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Relationships of Pain Intensity, Kinesiophobia and Quality of Life in Chronic Subacromial Pain Syndrome

Kronik Subakromiyal Ağrı Sendromunda Ağrı Şiddeti, Kinezyofobi ve Yaşam Kalitesi Arasındaki İlişki

Sevtap Günay Uçurum[1]

[1]İzmir Katip Çelebi University Faculty of Health Sciences Department of Physiotherapy and Rehabilitation

Abstract

Objectives: Shoulder pain is an important and frequently reported biopsychosocial problem. In addition to physical problems, understanding of psychological problems that contribute to shoulder pain is important for the treatment process. Therefore, the purpose was to investigate the relationship between kinesiophobia, demographic characteristics, pain intensity and quality of life in patients seeking conservative treatment for chronic subacromial pain syndrome

Materials and Methods: Patients with chronic shoulder pain who applied to İzmir Atatürk Training and Research Hospital were included in the study. Demographic data of the patients were recorded. The pain severity with Visual Analogue Scale, kinesiophobia with the Tampa Scale of Kinesiophobia (TSK), and quality of life with SF-36 quality of life index were assessed. In statistical analysis, Spearman and Kendall Correlation Analysis were used. Statistical significance level was set at $p < 0.05$.

Results: Ninety-five patients, 32 male and 63 female, were included in the study. The median age was 51 (40-61) years, TSK score was 43(38-47), pain at rest was 3(0-5), pain during activity was 7 (5-8), SF-36 physical component (PC) and mental component (MC) scores were 36.50(29.3-42.1) and 42(34.9-49.6), respectively. While there was no difference between the pain (rest pain female/male= 3/2, p=0.054; activity pain female/male= 7/6, p=0.187) and kinesophobia scores (female/male=43/41, p=0.185) between genders, physical (female/male= 34.40 /41.40, p=0.001) and mental components (female/male=37.70/48.45, p<0.001) of quality of life was lower in women. Kinesiophobia score showed correlations with educational level, physical and mental components of quality of life (r= -0.163, p= 0.039; r= -0.499, p< 0.001; r= -0.279, p= 0.006).

Conclusion: Patients with subacromial pain syndrome had high kinesiophobia scores. Female and male participants showed similar pain and kinesiophobia, however, quality of life scores were better in male participants. Kinesiophobia showed negative correlations with the level of education, SF-36 scores. It is important to consider kinesiophobia, education level and quality of life integrations in chronic shoulder rehabilitation.

Key words: Shoulder pain, Quality of life, Kinesiophobia

Öz

Amaç: Omuz ağrısı sıkça karşılaşılan biyopsikososyal bir problemdir. Fiziksel problemlerin yanı sıra, omuz ağrısına katkıda bulunan psikolojik sorunların anlaşılması, tedavi süreci açısından önemlidir. Bu nedenle çalışmanın amacı kronik subakromiyal ağrı sendromunda demografik özellikler, ağrı şiddeti, kinezyofobi ve yaşam kalitesi arasındaki ilişkiyi araştırmaktı.

Materyal ve Metot: Çalışmaya İzmir Atatürk Eğitim Araştırma Hastanesine başvuran kronik omuz ağrılı hastalar dâhil edildi. Hastaların demografik bilgileri kaydedildi. Ağrı şiddeti Görsel Analog Skala ile, kinezyofobi Tampa Kinezyofobi anketi (TSK) ile ve yaşam kalitesi SF-36 yaşam kalitesi indeksi ile değerlendirildi. İstatistiksel analizde spearman ve kendal korolesyan analizi kullanıldı. İstatistiksel anlamlılık düzeyi p< 0,05 olarak kabul edildi.

