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Examination of Variables Related to Disease Adaptation of Adults Diagnosed with Non-communicable Diseases

Bulaşıcı Olmayan Hastalık Tanısı Alan Yetişkin Bireylerin Hastalığa Uyumla İlişkili Değişkenlerin İncelenmesi

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Abstract

Aim: This study aims to examine the level of adjustment to illness of adults with at least one non-communicable disease (NCD) in Antalya and some socio-demographic characteristics and health history-related factors that may be related to adjustment to illness.

Methods: This descriptive study included 329 individuals diagnosed with at least one NCD. Data were collected using the descriptive characteristics form and the Adaptation to Chronic Illness Scale (ACIS).

Results: The participants' mean age was 58.76 ± 6.79 years; 62.6% were female, and 28.0% had a low-income level. Most participants had cardiovascular disease (71.7%) and diabetes (59.6%), while 26.1% had respiratory diseases and 3% had cancer. Their mean total ACIS score was 100.01 ± 11.08. The level of adjustment to illness of individuals with NCDs was significantly associated with having respiratory disease, regular health checks, regular drug use, and the general status (perceived health, quality of life) and psychological dimensions of the World Health Organization Quality of Life-BREF Turkish Version (WHOQOL-BREF-TR) (p <0.05).

Conclusions: The participants' mean total ACIS score was above average. Healthcare professionals in family health centers should identify at-risk individuals with low adjustment to their NCD and train them according to their needs.

Keywords: Adaptation, noncommunicable diseases, patient, primary health care

Özet

Amaç: Bu çalışmada Antalya'da bir aile sağlığı merkezine (ASM) kayıtlı en az bir bulaşıcı olmayan hastalık (BOH) tanısı olan yetişkin bireylerin hastalığa uyum düzeyi ve hastalığa uyumla ilişkili olabilecek bazı sosyodemografik özellikler ve sağlık öyküsü ile ilişkili faktörleri incelemek hedeflenmiştir.

Yöntem: Tanımlayıcı tipte olan çalışmaya en az bir BOH tanısı olan 329 birey alınmıştır. Veriler; demografik özellikler, sağlık öyküsü formu ve Kronik Hastalığa Uyum Ölçeği (KHUÖ) ile toplandı.

Bulgular: Katılımcıların yaş ortalaması 58,76±6,79 olup, %62,6'sı kadın, %53,8 'i ilkokul mezunu ve %28'inin gelir düzeyi düşüktür. Katılımcıların çoğunda kalp-damar hastalığı (%71,7) ve diyabet (%59,6) bulunurken, %26,1'inde solunum yolu hastalıkları ve %3'ünde kanser vardı. Çalışmamızda KHUÖ toplam puan ortalaması 100,01±11,08'dır. BOH'lu bireylerin hastalığa uyum düzeyi ile solunum yolu hastalığına sahip olma, sağlık kontrollerini düzenli yaptırma, sürekli ilaç kullanıma ve Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeği Türkçe Formu (WHOQOL-BREF-TR)'nun genel durum (algılanan sağlık, yaşam kalitesi) ve psikolojik boyutu düzeyleri anlamlı şekilde ilişkilidir (p<0,05).

Sonuç: Katılımcıların hastalığa uyum toplam puan ortalaması ortalamanın üzerindedir. ASM'de görevli sağlık çalışanları tarafından BOH'a uyum düzeyi düşük olan riskli bireylerin belirlenerek, gereksinimlerine uygun eğitim verilmesi önerilmektedir.

Anahtar Kelimeler: Uyum, bulaşıcı olmayan hastalıklar, hasta, birincil sağlık bakımı

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Introduction

Non-communicable diseases (NCDs) tend to be long-lasting and are caused by a combination of genetic, physiological, environmental, and behavioral factors. The main types of NCDs are cardiovascular diseases (such as heart attack and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease [COPD] and asthma), and diabetes.[1,2] NCDs are the leading cause of mortality worldwide, with over three-quarters of global NCD-related deaths occurring in low- and middle-income countries.[1,3] NCD expenditures constitute the heaviest economic costs to these countries.[3]

