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## Fatigue After Stroke and Quality of Life

**Objective:** Fatigue is a common symptom in patients with stroke. Fatigue includes both physical and mental lack of energy, decreased functional status, and irritability. Poststroke fatigue can influence daily activities of individuals considerably severely and can reduce their activity or working performances. Besides, it can cause a constant functional capacity insufficiency by reducing the physical activity. The primary goal of this study was to determine the severity of fatigue and then affecting factors were investigated.

**Material and Methods:** This descriptive study included 211 stroke patients. Data were collected using Fatigue Severity Scale and SF-36. The Mann-Whitney U test and the chi-square test were used in the analysis of data.

**Results:** Fatigue was reported in 64.5% of the patients. The mean Fatigue Severity Scale score was  $4.93 \pm 2.07$  in patients. The highest mean item scores were found "exercise brings on my fatigue" and "my motivation is lower when I am fatigued".

**Conclusion:** The results obtained from our research showed that fatigue remains a frequent and persistent symptom experienced after stroke development. The awareness and assessment of fatigue is essential for the management of stroke patients. In this study, it was shown that post-stroke fatigue is a significant problem of patients and the level of fatigue was determined.

**Key Words:** Fatigue, nursing care, quality of life, stroke.

### İnme Sonrası Yaşam Kalitesi ve Yorgunluk

**Amaç:** Yorgunluk inmeli hastalarda yaygın görülen bir semptomdur. Yorgunluk, fiziksel ve mental enerjide azalma, fonksiyonel durumda azalma ve sinirliliği içerir. İnme sonrası yorgunluk insanların günlük aktivitelerini ciddi şekilde etkileyebilmekte ve iş performansını düşürebilmektedir. Ayrıca fiziksel aktiviteyi azaltarak, sürekli fonksiyonel kapasitede yetersizliklere neden olabilmektedir. Bu çalışmanın temel amacı yorgunluğun şiddetini belirlemek ve etkileyen faktörleri incelemektir.

**Gereç ve Yöntem:** Bu tanımlayıcı çalışmanın örneklemini 211 inme hastası oluşturdu. Veriler, Yorgunluk Şiddet Ölçeği ve SF-36 kullanılarak toplandı. Verilerin analizinde Mann-Whitney U testi ve ki-kare kullanıldı.

**Bulgular:** Hastaların %64.5'inde yorgunluk saptandı. Hastalarda yorgunluk şiddet ölçeği ortalaması  $4.93 \pm 2.07$ 'dir. En yüksek ortalama skorlar "egzersiz beni yoruyor" ve "yorgun olduğum zaman motivasyonum düşer" maddeleridir.

**Sonuç:** Araştırmadan elde edilen sonuçlar inme sonrası yorgunluğun sürekli ve sık yaşanan bir semptom olduğunu gösterdi. Yorgunluğun değerlendirilmesi ve farkına varılması inmeli hastaların yönetiminde temeldir. Bu çalışma, inme sonrası yorgunluğun hastaların önemli bir problem olduğunu ve yorgunluğun şiddetinin belirlenmesi gerektiğini gösterdi.

**Anahtar kelimeler:** Yorgunluk, hemşirelik bakımı, yaşam kalitesi, inme.

### Introduction

As a major chronic disease, stroke develops with complications and it can cause disability in the absence of proper treatment and can significantly lower the quality of life (1, 2). Stroke brings serious restrictions on the ability to activate, use and restore the physiological and psychosocial resources, which, in turn, gives rise to the imbalance resulting in subjective fatigue (1). Fatigue is highly prevalent and has a negative impact on quality of life (3). It can be observed in almost all chronic diseases (multiple sclerosis, stroke, rheumatoid arthritis, cancer, health failure and Parkinson's disease etc.). Fatigue is experienced months and even years after the stroke and constitutes one of the main complaints. A significant number of patients report that fatigue is either the worst or one of the worst symptoms of stroke (1, 4). A study focusing upon the prevalence and severity of post-stroke fatigue revealed that a large proportion of stroke patients had fatigue problems (5). Post-stroke fatigue prevalence rates have been reported to range from 38% to 68% (n=223 patients) (6). Annoni et al. (7) indicated that post-stroke objective or subjective fatigue occurs in around 50% of patients and fatigue percentage in post-stroke survivors ranges from 29% to 68%. Park et al. (8) found that 30% of

stroke victims had post-stroke fatigue. Fatigue can affect the health of individual by causing decrease in performance, concentration, changes in social life, and failure in rehabilitation. The incidence of feeling low vitality affects daily activities (9).

