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RESEARCH ARTICLE / ARAŞTIRMA MAKALESI

Comparison of Kinesiophobia in Sedentary Individuals with Non-Traumatic Upper and Lower Extremity Injuries: A Retrospective Study

Sedanter Bireylerde Travmatik Olmayan Üst ve Alt Ekstremite Yaralanmalarında Kinezyofobinin Karşılaştırılması: Retrospektif Bir Çalışma

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ABSTRACT

Objective: This study aimed to compare kinesiophobia (fear of activities) in sedentary individuals with non-traumatic lower extremity and upper extremity injuries and to examine associated factors.

Materials and Methods: The study included 111 individuals diagnosed with overuse injuries and complaining of pain in their lower or upper extremities. Information regarding age, height, body weight, lower and upper extremity injury status, and affected side was obtained from the individuals' medical records. Pain was assessed using a visual analog scale, and fear of movement was assessed using the Tampa Kinesiophobia Scale. Individuals were divided into two groups; those with upper and lower extremity injuries. The relationships between Tampa score and age, body weight, height, Body Mass Index (BMI), duration of complaint, rest pain, and activity pain were examined using Spearman's ordinal correlation coefficient.

Results: No difference was found between the groups in terms of age, body weight, height, BMI, duration of complaint, rest pain, activity pain, and Tampa score (p=0.369; p=0.601; p=0.551; p=0.142; p=0.066; p=0.481; p=0.290; p=0.178). There was a difference between the groups in terms of night pain score (p=0.031). There was a difference between the groups in terms of the affected extremity (p=0.002). There was no difference between the groups in terms of the dominant side of the extremity (p=0.145). No significant correlation was found between the Tampa score and age, body weight, height, Body Mass Index, duration of complaints, rest pain, or activity pain (all p>0.05).

Conclusion: It was determined that non-traumatic injuries to the lower and upper extremities did not cause a difference in kinesiophobia, and activity fear was similar in these two groups. Furthermore, kinesiophobia was not associated with age, body weight, height, BMI, duration of complaints, rest pain, or activity pain.

Keywords: Activity, kinesiophobia, pain, rehabilitation

ÖZ

Amaç: Bu çalışma, sedanter bireylerde travmatik olmayan alt ekstremite ve üst ekstremite yaralanmalarında kinezyofobiyi (hareket korkusu) karşılaştırmayı ve ilişkili faktörleri incelemeyi amaçlamıştır.

Gereç ve Yöntemler: Çalışmaya, aşırı kullanım yaralanması tanısı almış ve alt veya üst ekstremitelerinde ağrı şikâyeti bulunan 111 birey dâhil edildi. Bireylerin yaş, boy, vücut ağırlığı, alt ve üst ekstremite yaralanma durumu ve etkilenen taraf bilgileri tıbbi kayıtlarından elde edildi. Ağrı görsel analog skala ile, hareket korkusu ise Tampa Kinezyofobi Ölçeği ile değerlendirildi. Bireyler üst ekstremite yaralanması olanlar ve alt

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ekstremite yaralanması olanlar olmak üzere iki gruba ayrıldı. Tampa skoru ile yaş, vücut ağırlığı, boy, Vücut Kitle İndeksi (VKİ), şikâyet süresi, istirahat ağrısı ve aktivite ağrısı arasındaki ilişkiler Spearman sıralı korelasyon katsayısı kullanılarak incelendi.

Bulgular: Gruplar arasında yaş, vücut ağırlığı, boy, VKİ, şikâyet süresi, istirahat ağrısı, aktivite ağrısı ve Tampa skoru açısından fark bulunmadı (p=0,369; p=0,601; p=0,551; p=0,142; p=0,066; p=0,481; p=0,290; p=0,178). Gece ağrısı skoru açısından gruplar arasında fark bulundu (p=0,031). Etkilenen ekstremite açısından gruplar arasında fark vardı (p=0,002). Ekstremitenin dominant tarafı açısından ise gruplar arasında fark bulunmadı (p=0,145). Tampa skoru ile yaş, vücut ağırlığı, boy, VKİ, şikâyet süresi, istirahat ağrısı veya aktivite ağrısı arasında anlamlı bir ilişki bulunmadı (tüm p>0,05).

