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Research Article

Investigation Of The Relationship Between Postural Control and Quality Of Life In Stroke Patients

İnmeli Hastalarda Postüral Kontrol ve Yaşam Kalitesi Arasındaki İlişkinin İncelenmesi

Ozden BASKAN [1], Cansu DEMIR[2]

[1,2]Istanbul Rumeli University, Faculty of Health Sciences, Istanbul, Türkiye

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Corresponding Author
Ozden BASKAN
ozdenbaskan@gmail.com

ORCID
O BASKAN
0000-0002-1549-4838

C DEMİR
0009-0002-6266-2002

Abstract

Aim: This study aimed to evaluate the relationship between postural control and quality of life in stroke patients. **Materials and Methods:** This cross-sectional study included 90 patients who had a stroke and were continuing to participate in a physiotherapy program. Demographic information and the duration of the stroke were recorded. Postural control and balance were measured with the Postural Assessment Scale (PASS-Turk) and quality of life was assessed with the Stroke Specific Quality of Life Scale (SS-QOL). **Results:** Of the 90 stroke patients included in the study, 53.3% were women (n=48) and 46.7% were men (n=42). The mean age of the participants was 51.96 ± 14.64 years. The mean body mass index of the patients in the overweight group was 26.07 ± 4.27 kg/m². The mean score of the PASS-Turk scale was 20.97 ± 8.87 and the mean score of the SS-QOL scale was 131.77 ± 41.76. A moderately significant correlation was found between the scores of the stroke patients on the PASS-Turk scale and the SS-QOL scale (r= 0.65, p<0.001). A significant negative correlation was found between age and the PASS-Turk score and between age and the SS-QOL score (r=-0.35, p=0.001; r=-0.38, p<0.001). There was a relationship between gender and quality of life ((r= 0.40, p<0.001). A negative relationship was found between the duration after stroke and postural control (r=-0.40, p<0.001). **Conclusion:** In stroke patients, there was a relationship between age and postural control and age and quality of life. There was also a positive correlation between postural control and quality of life. The results suggest that regular assessments of postural control may positively affect patients' quality of life. Therefore, the importance of postural control should be emphasized in rehabilitation programs after stroke.

Öz

Amaç: Bu çalışmada inme geçiren hastalarda postüral kontrol ile yaşam kalitesi arasındaki ilişkinin değerlendirilmesi amaçlandı. **Gereç ve Yöntem:** Bu kesitsel çalışmaya inme geçirmiş ve fizyoterapi programına devam eden 90 hasta dahil edildi. Katılımcıların demografik bilgileri ve inme geçirme zamanı kaydedildi. Ayrıca postüral kontrol ve denge düzeyi Postüral Değerlendirme Ölçeği (PASS-Turk) ile ölçülürken; yaşam kalitesi ise İnmeye Özgü Yaşam Kalitesi Ölçeği (SS-QOL) ile değerlendirildi. **Bulgular:** Çalışmaya dahil edilen 90 inmeli hastanın %53.3'ünü kadınlar (n=48), %46.7'sini erkekler (n=42) oluşturmaktaydı. Katılımcıların yaş ortalaması 51.96 ± 14.64 yıldı. Hastaların vücut kitle indeksi ortalaması 26.07 ± 4.27 kg/m² ile fazla kilolu kategorisindeydi. PASS-Turk ölçeğinin skor ortalaması 20.97 ± 8.87 iken SS-QOL ölçeğinin skor ortalaması ise 131.77± 41.76 idi. İnmeli hastaların PASS-Turk ile SS-QOL ölçekleri arasında orta düzeyde negatif yönlü ilişki bulundu (r=0.65; p<0.001). Yaş ile Pass-Turk ve yaş ile SS-QOL arasında negatif yönlü ilişki bulundu (r=-0.35, p=0.001; r=-0.38, p<0.001). Cinsiyet ile yaşam kalitesi arasında ilişki bulundu (r= 0.40, p<0.001). İnme sonrası geçen süre ile postüral kontrol arası negatif yönlü ilişki bulundu (r=-0.40, p<0.001). **Sonuç:** İnme geçirmiş hastalarda yaş ile postüral kontrol ve yaş ile yaşam kalitesi arasında ilişki bulundu. Ayrıca postüral kontrol ile yaşam kalitesi arasında pozitif yönlü ilişki bulunmaktadır. Sonuçlar, postüral kontrolün düzenli olarak değerlendirilmesi ve izlenmesinin, hastaların yaşam kalitesi üzerine olumlu etkiler yaratabileceğini göstermektedir. Bu nedenle inme sonrası rehabilitasyon programlarında postüral kontrolün önemi vurgulanmalıdır.