Bulgular: Çalışmaya 32' si erkek, 63'ü kadın olan 95 hasta alındı. Olguların yaş ortancaları 51 (40-61) yıl, TSK skoru 43 (38-47), istirahat ağrısı(3 (0-5), aktivite sırasındaki ağrı 7 (5-8), SF-36 fiziksel bileşen (PC) ve mental bileşen (MC) skorları sırasıyla 36,50 (29,3-42,1) ve 42 (34,9-49,6) du. Cinsiyetler arasında ağrı (istirahat ağrısı kadın/erkek= 3/2, p=0,054; aktivite ağrısı kadın/erkek= 7/6, p= 0,187) ve kinezyofobi skorları (kadın/erkek= 43/41, p= 0,185) arasında fark yokken, yaşam kalitesinin fiziksel (kadın/erkek= 34,40 /41,40, p= 0,001) ve mental komponentlerinin (kadın/erkek= 37,70/48,45, p< 0,001) kadınlarda daha düşük olduğu bulundu. Kinezyofobi skorunun eğitim düzeyi, yaşam kalitesinin fiziksel ve mental

komponenti ile ilişkili olduğu bulundu (r= -0,163, p= 0,039; r= -0,499, p< 0,001; r= -0,279, p= 0,006).
Sonuç: Subakromiyal ağrı sendromu olan hastalarda kinezyofobi skorları yüksek bulundu. Ağrı ve kinezyofobi değerleri kadın ve erkeklerde benzer bulunurken, erkek katılımcılarda yaşam kalitesi puanları daha iyi bulunmuştur. Kinezyofobi ile eğitim düzeyi ve yaşam kalitesi arasında negatif ilişki bulunmuştur. Kronik omuz ağrı rehabilitasyonunda kinezyofobi, eğitim düzeyi ve yaşam kalitesi entegrasyonlarının dikkate alınmasının önemli olduğunu düşünmekteyiz.
Anahtar Kelimeler: Omuz ağrısı, Yaşam kalitesi, Kinezyofobi

Yazışma Adresi / Correspondence:
Dr. Sevtap Günay Uçurum
e-mail: sevtapgunay.tfd@gmail.com
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Introduction

Shoulder pain is the fifth most frequently reported type of musculoskeletal pain and an important biopsychosocial problem in general population[1]. The term 'subacromial pain syndrome' (SAPS) was declared to be better than 'impingement' in shoulder pain, and it was the most common diagnosis[2]. Luime et al. reported 6.9 – 26% for the point prevalence, 18.6 – 31% for the 1-month prevalence, 4.7 – 46.7% for the 1-year prevalence and 6.7 – 66.7% for the lifetime prevalence of shoulder complaints in their review.[3] The incidence was greater among women than men. In the age range of 25 – 44 years, the demonstrated prevalence of shoulder pain was 13.3% among men and 22.8% among women, a peak prevalence of 21.4% in men and 30.9% in women in the 45 – 64 years age group, and for the 65 years plus age group a prevalence of 13.2% in men and 23.1% in women.[4]

Conservative treatment has been demonstrated as the first choice of treatment to provide significant improvement of pain and shoulder functions. Exercise is declared to be the major treatment in most up-to-date reviews.[5] Although, it is possible to have functional improvements with appropriate, supervised exercise within weeks, %22 - %68 of patients experience permanent symptoms up to 12 months following onset of shoulder pain.[6]

Therefore, understanding which physical and psychological defects contribute to shoulder pain and barriers for function and exercise have been important to assist this population as earliest as possible in the rehabilitation process. Deficits in strength, stability or coordination of shoulder girdle muscles, posture and scapular dyskinesia have been considered as major physical factors.[7] Moreover, multiple studies have proposed that kinesiophobia and fear of avoidance believes as psychological factors which can affect functioning, treatment process and recovery adversely.[6] Kinesiophobia was described as a growing concern about activity arising from fear which occurs from injury or repetitive injury.[8] When any part of the body is exposed to an injury, the afterward painful condition may cause the restriction of movement and even after the recovery, it can create fear of movement. Among people with musculoskeletal problems, kinesophobia are widespread and can cause disability and functional restriction.[9] Moreover, such fear may bring out difficulties and limitations for the rehabilitation process that patients may overact some therapeutic approaches such as manual therapy, and avoid doing regular exercises.[10] Experienced pain after

exercise may also contribute to fear and prevent patients to exercise.[8] Furthermore, the perception of pain may affect the quality of life of the patients.[11]

