# The Relationship Between Adaptation to Chronic Disease and Medication Adherence, Frequency of Emergency Department Visits, and Quality of Life in Individuals with Chronic Disease

## Kronik Hastalığa Sahip Bireylerde Hastalığa Uyum, İlaç Uyumu, Acil Servis Ziyaret Sıklığı ve Yaşam Kalitesi Arasındaki İlişki

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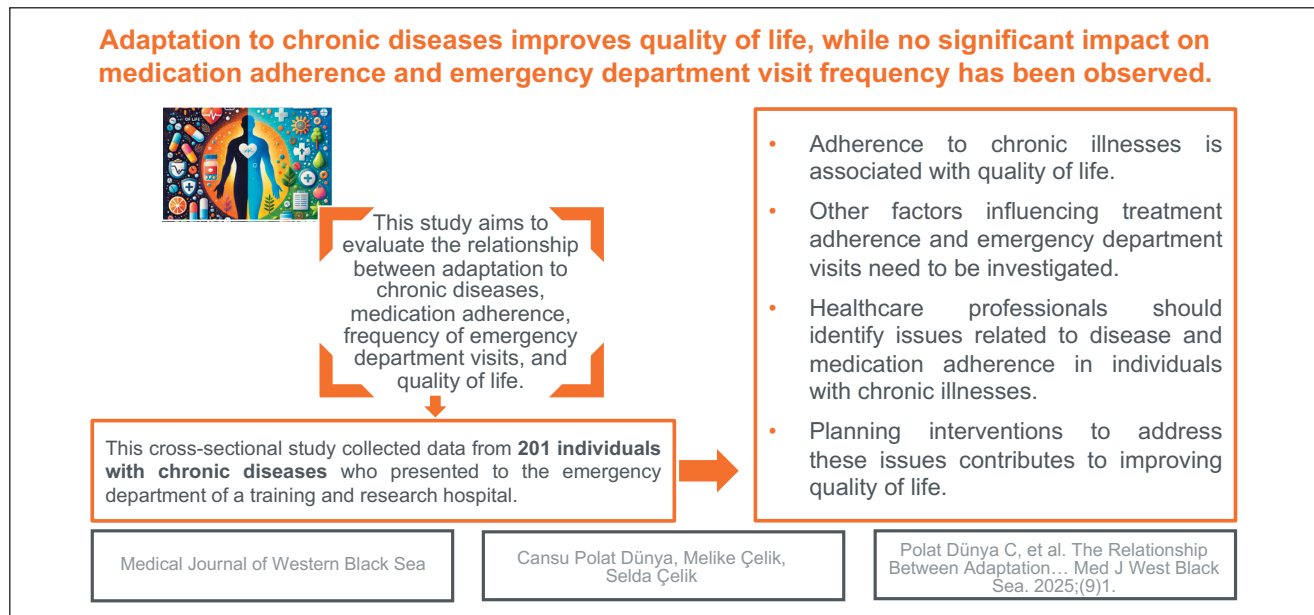[1]Istanbul University, Faculty of Nursing, Internal Medicine Nursing Department, Istanbul, Türkiye
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**GRAPHICAL ABSTRACT**



**Adaptation to chronic diseases improves quality of life, while no significant impact on medication adherence and emergency department visit frequency has been observed.**

This study aims to evaluate the relationship between adaptation to chronic diseases, medication adherence, frequency of emergency department visits, and quality of life.

This cross-sectional study collected data from **201 individuals with chronic diseases** who presented to the emergency department of a training and research hospital.

- Adherence to chronic illnesses is associated with quality of life.
- Other factors influencing treatment adherence and emergency department visits need to be investigated.
- Healthcare professionals should identify issues related to disease and medication adherence in individuals with chronic illnesses.
- Planning interventions to address these issues contributes to improving quality of life.

