Research Article / Araştırma Makalesi

Comparison of Exercise-Physical Activity Consciousness and Fear Avoidance Beliefs in Inflammatory Rheumatological Diseases

İnflamatuar Romatizmal Hastalıklarda Egzersiz-Fiziksel Aktivite Bilinç Düzeyi ve Korku Kaçınma İnanışlarının Karşılaştırılması

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Abstract

The aim of this study was to compare the quality of life, fear avoidance beliefs, physical activity levels, exercise and physical activity consciousness status of Ankylosing spondylitis (AS), Rheumatoid Arthritis (RA) and healthy individuals and to investigate the relationship between disease activity level with these parameters in AS and RA. AS (n=27), RA (n=28), and healthy (n=28) individuals were included in this study. Participants' disease activity levels, physical activity levels (Short form-International Physical Activity Questionnaire, IPAQ-7), fear avoidance beliefs (Fear-Avoidance Beliefs Questionnaire), FABQ), physical activity and exercise awareness (Exercise and Physical Activity Consciousness Questionnaire, EPACQ), and quality of life (Short form-36, SF-36) were evaluated. AS and RA groups; IPAQ-7, EPACQ and SF-36 scores were similar and lower than healthy group (p<0.05). FABQ scores of the AS and RA groups were higher than the healthy individuals (p<0.05). There was a negative correlation between disease activity and UFAA-7 and SF36 scores (p<0.05); A positive correlation was found between the disease activity and FABQ scores in the AS and RA groups (p<0.05). These results may indicate that patients with RA and AS may have similar disease burden and may have false beliefs that exercise and physical activity will increase the disease burden in these patients.

Keywords: rheumatology, arthritis, exercise, fear, movement, quality of life.

Özet

Bu çalışmanın amacı, Ankilozan spondilit (AS), Romatoid Artrit (RA) ve sağlıklı bireylerin yaşam kalitesi, korku kaçınma inançları, fiziksel aktivite düzeyleri, egzersiz ve fiziksel aktivite bilinç durumlarını karşılaştırmak ve hastalık aktivitesi ile bu parametreler arasındaki ilişkisini araştırmaktı. Bu çalışmaya AS (n=27), RA (n=28) ve sağlıklı (n=28) bireyler dahil edildi. Katılımcıların hastalık aktivite düzeyleri, fiziksel aktivite düzeyleri (Kısa form-Uluslararası Fiziksel Aktivite Anketi, UFAA-7), korku kaçınma inanışları (Korku-Kaçınma İnançları Anketi, KKİA), fiziksel aktivite ve egzersiz farkındalığı (Egzersiz ve Fiziksel Aktivite Bilinci Anketi, EFBA) ve yaşam kalitesi (Kısa form-36, SF-36) değerlendirildi. AS ve RA grupları; UFAA-7, EFBA ve SF-36 skorları açısından benzer (p>0.05) ve sağlıklı gruba göre düşüktü (p<0.05). AS ve RA gruplarının KKİA puanları sağlıklı bireylerden daha yüksekti (p<0.05). Hastalık aktivitesi ile UFAA-7 ve SF36 skorları arasında negatif yönde (p<0.05); AS ve RA gruplarında hastalık aktivite skoru ile KKİA arasında pozitif yönde ilişki bulundu (p<0.05). Bu sonuçlar, RA'daki ve AS'deki hastaların hastalık yükünün benzer olabileceğini ve bu hastalarda egzersiz ve fiziksel aktivitenin hastalık yükünü artıracağına dair yanlış inançlara sahip olabileceğini gösterebilir.

Anahtar Kelimeler: romatoloji, artrit, egzersiz, korku, hareket, yaşam kalitesi.

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1. Introduction

Ankylosing spondylitis (AS) and Rheumatoid arthritis (RA) are progressive type of chronic inflammatory diseases that can cause joint damage and loss of function in organs. AS is often characterized by spinal and sacroiliac joint involvement. In RA, peripheral joint involvement is usually prominent, but atlantooccipital and sacroiliac joint involvement can also be seen (1). Although these inflammatory disorders are characterised by different clinical, laboratory and imaging markers, symptoms such as pain, loss of function and fatigue are similar (2). In AS and RA, the most common symptom is chronic pain. It is thought that chronic pain in the musculoskeletal system creates a feeling of fear and avoidance in some individuals (3,4,5). Although there are studies indicating that both AS and RA patients experience fear of movement separately, there is a need for studies examining factors such as disease activity and exercise consciousness level.

