Turkish Journal of Cerebrovascular Diseases 2024; 30(1): 22-29 Türk Beyin Damar Hastalıkları Dergisi 2024; 30(1): 22-29
Turk J Cereb Vasc Dis
doi: 10.5505/tbdhd.2024.65002

ORIGINAL ARTICLE **ÖZGÜN ARAŞTIRMA**

THE EVALUATION OF ACUTE ANXIETY LEVELS IN CAREGIVERS OF HOSPITALIZED STROKE PATIENTS

Fettah EREN, Duran ÖZKAN, Omar ELQUTOB, Gökhan ÖZDEMİR, Şerefnur ÖZTÜRK

Selçuk University Faculty of Medicine, Department of Neurology, Konya, TÜRKİYE

ABSTRACT

INTRODUCTION: Stroke patients often continue their lives with a long process of rehabilitation and treatment after hospitalization. The adaptation to this process can be challenging for caregivers, particularly during the acute phase. Previous studies about anxiety in stroke have mainly focused on the subacute and chronic phases. Therefore, this study aimed to assess anxiety levels during the acute phase within caregivers of stroke patients in the hospitalization period, along with associated factors.

METHODS: Hospitalized patients for acute stroke and their caregivers were included in the study. Sociodemographic characteristics of patients and their caregivers were recorded. Clinical conditions and disease features of patients were evaluated. Caregivers were administered the State-Trait Anxiety Inventory (STAI) and the Hospital Anxiety and Depression (HAD) scales. The relationships between these variables were assessed.

RESULTS: The study included 100 patients with a mean age of 67.09±11.48 and 100 caregivers with a mean age of 46.19±13.36. Higher anxiety scores were observed in caregivers of patients who were younger than 65, had ischemic stroke, and were treated in the neurology service (p=0.001; p=0.001; p=0.019). A negative correlation was found between the number and satisfaction of physician's daily information with anxiety scores (p=0.001). In addition, higher anxiety scores were identified in caregivers, particularly female caregivers of patients in the 1st and 2nd degree relatives (p=0.032; p=0.033).

DISCUSSION AND CONCLUSION: Caregivers to stroke patients experience significant levels of anxiety, and depression. This situation is associated with various factors. It is important to provide more frequent and satisfactory information to caregivers, especially in the hospitalization period.

Keywords: Stroke, acute period, hospitalization, anxiety.

Address for Correspondence: Assoc. Prof. Fettah Eren, M.D. Selçuk University Faculty of Medicine, Department of Neurology, Konya, Türkiye.
Phone: +90 0332 224 40 07 **E-mail:** dreren42@hotmail.com
Received: 01.12.2023 **Accepted:** 18.03.2024
ORCID IDs: Fettah Eren 0000-0001-6834-0827, Duran Özkan 0000-0002-1798-1664, Omar Elqutob 0009-0005-5893-9154, Gökhan Özdemir 0000-0001-8140-6333, Şerefnur Öztürk 0000-0001-8986-155X.
Please cite this article as following: Eren F, Özkan D, Elqutob O, Özdemir Ö, Öztürk Ş. The evaluation of acute anxiety levels in caregivers of hospitalized stroke patients. Turkish Journal of Cerebrovascular Diseases 2024; 30(1): 22-29. doi: 10.5505/tbdhd.2024.65002

HASTANEDE YATAN İNME HASTALARINA BAKIM VERENLERDE AKUT ANKSİYETE DÜZEYLERİNİN DEĞERLENDİRİLMESİ

ÖZ

GİRİŞ ve AMAÇ: İnme hastaları hastaneye yatış sonrasında sıklıkla uzun bir rehabilitasyon ve tedavi süreciyle hayatlarına devam etmektedirler. Bu sürece uyum sağlamak, özellikle akut dönemde bakım verenler için zorlayıcı olabilmektedir. İnmede kaygı üzerine önceki çalışmalar esas olarak subakut ve kronik dönemlere odaklanmıştır. Bu nedenle bu çalışmada, inme hastalarına bakım verenlerde hastanede yatışta akut dönem kaygı düzeylerini ve ilişkili faktörleri değerlendirmeyi amaçladık.