In literature, the role of kinesiophobia has been a popular research topic in musculoskeletal disorders.[12] George et al.[13] demonstrated that higher fear of pain was the cause of higher disability. The research showed that fear of pain was consistently associated with pain, disability and kinesiophobia outcomes.[13] Boersma and Linton pointed the relationship between kinesiophobia and disability in low back pain.[14] Hart et al.[15] studied kinesiophobia in acute stages of upper and lower extremity disorders, neck pain, and low back pain. Although, it is not as common as back pain, kinesiophobia has also been a matter of interest in shoulder pain[6]. However, the studies focused on physical impairment and functional results for SAPS[6]. Most of them focused on the function, but none of them questioned the quality of life.

Therefore, the study aimed to investigate the relationship between kinesiophobia, demographic characteristics, pain intensity and quality of life in patients seeking conservative treatment for chronic SAPS. The following hypotheses were questioned: 1.There is a relationship between demographic characteristics and kinesiophobia; 2.There is a relationship between symptom duration, pain and quality of life in chronic SAPS patients.

Materials and Methods

Participants

Patients who are diagnosed as SAPS and referred to outpatient Physical Therapy and Rehabilitation Department of the Training Research Hospital for conservative treatment were included in the study between May 2015 and June 2016. Inclusion criteria were: 1) having had shoulder pain symptoms at least for 3 months unilaterally; 2) being between ages of 18-75 years; 3) being volunteer to participate the study; 4) not having any physical therapy for shoulder in the last six months, 5) good language and understanding quality and having a moderate-to-good communication ability. Exclusion criteria were: 1) having any shoulder surgery; 2) having previous shoulder dislocation or fracture history on both involved and non-involved sides; 3) having any neck, elbow, wrist complaints; 4) presence of any other orthopedic and neurological deficits; 5) having any inflammatory or rheumatologic disease or cancer; 6) being pregnant; 7) having any diagnosed psychological disorder and drug usage.

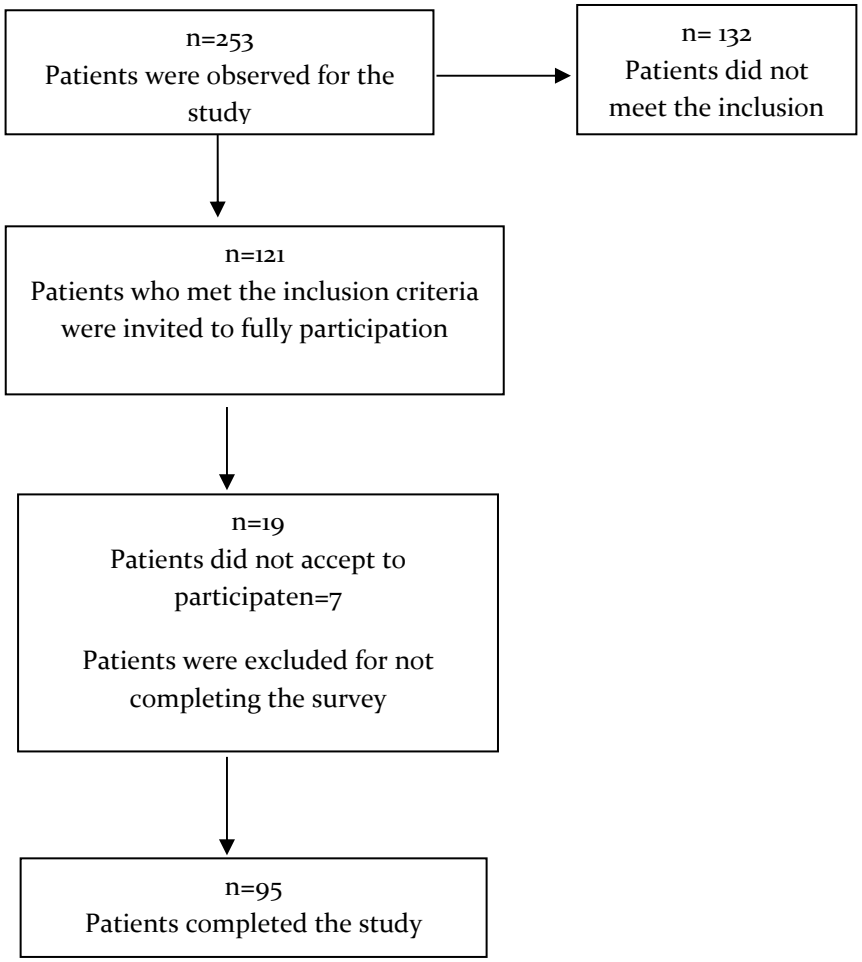
Having given detailed information about the study, patients submitted informed consent form. All patients were evaluated by face to face interview methods. This study was conducted in accordance with the rules of the Declaration of Helsinki. It was approved by the Ethics Committee of the University (Approval number: 419 / 19.12.2018).