Cardiovascular diseases are the leading cause of NCD-related deaths globally, accounting for 17.9 million, followed by cancer (9.3 million), chronic respiratory diseases (4.1 million), and diabetes (2.0 million). These four disease groups account for >80% of all early NCD-related deaths, and most health expenditures result from the diseases in these groups.[1] NCDs cause 89% of deaths in Türkiye.[4] Most of these deaths are caused by cardiovascular diseases (36%), followed by cancer (28%), respiratory diseases (7%), and diabetes (6%).[5]

NCDs decrease an individual's independence and restrict their social activities and health perception. They also cause physical, psychological, social, and economic problems for the patient and their families.[6,7] Therefore, combating NCDs can improve population health and the economy.[3] The individual's disease adaptation may affect all factors related to their disease and treatment.[8] Adaptation problems experienced by patients during the NCD process may prevent managing their NCD effectively and reaching the desired goals, which may increase their frequency of hospitalization, risk of developing complications, and related mortality.[7,9]

Some studies have shown that the disease adaptation of individuals with NCDs is adversely affected by disease symptoms and treatment, how the individual perceives the disease, inability to perform daily living activities, changes in body image, deterioration of family relationships, and fear of death.[10-13] Individuals with NCDs are expected to make considerable lifestyle changes to minimize the impact of these factors and control the disease process. Developing and maintaining lifestyle behaviors require long-term support and counseling.[6,7] It is first necessary to understand a patient's beliefs, attitudes, behaviors, and fears regarding their disease to enable them to adapt to their disease. Understanding difficulties in adapting to a disease, developing appropriate coping strategies, and planning supportive care interventions is vital for the quality of life of individuals with NCDs.[14] Determining the disease adaptation levels of individuals with NCDs, and the influencing factors can guide interventional studies planned to reduce the adverse effects of the disease process, care costs, and comorbid conditions. This study was planned to examine the disease adaptation of individuals with at least one NCD diagnosis registered at an FHC in Antalya province and some variables (demographic and health history) likely to be associated with disease adaptation.

Methods

Study Design

This study used a descriptive cross-sectional design. It was conducted with 329 patients between January and June 2021 at Dt. Selahattin Topçu Family Health Center (FHC) No. 17 in Antalya province, the largest city in the Southwest of Türkiye. This FHC is a primary healthcare institution where individuals with different socioeconomic levels and economic incomes first attend to receive health services.

Study Population and Sample

The research population comprised 8,152 individuals aged 30–70 diagnosed with NCDs and registered at the stated FHC. The inclusion criteria were (i) registered with the FHC, (ii) diagnosed with an NCD at least three months ago (diabetes, COPD, asthma, respiratory allergies, occupational lung diseases, pulmonary hypertension, coronary artery disease, cerebrovascular disease, rheumatic heart disease, peripheral heart disease, congenital heart disease, hypertension, deep vein thrombosis and pulmonary embolism, and cancer), (iii) aged 30–70 years, (iv) ability to understand and speak Turkish, and (v) volunteering to participate in this study. The study's sample size was calculated using the formula in which the incidence of an event is examined and the number of individuals in the population is known [15]:

$$n = \frac{N z^2 \sigma^2}{d^2(N-1) + z^2\sigma^2}$$

Therefore, the sample size was calculated to be 320.11 subjects, considering the variance of the mean chronic disease adaptation score in the study by Atik and Karatepe (σ = 7.45; 14) and a 95% confidence interval (N = 8.152, z = 1.96, d = 0.8). This study included 329 individuals with NCDs who met the study inclusion criteria.

Data Collection Tools
Data were collected using descriptive characteristics form and the World Health Organization Quality of Life-BREF Turkish Version (WHOQOL-BREF-TR).