YÖNTEM ve GEREÇLER: Akut inme nedeniyle hastaneye yatırılan hastalar ve onların bakım verenleri çalışmaya dahil edildi. Hastaların ve bakım verenlerin sosyodemografik özellikleri kaydedildi. Hastaların klinik durumları ve hastalık özellikleri değerlendirildi. Bakım verenlere Durumluk-Sürekli Kaygı Envanteri (STAI) ve Hastane Anksiyete ve Depresyon (HAD) ölçekleri uygulandı. Bu değişkenler arasındaki ilişkiler değerlendirildi.

BULGULAR: Çalışmaya yaş ortalaması 67,09±11,48 olan 100 hasta ve yaş ortalaması 46,19±13,36 olan 100 bakım veren dahil edildi. 65 yaş altı, iskemik inme geçiren ve nöroloji servisinde tedavi gören hastaların bakım verenlerinde anksiyete puanlarının daha yüksek olduğu görüldü (p=0,001; p=0,001; p=0,019). Hekimin günlük bilgilendirme sayısı ve memnuniyeti ile anksiyete puanları arasında negatif korelasyon bulundu (p=0,001). Ayrıca 1. ve 2. derece akraba olup bakım verenlerde, özellikle de kadın bakım verenlerde anksiyete puanlarının daha yüksek olduğu belirlendi (p=0,032; p=0,033).

TARTIŞMA ve SONUÇ: İnme hastalarının bakıcıları önemli düzeyde kaygı ve depresyon yaşarlar. Bu durum birçok faktörlerle ilişkilidir. Özellikle hastanede yatış döneminde bakım verenlere daha sık ve tatmin edici bilgi verilmesi önemlidir.

Anahtar Sözcükler: İnme, akut dönem, hastane yatışı, kaygı.

INTRODUCTION

Stroke is the second leading cause of death and first cause of disability worldwide. Stroke is grouped as ischemic or hemorrhagic stroke. However, 87% of cases belong to ischemic. Approximately 700,000 patients have ischemic stroke in the United State each year (1). Various levels of physical and cognitive changes occur in the stroke patients and caregivers. The disabilities experienced brings about the need for caregivers, health care providers, and various institutions (2). Following a stroke, both the affected individual and their family members experience changes in their lives at different levels. This situation also gives rise to numerous psychological manifestations. Many stresses accompany the adaptation process to this new life. Delayed adaptation negatively impacts the treatment process and quality of life (3).

Reviewing the literature has demonstrated that there has been a particular focus on the chronic period after stroke. Despite some inconsistencies among these studies, it has been highlighted that young age, female gender, and lower physical and cognitive status lead to increased anxiety. However, many of these studies emphasize the evaluation of anxiety levels in patients and their caregivers, and the necessity for social and psychological support (4-9).

Stroke patients often continue their lives with a prolonged rehabilitation and treatment process after acute hospitalization period. During these periods, psychiatric symptoms such as anxiety and depression are present at various levels in patients and caregivers. Previous studies have primarily focused on the post-discharge and rehabilitation periods (7,8). However, it is known that the acute phase of the disease contains more concern and anxiety. The level of anxiety can be higher; and these symptoms hinder effective communication and optimal treatment. This process becomes more challenging, particularly for patients, relatives, or caregivers who cannot establish effective communication and adapt to the current situation (4,6).

Upon examining studies, the main focus is observed to be on the anxiety of caregivers, especially in the rehabilitation process during the subacute phase. Therefore, there is limited data specifically addressing anxiety during hospitalization, especially in neurology in-patient clinics. During this period, the excessive anxiety of caregivers may negatively impact the treatment

process. And thus, the aim of this study is to evaluate the anxiety level in caregivers of hospitalized stroke patients in the acute phase and to assess associated factors during this period.

METHODS

Study Design and Ethical Approval: Caregivers of hospitalized patients for acute stroke and treated in the neurology clinic were included in the study. It was planned as a prospective study. This study has been approved from the Selçuk University Clinical Research Local Ethics Committee (Date: 07.11.2023, No: 2023/20). This research was developed following the Good Clinical Practice's Guidelines and the WMA Helsinki Declaration. A form prepared for the research was given to each participant. Participants who read and consented to this form were included in the study.

Participants and Sociodemographic Characteristics: Caregivers of hospitalized patients for acute stroke were included in the study. Firstly, demographic and clinical data of the patient were evaluated by the physician. Gender, age, marital status, occupation, education, the day of admission, and the time of admission to the hospital were queried. The clinical setting of the patient's admission (neurology ward, intensive care) was assessed. The patient's presenting symptoms (consciousness impairment symptoms, motor symptoms, sensory symptoms, cerebellar symptoms, visual symptoms, speech impairment symptoms, and others), acute treatments received (endovascular treatment, intravenous thrombolysis, medical treatment), stroke subtype (transient ischemic attack, ischemic stroke, and hemorrhagic stroke), chronic illnesses, family history, and tobacco-alcohol (hypertension, diabetes mellitus (DM), hyperlipidemia, smoking, alcohol, previous stroke, family history of stroke, others) were evaluated.

