



## The Effects of Depression, Anxiety and Stress Levels on Quality of Life of Individuals with Hypertension

### Hipertansiyon Hastası Olan Bireylerin Depresyon, Anksiyete ve Stres Düzeylerinin Yaşam Kalitesi Üzerine Etkisi

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#### ARTICLE INFO

##### Article History:

Received: 27.04.2023

Received in revised form: 17.05.2023

Accepted: 29.05.2023

##### Keywords:

Anxiety  
Depression  
Hypertension  
Stress  
Quality of Life

#### ABSTRACT

**Objective:** This study was planned to determine the effects of depression, anxiety and stress levels of individuals with hypertension on their quality of life.

**Method:** This descriptive study was conducted with 161 hypertension patients who presented to the emergency department of a district state hospital affiliated to Samsun Provincial Health Directorate and volunteered to participate in the study. Data were collected with the Descriptive Information Form, SF-12 (Quality of Life Scale Short Form), and Depression, Anxiety, Stress Scale (DASS-21) through face-to-face interviews.

**Results:** The mean age of the patients participating in the study was 62.3±14.3 years. The mean scores they obtained from the depression, anxiety and stress sub-dimensions of the DASS-21 were 9.1±4.4, 7.8±4.3 and 9.8±4.0, respectively. The mean scores they obtained from the Physical Component Summary-12 (PCS-12) and Mental Component Summary-12 (MCS-12) of the SF-12 were 39.7±9.1 and 38.3±8.9, respectively. While the depression and anxiety levels were higher in the female participants, the level of the quality of life was higher in the male participants.

As the participants' age increased, their depression, anxiety and stress levels increased, and the quality-of-life levels decreased. In the participants who exercised while depression, anxiety and stress levels were lower, the level of quality of life was higher.

**Conclusion:** In this study, depression and anxiety levels are higher in women and lower in married couples. Higher education level has a positive effect on depression, anxiety, stress and quality of life. Individuals who do not have chronic diseases and exercise have low levels of depression, anxiety, and stress.

#### MAKALE BİLGİLERİ

##### Makale Geçmişi:

Geliş Tarihi: 27.04.2023

Revizyon Tarihi: 17.05.2023

Kabul Tarihi: 29.05.2023

##### Anahtar Kelimeler:

Anksiyete  
Depresyon  
Hipertansiyon  
Stres  
Yaşam Kalitesi

#### ÖZET

**Amaç:** Bu araştırma; hipertansiyonu olan kişilerin depresyon anksiyete stres düzeylerinin yaşam kalitesi üzerine etkisini belirlemek amacıyla planlandı.

**Yöntem:** Araştırma Samsun İl Sağlık Müdürlüğü'ne bağlı bir ilçe devlet hastanesinde acile başvuran hipertansiyon hastaları ile yapıldı. Araştırma çalışmaya katılmaya gönüllü olan 161 hasta ile gerçekleştirildi. Çalışma tanımlayıcı tipte yürütüldü. Veriler Tanımlayıcı Anket Formu, SF-12 Yaşam Kalitesi Ölçeği kısa formu, Depresyon, Anksiyete, Stres Ölçeği (DASS-21) kullanılarak yüz yüze anket formuyla toplandı.

**Bulgular:** Çalışmaya katılan hastaların yaş ortalaması 62.3±14.3, depresyon puan ortalaması 9.1±4.4, anksiyete puan ortalaması 7.8±4.3, stres puan ortalaması 9.8±4.0, Fiziksel Bileşen Özet Puanı (FBÖ-12) puan ortalaması 39.7±9.1, Mental Bileşen Özet Puanı (MBÖ-12) puan ortalaması 38.3±8.9 saptandı. Cinsiyet grupları ile karşılaştırıldığında depresyon ve anksiyete seviyesinin kadınlarda erkeklerden daha fazla olduğu, yaşam kalitesinin erkeklerde daha iyi olduğu bulundu. Yaş ortalaması arttıkça depresyon, anksiyete, stres oranının arttığı, yaşam kalitesinin azaldığı görüldü.