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**ABSTRACT**

**Aim:** The study aimed to determine how people with chronic diseases adapt to disease and treatment and examine the relationship between the frequency of emergency department visits and quality of life.
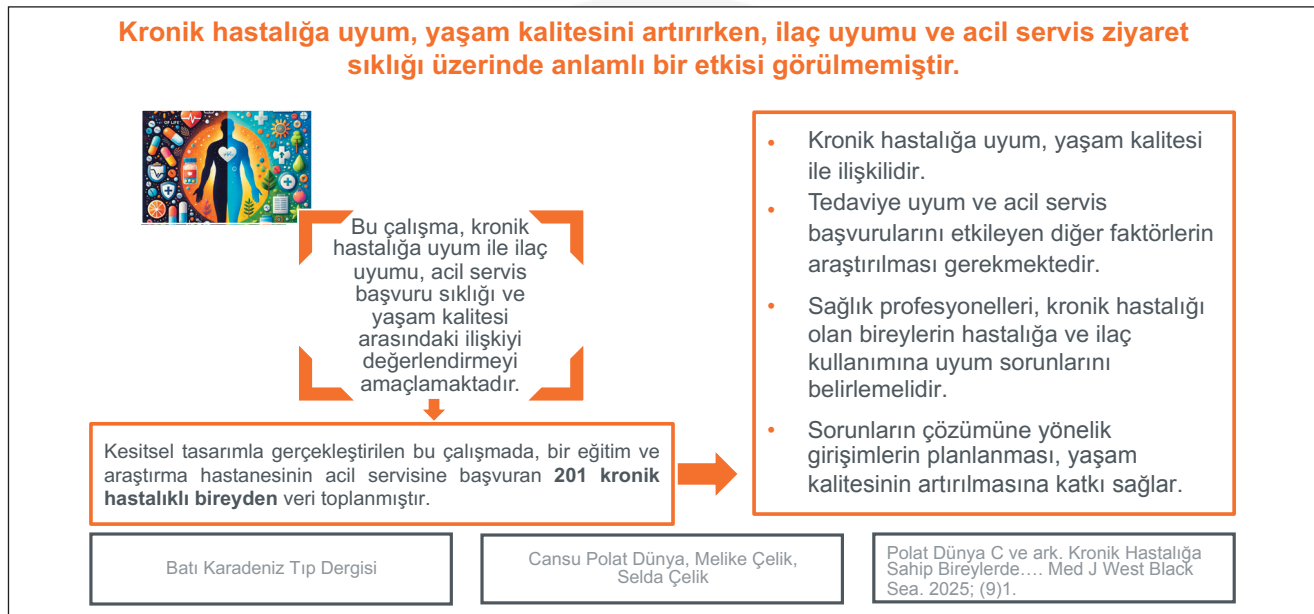
**Material and Methods:** This cross-sectional study was conducted with 201 people with chronic diseases admitted to the emergency department of a training and research hospital. Data were collected using the Patient Information Form, Adaptation to Chronic Diseases Assessment Scale, Morisky, Green, Levine Adherence Scale, and EuroQol-5D Quality of Life Scale.

**Results:** The mean age of the people with chronic diseases was 69.37±12.17 years. The three most common chronic diseases were hypertension 76.6%, diabetes mellitus 39.3%, and heart failure 27.9%. In the last year, 31.8% of the patients had visited the emergency department more than three times. The mean total score of adaptation to chronic diseases was 65.33±7.39, the mean medication adherence score was 1.97±0.73 and the mean quality of life score was 56.87±17.78. There was a relationship between adaptation to chronic diseases and quality of life (p<0.001). However, there was no relationship between adaptation to chronic diseases, medication adherence, and frequency of emergency department visits.

**Conclusion:** This study shows that adaptation to chronic disease is associated with quality of life and other factors affecting adherence to treatment and emergency department visits should also be investigated. Healthcare professionals' identification of problems of adaptation to disease and medication use in people with chronic diseases, and planning of interventions to address these problems, will contribute to improving quality of life.

**Keywords:** Adaptation, chronic disease, medication adherence, emergency department, quality of life

**GRAFİKSEL ÖZET**



### Kronik hastalığa uyum, yaşam kalitesini artırırken, ilaç uyumu ve acil servis ziyaret sıklığı üzerinde anlamlı bir etkisi görülmemiştir.

Bu çalışma, kronik hastalığa uyum ile ilaç uyumu, acil servis başvuru sıklığı ve yaşam kalitesi arasındaki ilişkiyi değerlendirmeyi amaçlamaktadır.

Kesitsel tasarımla gerçekleştirilen bu çalışmada, bir eğitim ve araştırma hastanesinin acil servisine başvuran **201 kronik hastalıklı bireyden** veri toplanmıştır.