Demographic characteristics of the patient's caregiver were also recorded. Age, gender, occupation, and education were inquired. Additionally, some questions were asked to caregiver: the number of hospitalization days, experience in caregiving, hospitalization history, degree of relative, how many times per day they were informed by the physician and satisfaction with the physician's information (none, a little, a lot, or complete satisfaction).

Assessment Scales

Modified Rankin Score: The Modified Rankin Score (mRS) was used to assess the degree of disability of the patient. This score was rated from 0 to 6. 0: no symptoms, 6: expressed as death. Scores From 1 to 5, were classified as follows: symptoms present with no disability, mild, moderate, severe, and very severe disability (10). The patients' disability status of 0-2 were categorized as mild while 3-5 as severe disability. First, the patient's mRS was calculated and then the caregiver's anxiety and depression scales were applied. All evaluations were made by the same researcher.

State-Trait Anxiety Inventory: The State-Trait Anxiety Inventory (STAI) was administered to the caregivers (11-13). This scale consists of 20 questions. Participants were asked to respond to the questions based on their current mood. However, only the forms of patients who answered all questions were included in the study. Responses were categorized as follows: 1: Never, 2: Sometimes, 3: Often, and 4: Almost always, and scored accordingly. The scale includes both direct and reversed statements. Direct statements reflect a positive mood indicating anxiety, while reversed statements reflect the absence of anxiety. Scores from direct and reversed statements were calculated separately. The scores from direct answers were subtracted from the reversed ones. To this value, a constant number, 50 was added. Higher scores on this scale were considered indicative of higher anxiety levels.

Hospital Anxiety and Depression Scale (HAD): The Hospital Anxiety and Depression Scale (HAD) was applied to the caregivers (14,15). This scale consists of a total of 14 questions with responses on a four-point scale. The scale is divided into two subscales: HAD-A for anxiety and HAD-D for depression. Scores from both subscales range from 0 to 21. Increasing scores are associated with increased severity of anxiety and depression. A cutoff score of 10 was considered for the anxiety subscale, and 7 for the depression subscale. Scores above these cutoffs were interpreted as indicating anxiety and depression. This scale was particularly chosen for this study as it does not include somatic symptoms.

Statistical Analysis: SPSS 26.0 Package Software was used for data analysis. Normality analysis was conducted at the beginning of the study using the

Kolmogorov-Smirnov test. Statistical methods were selected based on the normality analysis of the data. Data were expressed as numbers (n), percentages (%), median (minimum-maximum), or mean ± standard deviation (minimum-maximum). Independent Sample T-Tests, Kruskal-Wallis, and Mann-Whitney U tests were applied to compare these means. Non-parametric data were analyzed by comparing them with the results of the normality analysis using the $\chi 2$ or Fisher's exact test. Spearman's correlation test was applied to assess the relationship between numerical data. Results were considered statistically significant at a 95% confidence interval, with $p < 0.05$.

RESULTS

Descriptive Parameters: In the study, there were 100 patients diagnosed with acute stroke and 100 caregivers accompanying these patients in the hospital. Of the patients, 56 (56%) were female, and 44 (44%) were male. The mean age of the patients was 67.09±11.48 (34-89). The most common subtype of stroke in patients was ischemic stroke, accounting for 70% (n=70). Of the caregivers, 51% were male, and 49% were female, with a mean age of 46.19±13.36 (17-74). Among them, 75% (n=75) were first-degree relatives, 69% of all caregivers had previous caregiving experience. The characteristics of stroke patients and their caregivers are summarized in Table 1.

The average length of hospitalization for patients was 6.21±6.68 (1-35) days. The patients' mean mRS was evaluated as 3.23±1.90 (0-5), and the number of days the caregiver accompanied the patient was 4.3±2.90 (1-14). Caregivers were informed about treatment and prognosis by a physician an average of 1.23±0.94 (0-5) times per day.