Sonuç: Travmatik olmayan alt ve üst ekstremite yaralanmalarının kinezyofobi açısından farklılığa yol açmadığı ve bu iki grupta aktivite korkusunun benzer olduğu belirlenmiştir. Ayrıca kinezyofobinin yaş, vücut ağırlığı, boy, VKİ, şikâyet süresi, istirahat ağrısı veya aktivite ağrısı ile ilişkili olmadığı bulunmuştur.

Anahtar Sözcükler: Aktivite, kinezyofobi, ağrı, rehabilitasyon

INTRODUCTION

Kinesiophobia (fear of activity) is generally defined as a dysfunctional cognitive disorder associated with a fear of movement (1). Kinesiophobia develops as a result of avoiding any movement/activity in response to any new pain exposure (2). It leads to avoidance of activities perceived as potentially painful, such as physical activity and exercise (2). This avoidance is based on the fear-avoidance model (3). When pain is perceived as threatening, pain catastrophizing develops, which in turn creates pain-related fear and anxiety (3). Avoidance behavior is a condition in which an individual avoids work, leisure, and social activities associated with high levels of pain (4). Kinesiophobia is more concerning than the pain itself (3,5). This is because, in the long term, it can lead to loss of physical condition, avoidance of physical activity, and symptoms of depression (3,5).

Kinesiophobia has been recognized as an important aspect of rehabilitation strategies in patients. It has been emphasized that kinesiophobia must be addressed in detail to achieve a successful outcome in the rehabilitation process (4). Fear of activity has been investigated in the literature in individuals with various injuries and conditions (6). Günendi et al. determined that individuals with osteoporosis have higher kinesiophobia compared to healthy individuals of the same age and gender (7). Similarly, kinesiophobia has been investigated in lower and upper extremity pathologies, and it has been stated that kinesiophobia affects the functional level of individuals. In a study on the lower extremities, kinesiophobia levels were evaluated in individuals with plantar heel pain and it was determined that kinesiophobia was associated with decreased foot function (8). Yıldız et al. compared lower extremity functions according to the level of kinesiophobia in patients with foot problems and determined that lower extremity functionality was reduced in patients with high levels of kinesiophobia (9). Similar results were found in studies on the upper extremities. In 2021, Bartlett et al. found moderate-level evidence supporting the relationship between a high perception of disability and increased kinesiophobia in patients with upper extremity injuries (10). Another study examining activity fear in the upper extremity reported high levels of kinesiophobia in a large proportion of patients undergoing rotator cuff repair (11). Depression, fear of re-injury, and kinesiophobia were found to be associated with pain, functionality, quality of life, and return to sports in individuals with shoulder instability (12). Koçyiğit et al. reported a high prevalence of kinesiophobia in patients with fibromyalgia and reported a relationship between kinesiophobia and body mass index, fibromyalgia impact score, and vitamin D concentrations (13).

Studies in the literature agree that injury/disability/illness causes kinesiophobia (4, 7-14). Studies generally examine kinesiophobia and associated factors in individuals who have and have not experienced injury/disability/illness. Kinesiophobia has been investigated in the literature in diseases affecting the lower or upper extremities (8-11), but a limited number of studies have compared kinesiophobia between the lower and upper extremities in non-traumatic injuries (15,16). Furthermore, these studies (15,16) did not compare injuries based on whether they were on the dominant or

non-dominant side, nor did they examine associated factors.

The aim of this study was to compare non-traumatic injuries occurring in the lower and upper extremities in terms of kinesiophobia and to identify associated factors. The findings will help clinicians develop more effective strategies in the rehabilitation process by revealing which group is more likely to experience kinesiophobia in lower or upper extremity injuries and the factors that influence kinesiophobia.