- Kronik hastalığa uyum, yaşam kalitesi ile ilişkilidir.
- Tedaviye uyum ve acil servis başvurularını etkileyen diğer faktörlerin araştırılması gerekmektedir.
- Sağlık profesyonelleri, kronik hastalığı olan bireylerin hastalığa ve ilaç kullanımına uyum sorunlarını belirlemelidir.
- Sorunların çözümüne yönelik girişimlerin planlanması, yaşam kalitesinin artırılmasına katkı sağlar.

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## ÖZ

**Amaç:** Araştırmanın amacı, kronik hastalığa sahip bireylerin hastalığa ve tedaviye uyumlarının belirlenmesi, acil servise başvuru sıklığı ve yaşam kalitesi arasındaki ilişkinin incelenmesidir..

**Gereç ve Yöntemler:** Kesitsel nitelikte olan bu çalışma bir eğitim araştırma hastanesinin acil servisine başvuran kronik hastalığı olan 201 birey ile gerçekleştirildi. Veriler "Hasta Tanılama Formu", "Kronik Hastalıklara Uyumu Değerlendirme Ölçeği", "Morisky, Green, Levine Uyum Ölçeği" ve "EuroQol-5D Yaşam Kalitesi Ölçeği" kullanılarak toplandı.

**Bulgular:** Kronik hastalığı olan bireylerin yaş ortalaması 69,37±12,17 idi. En sık görülen ilk üç kronik hastalık %76,6 hipertansiyon, %39,3 diabetes mellitus ve %27,9 kalp yetersizliği idi. Hastaların son bir yıl içinde %31,8'inin üç defadan fazla acil servise başvurmuştu. Kronik hastalıklara uyum toplam puan ortalaması 65,33±7,39, ilaç uyumu puan ortalaması 1,97±0,73 ve yaşam kalitesi puan ortalaması 56,87±17,78 idi. Kronik hastalıklara uyum ile yaşam kalitesi arasında ilişki vardı (p<0,001). Ancak kronik hastalığa uyum ile ilaç uyum ve acil servise başvuru sıklığı arasında ilişki bulunmadı.

**Sonuç:** Bu çalışma, kronik hastalığa uyumun yaşam kalitesi ile ilişkili olduğunu, tedaviye uyum ve acil servis başvurularını etkileyen diğer faktörlerin de araştırılması gerektiğini göstermektedir. Sağlık profesyonellerinin kronik hastalığı olan bireylerin hastalığa ve ilaç kullanımına uyum sorunlarını belirlemeleri ve sorunların çözümüne yönelik girişimlerini planlamaları yaşam kalitesinin artırılmasına katkı sağlayacaktır.

**Anahtar Sözcükler:** Uyum, kronik hastalık, ilaç uyumu, acil servis, yaşam kalitesi

## INTRODUCTION

Chronic diseases are health problems that profoundly affect the quality of life of people and place a heavy burden on health systems. Diseases such as cardiovascular disease, diabetes, and respiratory disorders require long-term care and treatment. The impact of these diseases is not only limited to physical health but also significantly affects the overall well-being and quality of life of those affected (1,2). Managing chronic diseases involves a complex process that requires individuals to make substantial changes in their lives.

One of the most important factors in the successful management of chronic diseases is ensuring adaptation to the disease. Adaptation is the process of accepting changes in the internal and external environment and developing attitudes and behaviors appropriate to these changes (3). However, only a few studies have investigated adaptation to chronic disease (3-7). The adaptation process in people with chronic diseases is influenced by several factors, including cognitive and emotional status, disease severity and complications, knowledge and awareness about the disease, financial status, presence of social support, access to healthcare services, and treatment adherence (3,4). Among these factors, medication adherence plays a critical role in controlling chronic diseases. Regular and correct use of prescribed medications is a fundamental element of disease management. Poor medication adherence can lead to uncontrolled chronic diseases, resulting in acute exacerbations and disease-related complications (8,9). Furthermore, lack of access to appropriate outpatient care leads to more frequent emergency department visits, increasing the burden on emergency departments from individuals with chronic diseases (10,11). Therefore, it is of great importance to investigate the effects of disease and treatment adherence on the frequency of emergency department visits and quality of life in people with chronic diseases. A review of the literature shows that medication adherence and quality of life are often emphasized in people with chronic diseases (8,9). However, there is a limited amount of research on the relationship between chronic disease adherence to medication, frequency of emergency department visits, and quality of life (5,7,12).