Procedure

The study was designed in cross-sectional design. Over a 12-month period 253 patients were observed for the study. One hundred and twenty one eligible patients who met the inclusion criteria were invited to fully participation. Nineteen patients did not accept to participate and 7 patients were excluded for not completing the survey. Ninety-five patients (32 male, 63 female, age: 49.21 ± 14.39 years) completed the study (Figure 1). Data were obtained using the standardized assessment form. The

demographic information of the individuals such as age, sex, height, weight and body mass index (kg/m²), physical activity and smoking habits, alcohol consumption, education level and duration of shoulder complaints were recorded. Then, pain level, kinesiophobia and quality of life questioned respectively.

Figure 1. The flow chart of the participants



Outcome measures

Pain was measured both at rest and during activity by Visual Analog Scale (VAS). Activity fear of the patients and kinesiophobia were assessed using a Tampa Scale of Kinesiophobia (TSK) questionnaire. The quality of life was evaluated with the SF-36 quality of life index with physical and mental component outcomes.

Pain Assessment; VAS was used for pain perception. VAS is a straight horizontal line of fixed length, usually 100 mm. The ends of horizontal line are defined as the extreme limits of the pain to be measured "0 point" indicated "no pain" and "100 point" indicated "worst pain".[16] The patients marked on the line the point that they feel that represent the perception of their current state both at rest and during shoulder related daily-living activities.

Kinesiophobia Assessment; The Tampa Scale for Kinesiophobia (TSK) was first introduced by Miller et al.[17] The original version had 17 items. Each item is scored by 4-

point Likert-type scale such as absolutely agree, agree, disagree and absolutely disagree. Scale contains 2 sub-group as avoiding from activities and somatic. Total score ranges from 17-68 and is used the total score to evaluate. Higher score indicates higher kinesiophobia level. A cut-off score was developed by Vlaeyen (1995), where a score of 37 or over is considered as a high score.[18] The Turkish version of the original form was done by Tunca Yılmaz et al.[9] and the test-retest reliability was found to be 0.806 (95% CI=0.720-0.867). However, because the Turkish version was with 17 items and the use of a total score (including all 17 items) was recommended, we used the original form.

Quality of Life Health Status Assessment (SF-36 Questionnaire); The SF-36 is an indicator of overall health status. Detected of reliability in the physical and mental sections are typically above 0.90. [20] Turkish reliability was carried out by Koçyiğit et al.[21] It is comprised mainly of the physical component summary (PCS) and mental component summary (MCS). The best score is"100" and the worst score is "0." Higher scores indicate better physical or mental functioning.

