% ( $n=71$ ) were living alone. Regarding education, 48% ( $n=202$ ) of the participants had completed primary school, and all participants had health insurance.

The participants had an average duration of  $16.54 \pm 10.44$  years of hypertension, and 81% ( $n=341$ ) had other chronic conditions besides hypertension. The median number of daily medications used for their chronic conditions was four.

Regarding awareness, 97.1% ( $n=409$ ) of the participants reported being informed about hypertension and its treatment, while 37.3%

( $n=157$ ) stated that their families were also informed. Among the participants, 54.2% ( $n=228$ ) believed that their families provided support in their treatment.

The mean systolic blood pressure (SBP) of the participants was  $137.15 \pm 20.38$  mm Hg (minimum 92 mm Hg, maximum 206 mm Hg), and the mean diastolic blood pressure (DBP) was  $81.25 \pm 10.62$  mm Hg (minimum 61 mm Hg, maximum 120 mm Hg). The distribution of blood pressure according to the 2019 Turkish Hypertension Consensus Report is presented in Table 1 (13). Participants with SBP under 120 mmHg and DBP under 80 mmHg were considered to have controlled blood pressure.

**Table 1.** Blood pressure levels of the participants

	n	%
<b>Under control</b>	34	8
<b>Elevated blood pressure</b>	125	29.7
<b>Grade 1 hypertension</b>	168	40
<b>Grade 2 hypertension</b>	94	22.3

The scores of the participants from the ACIS and its sub-dimensions are shown in Table 2. The mean score of adaptation to chronic diseases was found to be  $87.04 \pm 9.77$ .

**Table 2.** Mean ACIS scores of the participants

	Min – Max	Mean ± Sd
<b>ACIS</b>	62-116	87.04±9.77
<b>Physical adaptation</b>	23-53	38.50±5.70
<b>Social adaptation</b>	16-47	25.10±3.08
<b>Psychological adaptation</b>	16-31	23.45±3.25

ACIS: Adaptation to Chronic Illness Scale; Min: Minimum; Max: Maximum; Sd: Standart deviation

The socio-demographic and personal variables associated with the mean scores of adaptation to chronic diseases are presented in Table 3.

There was no significant relationship found between gender ( $p=0.77$ ), duration since the diagnosis of hypertension ( $p=0.07$ ), presence of chronic diseases other than hypertension ( $p=0.99$ ), and the ACIS score. Similarly, no statistically significant relationship was observed between participants' knowledge of hypertension and its treatment and the ACIS score ( $p=0.05$ ). However, it was observed that participants whose families were informed about their condition had higher ACIS scores ( $p=0.02$ ).