MATERIAL AND METHODS

This study was planned as a retrospective study. Ethics committee approval was obtained from the Health Sciences Ethics Committee of Ankara Yıldırım Beyazıt University (March 20, 2025/03-1169). The study was conducted retrospectively by reviewing the files of individuals who presented to the Department of Sports Medicine at a public hospital between January 1, 2019, and January 1, 2023, and who sustained non-traumatic injuries to the lower or upper extremities. All participants were sedentary individuals who did not have regular physical activity habits. Information regarding age, height, body weight, lower and upper extremity injury status, and the affected side were obtained from the individuals' files. Furthermore, data were recorded for individuals whose resting pain, activity pain, and night pain levels were assessed using a 10-centimeter visual analog scale. Data were obtained from the files of individuals whose fear of movement was assessed using the Tampa Kinesiophobia Scale. Individuals were then divided into two groups: those with lower extremity injuries and those with upper extremity injuries. Participants in the study had not been involved in any rehabilitation program in the last year and had not received any pharmacological treatment or injection therapy other than simple analgesics (which they did not use on the day of the evaluation).

Tampa Kinesiophobia Scale

The Tampa Kinesiophobia Scale was developed in 1991 by Miller, Kopri, and Todd and published by Vlaeyen et al. in 1995. Its Turkish validity and reliability study was conducted by Tunca Yılmaz et al. in 2011. The Tampa Kinesiophobia Scale, consisting of 17 questions, assesses fear of re-injury. The questions are answered on a 4-point Likert scale. The tester receives a minimum score of 17 and a maximum score of 68. As the score increases, the level of kinesiophobia also increases (17).

Inclusion Criteria:

The file must contain information on age, height, body weight, lower and upper extremity injury status, and the affected side.

The level of rest pain, activity pain, and night pain must be assessed using a 10-centimeter visual analog scale.

The fear of movement must be assessed using the Tampa Kinesiophobia Scale.

Diagnosis of an ovarian injury.

Pain in the lower or upper extremities.

Voluntariness to participate in the study.

Being between the ages of 18 and 60.

Exclusion Criteria:

A history of trauma.

Having undergone any surgery.

Pain in the trunk, waist, back, or neck.

Information required for the study could not be obtained from the file.

Statistical Analysis

The data obtained from this study were analyzed using SPSS (The Statistical Package for the Social Sciences) 23. For quantitative variables, mean, standard deviation, median, minimum, and maximum values were used. For qualitative variables, frequency (n) and relative frequency (%) were given. The normal distribution of the data was investigated using the Shapiro-Wilks ($n<50$) or Kolmogorov-Smirnov ($n\geq50$) tests. Groups (lower and upper extremity) were compared in terms of gender, affected side, and dominant side using Pearson's chi-square test and Fisher's exact chi-square test. Quantitative variables were found not to be norm-

ally distributed, so groups were compared using the Mann-Whitney U test. Relationships between the Tampa score and other variables were examined using Spearman's ordinal correlation coefficient. The results were evaluated at the 0.05 significance level.

RESULTS

111 participants were included in the study. 68 of the participants were female and 43 were male. General characteristics of the participants are shown in Table 1. Demographic data, duration of complaints, pain scores, and Tampa scores are shown in Table 2. In our study, patients with upper extremity injuries were diagnosed with medial epicondylitis and lateral epicondylitis, and patients with lower extremity injuries were diagnosed with Medial Tibial Stress Syndrome (MTSS), calcaneal spur, achilles tendinitis and plantar fasciitis.

Table 1. General characteristics

Variables	Levels	Frequency (%)
Sex	Female Male	68 (%61.3) 43 (%38.7)
Group	Individuals with lower limb injuries Individuals with upper limb injuries	57 (%51.4) 54 (%48.6)
Affected side	Right Left	53 (%47.7) 58 (%52.3)
Dominant side	Right Left	98 (%88.3) 13 (%11.7)

No significant relationship was found between the Tampa score and age, body weight, height, Body Mass Index (BMI), duration of complaints, rest pain, or activity pain (all p>0.05; Table 3).