**Sonuç:** Bu çalışmada; depresyon ve anksiyete düzeyinin kadınlarda daha fazla, evli çiftlerde daha düşük olduğu, eğitim düzeyinin yüksek olmasının depresyon, anksiyete, stres ve yaşam kalitesi üzerinde olumlu yönde etkili olduğu, kronik hastalığı olmayan ve egzersiz yapan bireylerde depresyon, anksiyete, stres seviyelerinin düşük olduğu, yaşam kalitesinin yüksek olduğu belirlendi.

#### 1. Introduction

Globalizing conditions bring about many chronic diseases. Hypertension is among the most common chronic diseases. Hypertension is one of the main risk factors for cardiovascular and

cerebrovascular diseases accepted as an important public health problem in the world and the main causes of death (1,2). Unhealthy diet and living conditions can cause cardiovascular diseases and hypertension (3).

Hypertension can be accompanied by several other disorders such as anxiety, depression, and stress which constitute a global burden. They pave the way for cardiovascular diseases and hypertension, and thus increase the risk of morbidity and mortality (4). and adversely affect mental health and blood pressure (4). Therefore, it is important to know the factors affecting blood pressure in the care of hypertension, and its relationship with mental health in order to reduce the mortality rate and to improve the quality of life (4,5).

According to the WHO (2020), quality of life is an important indicator of overall health. Quality of life is defined not only as the absence of disease and disability, but also as the integrity of perceived physical and mental health and social well-being (6). Hypertension can affect activities of daily living and lead to a decrease in quality of life (7). Depression, stressful life events, and psychosocial risk factors may have adverse effects on blood pressure (8,9). In hypertension, it is thought that there may be association between depression and anxiety, and poor quality of life (10). We carried out the present study to determine the effect of depression, anxiety and stress levels on the quality of life of individuals with hypertension.

Research Questions:

1. Depression anxiety stress levels have no effect on quality of life of individuals with hypertension.
2. Of individuals with hypertension, depression anxiety stress levels have an effect on the quality of life.

## 2. Materials and Methods

### 2.1. Type of the study and sample selection

The sample of this descriptive study consisted of hypertension patients who presented to the emergency department of a district state hospital between April 01, 2022 and June 01, 2022 (n=161). Sample selection was not made in the study, and all patients who applied between these dates were tried to be reached. Among the patients who applied to the emergency department between the aforementioned dates, those who were over the age of 18, who were literate, who had hypertension and who volunteered to participate in the study were included in the study. Research data were collected by face-to-face application of questionnaires to people who applied to the emergency department and had hypertension. It took approximately 10-15 minutes to fill in the data collection tools.

### 2.2. Data collection tools

The Descriptive Information Form, SF-12 (Quality of Life Scale Short Form), and DASS-21 (Depression, Anxiety, Stress Scale) were used to collect the data.

**Descriptive Information Form:** The questionnaire prepared by the researcher based on the literature included items questioning the participants' descriptive characteristics such as age, sex, educational status, marital status, presence of a chronic disease, etc. (11-14).

**Depression, Anxiety, Stress Scale (DASS-21):** The DASS-21 was developed by Lovibond and Lovibond (1995b). The validity and reliability study of the Turkish version of the DASS-21 was performed by Sarıçam. It has the following three sub-dimensions: depression, anxiety, and stress (15). The Cronbach's alpha value of the scale for depression, anxiety, and stress subscales were found respectively,  $\alpha=0.87$ ,  $\alpha=0.85$ ,  $\alpha=0.81$ , and respectively, 0.89, 0.88, 0.85 in our study.

**SF-12 (Quality of Life Scale Short Form):** The scale was developed by Ware et al., validity and reliability study was conducted by Soyulu and Kütük (16, 17). The SF-12 includes 12 items and the following 8 subscales: role physical (2 items), physical functioning (2 items), general health (1 item), vitality (1 item), bodily pain (1 item), role emotional (2 items), mental health (2 items), and social functioning (1 item).

Items about the role emotional and role physical are yes / no questions. Responses given to the other items are rated on a scale ranging from 3 to 6, which yields the raw score of that item.

While raw scores obtained from physical functionality, role physical, general health and bodily pain sub-dimensions make up the Physical Component Summary-12 score, raw scores obtained from the mental health, social functionality, role emotional and vitality sub-dimensions make up the Mental Component Summary-12 score.