Anxiety Levels of Caregivers with STAI scale and Associated Factors: When examining the anxiety levels of caregivers, the total anxiety level was determined as 55.7±12.56 (32-80). It was found that younger patient's (especially for patients under 65) caregiver's anxiety levels were considered higher (p=0.001). The anxiety score for caregivers of ischemic stroke patients was 55.27±12.59; for transient ischemic attack, it was 62.81±13.40, and for hemorrhagic stroke, it was 49.71±7.11. The anxiety score for caregivers of patients admitted to the neurology clinic was 60.15±13.74, while in the neurology intensive care

Table 1. General characteristics of the patients and their relatives in the study and the distribution of the groups.

Characteristics in the patients (n=100)	
Gender	
Male	44
Female	56
Marital status	
Married	85
Single	6
Others	9
In-hospital time	
$8^{00a.m.}$-12^{00}	8
12^{00}-$4^{00p.m.}$	21
$4^{00p.m.}$-8^{00} p.m.	32
$8^{00p.m.}$-$8^{00a.m.}$	39
Clinic	
Service	51
Intensive care	49
Treatment	
Medical	87
Endovascular thrombectomy	6
Intravenous thrombolysis	7
Presentation symptom	
Impaired consciousness	29
Motor disorder	64
Sensory disorder	28
Cerebellar disorder	8
Visual impairment	4
Speech disorder	37
Other	23
Stroke subtype	
Transient ischemic stroke	16
Ischemic stroke	70
Hemorrhagic stroke	14
Chronic diseases	
Smoking	22
Alcohol	1
Hypertension	79
Diabetes mellitus	40
Hyperlipidemia	20
Chronic stroke	10
Stroke in the family	20
Other	10
Characteristics of caregivers (n=100)	
Gender	
Male	51
Female	49
Marital status	
Married	81
Single	13
Others	6
Working status	
Not working	50
Working	50
Education	
Not school	1
Primary school	47
High school	21
University	28
Master's/Ph.D.	3
Patient care experience	
None	31
Yes	69
Hospitalization history	
None	55
Yes	45
Relative	
First degree	75
Second degree	12
Other	13

unit, it was 51.06±9.26. Especially in caregivers of ischemic stroke patients and in those whose relatives were hospitalized in the neurology clinic, the anxiety level was higher (p=0.019; p=0.001). There was no difference in anxiety levels among the mechanical thrombectomy, intravenous thrombolysis, and medical treatment groups for caregivers (p=0.333). The mean values of the STAI scale scores among the groups are summarized in Table 2.

Table 2. Anxiety levels in caregivers and related factors.

	STAI	p-value
Patients' age		
Under 65 (n=39)	61.82±13.58	0.001*
65 and above (n=61)	51.78±10.18	
In-hospital time		
$8^{00a.m.}$-$4^{00p.m.}$ (n=29)	55.58±12.62	0.954
$4^{00a.m.}$-$8^{00a.m.}$ (n=71)	55.74±12.63	
Clinic		
Service (n=51)	60.15±13.74	0.001*
Intensive care (n=49)	51.06±9.26	
Treatment		
Mechanical thrombectomy (n=7)	56.37±12.71	
Intravenous thrombolysis (n=6)	53.00±9.93	0.333
Medical (n=87)	49.57±12.13	
Disability		
Mild (mRS 0-2) (n=30)	57.93±13.05	0.179
Severe (mRS 3-5) (n=70)	54.74±12.32	
Stroke subtype		
TIA (n=16)	62.81±13.40	
Ischemic stroke (n=70)	55.27±12.59	0.019*
Hemorrhagic stroke (n=14)	49.71±7.11	
Caregiver's gender		
Male (n=51)	57.84±13.68	0.070
Female (n=49)	53.46±10.97	
Caregivers' education		
Primary school and under (n=48)	54.56±12.15	0.435
High school and above (n=52)	56.75±12.95	
Caregiving experience		
None (n=31)	57.87±12.01	0.240
Yes (n=69)	54.72±12.76	
Caregivers' hospitalization history		
None (n=55)	55.65±13.55	0.923
Yes (n=45)	55.75±11.39	
Relatives of the caregiver		
First degree (n=75)	54.41±12.20	
Second degree (n=12)	60.84±10.72	0.155
Other (n=13)	58.16±15.64	

*Statistically significant value, n=number, STAI: State-Trait Anxiety Inventory, TIA: Transient ischemic attack, mRS: Modified Rankin Score.