55.9% of women had lower extremity injuries, and 44.1% had upper extremity injuries. 44.2% of men had lower extremity injuries, and 55.6% had upper extremity injuries. There was no difference between the groups in terms of gender (p=0.230). Among those whose right side was affected, 35.8% had lower extremity injuries, and 64.2% had upper extremity injuries. Of those with the left side affected, 65.5% had lower extremity injuries, and 34.5% had upper extremity injuries. There was a difference between the groups in terms of the affected extremity (p=0.002), with those with the right side affected more often having upper extremity injuries, and those with the left side affected more often having lower extremity injuries. Of those with the right side dominant, 54.1% had lower extremity injuries, and 45.9% had upper extremity injuries. Of those with the left side dominant, 30.8% had lower extremity injuries, and 69.2% had upper extremity injuries. There was no difference in the dominant extremity between the groups (p=0.145; Table 4).

Table 2. Information on participants' age, body weight, body height, BMI, duration of complaint, pain scores and tampa score

Variables	Mean±SD	Median	Range [Min-Max]
Age (years)	45.01±8.79	46.00	41.00 [19.00 - 60.00]
Body Weight (kg)	78.87±12.51	79.00	59.00 [52.00 - 111.00]
Body Height (cm)	167.81±10.07	167.00	40.0 [150.00 - 190.00]
BMI (kg/m^2)	28.00±3.75	28.20	20.96 [21.26 - 42.22]
Complaint duration (month)	16.77±19.36	7.00	59.00 [1.00 - 60.00]
Rest pain	2.95±2.85	3.00	9.00 [0.00 - 9.00]
Activity pain	7.51±2.07	8.00	10.00 [0.00 - 10.00]
Night pain	2.86±3.41	0.00	10.00 [0.00 - 10.00]
Tampa score	40.21±6.09	41.00	42.00 [23.00 - 65.00]

Mean ± SD: Mean ± Standard Deviation, min: minimum, max: maximum kg: kilogram, cm: centimeter, BMI: Body Mass Index, m: meter.

Table 3. The correlation analysis between tampa score and participants' age, body weight, body height, BMI, duration of complaint, pain scores.

Variables	Tampa Score	
	Coefficient[a]	*p*
Age	0,028	0,770
Body Weight	-0,065	0,501
Body Height	-0,038	0,690
BMI	-0,111	0,247
Complaint duration	0,101	0,292
Rest pain	0,007	0,939
Activity pain	0,114	0,234
Night pain	0,105	0,274

a: Spearman rank-order correlation coefficient result.

Table 4. Comparison of gender, affected side, dominant side status by groups

Variables	Levels	Individuals with lower limb injuries	Individuals with upper limb injuries	*p*
		Frequency (%)	Frequency (%)	
Sex	Female Male	38 (%55.9) 19 (%44.2)	30 (%44.1) 24 (%55.6)	0.230[a]
Affected side	Right Left	19 (%35.8) 38 (%65.5)	34 (%64.2) 20 (%34.5)	**0.002[a]****
Dominant side	Right Left	53 (%54.1) 4 (%30.8)	45 (%45.9) 9 (%69.2)	0.145[b]

*a: Pearson's chi-square, b: Fisher's exact chi-square test result, **: p<0.05, %: percentage.*

There was no difference between the groups in terms of age, body weight, height, BMI, duration of complaints, rest pain, activity pain, and Tampa score (p=0.369; p=0.601; p=0.551; p=0.142; p=0.066; p=0.481; p=0.290; p=0.178). A difference was found between the groups in terms of night pain score. Individuals with upper extremity injuries had higher night pain scores (p=0.031; Table 5).