The raw scores obtained from the Physical Component Summary-12 and Mental Component Summary-12 are converted to a standardized scale of 0 to 100. The higher score is, the better the health is (16). The Cronbach's alpha value of the scale in our study was found respectively, 0.85 for physical health and 0.78 for mental health.

### 2.3. Statistical analysis

Statistical Package for the Social Sciences (SPSS) version 26 was used in the analysis of the data. For descriptive statistics, number, percentage, arithmetic mean, standard deviation, median, minimum and maximum values were used. In addition, the Cronbach's Alpha statistics were made for the scale scores. For quantitative measurements, the independent samples t-test was used for the comparison of two samples. In cases where homogeneity of variance was not achieved, Welch's t-test was used. If there were more than two variables, Welch's ANOVA test was used in cases where variance homogeneity was not achieved with one-way analysis of variance (ANOVA). In cases where ANOVA test results were found significant when homogeneity of variance was achieved, Tukey

HSD test was used. When variance homogeneity was not achieved, paired comparison was made with Games-Howell tests. Pearson correlation coefficient was used for the relationship between the variables. P-values less than 0.05 were considered statistically significant.

**2.4. Ethical approval**

Before the study was conducted, ethical approval was obtained from the Human Research Ethics Committee of Sinop University (Decision date: February 09, 2022, Decision number: 2022/005). Institutional permission was obtained from the provincial health directorate of the district state hospital where the research was to be conducted. Written informed consent was obtained from the participants. The study was carried out in accordance with the Declaration of Helsinki.

**3. Results**

The patients participating in the descriptive statistics are given in Table 1.

**Table 1.** Descriptive characteristics of the participants

		n	%
<b>Age</b>	62.3±14.3 (years)		
<b>Sex</b>	Women	93	57.8
	Men	68	42.2
<b>Educational status</b>	Primary school	98	60.9
	High school	40	24.8
	University	23	14.3
<b>Marital status</b>	Married	131	81.4
	Single	30	18.6
<b>Occupation</b>	No occupation	67	41.6
	Retiree	45	28.0
	Public sector	20	12.4
	Self-employed	29	18.0
<b>Length of having the diagnosis</b>	1-5 years	58	36.0
	6-10 years	50	31.1
	≥11 years	53	32.9
<b>Presence of a chronic disease</b>	Yes	125	77.6
	No	36	22.4
<b>Being on a diet</b>	Yes	15	9.3
	No	146	90.7
<b>Exercising</b>	Yes	26	16.1
	No	135	83.9

DASS-21 mean scores they obtained from the Physical Component Summary-12 and Mental Summary-12 the mean scores are given in Table 2.

**Table 2.** Mean scores obtained from the sub-dimensions of the Depression, Anxiety, Stress Scale and Quality of Life Scale Short Form

	Mean	Standard deviation	Median	Min.	Max.
<b>Depression</b>	9.1	4.4	9.0	0.0	21.0
<b>Anxiety</b>	7.8	4.3	8.0	0.0	21.0
<b>Stress</b>	9.8	4.0	10.0	0.0	21.0
<b>Physical Component Summary-12</b>	39.7	9.1	39.8	20.4	58.2
<b>Mental Component Summary-12</b>	38.3	8.9	38.4	19.4	61.7

While depression and anxiety levels were higher in women than in men, the level of quality of life was higher in men. As the participants' age increased, their depression, anxiety and stress levels increased and quality of life levels decreased. In the married participants while depression, anxiety and stress rates were lower, the level of quality of life was higher. As the education level increased, the rates of depression, anxiety and stress decreased, and the quality of life increased. As the level of education level changed, so did the scale scores.

The comparison of the participants in terms of their occupations demonstrated that the stress and anxiety levels were higher in housewives whereas the level of quality of life was higher in retirees and those working in the public sector. As for the length of having diagnosis of hypertension, as the duration increased, depression and anxiety levels increased and the level of quality of life decreased. According to the comparison of the participants in terms of the presence of a chronic disease, depression, anxiety and stress levels were higher and the level of quality of life was lower in the participants with a chronic disease than they were in the participants without a chronic disease. There was not a statistical significance between the participants who were on a diet and those who were not. While the participants who exercised had lower levels of depression, anxiety and stress, they had a higher level of quality of life (Table 3).