When examining the correlation analysis between numerical data: as the age of the patient decreased, an increase in the anxiety level of caregivers (p=0.001; r=-0.325). A negative but weak correlation was found between the mRS and the STAI anxiety scale (p=0.005; r=-0.276). A negative correlation was found between the amount of information by physician and satisfaction with these briefings and the STAI anxiety scale (respectively p=0.001; r=-0.403; r=-0.377). The relationship between numerical variables and the STAI scale is summarized in the first column of Table 3.

Table 3. Correlation between numerical variables and anxiety, anxiety and depression scores.

	3.a. STAI	3.b. HAD-A	3.c. HAD-D
Patient's age	p=0.001*	p=0.037*	p=0.059
	r=-0.325	r=-0.209	r=0.189
Hospitalization day	p=0.871	p=0.978	p=0.589
	r=0.017	r=-0.003	r=0.055
mRS	p=0.005*	p=0.315	p=0.784
	r=-0.276	r=0.101	r=-0.028
Caregivers' age	p=0.081	p=0.435	p=0.043*
	r=-0.176	r=0.079	r=0.203
Caregiving day	p=0.549	p=0.788	p=0.796
	r=-0.061	r=0.027	r=-0.026
Information: number in a day	p=0.001*	p=0.021*	p=0.415
	r=-0.403	r=-0.230	r=0.082
Satisfaction in the physician's information	p=0.001*	p=0.001*	p=0.193
	r=-0.377	r=-0.322	r=0.131

*Statistically significant value, r: correlation coefficient, STAI: State-Trait Anxiety Inventory, HAD-A: Hospital anxiety and depression scale-Anxiety, HAD-D: Hospital anxiety and depression scale-Depression, mRS: Modified Rankin Score.

Caregiver's In-Hospital Anxiety and Depression Levels and Associated Factors: When evaluating the in-hospital anxiety and depression scores of caregivers, 36% of the participants showed consistent results with anxiety, and 93% showed results consistent with depression. Anxiety was determined to be 35.7% in ischemic stroke and 50% in hemorrhagic stroke, while depression rates were 64% for ischemic stroke and 100% for hemorrhagic stroke. The anxiety score for caregivers of patients admitted to the hospital during working hours was 7.44±3.98, while admissions during after-working hours had a higher score of 8.36±4.60. However, the relationship between them was not statistically significant (p=0.206). Similarly, for caregivers of patients admitted to the intensive care unit or those undergoing mechanical thrombectomy / intravenous thrombolysis, the scores were higher; but no statistical significance (p=0.128, p=0.513). Specifically, female caregivers were found to have higher anxiety scores (9.00±4.12 compared to 7.23±4.58; p=0.032). Anxiety scores were higher when the caregivers were of the 1st or 2nd degree (p=0.033). There was no statistically significant difference in depression scores among the groups (p > 0.05). However, when looked at overall, depression scores were globally high. The total in-

hospital anxiety score was 8.10±4.43, and the depression score was 11.39±2.87. Factors associated with caregivers' in-hospital anxiety and depression scores are summarized in Table 4.

Table 4. In-hospital anxiety and depression scores in patient's caregivers and related factors.

	HAD-A	p-value	HAD-D	p-value
Patients' age				
Under 65 (n=39)	7.22±4.59	0.067	11.07±2.39	0.519
65 and above (n=61)	8.71±4.16		11.59±3.13	
In-hospital time				
$8^{00a.m.}$-$4^{00p.m.}$ (n=29)	7.44±3.98	0.206	11.41±2.86	0.768
$4^{00a.m.}$-$8^{00a.m.}$ (n=71)	8.36±4.60		11.38±2.89	
Clinic				
Service (n=51)	7.45±4.91	0.128	11.68±2.56	0.124
Intensive care (n=49)	8.77±3.80		11.08±3.15	
Treatment				
Medical				
Endovascular	9.16±2.63		11.16±5.67	
thrombectomy	9.28±4.34	0.513	11.00±2.30	0.763
Intravenous	7.39±4.55		11.43±2.68	
thrombolysis				
Disability				
Mild (mRS 0-2) (n=30)	8.10±4.80	0.898	11.50±2.22	0.367
Severe (mRS 3-5) (n=70)	8.10±4.30		11.34±3.12	
Stroke subtype				
TIA (n=16)				
Ischemic stroke	6.87±5.25		11.37±2.65	
(n=70)	8.25±4.35	0.426	11.25±2.85	0.831
Hemorrhagic stroke	8.71±3.89		12.07±3.29	
(n=14)				
Caregivers' gender				
Male (n=51)	7.23±4.58	0.032*	11.72±2.91	0.126
Female (n=49)	9.00±4.12		11.04±2.81	
Caregivers' education				
Primary school and under (n=48)	8.91±4.23	0.148	11.85±3.40	0.187
High school and above (n=52)	7.34±4.52		10.96±2.21	
Caregiving experience				
None (n=31)	6.96±4.22	0.077	11.87±3.29	0.499
Yes (n=69)	8.60±4.46		11.17±2.65	
Caregivers' hospitalization history				
None (n=55)	8.16±4.57	0.920	11.83±3.28	0.186
Yes (n=45)	8.02±4.30		10.84±2.18	
Relatives of the caregiver				
First degree (n=75)	8.61±4.26		11.60±2.66	
Second degree (n=12)	8.16±5.33	0.033*	11.33±2.64	0.115
Other (n=13)	5.07±3.52		10.00±3.52	

