

Determination of Activities of Daily Living Problems in Patients with Lateral Epicondylitis and Investigation of the Relationship between Pain and Perceived Occupational Performance and Satisfaction**Lateral Epikondilit Hastalarında Günlük Yaşam Aktivite Problemlerinin Belirlenmesi ve Ağrı ile Algılanan Aktivite Performansı ve Memnuniyet İlişkisinin İncelenmesi**Berkan TORPİL¹, Özgür KAYA²**Özet****Amaç:**

Lateral epikondilit dirsekte ağrıya neden olan, günlük yaşam aktivitelerini olumsuz yönde etkileyen ve üst ekstremitede en yaygın görülen hastalıklardan biridir. Bu çalışma, lateral epikondilit tanılı erişkin bireylerde günlük yaşam aktivitelerinin belirlenmesi ve ağrı ile günlük yaşam aktivitelerinde algılanan aktivite performans ve memnuniyeti arasındaki ilişkinin incelenmesi amacıyla planlandı.

Gereç ve Yöntem:

Çalışmayı yaş ortalaması 52,185,92 yıl olan 17'si erkek 39'u kadın toplamda 56 lateral epikondilit tanılı birey tamamladı. Ağrının değerlendirilmesi için Visual Analog Skalası (VAS), algılanan aktivite performans ve memnuniyet düzeyinin belirlenmesi için Kanada Aktivite Performans Ölçeği (KAPÖ) kullanıldı.

Bulgular:

Katılımcıların VAS'a göre istirahatteki ağrı ortalaması 2,400,72, aktivite sırasındaki ağrı ortalaması 6,141,11 olduğu belirlendi. KAPÖ'ye göre katılımcıların günlük yaşam aktivitelerinde algılanan aktivite performans ortalaması 4,131,04 ve memnuniyet ortalaması 4,071,17 olduğu belirlendi. Katılımcıların ağrı ile günlük yaşam aktivitelerindeki ilişkisi incelendiğinde, istirahatte ağrı ile algılanan aktivite performans ($r=-0,015$, $p=0,911$) ve memnuniyet ($r=-0,064$, $p=0,639$) düzeyi arasında herhangi bir ilişki bulunmadı. Aktivite sırasındaki ağrı ile algılanan aktivite performans ($r=-0,729$, $p<0,001$) ve memnuniyet ($r=-0,774$, $p<0,001$) arasında orta derecede güçlü negatif bir ilişki bulundu ($p<0,05$). Katılımcıların %43,37'sinin kendine bakım, %39,72'sinin üretkenlik ve %16,89'unun serbest zaman aktivitelerinde problem yaşadığı belirlendi.

Sonuç:

Lateral epikondilit tanılı bireylerde aktivite sırasında ağrı ile günlük yaşam aktivitelerinde algılanan aktivite performans ve memnuniyet düzeyinin ilişkili olduğu belirlenmiştir.

Anahtar kelimeler:

Günlük yaşam aktiviteleri; Ağrı; Aktivite performansı; Memnuniyet

Abstract**Aim:**

Lateral epicondylitis is one of the most common diseases in the upper extremity that causes pain in the elbow, negatively affects activities of daily living. This study was planned to determine the activities of daily living in adults with lateral epicondylitis and to examine the relationship between pain and perceived occupational performance and satisfaction in activities of daily living.

Material and method:

A total of 56 individuals with a diagnosis of lateral epicondylitis, 17 males and 39 females, with a mean age of 52.18±5.92 years, completed the study. Visual Analogue Scale (VAS) was used to evaluate pain, and Canadian Occupational Performance Measure (COPM) was used to determine perceived occupational performance and satisfaction level.

Results:

According to the VAS, the mean pain at rest of the participants was 2.40±0.72, and the mean of pain during activity was 6.14±1.11. According to COPM, the perceived occupational performance mean of the participants in activities of daily living was 4.13±1.04 and the mean satisfaction was 4.07±1.17. When the correlation between pain and activities of daily living was examined, there was no correlation between pain at rest and perceived occupational performance ($r=-0.015$, $p=0.911$) and satisfaction ($r=-0.064$, $p=0.639$). A moderately strong negative was found between pain during activity and perceived occupational performance ($r=-0.729$, $p<0.001$) and satisfaction ($r=-0.774$, $p<0.001$) in activities of daily living ($p<0.001$). It was determined that 43.37% of the participants had problems in self-care, 39.72% in productivity and 16.89% in leisure time activities.