The purpose of this study is to examine the relationship between adaptation to chronic diseases and medication adherence, frequency of emergency department visits, and quality of life in individuals with chronic diseases.

## MATERIALS and METHODS

### Research Design

The study is descriptive and cross-sectional in design. This study aimed to address the following research questions:

What is the relationship between adaptation to chronic diseases and medication adherence? How does adaptation to chronic diseases affect the frequency of emergency department visits? and What is the association between adaptation to chronic diseases and quality of life?

The population of the study consisted of individuals who met the inclusion criteria and visited the emergency department of a training and research hospital in Istanbul between October 2021 and May 2022. A purposive sampling method was used to select participants. The inclusion criteria included being 18 years of age or older, having at least one chronic disease, receiving multiple drug treatments, being able to communicate verbally, and volunteering to participate in the study. Individuals with severe cognitive problems were excluded. The study was concluded with 201 individuals due to reasons such as unwillingness to participate (inability to focus on the survey due to the urgency of their situation) and incomplete survey responses (Participation rate: 82%). Following data collection, a post-hoc power analysis was conducted to ensure that the study's sample size was sufficient to detect statistically significant results with a power of 95%, a significance level of 0.05, and an effect size of 0.45.

### Data Collection Tools

Patient information forms, Adaptation to Chronic Diseases Assessment Scale, Morisky, Green, Levine Adherence Scale, and EUROQOL 5D-Visual Analog Scale were administered to patients who met the study's inclusion criteria.

**Patient Information Form:** This form, which was prepared in line with the literature, includes questions on the socio-demographic characteristics (age, gender, income status, etc.) of individuals with chronic diseases and questions on disease diagnosis and treatment (3-7).

**Adaptation to Chronic Diseases Assessment Scale:** The scale was developed by Kacaroğlu and Birgili (3). The scale consists of 28 items and the responses are in triple Likert type (1=strongly agree, 2=undecided, 3=strongly disagree). The scale has four sub-dimensions: Physiological (4 items), Psychological (16 items), Social (5 items) and Spiritual (3 items). The score that can be obtained from the scale is in the range of 28-84. As the score obtained from the scale increases, the adaptation level of individuals to chronic diseases increases. In the Turkish version of the scale, the total Cronbach's alpha value was 0.83 (3). In this study, it was calculated as 0.80.

**Morisky, Green, Levine Adherence Scale:** This scale was developed by Morisky et al. to evaluate drug compliance (13). The status of believing in the benefit of treatment, the habit of taking medication on time, and the status of forgetting or stopping medication are questioned. The scale consists of four questions. In the evaluation of the answers given as "Yes" or "No"; in question 2, the yes answer is calculated as 1

point, and the no answer is calculated as 0 point; in the other questions, the yes answer is calculated as 0 points and no answer is calculated as 1 point. A high score indicates high medication compliance. In the Turkish adaptation study of the scale, Cronbach's alpha reliability coefficient was found to be 0.62 (14). In this study, the Cronbach's alpha reliability coefficient was found to be 0.68

**EUROQOL 5D-Visual Analog Scale:** It is a visual analog scale in which individuals give values between 0 and 100 about their current health status and mark it on a thermometer-like scale. A high score obtained from the scale indicates a high quality of life. In the Turkish adaptation study of the scale, Cronbach's alpha reliability coefficient was found to be 0.86 (15). In this study, the Cronbach's alpha reliability coefficient was found to be 0.83.

### Data Collection

Individual patient interviews conducted face-to-face were used to gather research data. Each patient was informed before the study, and their informed consent was obtained verbally and in writing to participate in the research.

### Ethical Considerations

Declaration of Helsinki principles were followed in the conduct of the study. Ethics committee permission was obtained from the Health Sciences University Hamidiye Scientific Research Ethics Committee (Date:21.09.2021 and Number:4656) Written and verbal "Informed Voluntary Consents" were obtained by explaining to the individuals who volunteered to participate in the research that the purpose of the study, all personal information would remain confidential, they could leave the research at their request and the research data would not be shared with anyone.

### Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences 21.0 (IBM Corp., Armonk, NY, USA). Descriptive statistical methods (Number, Percentage, Mean, Standard deviation) were used to evaluate the data. The normal distribution of the data was analyzed by Kolmogorov-Smirnov and Shapiro-Wilk tests. Kruskal-Wallis non-parametric tests were used to compare variables between groups in the case of more than two groups. When there was a significant difference between the groups, Dunn's post hoc test was used to determine which particular groups showed significance. The relationship between the variables of the study was tested by Spearman correlation analysis. The findings were evaluated at a 95% confidence interval and 5% significance level.