*Statistically significant value, r: correlation coefficient, HADS-A: Hospital anxiety and depression scale-Anxiety, HADS-D: Hospital anxiety and depression scale-Depression, IVT: Intravenous thrombolysis, mRS: Modified Rankin Score.

When examining correlation data, a decreased age of the patient was associated with an increased caregivers' anxiety scores (p=0.037; r=-0.209). A positive correlation was found between the age of the caregiver and the depression score (p=0.043; r=0.203). The total amount of information by the physician and satisfaction with this information were negatively correlated with anxiety scores (respectively; p=0.021; p=0.001; r=-0.230; r=-0.322). However, there was no relationship between the information by physician and depression scores (p=0.415; p=0.193). Results showing the correlation between numerical variables and the HAD-A and HAD-D scales are summarized in columns b and c of Table 3.

DISCUSSION AND CONCLUSION

The design of this study emerged as a result of our clinical observation of the high anxiety levels in the relatives of patients with acute stroke. This anxiety sometimes reaches such extreme levels that it negatively affects the clinical process and treatment. Therefore, the investigation of acute anxiety, stress and depression levels, was planned in the relatives of these patients, along with associated factors. When evaluating the literature, studies related to psychiatric symptoms and findings in relatives of stroke patients are more often focused on the subacute and chronic periods. Limited data is available on the acute phase of stroke patients, in particular the in-hospital neurological treatment phase.

Relatives and caregivers play a crucial role in providing physical and psychological support to the patient in the post-acute phase of stroke. This process can also lead to physical and psychological disorders in caregivers (16). Moreover, in these relatives, social isolation, depression, and anxiety can cause a significant deterioration in quality of life (17). Since stroke occurs suddenly, and symptoms begin abruptly, adaptation for relatives is challenging during this acute phase (16,18). Caregivers, especially relatives and friends, experience various anxieties during this period. Anxiety and depressive symptoms, in particular, affect the physical and mental health of caregivers. Although rates of depression vary due to physical impairment and changes in communication, depression rates have been found to be between 34-52% (19,20). In our study, this rate was higher (93%), possibly due to the acute shock situation and the unpredictable prognosis in relatives. Caregivers often experience anxiety and stress, especially during their first encounter with the disease. This situation arises from concerns about the patient's condition and the thought that they may allocate less time to their personal activities (21). This clinical picture in patients adversely

affects the quality of life in caregivers (22). Although this condition is associated with various factors, a study involving 56 participants providing care to stroke patients has shown that young age is associated with a deterioration in the quality of life (23). In our study, especially young patients are associated with a higher level of anxiety. This may be particularly related to a young patients' greater social involvement.

It is known that caregivers of stroke patients experience high levels of anxiety and depression, particularly related to the patient's disability status. It has been demonstrated that a more severe clinical condition in patients is associated with a higher degree of impairment in quality of life and increased anxiety levels (22,24,25). In our study, however, a negative but weak correlation was found between the disability score assessed by the modified Rankin Scale (mRS) and anxiety levels. Additionally, the anxiety levels in patients admitted to non-intensive care neurology unite were higher than those in patients in the neurology intensive care unit. This is attributed to caregivers being constantly with the patient, which might be associated with an increased anxiety levels due to continuous exposure. Despite intensive care unit patients having more disability, the caregivers may experience less anxiety as they are not continuously with the patient.