Conclusion:

It was determined that pain during activity and perceived occupational performance and satisfaction level in activities of daily living were related in individuals diagnosed with lateral epicondylitis.

Keywords:

Activities of daily living; Pain; Occupational performance; Satisfaction

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Determination of Activities of Daily Living Problems in Patients with Lateral Epicondylitis and Investigation of the Relationship between Pain and Perceived Occupational Performance and Satisfaction

Introduction

Lateral epicondylitis, also known as Tennis Elbow or Lateral Elbow Tendinopathy, is one of the most common overuse syndromes in the elbow, which negatively affects the quality of life, activities of daily living and participation to these activities.¹ In the early stages, as a result of repetitive mechanical overuse or overload, the tendon's ability to repair itself is impaired. This then leads to structural change (tendon rupture), fibrosis, and calcification.² Symptoms present with chronic lateral elbow pain that is exacerbated by repeated wrist extension and/or forearm supination. Dominant limb involvement is common, and the extensor carpi radialis brevis is the most commonly affected tendon.³ It most commonly affects patients aged 30 to 60 years.⁴ Although there was no gender difference in prevalence, it was observed that the symptoms were longer and more severe in women.^{5,6} While the prevalence of lateral epicondylitis is between 1 and 3% in the general population, this prevalence rate rises in workers.⁷

Pain and point tenderness over the lateral epicondyle, weak grip strength, and functional limitation are typical findings.⁸ Although it is easy to diagnose, a universally accepted treatment protocol has not been defined yet.⁹ However, the therapeutic goals in the treatment of lateral epicondylitis are control of elbow pain, preservation of motion in the affected extremity, improvement in grip strength and endurance, return to normal function as well as prevention of further histological and clinical deterioration.⁶

Loss of function in the upper extremity in individuals diagnosed with lateral epicondylitis causes significant occupational performance and satisfaction problems in activities of daily living.^{10,11} Many conditions such as pain, negative sensory affect (such as proprioceptive sensory affect), loss of strength, repetitive ongoing activities and impaired life style affect these problems negatively.^{10,11} Finally, the chronicity of musculoskeletal conditions can lead to fear and avoidance behaviors.^{10,11} Therefore, researchers observed that individuals with a diagnosis of lateral epicondylitis can avoid many different activities.^{10,11} It is known that one of the most important problems when performing the activities of daily living of individuals with lateral epicondylitis in clinical practice is pain.^{6,10,11} As well as our knowledge, there was no study that examines activities of daily living problems and the relationship between pain and perceived occupational performance and satisfaction in activities of daily living. Therefore, the current study was planned to examine the relationship between pain and perceived occupational performance and satisfaction in activities of daily living in adults with a diagnosis of lateral epicondylitis, and to identify activities that have problems in daily life.

Material and Method

Study Design

This cross-sectional study was conducted with 56 individuals diagnosed with lateral epicondylitis, aged 18-65 years, who applied to Private Lokman Hekim Etlik Hospital between April 2021 and December 2021.

Ethical Consideration

The participants were informed about the study and all participants signed the informed consent form. The current study was carried out in accordance with the Principles of the Declaration of Helsinki. The current study was approved by the Lokman Hekim University Non-Interventional Clinical Research Ethics Committee on 10/03/2021 with the decision number 2021/031.

Participants

The current study was completed with 56 individuals diagnosed with lateral epicondylitis according to the inclusion and exclusion criteria. Inclusion criteria for the study; (1) diagnosis of lateral epicondylitis and complaint of elbow pain lasting longer than 6 weeks; (2) being between 18-65 years of age; (3) having a Mini Mental State Test score of 24 and above; (4) volunteering to participate in the study. The exclusion criteria are; (1) having any chronic disease that may affect the work in addition to the diagnosis of lateral epicondylitis (such as neurological, psychiatric, orthopedic, etc.), (2) administration of treatments such as steroid injection and platelet rich plasma for the treatment of lateral epicondylitis, (3) surgical operation due to lateral epicondylitis.

Measurement And Data Collection

Demographic form, Mini Mental State Examination, Canadian Occupational Performance Measure and Visual Analogue Scale were used to evaluate the participants.

Demographic Information Form

Participants' information such as age, gender, body mass index, dominant side, affected side, educational status and smoking/alcohol use were recorded.

