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ORIGINAL ARTICLES

Investigation of factors affecting physical activity level in patients with primary Sjögren's syndrome

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ABSTRACT

Objectives: This study aimed to determine physical activity levels and understand the factors influencing an active lifestyle among patients with primary Sjögren's syndrome (pSS).
Methods: Ninety-seven patients participated in this multicentric study. Physical activity levels were assessed using the International Physical Activity Questionnaire-Short Form (IPAQ-SF). The Inflammatory Arthritis Facilitators and Barriers (IFAB) questionnaire was used to evaluate perceived barriers and facilitators to physical activity.
Results: Forty-six patients were physically inactive and the rest of them were moderately active. Commonly identified barriers included a lack of motivation, fatigue, and pain. Conversely, knowledge of the health and mood benefits for physical activity emerged as a key motivator. Patients with better scores on facilitators and lower scores on barriers exhibited higher physical activity levels ($p<0.05$). Notably, a high level of perceived facilitators of physical activity (odds ratio [OR]: 1.02; 95% confidence interval [CI], 1.00 – 1.05) and reduced pain (OR: 0.81; 95% CI: 0.69 – 0.95) were linked to an active lifestyle.
Conclusions: This study emphasizes the role of motivation and awareness of the benefits of physical activity for health and mood in driving physical activity for patients with primary Sjögren's syndrome. Tailored physical activity programs that address psychological aspects and disease-related pain, and fatigue should be designed to counter sedentary lifestyles in pSS patients.

Keywords: Fatigue; Pain; Physical activity; Physical function; Sjögren syndrome.

INTRODUCTION

Physical activity has many health benefits for all people, including those with rheumatic diseases [1, 2]. Physical activity can improve physical fitness, quality of life, and disease-related outcomes in this population with an increased risk of having comorbidities like cardiovascular diseases, preventable through an active lifestyle[3]. Therefore, promoting physical activity in rheumatic diseases is crucial for disease management.

Current physical activity recommendations include engaging ≥ 150 minutes of moderate-intensity activity per week and/or ≥ 75 minutes of vigorous-intensity activity per week, along with muscle strengthening exercises[4,5]. Same recommendations have been proposed for patients with inflammatory arthritis, indicating their effectiveness and applicability[2]. However, adherence to these recommendations and physical activity level are lower in patients with rheumatic diseases[2]. Patients with Sjögren's syndrome engage in less moderate and vigorous intensity physical activity but spend nearly the same amount of time being sedentary as healthy individuals [6]. Hence, it is vital to understand the level of physical activity in this patient group.

Primary Sjögren's syndrome (pSS) is a systemic autoimmune inflammatory disease characterized by lymphocytic infiltration of exocrine glands[7], predominantly affecting women[8, 9]. The main symptoms of this disease are dry mouth and eyes, diffuse joint pain, and fatigue[7]. Fatigue is a prevalent complaint and a primary treatment target for pSS, often associated with higher activity avoidance and reduced physical activity participation[10]. Additionally, patients with pSS have reduced physical capacity and muscle strength which may lead to sedentary behavior[11,12]. These patients may also be more prone to have dyslipidemia, arterial hypertension, coronary artery disease, osteoarthritis, osteoporosis, and depression [9, 13]. Among these comorbidities, 24% of patients with pSS have depression[14], which has been shown to be a predictor of physical activity level[15]. Participation in physical activity programs can help to manage fatigue, improve physical function, and al-

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leviate depression[16,17], highlighting the integral role of physical activity by preventing morbidity and enhancing quality of life in this patient group.

Implementing physical activity in healthcare setting is challenging due to generic or disease-specific barriers. Some studies have identified determinants of physical activity in various rheumatic disorders including rheumatoid arthritis[18], axial spondyloarthritis[19], and systemic sclerosis[20]. However, there is no available data on the determinants of physical activity in patients with pSS. Determining the barriers and facilitators of physical activity can increase the chance of designing a tailored, successful, and sustainable program which can help to overcome sedentary behavior in this patient group.

Therefore, this study aims to ascertain pSS patients' perspectives on the determinants of physical activity using a standardized questionnaire. Another aim was to investigate the impact of factors affecting a physical active lifestyle among patients with pSS.

MATERIALS AND METHODS

Patients

Ninety-seven patients (93 women), aged 18 to 70 years, diagnosed with pSS were consecutively included in this study from the rheumatology clinics of two different research and training hospitals (Haydarpaşa Numune Research and Training Hospital and Dr. Lütfi Kırdar City Hospital, Istanbul). Patients were eligible if they had fulfilled the American College of Rheumatology and European League Against Rheumatism (EULAR) criteria[21], were able to walk, and were over 18 years old. Those with accompanying rheumatic or neurological diseases, who were pregnant, and who had ongoing pain due to musculoskeletal issues such as low back pain or knee disorders were excluded. All participants provided written informed consent. This study adhered to the STrengthening the Reporting of OBservational Studies in Epidemiology (STROBE) statement [2]. Ethical approval was obtained from the university's ethics committee (ATADEK 2022/12) and the study was conducted following the principles of the Declaration of Helsinki.