Depressive symptoms are quite common in acute stroke patients, especially within the three months, with a subsequent decrease reported (26). In our study, depression was found to be quite common. However, since a second assessment was not conducted, no comments can be made about long-term depressive symptoms. Therefore, knowledge of caregivers experiencing a depressive mood during the hospitalization stage in the acute phase is of importance. Furthermore, the degree of relatives and the emotional connection between the caregivers affect the overall emotional state (27). In line with this, our study found that particularly in first-degree family members, more pronounced anxiety and depression was observed, with 75% of caregivers being first-degree family members during the hospitalization period.

A study examining the emotional state of caregivers according to the stroke subtype showed that caregivers of hemorrhagic stroke patients had better quality of life and psychological processes than caregivers of ischemic stroke patients (28).

Our study is consistent with the literature, revealing higher anxiety scores in caregivers of ischemic stroke patients. This is particularly more evident in caregivers of transient ischemic attack (TIA) patients. Providing information to caregivers of TIA patients about the risk of recurrence and the constant fear of the patient having a stroke under observation might be associated with this anxiety. Therefore, it seems essential to provide comprehensive information to caregivers of TIA patients.

The second aim of this study is to evaluate the relationship between the information provided to caregivers and the levels of anxiety, and depressive symptoms along with their satisfaction with this information. Cognitive and behavioral disorders among caregivers, patients, and healthcare professionals adversely affect the treatment process (22,29-32). In our study, it was found that the daily information provided to caregivers was associated with a decrease in anxiety levels. While depressive symptoms were found to be quite high across all caregivers, there was no relationship between information by a physician and depressive symptoms. Moreover, there was a positive correlation with age of the caregiver and depressive symptoms. However, the correlation coefficient is quite low ($p=0.043$; $r=0.203$).

In conclusion, first-degree relatives are the most common caregivers for stroke patients. Anxiety levels are higher in caregivers of ischemic stroke patients, particularly those under 65 years of age. Regardless of the variables, caregivers exhibit significantly high levels of depressive symptoms. However, providing caregivers with more information can reduce anxiety levels. Therefore, detailed information should be provided to caregivers as well as patients.

REFERENCES

1. Capriotti T, Murphy T. Ischemic Stroke. Home Healthc Now 2016; 34(5): 259-266.
2. Bakas T, McCarthy MJ, Miller EL. Systematic Review of the Evidence for Stroke Family Caregiver and Dyad Interventions. Stroke 2022; 53(6): 2093-2102.
3. Opara JA, Jaracz K. Quality of life of post-stroke patients and their caregivers. J Med Life 2010; 3(3): 216-220.
4. Del-Pino-Casado R, Rodríguez Cardosa M, López-Martínez C, et al. The association between subjective caregiver burden and depressive symptoms in carers of older relatives: A systematic review and meta-analysis. PLoS One 2019; 14(5): e0217648.
5. Steigleder T, Kollmar R, Ostgathe C. Palliative care for