Descriptive Characteristics Form
This form was designed after reviewing the literature and included questions about participants' demographic characteristics and health history.[16-19] Among the demographic characteristics, age was evaluated as a continuous variable, and sex, marital status, number of children, education level, perceived income, and duration of residence in Antalya were evaluated as categorical variables. Participants' health history was evaluated based on weight and height (body mass index [BMI]), smoking and alcohol use status, physical disability status, presence of an NCD, diagnosis duration, regular medication use, and regular health check status. Weight, height, diagnosis duration, and other open-ended questions were asked categorically. BMI was calculated using the formula "weight (kg) / [height (m)]^2" .[20] BMI was categorized according to the WHO classification.[21] In this section, patients' quality of life (one question), perceived health (one question), and psychological health (six questions) were evaluated using the domains taken from the WHOQOL-BREF.
The WHOQOL-BREF comprises two questions on quality of life (one question) and perceived health (one question) and four domains elected from the WHOQOL-100 scale, which comprises 100 questions.[22] This five-point Likert-type scale, adapted to Turkish by Eser et al.[23], comprises 26 questions. The scale's four domains are physical well-being (seven questions), psychological health (six questions), social relations (three questions), and environmental (eight questions). The scores of the first two general questions (quality of life and perceived health) and the physical, psychological, social, and environmental domains vary from 20% to 100%; as the score increases, the quality-of-life increases. This scale's Cronbach's alpha coefficient was reported as 0.76, 0.67, 0.56, and 0.74 for the physical, psychological, social relations, and environmental domains, respectively.[23]
This study used the "quality of life" and "perceived health" items and the psychological domain items (5, 6, 7, 11, 19, and 26) of the WHOQOL-BREF-TR. The scale's psychological domain is used to evaluate positive emotions, thinking, learning, self-esteem, and body image. In this study, the Cronbach's alpha coefficient of the psychological domain was 0.85.

Adaptation to Chronic Illness Scale (ACIS)
Atik and Karatepe developed the ACIS to evaluate the disease adaptation level of patients diagnosed with NCDs.[14] It comprises 25 items and three sub-dimensions: physical adaptation (items 1, 9, 10, 13, 14, 15, 16, 18, 22, 23, and 24; 11–55 points), social adaptation (items 2, 3, 5, 7, 17, 19, and 25; 7–35 points), and psychological adaptation (items 4, 6, 8, 11, 12, 20, and 21; 7–35 points). It uses a five-point Likert-type scale, and some items are reverse-coded. Its maximum total score is 125. Increases in subscale and/or total scale scores indicate increases in patient disease adaptation levels. The Cronbach's alpha for the total scale was 0.88 in the original study[14] and 0.71 in this study.

Data Analysis
The data of the 329 individuals were analyzed using the IBM SPSS Statistics version 23.0. Percentages and arithmetic mean, minimum, and maximum values were calculated to describe the descriptive data (demographic information and WHOQOL-BREF-TR health history, quality of life, perceived health, and psychological domains). The normality of the variables was examined using the Kolmogorov–Smirnov test and skewness and kurtosis values. The Mann–Whitney U test and the Kruskal-Wallis H-test were used to compare the mean ACIS score and categorical variables. When there was a significant difference in the Kruskal-Wallis H-test, we used pairwise corrected comparisons according to Dunn-Bonferroni. The relationships between the mean adaptation to chronic illness scale score and age and WHOQOL-BREF-TR (quality of life, perceived health, and psychological domains) were evaluated using Pearson's product-moment correlation coefficient (r). The r value was interpreted as weak ($r < 0.3$), moderate ($0.3 < r < 0.7$), and strong ($r > 0.7$).[24] The effects of the significant variables in these analyses on adaptation to chronic illness were evaluated using multiple linear regression analysis. The statistical significance level was set as $p < 0.05$.
Ethical Considerations: Before starting this study, it was approved by the Akdeniz University Faculty of Medicine Clinical Research Ethics Committee (approval no: 70904504/512) and the Antalya Provincial Health Directorate. In addition, participants' informed consent was obtained.

Results

The participants' mean age was 58.76 ± 6.79 years; 62.6% were female, 53.8% were primary school graduates, 72% had an equal or greater income than their expenses, 71.7% had cardiovascular disease, 97.6% used medications regularly, and 94.5% underwent regular health checks. The mean total ACIS score of the participants with NCDs was 100.01 ± 11.08 (Table 1).

In our study, a highly significant ($p < 0.001$) but weak negative correlation existed between age and the mean total ACIS score (Table 1). As seen in Table 1, mean ACIS scores were higher among participants with two or fewer children than those with three or more, with equal or greater income than those with less income than their expenses ($p < 0.05$). In addition, mean ACIS scores were higher among participants with high school and above education than those with primary school and below education, and who were civil servants than those with other professions ($p < 0.05$; Table 1). However, the participants' mean total ACIS scores did not differ significantly by marital status, family type, and duration of residence in Antalya ($p > 0.05$; Table 1).