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INTRODUCTION

Stroke is a common global health problem, associated with high mortality and disability, and has a devastating course (1). According to the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2017, stroke ranked as the second-leading cause of mortality globally and the third-leading cause of death and disability overall (2).

Some patients with loss of muscle strength, balance-coordination, speech, vision, and memory after stroke can recover completely, while others have to continue their lives as severely dependent (3). One important component of the stroke patient's rehabilitation therapy is postural assessment. Postural control assessment in patients with stroke has also been shown to provide information about the prognosis of the disease (4).

Postural control is considered to be a complex motor skill that is formed through the functioning of multiple sensorimotor processes. Postural orientation and postural equilibrium are two main goals of postural control (5). Stroke patients commonly experience trunk disorders characterized by decreased sitting balance, trunk coordination, and muscle strength (6). Trunk control after stroke is associated with functional balance and activities of daily living (ADL) and is an important indicator of functional recovery (7). Although there are studies on limb and gait balance in stroke patients, there are few studies on postural control (8).

In a study, it was stated that the quality of life of individuals after stroke decreased considerably. For this reason, they stated that research on quality of life will contribute to improving quality of life (9). It is important for patients living with a disability after a stroke to achieve social integration and a better quality of life (10). Investigating the factors affecting the quality of life of patients with stroke provides insight into the social burden of the disease on the individual (11). A study investigating the factors affecting the quality of life in stroke patients reported that symptom severity, physical status, and social support significantly affected the quality of life (12). Investigation of the relationship between postural control and health-related quality of life after stroke is important for improving quality of life. In this study, we aimed to examine the relationship between postural control and health-related quality of life in patients with chronic stroke.

MATERIALS AND METHODS

Research Design: This descriptive study aimed to examine the relationship between postural control and quality of life in stroke patients. This study was conducted between September and November 2023 in an application and research center.

Population and Sample

According to the principles of the Declaration of Helsinki, patients between the ages of 25 and 85 who were diagnosed with stroke, who were treated in a private clinic, and who continued their physiotherapy program were included in the study. Patients who could communicate, had no visual or hearing problems, had a stable medical condition, had a cerebrovascular event at least 6 months prior, and volunteered to participate in the study were included in the evaluation. Cases that did not meet the specified criteria were excluded from the study. The checklist of STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) was used for this study.

Data collection tools

After providing their voluntary consent, participants were asked to provide demographic information. Postural control and balance were assessed with the Postural Assessment Scale in Stroke Patients (PASS-Turk) and quality of life was assessed with the Stroke Specific Quality of Life Scale (SS-QOL). The duration of the stroke and the rehabilitation time were recorded.

The PASS-Turk scale was designed to assess postural control and balance levels in stroke patients, and Turkish validity and reliability studies were performed (13,14). The PASS-Turk scale consists of 2 parts, posture maintenance and change, and 12 questions. Each question evaluating the individual's postural control and balance level is scored on a scale ranging from 0 to 3 points. The scale ranges from 0-36. Higher scores indicate better posture (15).

The Stroke-Specific Quality of Life Scale (SS-QOL) was developed by Williams et al. in 1999 to assess the quality of life of stroke patients. A Turkish validity and reliability study was subsequently conducted to adapt the scale for use in Turkish-speaking populations. (16). The 49-item, scale evaluates a total of 12 domains including mobility, energy, upper extremity function, self-care, thinking, occupation/productivity, temperament, family and social role, language, vision, and personality characteristics (17). The calculation of the scale score consisted of 2 stages. In the first stage, the score obtained from each domain is divided by the number of questions in the domain. In the other stage, the score of the scale is calculated by dividing the total score obtained from each domain by 12. The items of the SS-QOL were scored on a Likert scale from 1 to 5. A high scale score indicates a high quality of life and a low scale score indicates a low quality of life (18).

Statistical Evaluation of Data

Statistical analysis was performed using the SPSS 22.0 statistical program. The study sample size was determined by a power analysis performed in the G*Power program. According to the power analysis, a 90% confidence interval was accepted, and the power of the test was 80% (11). Ninety people participated in the study. Continuous variables are expressed as the means with standard deviations, and categorical variables are expressed as numbers and percentages. The conformity of the studies to a normal distribution was evaluated by the Shapiro–Wilk test. Spearman correlation analysis was applied to determine the relationship between the scales; $p<0.05$ indicated a statistically significant difference.