Mini-Mental State Examination

The Mini Mental State Examination (MMSE), which is used to determine the cognitive status of the inclusion criteria, consists of a total of 30 points and 5 main headings (Orientation 10 points, recording memory 3 points, attention and calculation 5 points, recall 3 points and language 9 points). MMSE accepts 24 points as the threshold value for normal cognitive functions. Scores below this value indicate that there is a problem in cognitive functions.¹² Turkish validity and reliability studies of the test have been conducted, and the researcher found the MMSE positive and negative predictive values of 0.90 and 0.95, respectively, and kappa score 0.86.¹³

Canadian Occupational Performance Measure

Canadian Occupational Performance Measure (COPM) was used to determine the occupations that individuals have problems in their activities of daily living and to evaluate the perceived occupational performance and satisfaction levels of individuals in these occupations. In the first step, the occupations that individuals have problems with in daily life in the areas of self-care, productivity and leisure are determined by semi-structured interview and it is requested to give an importance score for each occupation with which they have problems on the basis of the Likert system, which is graded between 1 and 10. Afterwards, the occupations with a maximum of 5 problems are determined according to the importance score, and they are asked to give performance and satisfaction points on the basis of the Likert system, which is also rated between 1 and 10 for each occupation. Perceived performance and satisfaction scores are obtained by summing the performance and satisfaction scores and dividing them by the number of occupations.¹⁴ The Turkish adaptation performed and test re-test reliability of Turkish version of COPM performance was .988 and satisfaction .986, indicating excellent reliability.¹⁵

Visual Analogue Scale

Visual Analogue Scale (VAS) was used to determine the severity of pain. In the current study, the level of pain during activity and rest was evaluated. While making the assessment, the participants were asked to mark the points where they felt pain at rest and during activity (activities such as cooking, working at work, carrying bags, etc.), respectively, on a 10 cm horizontal line. Before marking, the individuals were explained in detail what they should do. Then, the distance of the marked points to the 0 point was measured and recorded in centimeters.^{16,17}

Statistical Analysis

The analysis of the data obtained from the study was performed with the "IBM Statistical Package for Social Sciences" (SPSS) Version 25.0 statistical program. Descriptive statistics were given as mean±standard deviation for continuous variables. The normality of data was analyzed with the "Shapiro-Wilks Test". It was determined that the data did not show normal distribution and non-parametric statistical methods were used. Correlations between variables were analyzed using the Spearman correlation test. Spearman's correlation coefficient (r) values were classified as indicating "weak" (0,00–0,19), "mild" (0,20–0,39), "moderate" (0,40–0,59), "moderately strong" (0,60–0,79), and "strong" (0,80–1,00) relations between variables. The power of the study and effect sizes were analyzed using G*Power software, version 3.1.9.2. Power analysis was performed to calculate the sample size. When the sample size was calculated with medium effect size, 95% confidence interval and 80% power, it was calculated that 56 individuals were required.

Results

The present study consisted of 17 males with a mean age of 55.534.54 years (minimum 58 years, maximum 62 years), 39 females with a mean age of 50.725.90 years (minimum 37 years, maximum 62 years) with a total of 56 individuals diagnosed with lateral epicondylitis. 78.6% of the participants use

the right dominant and 21.4% use the left dominant upper extremity. 64.3% of the participants had lateral epicondylitis on the right, 21.4% on the left and 14.3% on both sides. It was determined that 7 of the participants smoked. It was determined that more than half of the participants were high school graduates. Demographic data of the participants are presented in Table 1.

Table 1. Sociodemographic data of individuals with lateral epicondylitis

	N	minimum	maximum	mean	standart deviation
Age (year)	56	37.0	62.00	52.18	5.92
BMI	56	24.31	34.04	29.99	2.21
Educational status	n				%
Primary school	11				19.6
High school	31				55.4
University	14				25.0
Sex	n				%
Male	17				30.4
Female	39				69.6

BMI: body mass index

According to VAS, the mean pain at rest of the participants was 2.400.72, and the mean of pain during activity was 6.141.11. According to COPM, the perceived occupational performance mean of the participants in activities of daily living was 4.131.04 and the mean satisfaction was 4.071.17. The pain and perceived occupational performance and satisfaction levels of the participants are shown in Table 2.