Fatigue is classified as subjective and objective fatigue in literature. Objective fatigue is an observable and measurable reduction in performance, while subjective fatigue is a feeling of getting tired quickly (10, 11). Fatigue has been defined as "an overwhelming sustained sense of exhaustion and decreased capacity for physical and mental work at the usual level" (12, 13). Post-stroke fatigue has impacts on functional outcomes and is typically associated with poor neurological recovery, low activity levels in daily life, decreased quality of life and higher possibility of mortality (13-17).

Fatigue is a symptom that should be considered multi-dimensional. Fatigue can lead to functional impairment, psychological distress, prolongation in the process of healing, and difficulties in the rehabilitation process (18). The duration of rehabilitation is a very important part of recovery in stroke patients. The aim of rehabilitation in stroke management is to reach patients to perform what they were able to do previously. It is necessary for nursing team to primarily to assess stroke patients subjective and objective fatigue.

Rehabilitation nurses should assess certain features (intensity, onset time, duration, factors that decrease or increase) and associated factors of fatigue (disease process, medications used, sleep and rest patterns, nutritional status, and depression) experienced by the patient in the patient's history. Early diagnosis of fatigue by nurses can increase the patient's quality of life (19).

In general, fatigue in stroke patients has been observed and its prevalence has been determined in the relevant research. In Turkey, however, there have been few studies on post-stroke fatigue, post-stroke quality of life and the factors which can affect it. It is of great importance that nurses providing care for stroke patients should have knowledge of fatigue. If fatigue can be diagnosed early and treated by the health care professionals, the quality of life of the stroke patient can be increased. The objectives of this descriptive study were (a) to evaluate fatigue in patients with stroke, (b) to describe socio-demographic factors associated with fatigue and (c) to evaluate quality of life.

## Material and Methods

### Design and sample

The sample of the study was consisted of outpatients who attended the Neurology Outpatient Clinic of a Hospital and were diagnosed with stroke. This descriptive study included 211 stroke patients.

The inclusion criteria of the sample were having no visual or hearing impairment, being able to communicate, and having no anemia and nutrition disorders.

### Socio-demographic data form

A socio-demographic data collection form consists of information about the patient and his/her illness. In this form, together with information about the patient's age, gender, marital status, education level were noted. The date that the illness was started, affected site (of the body), and comorbidities were assessed.

### The Fatigue Severity Scale

The Fatigue Severity Scale (FSS) was employed to assess fatigue. It was originally developed to determine the impact of fatigue on patients with multiple sclerosis but has also been used in stroke patients (6). The dual measurement determined the perceptions of patients about the effect of fatigue on defined functional activities over the previous week and measured the self-perceived level of fatigue on the day of encounter (1).

The FSS is a nine items questionnaire. Krupp et al. (20) demonstrated that the FSS was reliable and valid Cronbach's alpha was ( $r=0.81$ ) for test retest reliability and ( $r=0.89$ ) for concurrent validity.

Respondents answered the questionnaire using a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree) higher scores indicating high level of fatigue. For each respondent, the sum of scores of the nine items was divided by the number of items. Originally, respondents with mean scores more than 4 were defined as suffering from severe fatigue (21, 22). Validity and reliability studies of the scale were conducted in Turkey by Armutlu et al. in 2007. The Cronbach's alpha internal coefficient consistency of the scale was found 0.89.

### The SF-36 Health Survey

The SF-36 is a scale which is commonly used in Turkey to evaluate the quality of life of the patients (23-29). The SF-36, developed by Ware and Sherbourne (30), consists of a multi-item scale which assesses eight health concepts: physical functioning (PF), physical role (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), emotional role (RE), and mental health (MH). "Score interval is between 0 (low QOL) and 100 (high QOL) on the SF-36" (31). Validity and reliability studies of the scale was conducted in Turkey by Pinar in 1995. The Cronbach's alpha internal coefficient consistency of the scale was found 0.92 and reliability coefficients of test-retest were determined to vary between 0.73 and 0.90 (28).