stroke patients and their families: Barriers for implementation. Front Neurol 2019; 10: 164.
6. Byun E, Evans LK. Concept analysis of burden in caregivers of stroke survivors during the early poststroke period. Clin Nurs Res 2015; 24(5): 468-486.
7. Malhotra R, Chei CL, Menon E, et al. Short-term trajectories of depressive symptoms in stroke survivors and their family caregivers. J Stroke Cerebrovasc Dis 2016; 25(1): 172-181.
8. Kruithof WJ, Post MW, van Mierlo ML, et al. Caregiver burden and emotional problems in partners of stroke patients at two months and one year post-stroke: Determinants and prediction. Patient Educ Couns 2016; 99(10): 1632-1640.
9. Priego-Cubero E, Orgeta V, López-Martínez C, et al. The relationship between social support and anxiety symptoms in ınformal carers: A systematic review and meta-analysis. J Clin Med 2023; 12(3): 1244.
10. Pădureanu V, Albu CV, Caragea DC, et al. Quality of life three months post stroke among stroke patients and their caregivers in a single center study from Romania during the COVID 19 pandemic: A prospective study. Biomed Rep 2023; 19(2): 52.
11. DeVellis RF. Classical test theory. Med Care 2006; 44(11 Suppl 3): 50-59.
12. Julian LJ. Measures of anxiety: State-Trait Anxiety Inventory (STAI), Beck Anxiety Inventory (BAI), and Hospital Anxiety and Depression Scale-Anxiety (HADS-A). Arthritis Care Res (Hoboken) 2011; 63 Suppl 11(0 11): 467-472.
13. Öner N, Le Compte A (1983) Durumluk sürekli kaygı envanteri el kitabı, İstanbul, Boğaziçi Üniversitesi Yayınları.
14. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983; 67(6): 361-370.
15. Aydemir Ö. Hastane anksiyete ve depresyon ölçeği Türkçe formunun geçerlilik ve güvenilirlik çalışması. Türk Psikiyatri Dergisi 1997; 8(4): 280-287.
16. Lutz BJ, Young ME. Rethinking intervention strategies in stroke family caregiving. Rehabil Nurs. 2010; 35(4): 152-160.
17. Verama R, Sharma S, Balhara YPS, et al. Anxiety and Depression among the Caregivers of patients with Neurological illness. Delhi Psych J 2011; 14, 1.
18. Godwin KM, Swank PR, Vaeth P, et al. The longitudinal and dyadic effects of mutuality on perceived stress for stroke survivors and their spousal caregivers. Aging Ment Health 2013; 17(4): 423-431.
19. Ko JY, Aycock DM, Clark PC. A comparison of working versus nonworking family caregivers of stroke survivors. J Neurosci Nurs 2007; 39(4): 217-225.
20. Han B, Haley WE. Family caregiving for patients with stroke. Review and analysis. Stroke 1999; 30(7): 1478-1485.
21. Morais HC, Soares AM, Oliveira AR, et al. Burden and modifications in life from the perspective of caregivers for patients after stroke. Rev Lat Am Enfermagem 2012; 20(5): 944-953.
22. Efi P, Fani K, Eleni T, et al. Quality of Life and Psychological Distress of Caregivers' of Stroke People. Acta Neurol Taiwan 2017; 26(4): 154-166.
23. McPherson CJ, Wilson KG, Chyurlia L, et al. The caregiving relationship and quality of life among partners of stroke survivors: a cross-sectional study. Health Qual Life Outcomes 2011; 9: 29.
24. Hung JW, Huang YC, Chen JH, et al. Factors associated with strain in informal caregivers of stroke patients. Chang Gung Med J 2012; 35(5): 392-401.
25. Fauziah W, Kato M, Shogenji M, et al. Factors associated with depression among family caregivers of patients with stroke in Indonesia: A cross-sectional study. J Nurs Res. 2022; 30(5): e231.
26. Nir Z, Greenberger C, Bachner YG. Profile, burden, and quality of life of Israeli stroke survivor caregivers: A longitudinal study. J Neurosci Nurs 2009; 41(2): 92-105.
27. Hu P, Yang Q, Kong L, et al. Relationship between the anxiety/depression and care burden of the major caregiver of stroke patients. Medicine (Baltimore) 2018; 97(40): e12638.
28. Ekstam L, Johansson U, Guidetti S, et al. The combined perceptions of people with stroke and their carers regarding rehabilitation needs 1 year after stroke: A mixed methods study. BMJ Open 2015; 5(2): e006784.
29. Schulz R, Sherwood PR. Physical and mental health effects of family caregiving. Am J Nurs 2008; 108(9 Suppl): 23-27.
30. Forster A, Brown L, Smith J, et al. Information provision for stroke patients and their caregivers. Cochrane Database Syst Rev 2012; 11(11): CD001919
31. Crocker TF, Brown L, Lam N, et al. Information provision for stroke survivors and their carers. Cochrane Database Syst Rev 2021; 11(11): CD001919.
32. Lobo EH, Frølich A, Abdelrazek M, et al. Information, involvement, self-care and support-The needs of caregivers of people with stroke: A grounded theory approach. PLoS One 2023; 18(1): e0281198.

Ethics

Ethics Committee Approval: The study was approved by Selçuk University Clinical Research Local Ethics Committee (Date: 07.11.2023, No: 2023/20).

Informed Consent: The authors declared signed informed consent was obtained from all cases.

Authorship Contributions: Surgical and Medical Practices: FE, DÖ, OE, GÖ, SÖ. Concept: FE, DÖ, OE, GÖ, SÖ. Design: FE, DÖ. Data Collection or Processing: FE, DÖ, OE, GÖ, SÖ. Analysis or Interpretation: FE, GÖ, SÖ. Literature Search: FE, DÖ, OE, SÖ. Writing: FE, DÖ, OE, SÖ.

Copyright Transfer Form: Copyright Transfer Form was signed by all authors.

Peer-review: Internally peer-reviewed.

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

Financial Disclosure: The authors declared that this study received no financial support.