Statistical Analysis

We used the G*Power package software program (G*Power, Version 3.0.10, Franz Faul, Universität Kiel, German) to determine the power of this study. It was calculated that, with a sample consisting of 96 patients, the study power was 92% with r = 0.3 effect size, α = 0.05 type I error.

Analysis of all data was obtained by using the "SPSS 20.0 for Windows" statistical program. The variables were investigated using visual (histograms, probability plots) and analytical methods (Kolmogorov-Smirnov/Shapiro-Wilks test) to determine whether or not they were normally distributed. It was observed that age, weight, body mass index, VAS scores were not normally distributed, whereas, height, TAMPA and SF36 scores showed normal distribution. The outcomes were represented using medians and interquartile range (IQR). The relationships between kinesophobia values and quality of life and pain parameters were assessed by Spearman Correlation Analysis. Additionally, the relationships between kinesophobia values and educational level and complain duration were assessed by Kendall Correlation Analysis. Statistical significance level was set at $p < 0.05$.

Results

All demographic data and characteristics of the cases were listed in Table 1. Variable outcomes for resting and activity pain, TSK score, SF36 PC and MC score were represented at Table 2 with the comparison between genders. Although no differences were observed for pain and TKS scores, quality of life scores differed between genders in favor of male.

Correlation coefficients among variables are listed in Table 3 and Table 4. TSK score showed a correlation with educational level (r= -0.163, p= 0.039), SF-36 PC (r= -0.499, p= <0.001) and SF-36 MC score (r= -0.279, p= 0.006). No correlation was observed between the other variables.

Discussion

The study aimed to show the relationship between kinesiophobia, demographic characteristics, symptom duration, pain and quality of life in patients with SAPS. This

study showed that the patients have high kinesiophobia score. Female and male participants showed similar pain and kinesiophobia, however, quality of life scores were better in male participants. Kinesiophobia showed negative correlations with level of education, SF-36 PC and SF-36 MC score. No relationships were observed for other demographic characteristics, symptom duration and pain.

Table 1. Demographic data and characteristics of the cases

Characteristics	Median Interquartile Range (IQR) and %
Age (year)	51 (40-61)
Height (cm)	165 (160-172)
Weight (kg)	70 (61-80)
Body Mass Index (kg/m²)	25.60 (22.99-28.99)
Gender (n,%)	
Male	32 (33.7)
Female	63 (66.30)
Complain Duration (month)	6 (4-12)
Smoking Habit (n, %)	
No	75 (78.90)
Yes	20 (21.10)
Alcohol Consumption (n, %)	
No	91 (95.80)
Yes	4 (4.20)
General Physical Activity Habit (n, %)	
No	59 (62.10)
Yes	36 (37.90)
Education level (%)	
Illiterate	4 (4.20)
Primary school	34 (35.80)
Middle School	6 (6.30)
High school	24 (25.30)
University	27 (28.40)

Kinesiophobia was considered as one of the most important aspect of the biopsychosocial approach for musculoskeletal disorders. It was pointed out that the patients with musculoskeletal pain might have higher kinesiophobia scores which may cause avoidance of physical activity, functional disability, inability to fulfill social roles, and depression.[22] A cut-off score was developed by Vlaeyen[17], where a score of 37 or over was considered as a high score. The same score was also established for musculoskeletal disorders at the literature.[23,24] Later on, Barke et al.[25] declared the cut-off value of kinesiophobia score as 35.5 for low back pain patients. The average TSK score was found 42 in patients with SAPS in our study and it was similar for both genders. This might be considered as high kinesophobia when the cut-off values taken into account. Bränström and Fahlström pointed out the gender differences in chronic pain patients.[23] They concluded that optimal cut-off scores might differ between male and female patients. We did not observe any differences in between. However, both

physical and mental quality of life scores were better in men than women. Although the same pain and fear, the influence of it to quality of life was different. It seems that the catastrophizing or perception pattern might be different between genders. This should be taken into account for the rehabilitation process. Further studies need to be conducted on this issue.