Table 1. *The relationship between the participants' demographic characteristics and the ACIS average scores.*

Descriptive characteristics		**Total sample**		**ACIS**	**Statistic**
		N	%	Mean ± SD	
Age (mean ± SD)		58.76±6.79		100.01±11.08	R: -0.196 P: 0.000**
Sex	Female	206	62.6	99.97±11.90	U: 12112.0 P: 0.504
	Male	123	37.4	100.08±9.60	
Education status	Primary school	177	53.8	98.03±11.83	KW: 9.589 [a]P: 0.008**
	Secondary school	75	22.8	101.66±9.86	
	High school and above	77	23.4	102.97±9.51	
Marital status	Single or divorced	32	9.7	98.62±12.58	U: 4536.0 P: 0.672
	Married	297	90.3	100.16±10.92	
Number of children	≤ 2	181	55.0	100.91±11.63	U: 11487.0 P: 0.026
	≥ 3	148	45.0	98.91±10.30	
Profession	Laborer	23	7.0	94.60±11.94	KW: 8.53 P: 0.036*
	Civil servant	21	6.4	103.57±11.37	
	Freelance	195	59.3	99.71±11.25	
	Retired	90	27.4	101.23±10.01	
Perceived income	Income < expenditure	92	28.0	96.43±13.31	U: 8841.5 P: 0.008**
	Income = expenditure or Income > expenditure	237	72.0	101.40±9.77	
Family type	Nuclear family	326	99.1	99.98±11.12	U: 404.5 P: 0.606
	Extended family	3	0.9	103.66±6.11	
Duration of living in Antalya	<5 years	31	9.4	100.80±11.54	U: 4390.5 P: 0.650
	≥ 5 years	298	90.6	99.93±11.05	

ACIS: the Adaptation to Chronic Illness Scale, KW: Kruskal-Wallis test; U: Mann-Whitney U test; [a]Dunn–Bonferroni test, SD: Standart deviation *p<0.05;**p<0.01.

In addition, mean total ACIS scores were higher among participants without respiratory disease, who used medication regularly, and who underwent regular health checks ($p < 0.05$; Table 2). However, participants' mean total ACIS scores did not differ significantly by BMI, tobacco and alcohol use, cardiovascular disease presence, cancer status presence, diabetes presence, disease diagnosis duration, and physical disability ($p > 0.05$; Table 2).

A highly significant moderate positive correlation existed between the mean total ACIS score and the scores of the quality of life (r=0.445; p=0.000), perceived health (r=0.405; p=0.000), and psychological domains (r=0.503; p=0.000) of the WHOQOL-BREF-TR (Table 2).

Table 2. *The relationship between the participant's health history and the average of their ACIS scores.*

Health history	**Total sample**		**ACIS**	**Statistic**	
	N	**%**	**Mean±SD**		
BMI					
Normal weight	37	11.2	98.45±13.56	KW: 5.487	
Overweight	211	64.1	101.72±8.74	P: 0.064	
	81	24.6	96.29±14.06		
Obese					
Yes	42	12.8	98.023±14.12	U: 5640.50	
No	287	87.2	100.31±10.56	P: 0.502	
Alcohol use					
Yes	9	2.7	96.00±14.43	U: 1202.50	
No	320	97.3	100.13±10.98	P: 0.398	
Cardiovascular disease					
Yes	236	71.7	99.77±10.43	U: 9954.00	
No	93	28.3	100.62±12.63	P: 0.189	
Cancer					
Yes	10	3.0	93.40±15.09	U: 1172.00	
No	319	97.0	100.22±10.90	P:0.153	
Respiratory disease					
Yes	86	26.1	96.06±11.93	U:7547.00	
No	243	73.9	101.41±10.44	P:0.000**	
Diabetes					
Yes	196	59.6	100.40±11.56	U:11827.00	
No	133	40.4	99.45±10.35	P:0.154	
Disease diagnosis time					
3 -12 months	12	3.6	98.91±17.70	U:1682.00	
> 1 year	317	96.4	100.05±10.79	P:0.496	
Regular medication use					
Yes	321	97.6	100.33±10.70	U:762.00	
No	8	2.4	87.37±18.36	P:0.049*	
Regular health checks					
Yes	311	94.5	101.33±9.66	U:247.00	
No	18	5.5	77.27±9.40	P:0.000**	
Physical disability					
Yes	23	7.0	101.26±11.09	U:3377.00	
No	306	93.0	99.92±11.09	P:0.747	
WHOQOL-BREF-TR Quality of life Min-max (20-100) (mean ± SD)			75.74±18.11	100.01±11.08	R:0.445
					P:0.000**
WHOQOL-BREF-TR Perceived health Min-max (20-100) (mean ± SD)			73.06±18.82	100.01±11.08	R:0.405
					P:0.000**
WHOQOL-BREF-TR Psychological dimension Min-max (20-100) (mean ± SD)			84.90±13.41	100.01±11.08	r:0.503
					P:0.000**