When the medical treatment options of individuals with AS and RA are examined, it has been shown that no treatment option has a completely curative effect on the disease. The treatment goals of patients with AS and RA are to prevent structural damage, alleviate remission, and improve patients' quality of life. (5,6). It is known that physical activity and exercise contribute greatly to remission in these patients (7,8). Determining the knowledge and awareness levels of individuals with low physical activity levels and participation in exercise is important in terms of gaining exercise habits. As far as we know, there is no study comparing AS and RA patients and healthy individuals in terms of fear of movement beliefs, physical activity and exercise consciousness (9). In addition, there is no study examining the relationship between disease activity and these parameters in patients with AS and RA. Therefore, the aim of our study was to compare AS, RA and healthy individuals in terms of quality of life, fear avoidance beliefs, physical activity level, exercise and physical activity consciousness status, and to investigate the relationship between disease activity and these parameters in AS and RA.

2. Material and Methods

Research Design

This prospective controlled study was conducted on individuals aged 18-65 years who applied to Yozgat Bozok University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, diagnosed with AS or RA (who have been followed up regularly for at least 1 year and have not undergone any change in their treatment for the last 3 months) and healthy individuals (without inflammatory rheumatic disease and meeting the exclusion criteria).

Those with cognitive problems, cardiovascular and respiratory problems, neurological diseases, musculoskeletal deformities, surgical operations in the last 6 months, pregnant women and those using any psychiatric medication were not included in the study.

Data Collection

In the socio-demographical data form; Participants' age, height, body weight, gender, use of medical or herbal medicines, surgeries, marital status and smoking were questioned. Body Mass Index (BMI) of the participants was calculated with the formula weight/height^2.

Disease Activity: Disease activity of patients with AS was evaluated by BASDAI (Bath Ankylosing Spondylitis Disease Activity Index). BASDAI questions the patient's level of weakness/fatigue, spinal pain, joint pain/swelling and sensitivity to touch, morning stiffness and duration in the past week. BASDAI consists of 6 questions. The questions are evaluated by the patient with a 10 cm Visual Analogue Scale (VAS) (0→None, 10→Very severe). The score of the first four questions is added to the average of the scores of the last two questions questioning morning stiffness, and the total score is obtained (10). Turkish validity and reliability study Akkoç et al. (11). A higher score indicates increased disease activity, while a score of 4 or higher indicates higher disease activity. Disease activity in patients

with RA was evaluated with DAS-28 (Disease Activity Score-28). The number of evaluated joints is 28. These are bilaterally shoulder, elbow, wrist, MCP, PIF in the hand and knee joints. The number of swollen and painful joints was determined by clinical examination (12,13).

Physical Activity Level: International Physical Activity Questionnaire-Short form (IPAQ-7) was used to evaluate the physical activity levels of all individuals. IPAQ-7 evaluates the physical activity participation of individuals in the last 7 days. This questionnaire includes the sum of duration (minutes) and frequency (days) of walking, moderate and vigorous activity. The energy expenditure of individuals related to their physical activities for the last 7 days is converted to Metabolic activity (MET). The MET score represents each type of activity with energy expenditure and is calculated using 1 MET for sitting, 3.3 METs for walking, 4 METs for moderate-intensity activity, and 8 METs for intense activity (14).

Fear-Avoiding Beliefs: The Fear Avoidance Beliefs Questionnaire (FABQ) was used to evaluate the participants' fear-avoidance beliefs related to the effects of their problems (such as pain and activity limitation) on physical activity and work situations. FABQ consists of 16 questions and 2 parts. The first part includes physical activity and the second part includes beliefs about work. It consists of physical activity (5 questions) and division of labor (11 questions) sub-dimensions. The Physical Activity section is scored between 0-24 and the Labor section is scored between 0-36. Turkish version study Özcan Bingül et al. (15).