Table 2. Pain and perceived occupational performance and satisfaction results

	N	minimum	maximum	mean	standart deviation
VAS Activity	56	3.50	8.60	6.14	1.11
VAS Resting	56	1.00	4.00	2.40	0.72
COPM					
Performance	56	1.80	6.00	4.13	1.04
COPM					
Satisfaction	56	2.00	6.20	4.01	1.17

COPM: Canadian Occupational Performance Measure; VAS: Visual Analogue Scale

When the relationship between pain and perceived occupational performance and satisfaction in activities of daily living of individuals diagnosed with lateral epicondylitis is examined; No relationship was found between pain at rest and perceived occupational performance and satisfaction in activities of daily living ($p > 0.05$). A moderately strong negative was found between pain during activity and perceived occupational performance ($r = -0.729$, $p < 0.001$) and satisfaction ($r = -0.774$, $p < 0.001$) in activities of daily living ($p < 0.001$). The relationship between participants' pain and perceived activity performance and satisfaction in activities of daily living is presented in Table 3.

Table 3. The correlations between quality of life and perceived occupational performance and satisfaction

		COPM -Performance	COPM -Satisfaction
VAS Aktivite	r	-0.729**	-0.774**
	p	0.001	0.001
VAS İstirahat	r	-0.015	-0.064
	p	0.911	0.639

COPM: Canadian Occupational Performance Measure; VAS: Visual Analogue Scale

When the activity areas where the participants had problems in activities of daily living were examined, it was determined that the self-care area was 43.37%, the productivity area was 39.72%, and the leisure time area was 16.89%. Some of the most frequently encountered activities are; It was determined that 27 of the participants had problems in carrying any material anywhere, 21 in house cleaning, 15 in work, 14 in driving a car. The activities that the participants had problems in their daily living activities are listed in Table 4.

Table 4. The occupations and distributions of the participants according to their occupation performance areas

SELF-CARE	N (95)	%43.37
PERSONAL CARE	n (47)	% (21.46)
Taking a bath	14	6.39
Sleep	11	5.02
Skin and hair care	11	5.02
Button up	5	2.28
Drinking water/tea with a glass	3	1.36
Wearing shoes	3	1.36
FUNCTIONAL MOBILITY	n (27)	% (12.32)
Getting from one place to another with any material (such as carrying bags etc.)	27	
COMMUNITY MANAGEMENT	n (21)	% (9.58)
Driving a car	14	6.39
Shopping	7	3.19
PRODUCTIVITY	N (87)	39.72
PAID OR UNPAID WORK	n (26)	% (11.87)
Working	15	6.84
Using computer	11	5.02
HOUSEHOLD MANAGEMENT	n (49)	% (22.37)
Cleaning house	21	9.58
Cooking	12	5.79
Ironing	11	5.02
Cleaning the kitchen counter	5	2.28
SCHOOL AND/OR PLAY	n (12)	% (5.79)
Studying	6	2.73
Writing	6	2.73
LEISURE TIME	N (37)	16.89
QUIET RECREATION	n (14)	% (6.39)
Doing handicraft	8	3.65
Painting	3	1.36
Reading boks/newspapers	3	1.36
ACTIVE RECREATION	n (11)	% (5.02)
Doing sport (football, exercises, etc.)	11	5.02
SOCIALIZATION	n (12)	% (5.79)
Meeting friends	8	3.65
Traveling	4	1.82
TOTAL	219	100

N, n= Number of occupations for which participants stated problems.

Discussion

The current study was planned to examine the relationship between pain and perceived occupational performance and satisfaction in activities of daily living in individuals with a diagnosis of lateral epicondylitis, and to determine activities with problems in activities of daily living. No relationship was found between pain at rest and perceived occupational performance and satisfaction in individuals with lateral epicondylitis. During the activity, it was determined that there was a significant relationship between pain and perceived occupational performance and satisfaction level. On the other hand, when the activities of daily living of the participants were examined, it was found that they had problems in different activities in the areas of self-care, productivity and leisure time.

Researchers state that pain is one of the most important complaints of individuals diagnosed with lateral epicondylitis and that pain causes many problems in activities of daily living.^{18,19} In addition, it was determined that the functionality of activities of daily living increased with the decrease of pain.^{18,19,20} On the other hand, it has been reported that pain affects individuals diagnosed with lateral epicondylitis negatively in terms of psychosocial aspects. Researchers have determined that the pain in the acute period is aimed at protecting the affected upper extremity, and the pain observed in the chronic period causes the limitation of physical activities.¹¹ On the other hand, they reported that pain impairs the sleep quality of individuals diagnosed with lateral epicondylitis and negatively affects them psychologically and socially due to pain.^{11,21} In addition, Tryler et al. reported that individuals' participation in activities of daily living decreased due to negative conditions such as sleep problems and psychosocial problems caused by pain.²² Similarly, in the current study, we think that pain causes problems in performing many activities in daily life. As the pain level increased, it was observed that the perceived occupational performance and satisfaction level of individuals with lateral epicondylitis in activities of daily living negatively affected. We think that it will be important to develop rehabilitation approaches for the adaptation of activities in daily living and pain management in order to reduce pain in

individuals with lateral epicondylitis.