ACIS: the Adaptation to Chronic Illness Scale, BMI: Body mass index, WHOQOL-BREF-TR: the World Health Organization Quality of Life-BREF Turkish Version, KW: Kruskal-Wallis test; U: Mann-Whitney U test; SD: Standard Deviation, r: Pearson's correlation coefficient; *p<0.05; **p<0.01.

The multiple linear regression analysis indicated that the independent variables explained 52.4% of the variance in the ACIS scores in a significant regression model (p <0.001). The mean total ACIS score was affected by having a respiratory tract disease, having regular health checks, and the quality of life, perceived health, and psychological domains of the WHOQOL-BREF-TR (p < 0.001). The total ACIS score was also affected by regular medication use at a marginal significance level (p = 0.052). The total ACIS score was unaffected by the other variables included in the model (p > 0.05; Table 3).

Table 3. *Multiple linear regression analysis of factors associated with adaptation to chronic disease.*

Variables	**β***	**t**	**P**	**%95 CI**	**Statistics**
Age	-0.065	-1.548	0.123	-0.24 - 0.02	R =0.735 Adjusted R^2 = 0.524 F=33.864 P<0.001*
Having children	-0.033	-0.797	0.426	-2.53- 1.07	
Perceived income	0.053	1.202	0.230	-0.83-3.45	
Respiratory disease	-0.136	-3.445	0.001	-5.39-(-1.47)	
Regular drug use	-0.080	-1.948	0.052	-11.53-0.05	
Regular health checks	-0.277	-6.311	0.001	-17.70-(-9.28)	
Education status	-0.047	-1.147	0.252	-2.85-0.75	
Profession	-0.061	-1.550	0.122	-5.96-0.70	
WHOQOL-BREF-TR Quality of life	0.136	2.552	0.011	0.01- 0.14	
WHOQOL-BREF-TR Perceived health	0.144	2.937	0.004	0.02- 0.14	
WHOQOL-BREF-TR Psychological dimension	0.329	6.027	0.000	0.18-0.36	

WHOQOL-BREF-TR: the World Health Organization Quality of Life-BREF Turkish Version,
β: Standartize Beta Confficient; CI: Confidence Interval; *p<0.01.
Coding variables for analysis: Having children 3 and above =1. 2 and below =0; 1= Income is less than an expense. 0= Income is equal to expense or more than expense; Respiratory diseases having=1. not having=0; Regular drug use yes=0. no=1; Regular health checks yes=0 no=1; Primary school graduates =1. Secondary school =0. High school and above =0; Laborer =1. Self-employment =0. Civil servant =0. Retired=0.