RESULTS

Of the 90 stroke patients included in the study, 53.3% were women (n=48) and 46.7% were men (n=42). Most participants were primary school graduates, unemployed, and married. A total of 26.7% of the subjects reported smoking and 16.7% reported alcohol use. While the right side was affected in half of the stroke patients (n=45), the left side was affected in the other half (n=45) (Table 1).

Table 1. Demographic Characteristics of Participants

Variables	X±SD	Min-Max
Age (year)	51.96 ± 14.64	25-85
Height (cm)	167.53 ± 8.69	152-190
Weight (kg)	74.27 ± 14.37	55-130
BMI (kg/ m²)	26.07 ± 4.27	18.75-41.96
Variables	n	%
Sex		
Male	48	53.3
Female	42	46.7
Education		
Primary school	27	30
Middle school	24	26.7
High school	21	23.3
University	18	20
Marital status		
Married	63	70
Single	27	30
The usage of cigarette		
Yes	24	26.7
No	66	73.3
The usage of alcohol		
Yes	15	16.7
No	75	83.3
The affected side		
Right	45	50
Left	45	50

BMI: Body Mass Index, Min: Minimum, Max: Maximum, SD: Standard Deviation, X: Mean,

The mean age of the participants was 51.96±14.64 years. The patients' mean body mass index (BMI) was 26.07±4.27 kg/m², within the overweight range (Table 1).

The mean score of the PASS-Turk scale was 20.97±8.87, and the mean score of the SS-QOL scale was 131.77±41.76 (Table 2).

Table 2. PASS-Turk and SSQOL results with participants' evaluations

Variables	X±SD	Min-Max
PASS-Turk	20.97 ± 8.87	6-36
SS-QOL	131.77 ± 41.76	76-237
Duration of stroke (year)	4.17 ± 2.36	1-10
Rehabilitation time (month)	38.97 ± 30.11	5-120

Min: Minimum, Max: Maximum, PASS-Turk: Postural Assessment Scale for Stroke Patients, SS-QOL: Stroke Specific Quality of Life Scale, SD: Standard Deviation, X: Mean

A significant negative correlation was found between age and the Pass-Turk score and between age and the SS-QOL score ($r=-0.35$, $p=0.001$; $r=-0.38$, $p<0.001$). There was no significant correlation between sex ($r=0.07$, $p=0.51$) and the PASS-Turk score, but there was a significant correlation between sex and BMI ($r=0.29$, $p= 0.005$). There was a relationship between sex and SS-QOL. Quality of life was better for male patients than female patients ($r=0.40$, $p<0.001$).

No significant correlation was found between postural control level and the presence of comorbidities ($r=-0.14$, $p= 0.17$) or drug use ($r=-0.15$, $p= 0.14$). No significant correlation was found between SS-QOL and the comorbidities ($r=-0.13$, $p= 0.20$) or drug use ($r=-0.14$, $p= 0.18$).

A moderate and negative correlation was found between stroke patients' PASS-Turk and SS-QOL scores ($r= 0.65$, $p< 0.001$). There was a moderate, negative correlation between the PASS-Turk score and both the duration of the stroke ($r= -0.40$, $p< 0.001$) and the rehabilitation time ($r=-0.32$, $p=0.002$).

As the duration of stroke increased, postural control was adversely affected. However, no significant correlation was found between the SS-QOL score and duration of stroke ($r=-0.07$, $p= 0.50$) or rehabilitation time ($r=0.09$, $p= 0.36$) (Table 3).