Quality of Life: The overall health-related quality of life of all individuals was assessed with the Short Form-36 (SF-36). The SF-36 assesses functionality and well-being. SF-36 consists of 36 questions and has 8 sub-dimensions. The sub-dimensions in this scale are; physical function (10 items) (SF36-I), role limitation due to physical problems (4 items) (SF36-II), role limitation due to emotional problems (4 items) (SF36-III), mental health perception (5 items) (SF36-IV), social function (2 items) (SF36-V), general

health perception (5 items) (SF36-VI), body pain (2 items) (SF36-VII) and energy (4 items) (SF36- VIII). Each of the subscales is calculated over 0-100 points. "0: lowest, "100: highest" indicates quality of life The higher the total score, the higher the quality-of-life level (16)

Exercise and Physical Activity Awareness Level: The Health Exercise/Physical Activity Awareness Questionnaire (Turkish version developed by Tuncel et al (17)) was used to evaluate the exercise knowledge and consciousness levels of all participants. The scale consists of 82 items. Of the 82 items, 31 are for personal information, 51 for regular exercise and physical activity awareness. In this study, the 51-item regular exercise and physical activity awareness section of the scale was used. The reliability coefficient of 51 items for regular exercise and physical activity awareness is 0.95. Each item is scored as "I know very well" (3 points), "I have heard" (2 points), "I have no idea" (1 point). The total score of the survey is averaged. An increase in the score obtained means that the level of awareness about exercise and physical activity increases (18).

Ethical approval

The study Yozgat Bozok University was approved by the Faculty of Medicine, Clinical Research Ethics Committee. (Decision No: 2017-KAEK-189_2020.10.14_07). Informed consent forms were obtained from individuals who agreed to participate in the study.

Statistical Analysis

SPSS 21 program (IBM SPSS Statistics 21 software /Armonk, NY: IBM Corp.) was used for data analysis. The conformity of the data to the normal distribution was examined by histogram and Kolmogrov-Smirnov test. Continuous variables in the data were expressed as minimum-maximum values, and categorical variables were expressed as numbers and percentages. Chi-square test was used to compare categorical variables. In the comparisons between groups,

Kruskall Wallis test was used for data that was not normally distributed for continuous

variables, and the One-way Anova test was used for parameters suitable for normal distribution. The Mann Whitney U test was used for pairwise comparisons to determine between which groups the significant difference was in the data not normally distributed. For normally distributed data, Gabriel Test, one of the post-Hoc tests, was used after the Anova test. "Spearman correlation coefficient" was used to evaluate the relationship of two different measurements in independent groups. In all analyzes, p value of <0.05 was considered statistically significant.

3. Results

The study was completed with AS (n=27), RA (n=28) and healthy individuals (n=28). The comparison of demographic information and disease activity levels of the groups is given in Table 1. There was no difference in demographic characteristics (age, gender, BMI, education and marital status), disease activity scores (in RA and AS groups) and duration of diagnosis (in RA and AS groups) of the participants (p>0.05). There was a difference between the disease activity levels of the AS and RA groups. The disease activity level of the AS group was higher (p<0.05) (Table 1).

Table 1. Comparison of demographic information and disease-related status of the groups

	AS groups (n=27)	RA groups (n=28)	Healthy groups (n=28)	p
Age (years)	49 (36-57)	49.5(21-58)	50(38-59)	0.458^a ($X^2 =1.449$)
BMI (kg/m^2)	27.7±4.5	29±4.4	26.5±5.4	0.152^b (F= 1.929)
Marital status				
married	24 (88.9%)	23 (82.14%)	25 (89.3%)	0.677^c (X^2=0.781)
single	3 (11.1%)	5 (17.6%)	3 (10.7%)	
Gender				
Female	17 (62.97%)	19 (67.86%)	19 (67.86%)	0.907^c (X^2=0.195)
Male	10 (37.03%)	9 (32.14%)	9 (32.14%)	
Education				
Primary school	12 (44.44%)	17 (60.72%)	9 (32.14%)	0.276^c (X^2=5.11)
High school	8 (29.63%)	5 (17.85%)	8 (28.57%)	
Graduate	7 (25.93%)	6 (21.43	11 (39.29%)	
Disease activity level				
Low	14 (51.85%)	12 (42.86%)	----	
Middle	-	16 (57.14%)		**0.00^c** (X^2=29.145)
High	13 (48.14%)	-		
Disease activity score	3.1 (2.6-5.2)	3.43 (2.6-5)	----	0.736^d (z=358)
Diagnosis time (y)	10 (5-20)	10 (3-20)	----	0.387^d (z=327)
a: Kruskal Wallis Test, b: One way Anova, c=Pearson Kikare, d=Mann Whitney U				