### RESULTS

The mean age of the people with chronic disease was 69.37±12.17 (Min-Max= 21-88) years. It was determined that 65.2% of the population was male, 69.7% had a primary school and lower education, 77.6% were married and 70.1% had moderate income (Table 1).

The most common chronic condition was hypertension, affecting 76.6% of participants, followed by diabetes mellitus (39.3%), heart failure (27.9%), arrhythmias (26.9%), COPD (9%), kidney failure (3.5%), and other diseases (9%). The mean number of chronic diseases was 1.92± 0.94 (Min-Max: 1-5). In terms of education about their disease, 67.7% had not received any training, while 32.3% had received training. When it comes to attending regular health check-ups, 51.7% of participants reported attending regularly, whereas 48.3% did not. Regarding emergency department visits in the past year, 68.2% visited 1-3 times, 18.9% visited 4-6 times, and 12.9% visited 7 or more times. The primary reason for visiting the emergency department was chest pain (81.6%), followed by getting an examination (12.4%), and other reasons such as prescribing medication (6%) (Table 2).

The mean total score of adaptation to chronic diseases was found to be 65.33±7.39. It was observed that 80.6% of the patients had moderate medication adherence. The mean quality of life score was 56.87±17.75 (Table 3).

A positive and significant relationship was found between the total and subscale scores of the chronic disease adaptation assessment scale and quality of life. There is a moderate, positive, and statistically significant relationship between physiological adaptation (rho = 0.312, p = 0.014) and psychological adaptation (rho = 0.353, p <0.001) with quality of life. Social adaptation (rho = 0.246, p <0.001) and spiritual adaptation (rho = 0.139, p = 0.048) show a weak but statistically significant positive relationship with quality of life. There was no significant relationship between adherence to chronic diseases and medication adherence (Table 4).

**Table 1.** Distribution of sociodemographic characteristics of people with chronic diseases

| Distribution of sociodemographic characteristics | | Findings (n=201) |
|---|---|---|
| Gender, n (%) | Female | 70 (34.8) |
| | Male | 131 (65.2) |
| Education status, n (%) | Primary school and lower education | 140 (69.7) |
| | High school | 34 (16.9) |
| | University and higher education | 27 (3.4) |
| Marital status, n (%) | Married | 156 (77.6) |
| | Single | 45 (22.4) |
| Income status, n (%) | Income > expenses | 22 (11) |
| | Income = expenses | 141 (70.1) |
| | Income < expense | 38 (18.9) |

The present study analyzed adaptation to chronic diseases based on various disease characteristics. There was no significant difference in adaptation levels among individuals who visited the emergency department 1-2 times (65.16±7.49), 4-6 times (66.23±6.22), or 7 or more times (64.92±8.53) within the past year (KW = 0.158, p = 0.924). However, we found a statistically significant difference when examining adaptation levels based on the reasons for emergency department visits. A post hoc Dunn's test was conducted to determine which groups differed from

each other. The results showed that individuals visiting for examinations (68.64±5.80) had significantly higher adaptation levels compared to those visiting due to chest pain (64.77±7.39) (p < 0.05). No significant difference was found between other groups (KW = 2.789, p = 0.044).

## DISCUSSION

In this study, adaptation to chronic diseases was found to be associated with quality of life. However, it was observed that adaptation to chronic diseases did not make a significant difference on medication adherence and frequency of emergency department visits. In this context, our study emphasizes the importance of adaptation to chronic diseases in improving quality of life in the management of chronic diseases, but other factors affecting adherence to medication and emergency department visits should also be investigated.

Adaptation to chronic diseases has a critical importance in terms of controlling the disease, improving quality of life, preventing complications, protecting psychological and emotional health, and reducing health-related costs (3,4). For this purpose, the adaptation scale for chronic diseases developed by Kacaroglu and Birgili (3) guides in determining adaptation problems. In this study, it was found that the adjustment levels of individuals with chronic diseases were above the average (65.33±7.39). In the literature, it is supported by similar findings that the adjustment levels of individuals with different chronic diseases are above the average (5-7). These findings highlight the importance of tools for assessing patients' adaptation levels in clinical practice and provide healthcare professionals with the opportunity to develop care plans tailored to patients' needs. Strategies to enhance adaptation levels can be strengthened through initiatives such as patient education and support groups, contributing to the improvement of patient's quality of life. In this way, healthcare professionals can play a more effective role in chronic disease management and help patients cope with the challenges they face in their daily lives.