Table 5. Comparison of age, body weight, body height, BMI, complaint duration, pain level and Tampa score of the groups

Variables	Individuals with lower limb injuries		Individuals with upper limb injuries		*p**
	Mean±SD	Avarage Rank	Mean±SD	Avarage Rank	
Age (years)	45,58±9,19	58,67	44,41±8,39	53,19	0,369
Body Weight (kg)	79,58±11,88	57,55	78,13±13,22	54,36	0,601
Body Height (cm)	167,46±10,98	54,23	168,19±9,10	57,87	0,551
BMI (kg/m^2)	28,43±3,73	60,37	27,55±3,74	51,39	0,142
Complaint duration (month)	20,16±20,71	61,45	13,19±17,31	50,25	0,066
Rest pain	2,77±2,85	53,98	3,15±2,86	58,13	0,481
Activity pain	7,70±2,05	59,11	7,31±2,09	52,72	0,290
Night pain	2,20±3,11	50,11	3,56±3,60	62,22	**0,031****
Tampa score	39,40±5,65	52,00	41,06±6,46	60,22	0,178

*Mean ± SD: Mean ± Standard Deviation, Avarage Rank: Mean number of ranks, *: Mann-Whitney U test result, **: p<0.05, kg: kilogram, cm: centimeter, BMI: Body Mass Index, m: meter.*

DISCUSSION

Our study aimed to compare kinesiophobia (fear of activities) in sedentary individuals with non-traumatic injuries to the lower and upper extremities and to evaluate associated factors. It was determined that kinesiophobia was similar in those with non-traumatic injuries to the lower and upper extremities. It was also determined that kinesiophobia was not associated with age, body weight, height, BMI, duration of symptoms, rest pain, or activity pain.

Kinesiophobia is a multifactorial condition that can be influenced by many demographic and anthropometric factors (18). The literature has reported a relationship between kinesiophobia and age, and that kinesiophobia increases with age in patients diagnosed with ankylosing spondylitis (19). A relationship has been noted between kinesiophobia and body mass index in women with fibromyalgia (13). The same study reported no association between kinesiophobia and age in women diagnosed with fibromyalgia. It was also reported that kinesiophobia was not associated with pain duration in individuals with chronic low back pain (20), and kinesiophobia was not associated with complaint duration, activity, or rest pain in individuals with nonspecific chronic neck pain (21). In line with these literature examples, our study also found no association between kinesiophobia and age, BMI, complaint duration, activity, or rest pain.

Kinesiophobia has been investigated in the literature in both men and women with chronic pain, and kinesiophobia has been reported to be higher in men (14). This has been suggested as a reason for men interpreting pain and loss of function as a threat to their autonomy, triggering kinesiophobia (14). The lack of a gender difference between the groups in our study prevents the higher rate in men, as reported in the literature, from affecting the results of the study.

Miller and colleagues reported that kinesiophobia and pain catastrophizing in individuals with chronic pain were related to activity intensity at different times of the day rather than the total amount of daily activity (22). In

our study, no significant difference was found between the groups in terms of pain levels experienced at rest and during activity, while night pain was found to be more common in individuals with upper extremity injuries. This finding is consistent with studies in the literature demonstrating that night pain is commonly reported in various upper extremity injuries (23-25). Furthermore, some studies have reported significant relationships between pain experienced during activity and kinesiophobia (26). In contrast, the lack of a difference between the groups in terms of activity pain in our study increases the reliability of the results and supports their comparability with the literature.

There are differences between the groups in terms of the affected side and extremity. Those with the right side affected have more upper extremity injuries, while those with the left side affected have more lower extremity injuries. Studies on the epidemiology of lower and upper extremity injuries generally prioritize the type and location of injury, but neglect the affected side (6, 27). A study on lateral epicondylitis, the most common upper extremity injury, found that most injuries occurred on the right and dominant hand (28). The fact that upper extremity injuries in our study were non-traumatic and therefore more prevalent on the right side is consistent with this information in the literature. A meta-analysis reported that football players have a 1.6-fold increased risk of injury to the dominant extremity in prospective lower extremity injury studies (29). The fact that lower extremity injuries in our study were non-traumatic and therefore more prevalent on the left side may be explained by the fact that the study was conducted with sedentary individuals. A study in the literature found no relationship between the affected side and kinesiophobia (30). In our study, there was no difference between the groups in terms of the dominant side of the extremity. This supports the validity of our study's results because the groups were homogeneous and factors that could affect kinesiophobia were controlled.