**Table 3.** Comparison of the mean scores obtained from the sub-dimensions of the Depression, Anxiety, Stress Scale and Quality of Life Scale Short Form

		Depression	Anxiety	Stress	Physical Component Summary-12	Mental Component Summary-12
<b>Sex</b>	Women (n=93)	9.75±4.8	8.33±4.68	10.35±4.36	37.76±9.35	37.75±9.32
	Men (n=68)	8.25±3.6	7.15±3.54	8.97±3.32	42.39±8.16	38.95±8.27
	t	2.270*	1.832*	2.285*	-3.272	-0.844
	p	0.025	0.069	0.024	0.001	0.400
<b>Age</b>	≤50 years (n=32)	6.5±4.04 <sup>a</sup>	4.69±2.64 <sup>a</sup>	7.28±3.59 <sup>a</sup>	46.83±6.63 <sup>a</sup>	43.58±8.81 <sup>a</sup>
	51-65 years (n=62)	8.84±3.94 <sup>b</sup>	7.63±4.31 <sup>b</sup>	9.29±3.6 <sup>b</sup>	41.16±8.36 <sup>b</sup>	38.54±8.46 <sup>b</sup>
	>65 years (n=67)	10.63±4.34 <sup>c</sup>	9.52±3.98 <sup>c</sup>	11.4±3.87 <sup>c</sup>	34.99±8.23 <sup>c</sup>	35.45±8.19 <sup>b</sup>
	F	11.030	16.829	14.217	25.396	10.154
p	<0.001	<0.001	<0.001	<0.001	<0.001	
<b>Marital status</b>	Married (n=131)	8.53±3.86	7.33±4.02	9.27±3.59	41.06±8.28	39.48±8.39
	Single (n=30)	11.67±5.57	10.03±4.66	11.93±4.98	33.86±10.45	32.95±9.17
	t	-2.922	-3.227	-2.767	3.531*	3.775
	p	0.006	0.002	0.009	0.001	<0.001
<b>Educational status</b>	Primary (n=98)	10.54±4.39 <sup>a</sup>	9.32±4.3 <sup>a</sup>	11.23±3.84 <sup>a</sup>	35.73±7.99 <sup>a</sup>	35.19±8.13 <sup>a</sup>
	High school (n=40)	7.55±3.1 <sup>b</sup>	6.28±3 <sup>b</sup>	8.3±2.96 <sup>b</sup>	44.45±7.58 <sup>b</sup>	40.98±7.4 <sup>b</sup>
	University (n=23)	5.78±3.55 <sup>b</sup>	4.22±2.58 <sup>c</sup>	6.09±2.86 <sup>c</sup>	48.52±5.51 <sup>b</sup>	46.61±7.58 <sup>c</sup>
	F	17.309	28.489*	24.585	36.761	22.706
p	<0.001	<0.001	<0.001	<0.001	<0.001	
<b>Occupation</b>	No occupation (n=67)	10.78±4.56 <sup>a</sup>	9.4±4.38 <sup>a</sup>	11.36±4.09 <sup>a</sup>	34.46±8.28 <sup>a</sup>	35.6±8.36 <sup>a</sup>
	Retired (n=45)	8.76±3.62 <sup>b</sup>	8.07±3.67 <sup>ab</sup>	9.87±3.19 <sup>ab</sup>	39.41±7.59 <sup>b</sup>	37.09±7.85 <sup>a</sup>
	Public sector (n=20)	4.65±3.27 <sup>c</sup>	4.1±3.18 <sup>c</sup>	5.4±3.19 <sup>c</sup>	48.09±5.69 <sup>c</sup>	47.85±7.0 <sup>b</sup>
	Self-employed (n=29)	8.93±3.44 <sup>ab</sup>	6.41±3.55 <sup>bc</sup>	8.97±2.98 <sup>b</sup>	46.58±6.13 <sup>c</sup>	39.61±8.37 <sup>a</sup>
F	12.437	10.998	14.960	27.733	12.444	
p	<0.001	<0.001	<0.001	<0.001	<0.001	
<b>Length of having the diagnosis</b>	1-5 years (n=58)	7.28±4.04 <sup>a</sup>	5.76±3.57 <sup>a</sup>	7.78±3.47 <sup>a</sup>	45.47±6.71 <sup>a</sup>	41.7±8.58 <sup>a</sup>
	6-10 years (n=50)	9.1±3.25 <sup>b</sup>	7.92±3.26 <sup>b</sup>	10.16±3.01 <sup>b</sup>	39.92±7.05 <sup>b</sup>	38.1±7.98 <sup>a,b</sup>
	≥11 years (n=53)	11.15±4.83 <sup>c</sup>	10.02±4.72 <sup>c</sup>	11.58±4.43 <sup>b</sup>	33.24±8.99 <sup>c</sup>	34.65±8.7 <sup>b</sup>
	F	10.480*	16.541	15.157	32.957*	9.671
p	<0.001	<0.001	<0.001	<0.001	<0.001	
<b>Presence of a chronic disease</b>	Yes (n=125)	9.78±4.3	8.67±4.21	10.44±3.91	37.36±8.65	36.82±8.46
	No (n=36)	6.83±3.91	4.92±3.01	7.44±3.47	47.92±5.22	43.25±8.65
	t	3.686	4.995	4.152	-9.072*	-3.996
	p	<0.001	<0.001	<0.001	<0.001	<0.001
<b>Being on a diet</b>	Yes (n=15)	8.73±6.17	8.6±6.47	9.8±5.29	37.93±10.23	39.33±10.89
	No (n=146)	9.16±4.18	7.75±3.99	9.77±3.87	39.9±9.03	38.15±8.69
	t	-0.260*	0.497*	0.030	-0.795	0.489
	p	0.798	0.626	0.976	0.428	0.625
<b>Exercising</b>	Yes (n=26)	7.15±3.68	5.38±3.71	8.04±3.49	45.39±8.56	42.28±8.71
	No (n=135)	9.5±4.42	8.3±4.21	10.1±4.02	38.63±8.86	37.49±8.74
	t	-2.537	-3.295	-2.446	3.581	2.561
	p	0.012	0.001	0.016	<0.001	0.011