**Table 2.** Distribution of disease characteristics of people with chronic diseases

| Distribution of disease characteristics | | Findings (n=201) |
|---|---|---|
| Chronic Diseases*, n (%) | Hypertension | 154 (76.6) |
| | Diabetes mellitus | 79 (39.3) |
| | Heart failure | 56 (27.9) |
| | Arrhythmias | 54 (26.9) |
| | COPD | 18 (9) |
| | Kidney failure | 7 (3.5) |
| | Other | 18 (9) |
| Receiving education about the disease, n (%) | Yes | 65 (32.3) |
| | No | 136 (67.7) |
| Attending regular health check-ups, n (%) | Yes | 104 (51.7) |
| | No | 97 (48.3) |
| Number of visits to the emergency department in the last year, n (%) | 1-3 times | 137 (68.2) |
| | 4-6 times | 38 (18.9) |
| | 7 ve above | 26 (12.9) |
| Reason for visiting the emergency department in the last year, n (%) | Chest pain | 164 (81.6) |
| | Getting examination | 25 (12.4) |
| | Other (prescribing medication etc.) | 12 (6) |

* More than one option was selected; **COPD:** Chronic Obstructive Pulmonary Disease

**Table 3.** Mean scores of adaptation to diseases, medication adherence, and quality of life of people with chronic diseases

| Scores | | Values (n=201) |
|---|---|---|
| Adaptation to Chronic Diseases* | Total | 65.33±7.39 (44-80) |
| | Physiological | 9.79±1.79 (4-12) |
| | Psychological | 35.60±5.04 (24-48) |
| | Social | 12.40±2.37 (5-15) |
| | Spiritual | 7.54±1.81 (3-9) |
| EQ-5D $_{VAS}$* | | 56.87±17.78 (10-100) |
| Medication adherence* | Total | 1.97±0.73 (0-4) |
| | | n (%) |
| | Low (0 point) | 6 (3) |
| | Moderate (1-2 points) | 162 (80.6) |
| | High (3-4 points) | 33 (16.4) |

**EQ-5D$_{VAS}$:** EUROQOL 5D-Visual Analog Scale, *Min-Max: Minimum-Maximum, **SD:** Standard Deviation

**Table 4.** The relationship between adaptation to diseases, medication adherence, and quality of life in people with chronic diseases

| Adaptation to Chronic Diseases | Medication Adherence | | EQ-5D$_{VAS}$ | |
|---|---|---|---|---|
| | rho | p | rho | p |
| Physiological | -0.014 | 0.841 | 0.312 | 0.014 |
| Psychological | 0.027 | 0.706 | 0.353 | <0.001 |
| Social | 0.077 | 0.276 | 0.246 | <0.001 |
| Spiritual | -0.022 | 0.761 | 0.139 | 0.048 |
| Total | 0.023 | 0.742 | 0.380 | <0.001 |

**EQ-5D$_{VAS}$:** EUROQOL 5D-Visual Analog Scale, Spearman correlation, p < 0.05

Medication adherence in chronic diseases is a critical factor that directly affects the health outcomes of patients (8). Medication adherence requires taking medications at the right dose, at the right time, and regularly and is affected by various factors. In the literature, although adherence to chronic diseases is generally considered as medication adherence, studies frequently focus on specific diseases such as hypertension, diabetes, and renal diseases (8,16). In this study, it was found that 80.6% of individuals with different chronic diseases had moderate medication adherence. A comprehensive study by Garcia et al. found that 72.2% of patients with chronic heart disease were moderate/good adherent (17). In the literature, there are studies indicating that people with chronic disease have high medication adherence as well as studies reporting poor medication adherence (18,19). Adaptation to chronic disease covers a wide range and includes individual characteristics, level of awareness, and psychosocial and spiritual factors (3,4). In this study, no relationship was found between medication adherence and adaptation to general disease, and this may have resulted from the fact that the two types of adaptation have different components. Therefore, it is important that healthcare professionals evaluate patients in a comprehensive and individualized manner and question both disease and medication adherence in routine examinations.