Assessments

Primary outcome measures of this study are Inflammatory Arthritis Facilitators and Barriers to Physical Activity (IFAB) questionnaire and International Physical Activity Questionnaire-Short Form (IPAQ-SF). Secondary outcome measures are the EULAR Sjogren's Syndrome Patient Reported Index (ESSPRI), Hospital Anxiety and Depression Scale (HADS), and Health Assessment Questionnaire (HAQ). Barriers and facilitators to physical activity were assessed using the IFAB questionnaire, developed to evaluate physical activity determinants in patients with inflammatory arthritis. The IFAB consists of 10 questions (4 of them barriers/facilitators, 3 facilitators, 3 barriers) regarding the psychological status, social support, disease-related symptoms, and environmental factors. Each item can be scored from 0 to 10, resulting in a total score ranging from –70 to 70. A higher score indicates more facilitators and/or fewer barriers[23, 24].

The IPAQ-SF was used to assess self-reported physical activity levels by inquiring the number of days and the average time spent engaging in vigorous and moderate activities and walking. Participants were categorized as inactive, moderately active, or highly active using the IPAQ scoring protocol. The metabolic equivalent of task (MET) values for each activity type (walking = 3.3 METs, moderate activity = 4 METs, vigorous activity = 8 METs) were multiplied by the activity duration in minutes and the number of the days.

The ESSPRI was utilized to assess self-reported pain, fatigue, and dryness symptoms on a scale from 0 (no symptoms) to 10 (most severe symptom). The average of these domains was considered as the total score ranged between 0 to 10 and higher scores indicate worse symptom severity[25].

The HADS was employed to evaluate depression and anxiety status with 14 items (7 for depression and 7 for anxiety symptoms) with scores ranging from 0 to 3. Higher scores indicate a worse situation [26, 27].

The HAQ, a self-report tool, includes eight categories (dressing, eating, hygiene, walking, gripping, reaching, and other physical activities) assessing perceived difficulty performing in daily life activities was used to assess physical functioning and disability[28].

Statistical Analysis

Sample size was calculated based on a previous correlation value of 0.28 between IFAB total score and IPAQ-SF [29], with a power of 80 %, and a type 1 error of 0.05. A total of 98 participants were needed for this study. Data were analyzed using SPSS 22.0 (IBM Corporation, Armonk, New York) and Microsoft Excel (Microsoft Corporation). Data distribution was examined for normality through visual assessment (histogram and Q-Q plots) and analytical methods (Shapiro–Wilk Test). Descriptive statistics are presented as either median and interquartile range or mean and standard deviation for the continuous variables and frequency and percentage values for categorical variables. The IFAB items were categorized as barriers, facilitators, or neither.

Pearson or Spearman correlation analyses was conducted to identify potential correlations between MET values, HADS scores, HAQ, ESSPRI scores, and IFAB

total and item-based scores. Correlation coefficients were accepted as < 0.3 as weak, 0.3 to 0.7 as moderate, and >0.7 as strong [30]. Patients were compared based on their physical activity levels regarding ESSPRI, HAQ, HADS, and IFAB (total and item-based) scores, utilizing Independent-t-tests or Mann-Whitney-U test according to data distribution.

A binary logistic regression model was constructed to clarify the determinants of being moderately physically active relative to being physically inactive. The IFAB total score, ESSPRI scores (total, pain, dryness, and fatigue), and HADS scores (depression and anxiety) were added into the model, and stepwise backward selection method was used for logistic regression analysis. The IFAB total score and ESSPRI pain score remained significant in the model. Unadjusted and adjusted (age, disease duration, and BMI) odds ratios (OR) with 95% confidence intervals were reported. Statistical significance was set 0.05 level.

RESULTS

All demographic and clinical characteristics are summarized in Table 1. Most patients were women with a mean age of 54.5 years and a mean disease duration of 5.7 years. Only 19.6% of the patients had a job, and more than half of them completed primary and secondary school (58.8%), and 85.5 % of them were married. Among the medications, hydroxychloroquine was the most frequently prescribed (64.9%) and 26.8 % of the patients did not use any medications related to pSS. According to the results of IPAQ-SF, half of the subjects were physically inactive, while the other half of them were moderately active.