\*Welch's t and Welch's ANOVA test statistics \*\*\*(abc): When the ANOVA tests are found significant, the Post Hoc test results are indicated with lower case letters. The difference between group means indexed with the same letters is not statistically significant.

There was a very strong positive relationship between depression, anxiety and stress and it was found to be effective on quality of life (Table 4).

**Table 4.** The relationship between categorical variables, scale sub-dimension and total scores

	Depression	Anxiety	Stress	Physical Component Summary-12	Mental Component Summary-12
<b>Depression</b>					
Anxiety	0.832*				
Stress	0.891*	0.835*			
<b>Physical Component Summary-12</b>					
Mental Component Summary-12	-0.622*	-0.704*	-0.640*		0.537*
	-0.734*	-0.624*	-0.665*	0.537*	

\*p<0.001

#### 4. Discussion

In our study conducted to determine the effect of depression, anxiety and stress levels on the quality of life of individuals with hypertension, we determined that the participants had a moderate level of depression, anxiety and stress. In a study, depression, anxiety, and stress levels were low in the participants with hypertension (18). The literature shows that hypertension affects symptoms of depression (14,19).

In our study, the scores the participants obtained from the SF-12 were low. In similar studies, it was observed that the highest and lowest scores were obtained from the mental health and physical health dimensions of the Quality-of-Life Scale, respectively (11,20,21). The participants' physical and mental aspects of the quality of life were affected (13). In our study, it was observed that the rates of depression, anxiety and stress affect the quality of life negatively. In another study, it was determined that depression has an effect on quality of life (22). Mental well-being can have positive consequences on quality of life.

The comparison of the participant in term of the sex variable demonstrated that while depression and anxiety levels were higher in women, the level of quality of life was higher in men. In a study, it was determined that in hypertensive patients, anxiety increased and depressive symptoms did not increase (8). Women are more likely to be affected by stress because of their physical and hormonal differences (18). Their being away from the working environment and being housewives is also thought to be effective in this process (23). Sex is an important factor affecting the quality of life of individuals with hypertension. In a study conducted in Jiangsu, the female patients had lower quality of life than did the male patients (1,21).

In the married participants while depression, anxiety and stress rates were lower, the level of quality of life was higher. The quality of life of the single participants was affected more than was that of the

married participants (24). Their mental distress levels were also higher (23).