Management of chronic diseases is closely related directly with the quality of life of patients (18). In people with various chronic diseases such as hypertension, diabetes mellitus, chronic obstructive pulmonary disease, and renal failure, compliance with treatment is associated with quality of life (20-22). The positive relationship between adaptation to chronic diseases and quality of life occurs when patients improve their physical, psychological, and social lives (3-4). In this study, a significant relationship was observed between adaptation to chronic diseases and quality of life, which supports these findings. This shows that increasing adaptation to chronic diseases is an important factor in improving the quality of life of individuals. Factors such as education, motivation, and social support can contribute to the improvement of quality of life by promoting adaptation to chronic diseases. Therefore, healthcare professionals should be aware that chronic disease adaptation is associated with quality of life and reflect this awareness in health policies and programs. Developing strategies to increase adherence to chronic diseases will make significant contributions to the improvement of public health.

The management of chronic diseases is directly related to patients' quality of life (18). Studies have shown that adherence significantly improves the quality of life in chronic conditions such as hypertension, diabetes, chronic obstructive pulmonary disease, and kidney failure (20-22). Specifically, individuals who demonstrate high adherence to treatment experience positive benefits, including reduced physical symptoms, improved psychological well-being, and increased social participation. Chantzaras and Yfantopoulos (23) reported that diabetic patients who adhered to their treatment regimens showed significant improvements in both glycemic control and quality of life. Similarly, Jarab et al. (24) noted that individuals with chronic obstructive pulmonary disease who regularly took their medications and made lifestyle changes experienced reduced disease severity, thereby improving their quality of life. In this study, a significant relationship was found between adaptation to chronic diseases and quality of life, suggesting that patients can improve their quality of life by enhancing their physical, psychological, and social well-being. In this context, it is crucial to regularly assess patients' treatment adherence levels in clinical practice and develop personalized care plans. Health policies should promote the expansion of educational and counseling services tailored to the needs of individuals with chronic diseases. Additionally, strengthening support systems by forming multidisciplinary teams that include nurses, psychologists, dietitians, and social workers can offer an effective approach to enhancing patients' quality of life. Such strategies can help healthcare professionals develop more effective treatment processes and improve overall public health.

Since chronic diseases are conditions that require long-term and complex health management, different symptoms, acute changes, and various complications may be frequently observed in the health status of patients. It has been reported that approximately 40% of patients presenting to the emergency department are elderly and have chronic diseases (10,11). The reasons for presenting to the emergency department are quite diverse, including preventable presentations due to non-urgent problems (25). However, one of the surprising findings of our study was that there was no correlation between the frequency of emergency department visits and hospitalization status of individuals with chronic disease in the last year and their adaptation to chronic disease. This finding may have resulted from the lifestyle, socioeconomic status, access to the healthcare system, comorbidities (other comorbidities), and crises. These findings suggest that a more comprehensive and multifaceted approach is required in the health management of individuals with chronic diseases. Additionally, the relationship between adaptation and medication adherence can be influenced by factors such as personal motivation, psychosocial support, and disease awareness. Adaptation involves the strategies patients use to manage their illness, while medication adherence pertains to their commitment to the treatment regimen (3,8). These two processes have different components, requiring healthcare professionals to consider both when developing personalized care plans.

Our study has some limitations. Firstly, due to the cross-sectional design of the study, our sample was limited to patients in a specific region and data were collected from only one hospital, which limits the generalizability of the findings. In addition, the fact that our study was conducted in a certain period may have caused the long-term changes in the course of chronic disease and fluctuations in the level of adaptation to chronic disease to be overlooked. Adjustment to chronic illness may change over time and longer follow-up studies are needed to fully understand these dynamics. Future research needs to examine these relationships in more depth with larger and more diverse samples, longitudinal designs, and controllable variables. Recognizing these limitations is important for interpreting the findings and guiding future studies.

In conclusion, this study found that adaptation to chronic diseases is associated with quality of life, but not with medication adherence and the frequency of emergency department visits. These findings emphasize the importance of adherence to the disease in improving quality of life and suggest that other factors affecting adherence to treatment and emergency department visits should be investigated. It is anticipated that this study will raise awareness among healthcare professionals and people with chronic diseases about the importance of adaptation and guide the development of effective strategies for managing chronic diseases.

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