### Data collection procedures

The researcher went to the Neurology Outpatient Clinic once a week as the patients included in the research were coming to the clinic once a week for checkup. Data were collected through face-to-face interviews with the stroke patients. Each interview lasted for approximately 20 minutes.

The researcher initially interviewed the patient's doctors and the patient's doctors decided together whether patients had any visual or hearing impairments, or whether they were able to communicate and had any cognitive impairments. Then, informed consent was obtained from the patients. Finally the patient's charts were checked by the researcher and comorbid diseases were recorded. Sociodemographic information forms, FSS and SF-36 were completed.

### Data analysis

Data analysis was performed using SPSS (Version 15.0 for Windows). Descriptive analysis carried out on data of the patients included numeric and percentile distributions. Mann-Whitney U test was also used to compare the sub-dimension mean scores of SF-36 by fatigued and non-fatigued groups. Between the total score of the Fatigue Severity Scale and socio-demographic and health variables (such as age, gender, and educational level) were determined using the chi-square test.

### Ethics

This study was approved by the Ethics Committee of a School of Nursing and the Neurology Outpatient Clinic of the Hospital. Informed consent was obtained from each patient.

### Results

Screening included 211 stroke patients (133 male, 63.0%, and 78 female, 37.0%). The age mean was 61.5 years (SD = 12.9). Regarding to educational level, 60.7% of the subjects were primary school graduates, 15.2% were secondary school graduates, 14.7% were university graduates and 9.5% were illiterate in terms of the education level. Eighty one percent of the subjects were married, whereas 42.7% of the patients had been diagnosed as stroke for between 7 months and 1 year. The number of those who were currently employed was 13.7%. Most of the patients (59.2%) had experienced left hemiplegia and had chronic diseases such as hypertension (71.6%).

The relationship between FSS scores and socio-demographic and health variables of the sample was summarized in Table 1. Many other related factors were also examined in search of links with fatigue. Age (P=0.52), gender (P=0.52), marital status (P=0.40), level of education (P=0.03), work (P=0.17), onset of stroke (P=0.18), hemisphere of stroke (P=0.28), time of stroke (p=0.18) and comorbid disease conditions (P=0.35). However, none of these factors found to be significant predictors of fatigue. Our study revealed that patients who were university graduates experienced higher levels of fatigue (P<0.05) (Table 1).

**Table 1.** Relationship between FSS scores and Sociodemographic and Health Variables (n=211)

Sociodemographic and Health Variables	Patients with Fatigue n (%)	Patients without Fatigue n (%)	Fatigue $\bar{x} \pm SD$	X <sup>2</sup>	P
<b>Age</b>					
<44	13 (50)	13 (50)	4.32±1.87		
45-54	22 (62.9)	13 (37.1)	5.16±2.11		
55-64	40 (69.0)	18 (31.0)	5.13±2.17		0.52
65-74	35 (64.8)	19 (35.2)	4.88±2.08		
>75	26 (68.4)	12 (31.6)	4.92±1.99		
<b>Gender</b>					
Female	50 (64.1)	28 (35.9)	4.93±2.03		0.52
Male	86 (64.7)	47 (35.3)	4.93±2.10		
<b>Marital status</b>					
Married	109 (63.7)	62 (36.3)	4.95±2.10	0.716	0.4
Unmarried	27 (67.5)	13 (32.5)	4.86±1.93		
<b>Level of education</b>					
Illiterate	14 (70.0)	6 (30.0)	4.88±2.04		
Primary school	80 (62.5)	48 (37.5)	4.83±2.16	8.501	0.03
Secondary school	16 (50.0)	16 (50.0)	4.52±1.90		
University	26 (83.9)	5 (16.1)	5.82±1.66		
<b>Work</b>					
Employed	16 (55.2)	13 (44.8)	4.43±2.01	0.298	0.17
Unemployed	120 (65.9)	62 (34.1)	5.01±2.07		
<b>Onset</b>					
<6 months	5 (83.3)	1 (16.7)	5.53±1.37		
7 months to 1 year	51 (56.7)	39 (43.3)	4.49±2.12	4.785	0.18
1-3 years	47 (68.1)	22 (31.9)	5.34±1.98		
>4 years	33 (71.7)	13 (28.3)	5.10±2.05		
<b>Hemisphere of stroke</b>					
Left	83 (66.4)	42 (33.6)	4.88±2.10	0.558	0.28
Right	53 (61.6)	33 (38.4)	4.97±2.05		
<b>Co-morbid disease</b>					
Present	99 (65.6)	52 (34.4)	5.00±2.13	0.634	0.35
Absent	37 (61.7)	23 (38.3)	4.76±1.90		