Discussion

Caring for individuals with NCDs requires jointly considering their physical, psychological, and social aspects. Evaluating the disease adaptation of individuals with NCDs in primary care is vital for managing their disease. This study examined the disease adaptation of middle-aged and older individuals with NCDs. It found significant relationships between disease adaptation and having a respiratory tract disease, having regular health checks, regular medication use, and the WHOQOL-BREF-TR perceived health, quality of life, and psychological domains.
In this study, patients' adaptation to chronic illness was good, consistent with the study by Atik and Karatepe.[14] In different studies conducted with patients with chronic disease, the total ACIS scores were slightly above average.[25,26] Another study conducted only with individuals with diabetes found their level of adaptation to chronic illness to be slightly above average.[27] No international studies have evaluated the level of adaptation to chronic illnesses; most separately evaluated medication adherence, treatment adherence, and mental status.[18,28-30] For

example, Bryant et al.[28] found that individuals with COPD had a low level of medication adherence. A study in India found that medication adherence was low in 63% of individuals with chronic diseases, moderate in 35%, and high only in 1.66%. A study conducted in primary care found that 55% of individuals with chronic diseases adhered to treatment.[29] Another study indicated that the psychosocial adaptation of elderly patients with heart failure was poor and associated with their quality of life.[31] Studies conducted in Türkiye have observed that patients' adaptation to chronic diseases was good. On the other hand, it was noticed that compliance was at low or moderate levels in international studies on medication adherence.

In this study, the quality of life, perceived health, and psychological domains of the WHOQOL-BREF-TR were found to be at a good level. A study in Türkiye found that the general health and psychological levels of individuals with colorectal cancer were below average.[32] In two different studies, the mean scores for the psychological domain of the WHOQOL-BREF-TR were at a good level.[33,34] A study in Iran showed that the psychological domain level was higher in healthy individuals than in those with diabetes. A study in Saudi Arabia indicated that the quality of life was lower for individuals with than without chronic diseases.[35] The WHOQOL-BREF-TR domain scores of the patients in our study are at a better level than those in other studies.

In this study, the level of adaptation to chronic diseases was higher among individuals with a smaller number of children, with a higher level of education and income, who were civil servants, without respiratory disease, who used medication regularly, and who underwent regular health checks. In addition, the correlation analysis showed that as age increased, adaptation to chronic illness decreased, and the scores for the general status (quality of life and perceived health) and psychological domain of the WHOQOL BREF-TR increased. The regression analysis showed that adaptation to chronic illness was affected by having respiratory tract disease, having regular health checks, using medications regularly, and the WHOQOL-BREF-TR quality of life, perceived health, and psychological domains.

This study found that individuals with respiratory diseases had lower adaptation levels than those without respiratory diseases. Obtaining results that differed from the expected outcome in our study suggested that patients' disease adaptation was adversely affected by prolonged administering inhaler drugs with a loud device, the difficulty of moving the device, and its high cost.

Our study found that individuals who underwent regular health checks and used medications regularly had good levels of adaptation to their NCDs indicating that our expected hypothesis was supported. A different study in which the disease adaptation of patients with chronic illnesses was close to a good level found that 68% fully adhered to their treatments.[27] It is believed that undergoing health checks more frequently and using medications regularly allowed individuals with NCDs to follow the course of their disease and see the results of their treatment, increasing their disease adaptation.

Limitations

This study had some limitations. First, its sample comprised patients with NCDs who applied to a FHC in the Western Mediterranean region of Türkiye. Therefore, its results cannot be generalized to other populations in this region or elsewhere in Türkiye. Second, it excluded patients applying to secondary and tertiary healthcare institutions. Third, it only included the quality of life, perceived health, and spiritual dimensions of the WHOQOL-BREF-TR scale.

Conclusions

Our study found that most patients used their medications continuously and underwent regular health checks. The participants' mean scores for the full ACIS and the perceived health, quality of life, and psychological domains of the WHOQOL-BREF-TR were at a good level.

Individuals with NCDs who were younger had fewer children, had a higher education level, had a good income, and were civil servants had good adaptation scores. Disease adaptation was positively affected in patients with respiratory disease, who underwent regular health checks, who used medications regularly, and with high scores on the quality of life, perceived health, and psychological domains of the WHOQOL-BREF-TR. At-risk individuals with low disease adaptation (e.g., no long-term medication use, irregular health checks, and mental depression) must be identified in primary healthcare institutions and given an education appropriate for their needs. These patients must be encouraged and monitored for healthy lifestyle behaviors to increase their disease adaptation. It is recommended that researchers plan studies on disease adaptation in individuals with a certain type of chronic disease, examine disease adaptation and its determinants in patients with NCDs presenting to secondary health institutions, and evaluate the relationships of disease adaptation with all WHOQOL-BREF domains.

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