Table 2. Variable outcomes of the cases

Variables	**Total (n=95) Median Interquartile Range (IQR)**	**Female (n=63) Median Interquartile Range (IQR)**	**Male (n=32) Median Interquartile Range (IQR)**	**p* value**
VAS at rest (cm)	3 (0-5)	3 (0-5)	2 (0-4.75)	0.054
VAS During activity (cm)	7 (5-8)	7 (6-8)	6 (4-8)	0.187
SF-36 PC	36.50 (29.30-42.10)	34.40 (28-39.20)	41.40 (33.77-50.87)	**0.001**
SF-36 MC	42 (34.90-49.60)	37.70 (33.80-44.30)	48.45 (42.15-58.15)	**<0.001**
TSK Score	43 (38-47)	43 (39-47)	41 (37-47)	0.1 85

* Mann-Whitney U testi, p< 0.05, TSK: The Tampa Scale for Kinesiophobia, VAS: Visual Analog Scale, SF36PC: SF-36 Physical Component, SF36MC: SF-36 Mental Component

The relationships between kinesophobia and other factors such as demographic characteristics, pain intensity, complaint duration, quality of life might be helpful for further interpretation and dealing with the fear and the musculoskeletal pain.

Table 3. Correlation coefficient results between kinesiophobia and variables

Correlations		TSK	Gender	Smoking Habit	Alcohol Consumption	Education Level	Physical Activity
Kendall's tau b P	TSK	1					
Kendall's tau_b p	Gender	-0.115 0.185	1				
Kendall's tau_b p	Smoking Habit	-0.121 0.160	0.040 0.696	1			
Kendall's tau_b p	Alcohol Consumption	0.106 0.220	-0.072 0.483	0.277** **0.007**	1		
Kendall's tau_b p	Education Level	-0.172* **0.030**	0.134 0.157	-0.153 0.107	-0.250** **0.008**	1	
Kendall's tau_b p	Physical Activity	0.046 0.599	-0.224* **0.030**	0.235* **0.023**	0.052 0.612	-0.124 0.191	1

*p< 0.05, **p<0.01. TSK: The Tampa Scale for Kinesiophobia

Our study, investigating some relationships, showed correlations between kinesophobia and educational level, SF 36 physical and mental components. Martinez-

Calderon et al.[26] have stated that level of education may be a decisive factor in shoulder pain. Dunn et al.[27] showed that pain was not related to rotator cuff tear severity but could be correlated with co-morbidities such as lower education level, and ethnicity. Feleus et al.[28] investigated kinesiophobia in patients with non-traumatic arm, neck and shoulder complaints and they found that one of the seven variables which were significantly related to the score on kinesiophobia was educational level. Similarly, we found relationship between kinesophobia and education level. As patient educational level decreased, kinesiophobia score increased. We believe that the level of education might be effective to better understand the importance of movement and exercise in treating the problem and the harmful effects of immobilization. The easy and fast realization and recognition, because education level might reduce the occurrence of kinesiophobia, increase the exercise consciousness and accelerate the rehabilitation process. However, good communication skills between physiotherapists and the patients might be also important.