The comparison of the participants' IPAQ-7 total score, SF-36 total and sub-parameters, exercise and physical activity awareness score, total and sub-dimensions of FABQ are given in Table 2. The IPAQ-7 total scores of the AS group and the RA group were similar (p>0.05), while the IPAQ-7 total score of the healthy group was higher than the other groups (p<0.05). The mean total score of FABQ and the mean of physical activity sub-dimension of FABQ were similar in AS and RA groups and higher than the healthy group (p<0.05). The mean scores of SF36-I and SF36-VII were higher in the healthy group than in the other groups (p<0.05). The mean EPACQ total score was similar in the RA and AS groups (p>0.05), while the mean score of the healthy group was statistically higher than the other groups (p<0.05). (Table 2). The relationship between the disease activity score and physical activity level, fear avoidance beliefs, quality of life, and exercise and

physical activity awareness level of the AS and RA groups are given in Table 3. In the RA group, a low-level positive and significant correlation (r=0.389, p= 0.041) was found between the disease activity score and the FABQ-work sub-dimension. In addition, a low negative correlation was found between IPAQ-total score and disease activity score (r= -0.458, p<0.05) (Table 3). In the AS group, the difference between disease activity score and IPAQ-total (r=-0.437), SF36-II (r= -0.464), SF36-VI (r= -0.386), SF36-VIII (r= -0.418) was low; high level between disease activity score and SF36-III (r= -0.802), SF36-IV (r= -0.781), SF36-V (r= -0.802); moderate level between SF36-VII (r= -0.633) was found to be negatively correlated. A high positive correlation (r= 0.752) was found between the disease activity score and FABQ-physical activity (Table 3).

Table 2. Comparison of IPAQ-7, SF-36, EPAQ, FABQ scores of the groups

	(A) AS groups (n=27)	(R) RA groups (n=28)	(H) Healthy groups (n=28)	p
IPAQ-7total	990 (396-1668)	1386 (198-2772)	1584 (396-2826)	**0.002**[a] (H-R, H-A)
FABQ-total	25.92±14.45	25.39±12.72	14.18±12.69	**0.002**[b] (A-H, R-H)
FABQ-P	12 (0-24)	14.5 (0-24)	5 (0-20)	**0.000**[b] (A-H, R-H)
FABQ-W	7 (0-29)	10.5 (0-30)	6 (0-23)	0.136[a]
SF36-I	55 (35-75)	55 (5-80)	80 (25-100)	**0.000**[a] (A-H, R-H)
SF36-II	100 (0-100)	100 (0-100)	100 (0-100)	0.388[a]
SF36-III	100 (0-100)	100 (0-100)	75 (0-100)	0.266[a]
SF36-IV	50±22.49	39.11±16.83	46.96±21.36	0.295[b]
SF36-V	59.89±16.80	53.07±15.29	56.5±16.08	0.178[b]
SF36-VI	75 (22.5-100)	100 (25-100)	75 (25-100)	0.248[a]
SF36-VII	55 (20-80)	55 (22-77)	67.5 (25-100)	**0.035**[a] (A-H, R-H)
SF36-VIII	50 (10-80)	35 (15-70)	47.5 (15-100)	0.061[a]
EPACQ-total	86 (68-147)	90 (57-134)	141.5 (57-153)	**0.005**[a] (H-A, H-R)

a: Kruskal Wallis Test, b: One way Anova, IPAQ: International Physical Activity Questionnaire, FABQ-P: Fear Avoidance Beliefs Questionnaire-Physical Activity, FABQ-W: Fear Avoidance Beliefs Questionnaire-Work, SF36: Short Form 36, I: physical Function, II: Role limitation due to physical problems, III: role limitation due to emotional problems, IV: mental health perception, V: social Function, VI: general health perception, VII: pain in the body, VIII: vitality, EPACQ: Exercise and Physical Activity Consciousness Questionnaire.