**Table 2.** Characteristics of FSS

FSS	$\bar{x} \pm SD$
My motivation is lower when I am fatigued	5.25±2.26
Exercise brings on my fatigue	5.48±2.17
I am easily fatigued	4.76±2.52
Fatigue interferes with my physical functioning	5.21±2.22
Fatigue causes frequent problems for me	4.7±2.55
My fatigue prevents sustained physical functioning	5.0±2.33
Fatigue interferes with carrying out certain duties and responsibilities	4.78±2.41
Fatigue is among my three most disabling symptoms	4.45±2.70
Fatigue interferes with my work, family, or social life	4.74±2.44
<b>Total</b>	<b>4.93±2.07</b>

**Table 3.** Comparison of Fatigue Groups According to SF-36 Sub-Dimension Scores

Subscale	Patients with Fatigue	Patients without Fatigue	Mann-Whitney U
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
Physical functioning	48.52±32.77	48.93±31.87	5053.000 P>0.05
Social functioning	66.90±27.36	72.66±24.37	4497.000 P>0.05
Physical role	44.85±49.91	50.66±50.33	4803.500 P>0.05
Emotional role	65.44±47.73	70.66±45.83	4833.500 P>0.05
Mental health	53.20±23.70	52.53±22.18	5001.000 P>0.05
Vitality	39.11±24.82	40.66±23.67	4848.500 P>0.05
Bodily pain	84.62±26.18	84.72±19.46	4646.500 P>0.05
General health	57.36±29.37	60.61±28.16	4807.000 P>0.05

Mean item scores of the FSS are shown in Table 2. Fatigue was reported in 64.5% of the patients and the mean FSS score was 4.93±2.07. The highest scores were found in the following items (mean scores in parentheses): "exercise brings on my fatigue" (5.48), "my motivation is lower when I am fatigued" (5.25), "fatigue interferes with my physical functioning" (5.21).

Differences between the fatigued and non-fatigued groups in the sub-dimensions of SF-36 were found to be statistically not significant (P>0.05) (Table 3).

## Discussion

Our study showed that fatigue was reported in 64.5% of the patients. It was determined in our study that age, gender, working status, duration of stroke and comorbid diseases did not affect the fatigue level. In a Turkish study, fatigue was detected in 55.7% (n=70) of stroke cases. Fatigue is one of the most important complaints following stroke, and was detected in 39-72 % of those who have experienced it (11). Stein et al. (32) found that 76% of patients made a complaint related to fatigue within 8 months following the stroke. Ingles et al. (33) found that 68% of patients complained about fatigue while this rate was 36% in the control group. In other studies, fatigue was reported in 57% of patients and post-stroke fatigue was reported in 51.3% of the patients (15, 34). Our results were parallel to those of the above-mentioned studies. Many studies demonstrated that most of the patients suffering stroke experienced fatigue and there was no relationship between fatigue and socio-demographic characteristics (5, 33). Colle et al. (11) did not find a relationship between fatigue and related

factors (age, gender, time since stroke). Lerdal et al. (22) reported that there was no relationship between fatigue and gender, level of education or age while unemployed patients reported fatigue significantly more frequently than employed patients. In our study, however, it was found that patients who were university graduates experienced higher levels of fatigue. It was thought that this difference may have resulted from the fact that the studies were carried out on different sampling groups. Besides, it can be easily seen when working conditions are examined that university graduates are employed in works which are both physically and mentally more intense and tiring in our country and this fact may have also resulted in the above-mentioned difference. According to researchers, being active in the social and business life may become a factor increasing the fatigue for the university graduates by making it hard for them to face the changes in their life styles following the stroke. When mean fatigue levels of the patients were considered by their age groups, it was found that fatigue level of the patients aged 44 and below (4.32±1.87) was lower than the other age groups and it was observed that fatigue levels increased at age groups of 45-54 and 55-64 but this difference was not found statistically significant (P>0.05). As the age of retirement is around 65 in our country, it can be said that individuals within this age group do not usually work. The elderly people and especially those having a chronic disease and needing physical assistance/care live in the same house with their daughters, sons, daughters-in-law and grandchildren and their requirements are met by the family members. Since the people of this age group have a sedentary life style, they experience lower levels of