A 2020 study comparing fear of movement in lower and upper extremity musculoskeletal injuries reported that individuals with lower extremity injuries had more fear of movement than those with upper extremity injuries (15). Goldberg et al., in their study of 853 patients diagnosed with musculoskeletal pain, divided the patients into three groups: lower extremity, upper extremity, and spinal injuries. They reported that kinesiophobia was similar in individuals with lower and upper extremity injuries (16). Ziroğlu et al. Pain, kinesiophobia, anxiety, sleep, and quality of life in patients with lower and upper extremity fracture injuries were compared, and no difference was observed between the two groups (31). In our study, we compared the two groups, taking non-traumatic lower and upper extremity injuries as similar in terms of the dominant extremity. Consequently, similar to the study by Ziroğlu et al., we determined that there was no difference in kinesiophobia.

We believe that the similarity in kinesiophobia in lower and upper extremity injuries in our study could be due to the fear of activity resulting from the injury of the lower extremity, as it is more important for mobility, locomotor movements, and independence in daily life. On the other hand, we believe that the fear of activity may be due to the injury of the upper extremity, as it is also important for functionality.

Luque-Suarez et al. stated that kinesiophobia, being a complex, multifactorial condition, may be related to occupational use profiles (32). Kinesiophobia may be more pronounced in individuals working in physically demanding occupations (33). Because our study was conducted retrospectively, occupational information could not be obtained from patient files. One of the limitations of our study was the lack of information on the participants' occupations.

Limitations of our study include the small sample size, the retrospective nature of the study, which does not provide long-term results on kinesiophobia levels, and the lack of questioning of educational status. Our study's strengths include its combined evaluation of non-traumatic lower and upper extremity injuries in terms of kinesiophobia, its investigation of the relationship between many components and kinesiophobia, and the similarity of many components affecting kinesiophobia in both groups. The limitations of our study include that the diagnoses of the participants in our

study included only medial epicondylitis and lateral epicondylitis in upper extremity injuries, only Medial Tibial Stress Syndrome (MTSS), calcaneal spur, Achilles tendonitis and plantar fasciitis in lower extremity injuries, and did not include other injuries.

CONCLUSION

Our study determined that non-traumatic lower and upper extremity injuries did not cause a difference in kinesiophobia, and that activity fear was similar in these two groups. It was also determined that kinesiophobia was not associated with age, body weight, height, BMI, duration of symptoms, rest pain, or activity pain.

Physicians, physiotherapists, and other healthcare professionals should not ignore activity fear when rehabilitating patients with lower and upper extremity injuries and should intervene accordingly, taking into account the condition of the injured extremity. Interpretation of post-treatment changes in kinesiophobia would enhance clinical applicability.

Ethics Committee Approval / Etik Komite Onayı

The approval for this study was obtained from the Clinical Research Ethics Committee of Ankara Yıldırım Beyazıt University, Ankara, Turkey (Decision no: 03/1169, Date: 20/03/2025).

Conflict of Interest / Çıkar Çatışması

The authors declared no conflicts of interest with respect to authorship and/or publication of the article.

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Author Contributions / Yazar Katkıları

Concept: BA, AO, TK; design: BA, AO, TK; supervision: BA; data collection and/or processing: AO, TK; analysis and interpretation: AEY; literature review: ZA; writing manuscript: BA, ZA; critical reviews: BA. All authors contributed to the final version of the manuscript and discussed the results and contributed to the final manuscript.

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