Figure 1 represents the number of patients who perceived the IFAB items as barriers or facilitators to physical activity. Lack of motivation was a commonly reported barrier to physical activity participation. Additionally, the level of symptoms (item 1) and weather conditions (item 2) were mainly considered as barriers to physical activity. Among the last 3 items of the IFAB, items 8 and 9 were considered as facilitators to physical activity, while items 3, 4, 5, 7, and 10 were not evaluated as barriers or facilitators to physical activity.

The IFAB total score significantly correlated with IPAQ-SF MET value, HADS-depression, and HAQ. IFAB item 1 was significantly correlated with HADS-depression, HAQ, and ESSPRI scores (total and fatigue). IFAB item 6 was significantly correlated with the evaluated parameters, except ESSPRI dryness and HAQ scores. IFAB item 8 and 9 were moderately correlated with the IPAQ-SF MET value. IFAB items 2, 3, 4, and 7 were not correlated with IPAQ-SF MET value, HADS-anxiety, HADS-depression, HAQ, ESSPRI total, and ESSPRI fatigue scores (Table II).

Weak correlation values were obtained between MET values, HADS-depression, HADS-anxiety, HAQ, and ESSPRI scores (Table III).

Physically inactive patients had higher ESSPRI total, fatigue, and pain scores, higher physical disability, and higher depression and anxiety symptoms compared to moderately active patients. When the IFAB total score and item-based scores were compared between the

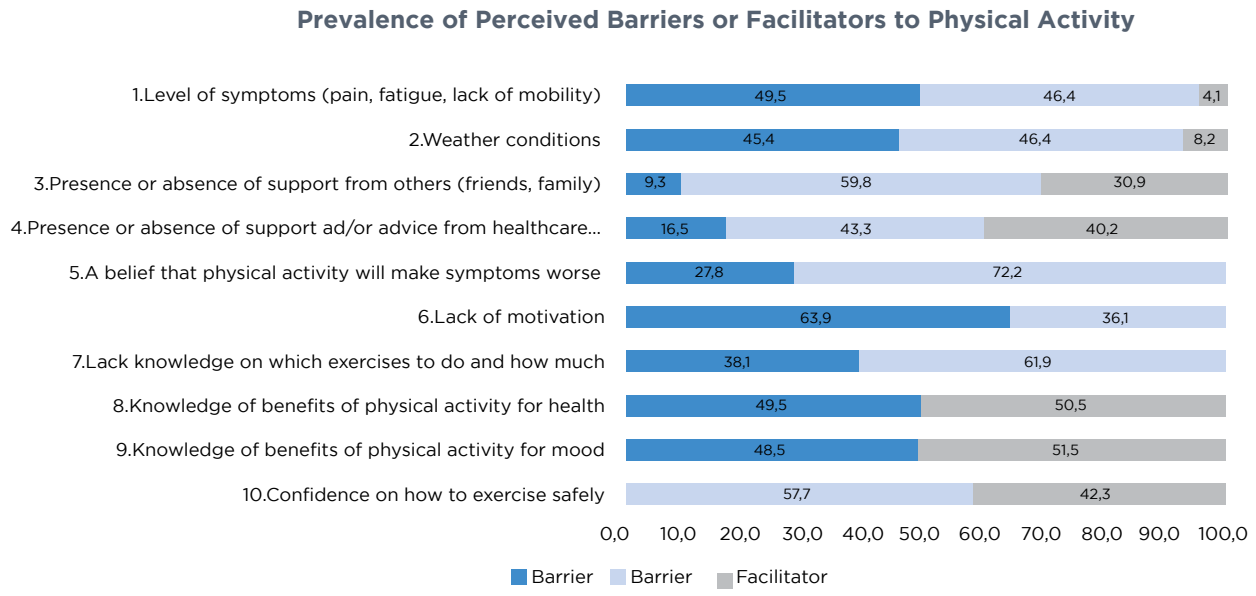

Figure 1. Prevalence of perceived barriers and facilitators of physical activity.