Table 3. Correlation of Scale Scores with Each Other and Demographic Data

Variables	Age	Sex	BMI	Comorbidity	Drug use	PASS-Turk	SS-QOL	Duration of stroke
Age (year)								
Sex	r= -0.25							
BMI (kg/m2)	r= 0.62	**r=0.29****						
Comorbidity	r= 0.41**	r= -0.11	**r= -0.36****					
Drug use	r= 0.45*	r= -0.13	r= -0.35**	**r= 0.99****				
PASS-Turk	r= -0.35*	r= 0.07	r= -0.03	r=-0.14	r= -0.15			
SS-QOL	r= -0.38**	**r= 0.40****	r= 0.08	r= -0.13	r= -0.14	**r= 0.65****		
Duration of stroke (year)	r= 0.26**	r= -0.05	**r= 0.33****	**r= -0.30****	**r= -0.29 ****	**r= -0.40****	r= -0.07	
Rehabilitation time (month)	r= 0.32**	r= -0.04	**r= 0.32****	**r= -0.22***	**r= -0.21***	**r= -0.32****	r= 0.09	**r= -0.94****

BMI: Body Mass Index; PASS-Turk: Postural Assessment Scale for Stroke Patients, SS-QOL: Stroke Specific Quality of Life Scale; *=p<0.05; **=p<0.01

DISCUSSION

In this study, we aimed to investigate postural control and quality of life in stroke patients and explore the relationship between these variables. We found that there was a negative relationship between postural control and quality of life. While previous research has examined postural control and quality of life in various disease groups and healthy individuals, to our knowledge, no study has specifically examined the relationship between postural control and quality of life in stroke patients (19).

The high risk of falls in patients who survived after stroke negatively affects the quality of life and leads to increased healthcare costs. Postural instability has been defined as one of the major fall risk factors. The importance of evaluating postural control to prevent falls has also been emphasized in the literature (20). In our study, we observed a significant positive correlation between postural control and quality of life among stroke patients. Specifically, we found that as the level of postural control increased, patients reported greater quality of life. Notably, individuals who experienced less difficulty in maintaining postural control and balance tended to report greater overall well-being and satisfaction with life. In a cross-sectional study similar to our study, 59 stroke survivors were analyzed in terms of balance and quality of life, and low balance level and fall risk were associated with low quality of life (21). In another study, balance, upper and lower limb function, and quality of life were assessed for 29 people who received a rehabilitation programme after a stroke. As a result of the study, it was reported that motor improvement in the lower extremity had a greater effect on health-related quality of life than in the upper extremity (22).

In a different study conducted on individuals with stroke, it was stated that aerobic training and strength training did not have a positive effect on improving balance, but both of the training methods positively affected the quality of life (23). More studies investigating the relationship between postural control and quality of life are needed.

Greater independence and mobility in daily life, better socioeconomic status and education level, and social support were associated with a greater quality of life. Anxiety, fatigue, and depression were found to be associated with a lower quality of life (24,25). In another study, functional status was reported as the most important determinant of quality of life (26). We identified a moderately positive correlation between postural control and quality of life. However, some studies suggest that physiotherapy interventions designed to improve postural control have positive effects on quality of life (27). Upon reviewing the literature, we found no studies that specifically examined the relationship between postural control and quality of life in patients with stroke.

In this study, we observed a negative correlation between age and postural control. Postural control was decreased with increasing age. This relationship is compatible with the literature (28). However, in another study, when the fall status of 2 groups, including elderly and young elderly individuals, was compared, no superiority was found between the groups (29).

It was observed that quality of life decreased with increasing age. A study conducted by Öztürk et al. revealed that one year after experiencing a stroke, older patients tended to report a worse quality of life (30). In another study examining the factors related to quality of life in patients with stroke, when the quality of life of patients aged 65 years and over was compared with the quality of life of patients aged under 65 years, it was observed that the quality of life of stroke patients aged over 65 years was lower. The literature contains studies indicating that advancing age is associated with declining quality of life (31,32).

In this study, we observed a correlation between sex and quality of life. Male patients had greater quality of life than females. In one study, it was found that the quality of life of male patients after stroke in the memory, psychological, and physical departments was better than that of female patients (33). In another study examining the effect of sex on quality of life in individuals with stroke and transient ischemic attack, Franzén-Dahlin et al. reported that the quality of life of women after stroke was lower than that of men. There are other supporting studies in the literature (34,35). The poor physical functional status of women before stroke and the presence of depression after stroke may negatively affect the recovery status of women and cause a decrease in quality of life (36). We believe that sex should not be ignored during rehabilitation.

Limitation of the present study was that the postural control and quality of life of patients with type of stroke (hemorrhagic, ischemic etc.) were not investigated. The fact that the comorbidities of patients with stroke were not analysed in detail is one of the limitations of the study.

CONCLUSION

Our study revealed the relationship between postural control and health-related quality of life in stroke survivors. The evaluation of postural control will give physiotherapists an idea about health-related quality of life. In addition, improving postural control will contribute positively to health-related quality of life.

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