Table 3. The relationship between disease activity score and IPAQ-7, FABQ, SF36, EPACQ scores

		RA (n=28) Disease activity Score (DAS-28)	AS (n=27) Disease activity Score (BASDAI)
IPAQ-total	r	-0.458	-0.437
	p	**0.014***	**0.023***
FABQ-total	r	0.257	0.465
	p	0.187	0.015
FABQ-P	r	0.035	0.752
	p	0.859	**0.000***
FABQ-W	r	0.389	0.115
	p	**0.041***	0.567
SF36-I	r	-0.182	
	p	0.353	-0.291
			0.141
SF36-II	r	-0.315	-0.464
	p	0.103	**0.015***
SF36-III	r	-0.090	-0.802
	p	0.649	**0.000***

SF36-IV	r		
	p	-0.177	-0.781
		0.366	**0.000***
SF36-V	r	-0.090	-0.802
	p	0.649	**0.000***
SF36-VI	r	0.021	-0.386
	p	0.916	**0.047***
SF36-VII	r	-0.202	-0.633
	p	0.302	**0.000***
SF36-VIII	r	-0.348	-0.418
	p	0.070	**0.030***
EPACQ-total	r	-0.015	-0.002
	p	0.938	0.993

r: Spearman Correlation Coefficient , *: p<0.005 statistical significance , DAS-28: Disease Activity Score-28, BASDAI: Bath Ankylosing Spondylitis Disease Activity

4. Discussion

Our study revealed that physical activity levels, exercise and physical activity awareness levels of AS and RA groups were similar and lower than healthy individuals. Fear avoidance beliefs (related to physical activity) were higher in individuals with RA and AS than healthy individuals. In addition, a relationship was found between disease activity and physical activity, quality of life, and fear avoidance beliefs. To the best of our knowledge, our study was the first to compare individuals with AS, RA, and healthy individuals in terms of fear-avoidance beliefs, exercise, and physical activity awareness levels.

In addition to symptomatic treatment in inflammatory rheumatic diseases, the anti-inflammatory effects of physical activity and exercise have been reported. The mechanism of this effect is realized by the release of IL-6 cytokine from muscle tissue due to exercise, showing an anti-inflammatory feature and inhibiting TNF-a (pro-inflammatory cytokine) via a different receptor pathway (19). In this way, it reduces muscle and joint damage due to chronic inflammation. The importance of exercise and physical activity, which has been reported to reduce the inflammatory process in this way, is still not fully understood. (8,20,21). In order to understand the importance of exercise and physical activity, it is very important to investigate the knowledge and consciousness on this subject. There is limited literature on the perceived benefits of exercise and the barriers to exercise. We found two studies investigating knowledge and thoughts about exercise and physical activity in rheumatic diseases. The first study investigated beliefs and thoughts about the disease in inflammatory rheumatic diseases. They found 35.5% of the patients who thought that physical activity triggered the exacerbations of the disease and 36.5% of those who advocated that it reduced them (22). In another study, the attitudes of adults with AS towards physical activity and exercise were investigated and it was determined that individuals with AS had low motivation to exercise and do physical activity. (20). Our three groups had similar education levels; but the physical activity level, exercise and physical activity awareness of individuals with AS and RA were considerably lower than healthy individuals. This may be due to the fact that individuals cannot gain enough exercise habits in their environment or that individuals think that they will not benefit from exercise in recovery.

Most of the studies conducted in the last decade have reported that most of the inflammatory rheumatic patients have low physical activity levels. (8,20,21). In our study, the physical activity level of both inflammatory rheumatic patient groups was low. These results may be due to the fact that the importance of physical activity and exercise is still not known and is not seen as a need.