A functional range of motion of the elbow joint of 30°-130° is required for performing activities of daily living related to the upper extremity.^{23,24} On the other hand, the majority of activities of daily living involve the act of upper extremity function.²⁵ When the elbow is in extension, the activity-participation level of the upper extremity is negatively affected due to insufficient grip strength. In other words, the researchers state that the activities performed by extending the arm (extension) and requiring grip are restricted and thus cause problems in daily living activities.⁶ On the other hand, researchers determined that factors such as pain caused by the disease, fear of re-injury, and avoidance of movement negatively affect perceived occupational performance and satisfaction in activities of daily living of individuals with lateral epicondylitis. In addition, the authors reported that wrong lifestyle conditions affect the activities of daily living negatively in individuals with lateral epicondylitis. It has been stated that it may be important to apply approaches such as activity modification in the improvement of this situation. In fact, the researchers stated that individuals with a diagnosis of lateral epicondylitis may also have problems in activities related to socialization.^{6,26,27} The current study shows that individuals diagnosed with lateral epicondylitis have problems in perceived occupational performance and satisfaction in activities of daily living, and that individuals also experience problems in different activities in the areas of self-care, productivity and leisure time. Since upper extremity functions have an important place in activities of daily living and many activities (such as carrying items such as bags from one place to another, taking a bath, driving a vehicle.) are performed through upper extremity functions, the perceived activity performance and satisfaction level of individuals with lateral epicondylitis may be negatively affected. In addition, we think that increased pain, especially during activity, negatively affects perceived occupational performance and satisfaction, and therefore causes problems in daily living activities.

Lateral epicondylitis is seen in those who perform activities that involve repetitive and difficult wrist extension.^{6,28} Vincenzino et al. stated in their study that 35-64% of all participants with lateral epicondylitis were people with occupations involving repetitive forearm and hand activities.²⁹ Waugh et al. stated in their study that activities involving repetitive wrist extension cause lateral epicondylitis, which results in chronic pain complaints.³⁰ Researchers have stated that long-term and frequent computer use, squeezing, rubbing, and heavy lifting may cause lateral epicondylitis because they involve intense repetitive movements. In addition, researchers have determined that office workers, housewives, people who deal with paint, whitewash and repair work are in the high-risk group. On the other hand, the authors stated that in individuals with lateral epicondylitis, behaviors such as fear and avoidance due to the disease affect the activities of daily living negatively.^{31,32,33} In the current study, when the activities of daily living of the participants were examined, it was determined that they had problems in activities such as cleaning the house, working at work, using a computer, cooking and ironing in the field of productivity. We think that he has problems in these activities because of the daily routines of the mentioned activities, that is, repetitive and compelling movements. It may be important to apply vocational rehabilitation and occupation-based rehabilitation approaches for individuals with lateral epicondylitis. In addition, ergonomic arrangements made in the work and home environment may be important in reducing the problems experienced due to lateral epicondylitis in productivity activities. On the other hand, when the area of socialization was examined, it was seen that the participants had more problems in doing sports. Similarly, occupational performance and satisfaction perceived by doing sports may be negatively affected due to decreased upper extremity functionality and pain.

There are some limitations of the current study. The first limitation was that participants were not questioned about sleep pain. Although it was observed that the participants had problems with sleep, we think that it would be important to evaluate the effect of this situation on activities of daily living more comprehensively. The second limitation is that the professions of the participants were not collected. We think that it is important to collect the professions because the occupations in which upper extremity functions and skills are used intensively affect the formation of lateral epicondylitis. Finally, one of our limitations is not evaluating the participants' range of motion,

analgesic/anti-inflammatory drug use, and the use of any orthosis.

Conclusion

As a result, it was determined that the pain during activity and perceived occupational performance and satisfaction level in activities of daily living were significantly related to individuals with a diagnosis of lateral epicondylitis. In addition, individuals diagnosed with lateral epicondylitis in their activities of daily living in the areas of self-care, productivity and leisure; It has been determined that he has problems in many activities where the use of upper extremities is intense, such as carrying anything from one place to another (such as carrying a bag), cleaning the house, working at work, driving a car, and taking a bath.

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Author's contribution:

All authors contributed to the methodology, analysis and writing of this manuscript.

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