**Table 3.** Mean ACIS scores of the participants according to different variables

	ACIS	Physical adaptation	Psychological adaptation	Social adaptation
<b>Age</b>				
<b>65-74</b>	89.04±9.95	39.73±5.55	23.79±3.45	25.53±3.20
<b>75-84</b>	84.93±9.14	37.36±5.69	22.94±2.81	24.62±2.76
<b>85+</b>	85.35±9.36	37.27±5.52	23.32±3.25	24.76±3.10
	<b>p=0.001</b>	<b>p&lt;0.001</b>	p=0.121	<b>p=0.028</b>
<b>Educational status</b>				
<b>Illiterate</b>	73.80±6.99	31.20±5.08	20.03±2.10	22.56±2.52
<b>Literate</b>	86.44±8.84	37.13±5.21	24.06±2.41	25.34±5.10
<b>Primary school</b>	87.34±8.94	38.55±5.20	23.66±3.11	25.12±2.78
<b>Secondary school</b>	90.58±8.04	39.79±4.48	24.54±3.17	26.25±3.06
<b>High school</b>	89.06±10.10	40.22±5.44	23.29±3.51	25.54±2.76
<b>University</b>	88.26±10.05	40.08±6.22	23.42±3.35	24.76±2.66
	<b>p&lt;0.001</b>	<b>p&lt;0.001</b>	<b>p&lt;0.001</b>	<b>p&lt;0.001</b>
<b>Marital status</b>				
<b>Single</b>	84.29±10.97	36.17±6.16	23.29±3.72	24.82±2.24
<b>Married</b>	89.10±9.12	39.78±5.17	23.81±3.32	25.50±2.76
<b>Widowed</b>	82.80±9.69	36.00±5.83	22.56±2.86	24.24±3.70
<b>Divorced</b>	86.75±9.03	36.25±7.58	26.25±2.87	25.10±1.08
	<b>p&lt;0.001</b>	<b>p&lt;0.001</b>	<b>p=0.003</b>	<b>p&lt;0.001</b>
<b>Living alone</b>				
<b>Yes</b>	81.40±9.24	34.76±5.95	22.52±2.94	24.16±2.79
<b>No</b>	88.19±9.49	39.26±5.34	23.64±3.29	25.29±3.11
	<b>p&lt;0.001</b>	<b>p&lt;0.001</b>	<b>p=0.016</b>	<b>p=0.003</b>
<b>Has your family been informed about your illness and its treatment?</b>				
<b>Yes</b>	88.62±9.04	39.96±4.90	23.59±3.28	25.07±3.18
<b>No</b>	86.11±10.09	37.63±5.96	23.36±3.24	25.12±3.03
	<b>p=0.025</b>	<b>p&lt;0.001</b>	p=0.620	p=0.828
<b>Does your family support you with your illness and treatment?</b>				
<b>Yes</b>	89.19±9.62	39.75±5.30	23.97±3.24	25.45±3.45
<b>No</b>	84.51±9.36	37.01±5.80	22.82±3.17	24.68±2.54
	<b>p&lt;0.001</b>	<b>p&lt;0.001</b>	<b>p&lt;0.001</b>	<b>p=0.007</b>

ACIS: Adaptation to Chronic Illness Scale

## DISCUSSION

The most common, disabling, and economically burdensome problems in a society are the most significant public health issues for that society. With the increasing elderly population, chronic diseases have become the most important public health problem. Hypertension, as a systemic disease that can lead to complications and is prevalent in the population, is an important chronic disease. In order to effectively manage chronic diseases, it is considered crucial for patients to actively participate in the management of their health. This can be achieved through patient education, support and motivation, and building trust between patients and the healthcare system and providers. Therefore, adherence to chronic disease management is important for both patients and healthcare professionals.

In our study, the proportion of participants with controlled blood pressure was found to be significantly lower compared to the literature (5, 14, 15). In the PatenT2 study conducted in our country in 2012 (5), it was reported that only 28.7% of hypertensive participants had their blood pressure under control. Furthermore, 50.9% had stage 1 hypertension, 15.3% had stage 2 hypertension, and 5.8% had stage 3 hypertension. The reason for the significant difference between our study and the literature is that previous studies considered blood pressure below 140/90 mm Hg as controlled, while in our study, participants with systolic blood pressure (SBP) below 120 mmHg and diastolic blood pressure (DBP) below 80 mmHg were considered as controlled, following the blood pressure target recommended for the elderly

according to the 2019 Turkish Hypertension Consensus Report (13).

In a study conducted on the quality of life of hypertensive patients, it was reported that as individuals age, their physical functioning and role, mental health, energy, social role, and sensory role scores decrease (17). The social and physical limitations that come with aging also affect the adaptation to chronic disease management. In primary care, the approach to elderly individuals allows for a more detailed and effective focus on social and physical limitations compared to other specialties. A comprehensive geriatric assessment in primary care enables the identification of various problems, classification of reserves and resilience, determination of necessary services for intervention, and development of a coordinated treatment plan through a multidisciplinary approach. The follow-up and treatment of chronic diseases can be carried out rapidly, reliably, affordably, and conveniently. The aim is to preserve functionality, ensure autonomy, and maintain the patient's quality of life at an optimum level. For all these reasons, necessary adjustments should be made in our healthcare system to increase the number of primary care physicians specializing in family medicine, improve the referral chain, and ensure that geriatric patients receive comprehensive and high-quality services at the primary care level, thus enhancing their adaptation to the disease.