Löof et al. (3) was the first to investigate the levels of fear of movement in patients with RA and found that patients with high levels of fear of movement had low levels of physical activity. The patient's ability to perform activities in daily life is an important goal of treatment. Therefore, any effort to improve patients' fear of movement can play an important role in treatment and improve functional outcomes. The most important parameter that prevents rheumatological patients from being physically active during daily activities is chronic pain (4,5). Patients with chronic pain often believe that their ability to control their pain is limited, and such negative beliefs can inhibit health-promoting behaviors. While negative beliefs can reinforce inactivity, decreased physical activity can lead to increased perception of pain, negative expectations, and increased avoidance. Therefore, appropriate belief assessment is advocated (3). Tezcan et al. (4) evaluated the fear-avoidance (FA) beliefs of patients with hand osteoarthritis (OA), rheumatoid arthritis (RA) and fibromyalgia (FM) and found that fear avoidance beliefs were higher in RA patients. In our study, we found that participants with RA and AS had similar fear avoidance beliefs (mostly in the physical activity sub-dimension) but higher than healthy individuals. This may indicate that patients with inflammatory rheumatism may show similar results in terms of fear of movement despite different involvement and forms. Individuals with rheumatic diseases experience more fear of movement than healthy individuals, the reason of this may be their negative prejudices (about physical activity can increase their current symptoms).

It has been reported in systematic studies that RA and AS have a significant effect on quality of life. Regular assessment of quality of life is very important for effective management of the disease (23,24). In our study, in accordance with the literature, the quality of life of the AS and RA groups was similar and lower than that of healthy individuals (SF36 pain and physical function sub-dimensions). This result may show that the most important parameters affecting the quality of life in inflammatory diseases are pain and physical function.

Due to the heterogeneity in the characteristics of inflammatory rheumatic diseases, it is expected that there may be differences between RA and AS in terms of disease burden. Zink et al. (25) reported that patients with RA, PsA, and AS had a comparable disease burden. In a study, the disease burden of RA, spondyloarthriopathy (SA) and psoriotic arthritis (PA) patients were compared and the disease activity of SA and PA patients was found to be higher than those of RA patients (26). In our study, the disease activity level of the AS group was higher than that of RA. Pain mechanisms in RA and AS may be different because the inflammatory process in AS often involves enthesitis and the spine. In addition, there were individuals with high disease activity in the AS group. Our study is similar to the studies shown previously and, it confirms the comparability of AS and RA.

In our study, when the relationships between the disease activity level and quality of life, fear avoidance beliefs and physical activity level of the AS and RA groups were examined; It was determined that fear avoidance beliefs (physical activity sub-dimension) and quality of life (physical, emotional and social sub-dimension) were highly correlated with disease activity. This may indicate that as the burden of disease increases, physical deformity and mental problems increase, leading to a sedentary lifestyle.

Some limitations of this study should be considered when interpreting the results. The appropriate sample used may have caused selection bias; Participants presenting to a physical medicine and rehabilitation clinic at a university hospital may not be representative of all adults with AS and RA. In addition, the majority of the participants had a low level of education, this issue can be investigated in individuals with inflammatory diseases (at different educational levels).

Despite these limitations, one of the strengths of the research is that it determines the level of consciousness of the participants about exercise and physical activity and gives an idea about the level of exercise programs that can be planned in the future. Another strength

is that the comparison of these parameters with the healthy control group at the same education level can provide information about which need is more in rehabilitation.

5. Conclusion

This study showed that inflammatory rheumatic patients had higher fear of movement and lower quality of life, physical activity and exercise awareness than healthy individuals. At the same time, disease activity may negatively affect quality of life, physical activity, and fear beliefs in RA and AS. Considering that inflammatory chronic diseases continue for life, exercise and physical activity counselors taking a more active role in developing appropriate coping strategies may facilitate the management of the disease. Exercise and physical activity practices (goal-directed therapy) can increase the remission rate and assist to cope with fear avoidance beliefs. In future studies, the effects of different exercise practices on these parameters in different rheumatic patients can be compared.

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