fatigue when compared to the younger age groups leading more active lives. Demographic factors such as age, gender and comorbidity did not have significant relationships with fatigue and the instrumental activities of daily life or health-related quality of life (6). Glader et al. (4) found that elderly female stroke patients showed more marked fatigue. In our study, no difference was observed between female and male patients with regard to fatigue, with an average of fatigue of 4.93 in both groups. In Turkey, women both work at home (cooking, taking care of the children, cleaning the house etc.) and take part in the business life. As for men, they work outside the house but they do not help women at home. It's thought that since both men and women have similar life conditions, there is no difference in their fatigue levels. These results are attributed to the differences of sampling groups in the studies and to the socio-cultural differences peculiar to the country. It was detected that fatigue levels of those having a comorbid disease ( $5.00 \pm 2.13$ ) were higher than those lacking a comorbid disease ( $4.76 \pm 1.90$ ) but that there was no statistically significant difference ( $P < 0.05$ ). Since fatigue is a subjective concept, this result is thought to possibly originate from different perception of the patients. Van de Port et al. (6) found that fatigue was experienced in 68% of patients within 6 months following the stroke, whereas 74% of patients felt fatigued within 1 year and 58% within 3 years after the stroke. Schepers et al. (35) found fatigue rates to be 64.1% within six months after the stroke and to be 69.5% within one year after the stroke. In our study, however, the highest average fatigue (5.53) was observed within first 6 months group. Thus, being able to measure this symptom constitutes an important part of the management of this disease as well as understanding its role in the overall impact of the disease. Rehabilitation nurses should carefully evaluate the presence and severity of fatigue as it is related to activity, self-care and quality of life in patients with stroke.

The highest scores were found in the following items: "exercise brings on my fatigue" and "my motivation is lower when I am fatigued". Choi-Kwon et al. (15) found a mean score of 2.9 while the highest score was obtained in the item "I am easily fatigued" (5.01) followed by "my motivation is lower when I am fatigued" (4.58). Michael et al. (1) found a mean total FSS score of 3.9 while 46% of the sample fell into the range that defines fatigue. Patients suffering from stroke scored highest on the following statements; "my motivation is lower when I am

fatigued" (5.42), "exercise brings on my fatigue" (4.2), and "fatigue interferes with my physical functioning" (4.32). In another study, the highest scores were noted on the items "exercise brings on my fatigue" (4.8), "my motivation is lower when I am fatigued" (5.8), and "fatigue interferes with my physical functioning" (4.5) (34).

In our study, the fatigue level was found to be high but there was no relationship between level of fatigue and quality of life. When the relationship between level of fatigue and quality of life was examined in the literature, it was found that fatigue reduced patients' quality of life (3, 6, 15). "In a study, relationships found between fatigue and the general perception of health, energy/vitality, overall physical and mental score of quality of life (30)" It is thought that stroke patients try hard to cope with these symptoms even though patients experience symptoms of fatigue. It is thought that the differences between the results of the studies originate from the varying characteristics of the sample groups in terms of age and duration of illness etc.

In conclusion, fatigue remains a frequent and persistent symptom experienced after a stroke has occurred. It is of basic importance for the nursing care management of patients experiencing fatigue that fatigue should be identified and evaluated. In this study, it was shown that post-stroke fatigue is a significant problem of patients and the level of fatigue was determined.

The nurse establishing one-to-one interaction with the patient must enable the patient to explain the effects of fatigue on his or her life and to express his individual abilities and interests. Nurses should describe activities which reduce or induce fatigue in patients. Energy conservation strategies should be taught to patients and should be configured into the daily activities of patients with stroke by planning activities and resting times. Besides, the patients and the families should be supported by nurses in shaping these activities and making environmental changes. Nurses should coordinate the care and the treatment which is provided to the patient by other members of the health team and encourage the therapists and the patients to communicate with each other.

Relevance to clinical practice: This study highlighted the importance the fatigue of stroke patients. It is recommended that our study can be used to determine the fatigue of stroke patients in Turkey.

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