There are studies in the literature that demonstrate the potential association between marital status and psychosocial adaptation (17, 18). In our study, a significant relationship was found between the participant's marital status and their scores on ACIS and its sub-dimensions, with the widowed group receiving lower scores. In a study by Erşan et al. (17), participants who were separated/divorced were found to have significantly higher levels of depression compared to those who were married. Similarly, in our study, it was determined that widowed individuals had significantly lower levels of adaptation compared to married individuals, which is consistent with the literature. This difference could be attributed to the stress caused by the loss of a spouse, lack of social and emotional support, and consequent difficulty in coping with stress.

There are studies in the literature that demonstrate the potential association between educational level and disease adaptation and adherence to treatment (19, 20). In a study conducted by Tokem et al. (19), it was found that illiterate individuals with hypertension had significantly lower levels of hypertension knowledge and adaptation compared to those who were literate or had completed school. Similarly, in our study, it was found that illiterate participants had lower levels of disease adaptation, which is consistent with the literature. This result may be attributed to higher-educated individuals having a

better awareness of their condition, a better understanding of their disease and its treatment, and more related knowledge.

In our study, it was found that individuals living alone had significantly lower disease adaptation compared to those who did not live alone. This finding is consistent with the study conducted by Çam et al. (18), which also found that individuals living alone had lower psychosocial adaptation to the disease. This difference may be attributed to the limited social support experienced by individuals living alone. Additionally, the absence of a family member who can motivate the individual to adhere to non-pharmacological treatments such as diet and exercise may also contribute to the lower disease adaptation observed in those living alone. Increasing the number of active aging centers, where the elderly can socialize and engage in various activities, and encouraging individuals to spend time in these centers can provide social support to the elderly. This can facilitate coping with stress and promote more positive emotions among those who may feel lonely or depressed.

In a study investigating the contribution of family involvement in patient education to hypertension management, participants were divided into four groups: control group, family-oriented group, patient-oriented group, and patient and family-oriented group. After a four-month education program, the patient and family-oriented group showed significant improvements in medication adaptation, low-sodium diet adaptation, adaptation to medical appointments, and overall treatment adaptation (21). Similarly, a systematic review has indicated that educating patients and their families through various methods contributes to patient adherence (22). Consistent with these findings, our study also found that participants whose families were informed had higher disease adaptation. When families are knowledgeable about the disease, they can assist the patient in adhering to dietary recommendations and engaging in exercise. Feeling supported by their families, patients may experience better psychosocial well-being and demonstrate better adaptation to their condition. Barretto et al. (23) highlighted that many individuals with chronic illnesses view their families as the main source of support and security, and therefore, family organization and interactions directly impact treatment success in chronic diseases. The most common form of support has been related to the continuity of non-pharmacological treatment (23). A meta-analysis on social support and adaptation has also shown that individuals with strong family bonds have better adaptation (24). In our study, participants who perceived support from their families also had higher levels of adaptation. Taken together, these findings suggest that involving and educating families in the management process of the disease

and ensuring their support is crucial for improving individuals' adaptation to the disease.

Our study is a single-center study; therefore, the findings do not represent the entire country. Variability may be observed between regions due to sociocultural and economic differences. Since our study is cross-sectional, it cannot demonstrate changes in adherence over time. A longer-term prospective study could be more effective in evaluating hypertension adherence in elderly individuals.

### CONCLUSION

Adherence is a complex process encompassing physical, psychological, and social

dimensions. Our study determined that age, marital status, education level, living alone, informing families about the disease, and providing support to patients have various impacts on adherence to chronic illness management. The adherence levels of elderly individuals were found to be significantly low. Existing literature predominantly focuses on the adherence to medication. There is a need for more studies that specifically address patients' adherence to their diseases. Such studies would enable us to better understand patients and develop new strategies to enhance their adherence.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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