Table 4. Correlation coefficient results between kinesiophobia and the variables

Correlations		TSK	Age	Height	Weight	BMI	Complaint Duration	VAS Rest	VAS Activity	SF36 PC	SF36 MC
Spearman's rho p	TSK	**1**									
Spearman's rho p	Age	-0.126 0.224	**1**								
Spearman's rho p	Height	-0.046 0.661	-0.064 0.536	**1**							
Spearman's rho p	Weight	-0.151 0.145	0.063 0.546	0.506** **<0.001**	**1**						
Spearman's rho p	BMI	-0.107 0.303	0.132 0.201	-0.165 0.111	**0.738**** **<0.001**	**1**					
Spearman's rho p	Complaint Duration	0.009 0.934	-0.085 0.412	-0.079 0.445	0.014 0.896	0.060 0.564	**1**				
Spearman's rho p	VAS Rest	0.051 0.623	-0.155 0.133	0.015 0.888	0.043 0.682	0.062 0.551	0.111 0.285	**1**			
Spearman's rho p	VAS Activity	0.099 0.342	-0.029 0.784	-0.028 0.788	0.006 0.952	0.017 0.869	0.047 0.651	0.342** **0.001**	1		
Spearman's rho p	SF36PC	-0.499** **<0.001**	0.127 0.220	0.061 0.556	0.019 0.854	0.025 0.808	-0.183 0.077	-0.300* **0.003**	-0.390** **<0.001**	1	
Spearman's rho p	SF36MC	-0.279** **0.006**	0.284** **0.005**	0.170 0.099	0.071 0.496	-0.043 0.677	0.038 0.717	-0.193 0.061	-0.029 0.778	0.231* **0.024**	1

*p< 0.05, **p<0.01. TSK: The Tampa Scale for Kinesiophobia, VAS: Visual Analog Scale, SF36PC: SF-36 Physical Component, SF36MC: SF-36 Mental Component

In literature, many studies have shown an association between kinesophobia and function or disability.[29-32] Wideman and Sullivan[29] showed that relationships between

fear-avoidance beliefs and long-term work disability and between catastrophizing and pain intensity. Das De et al.[30] showed that kinesiophobia and catastrophic thinking were the most important factors related to disability for patients with an upper-extremity-specific disability, and Potter at al.[31] found that psychological distress affects patient-reported scores of shoulder function. Lentz et al.[6] put forwarded that fear-of-pain scores affected shoulder function. However, there is very little work on the relationship between kinesophobia and quality of life in shoulder problems. Altug et al.[32] pointed out the relationship between kinesiophobia, physical activity level and quality of life. They found that kinesiophobia adversely affected the quality of life limiting the physical activity status of patients with chronic low back pain. In our study, we found that kinesiophobia score showed a negative correlation with both SF-36 physical component and mental component.

The following study had some limitations. We evaluated the patients who had diagnosed as SAPS and sought conservative treatment at the chronic stage. Although the outline of the patients was clearly revealed the subgroups of patients such as impingement syndrome, periarthritis, any rotator cuff pathology was underestimated. Moreover, the functional status or limited ranges of movement of the participants were considered neither for the study participation nor the data analyses. Although, complaint duration time was not normally distributed, the participants were at a chronic stage. As well as chronic stage, acute and sub-acute stages could also be important for kinesiophobia. Further studies needed to observe the fluctuations and compare the kinesiopobia levels between the stages. Another limitation was the women gender dominance in the study. It was almost two-third. When the prevalence of SAPS and the application to clinics for treatment were taken into account, this seems acceptable.

SAPS which leads to pain and functional restrictions are among the most common musculoskeletal problems and often persists far beyond expected tissue recovery duration. In addition to biomechanical deficits, fear avoidance beliefs and kinesiophobia also affect function and recovery negatively and may lead to avoidance behavior.[32] Kinesiophobia causes the patient to be afraid of moving. Immobilization negatively affects the shoulder functions and can lead to increased motion restriction and pain. The pain may cause more kinesiophobia. This vicious circle causes the problem to grow more and become more chronic. As a result of this, quality of life of person impairs. We recommend that, in addition to treating the pathophysiology, health-care providers should take into account the patient's kinesiophobia and quality of life especially for the long-running rehabilitation process.

Patients with SAPS had high kinesophobia scores. Female and male participants showed similar pain and kinesiophobia, however, quality of life scores were better in male participants. Kinesiophobia showed negative correlations with level of education, SF-36 PC and SF-36 MC scores. It is important to consider kinesiophobia, education level and quality of life integrations in chronic shoulder rehabilitation.

Having given detailed information about the study, patients submitted informed consent form.

There are no conflicts of interest for this manuscript.

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