As the participants' education level increased, their depression, anxiety and stress levels decreased and the quality of life level increased. The scores the participants obtained from the scales changed as their education level changed. Higher education is thought to alleviate the negative effects of hypertension (21). It seems that female individuals and individuals with lower education levels are more likely to suffer from psychological distress. The fact that individuals who are more educated have insight about themselves may cause them to be better spiritually (23).

According to the comparison of the participants in terms of their occupations, stress and anxiety levels were higher in housewives whereas the level of quality of life was higher in retirees and those working in the public sector. Income status is stated to affect depression (8). High-income patients with hypertension are more mobile, do regular activity more, and are less likely to experience anxiety- and depression-related problems than low-income patients (24). Working individuals have higher anxiety levels than do non-working individuals (18). Low-income status is stated to affect the quality of life adversely, which suggests that low-income hypertensive patients may have difficulties due to the financial burden which is imposed by poor health and which may adversely affect their quality of life (20). Studies have shown that individuals whose socioeconomic status is high have a high quality of life (21). Although socioeconomic status is not directly related to the disease, it may affect the quality of healthcare received if the person's income is not high (25). It is also thought that individuals with low socioeconomic status may be more vulnerable to unhealthy living conditions (26).

According to the comparison of the participants in terms of the length of having the diagnosis of hypertension, as the duration increased, the level of depression and anxiety increased and the level of quality of life decreased. Of the participants, those with a chronic disease had higher levels of depression, anxiety and stress, and lower quality of life than did those without a chronic disease. Of the participants, those with one or more comorbidities had higher depression and anxiety levels than did those without a comorbid disease.

As indicated in several studies, the most common comorbidities are diabetes and obesity. This finding highlights the need for the prevention and management of multiple morbidity in individuals with a chronic disease such as hypertension. In Italy and Japan, it has been reported that obesity and diabetes are effective in decreasing the quality of life in patients with hypertension.

Metabolic syndrome, which includes diabetes mellitus, obesity and hypertension, can adversely affect the quality of life in various populations (24,27,28).

There was no statistical significance between the participants who were on a diet and the participants who were not in terms of their depression, anxiety, stress and quality of life levels.

Among the participants, those who exercised had lower levels of depression, anxiety and stress, and better quality of life than those who did not exercise. In a study, it was demonstrated that physical activity positively affected quality of life (29). Walking less than 30 minutes a day can increase the level of depression and anxiety (8,30). Regular physical activity has been shown to improve psychological state and to affect medication compliance indirectly (31). In-service trainings can motivate people to exercise and to do physical activity, which helps individuals maintain an active and healthy lifestyle (32).

In line with these results, stress, anxiety and depression can adversely affect the cardiovascular system and blood pressure (33).

## 5. Conclusions

The results of the present study demonstrated that the participants' depression, anxiety and stress levels were moderate and the level of their quality of life was low. In this study, depression and anxiety levels are higher in women and lower in married couples, higher education level has a positive effect on depression, anxiety, stress and quality of life, individuals who do not have chronic diseases and exercise have low levels of depression, anxiety, and stress. In our study, it was observed that the stress levels experienced affected the mental and physical dimensions of the quality of life.

In this context, it is thought that regular blood pressure monitoring in individuals with hypertension will be effective in supporting individuals spiritually and physically, reducing their stress levels and increasing their quality of life. In order to improve the quality of life and reduce the burden of hypertension, it will be important to raise patients' awareness in this process.

## Limitations of the study

Since the study data were collected in a single hospital, its results cannot be generalized to the whole population. At the same time, sampling was not used in the study, and all individuals with hypertension who wanted to participate in the study between the given dates were included in the study.

**Conflict of Interest:** The authors declare that there were no potential conflicts of interest with regard to the research, authorship and/or publication of this article.

**Financial Support:** No financial support was received in this study.

**Ethics Committee Approval:** In order to conduct the research, written permission was obtained from the Sinop University Human Research Ethics Committee, decision dated 09.02.2022 and numbered 2022/005.

**Acknowledgements:** We would like to thank all the patients who participated in the study.

## Authorship Contribution:

YOG: Study idea and design, data collection, literature review, statistical analysis and interpretation of data, preparation of the study, approval of the final version to be published.

EA: Study idea and design, data collection, literature review, statistical analysis and interpretation of data, preparation of the study, approval of the final version to be published.

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