TABLE I. Demographic and clinical characteristics of primary Sjögren's Syndrome patients

Variable	All patients (n = 97)
Age (years), mean (SD)	54.5 (9.7)
Gender, female, n (%)	93 (95.9)
BMI (kg/m^2), mean (SD)	28.8 (5.5)
Marital status, n (%)	
Married	83 (85.5)
Educational status, n (%)	
Primary and secondary school	57 (58.8)
High school	25 (25.8)
University	15 (15.5)
Employment status, n (%)	
Employed	19 (19.6)
Current treatment, n (%)	
Hydroxychloroquine,	63 (64.9)
Methotrexate	4 (4.1)
Azathioprine	3 (3.1)
Prednisolone	5 (5.1)
NSAID	4 4.1)
None	26 (26.8)
Disease duration (years), mean (SD)	5.7 (4.5)
ESSPRI total score, mean (SD)	5.1 (2.2)
ESSPRI pain, median (IQR)	6 (3 – 8)
ESSPRI dryness, mean (SD)	5.3 (2.9)
ESSPRI fatigue, mean (SD)	4.6 (3.0)
IFAB total score, mean (SD)	0.2 (21.2)
IPAQ-SF MET value, median (IQR)	693 (382.5 – 1040)
IPAQ-SF, n (%)	
Inactive	46 (47.4)
Moderately active	51 (52.6)
HAQ, median (IQR)	0.25 (0.05 – 0.60)
HADS anxiety, median (IQR)	6 (4 – 9)
HADS depression, median (IQR)	6 (4 – 10)

Abbreviations: SD, Standard Deviation; IQR, Interquartile Range, BMI, Body Mass Index; IPAQ-SF, International Physical Activity Questionnaire-Short Form; HADS, Hospital Anxiety and Depression Scale; HAQ, Health Assessment Questionnaire; ESSPRI, European Sjögren's Syndrome Patient Reported Index.

groups, moderately active patients had higher IFAB total scores and items 6, 8, 9, and 10 than physically inactive patients (Table IV).

After adjusting for potential confounding factors (age, BMI, and disease duration), being moderately physically active was positively associated with IFAB total score (odds ratio [OR]: 1.02; 95% confidence interval [CI]: 1.00 – 1.05) and ESSPRI pain score was negatively associated with being moderately physically active (OR: 0.81; 95% CI: 0.69 – 0.95). Table 5 shows both adjusted and unadjusted odd ratios (ORs) for determinants of being moderately physically active relative to being physically inactive.

DISCUSSION

Our study revealed that the primary barriers to physical activity were frequently cited as lack of motivation, along with symptoms like pain, dryness, and fatigue in patients with primary Sjögren's syndrome. Nearly half of the patients with pSS considered the benefits of physical activity for health and mood as facilitators to physical activity. Among the items of the IFAB questionnaire, weather conditions, and the presence or absence of support from family, friends, or healthcare professionals were not considered as a barrier or facilitator to physical activity. Moreover, patients' knowledge of exercises or confidence in performing exercises in a safe way was accepted as neither a barrier nor a facilitator to physical activity. Lastly, patients did not have any belief that physical activity would make their symptoms worse. Additionally, a higher IFAB total score was significantly correlated with higher MET value, lower depression and anxiety symptoms, higher physical functioning, and lower disease-related symptom scores. Perceiving level of symptoms as a barrier to physical activity was correlated with higher depression, lower physical functioning, higher pain severity, and higher fatigue level. Also, an enhanced motivation status was associated with higher MET value, lower anxiety and depression, increased physical functioning, and lower pain and fatigue levels. A comparison of patients according to their physical activity level (physically inactive or moderately active) showed that moderately active patients had lower barriers to physical activity as expected. Item-based comparison indicated that knowledge of the benefits of physical activity for health or mood, and confidence in how to exercise safely were mostly facilitators of physical activity in moderately active patients. Lack of motivation was considered as a barrier mostly by physically inactive participants. Lastly, IFAB total score and pain were associated with a moderately physically active lifestyle.

There is ample evidence that physical activity or exercise improves overall health, however, a large proportion of adults do not meet physical activity recommendations[31]. Therefore, addressing physical activity determinants may help to raise physical activity levels in both the general population and in individuals with chronic conditions. Patients with rheumatic diseases declared fatigue[32], fear of joint damage, lack of support from healthcare providers[33], pain, and lack of motiva-

TABLE II. Correlation of the IFAB total and item-based scores with MET value, psychological symptoms, perceived disease symptoms, and physical function

Items	IPAQ MET value	HADS Anxiety	HADS depression	HAQ	ESSPRI Total	ESSPRI Pain	ESSPRI Fatigue	ESSPRI Dryness
IFAB Total Score	0.391 **(0.001)**	-0.231 **(0.023)**	-0.300 **(0.003)**	-0.439 **(0.001)**	-0.23 **(0.02)**	-0.067 (0.64)	-0.22 **(0.03)**	-0.124 (0.227)
IFAB Item 1	0.067 (0.512)	-0.109 (0.286)	-0.410 **(0.001)**	-0.371 **(0.001)**	-0.333 **(0.017)**	-0.286 **(0.042)**	0.401 **(0.004)**	-0.083 (0.561)
IFAB Item 2	-0.032 (0.756)	-0.118 (0.248)	-0.031 (0.765)	-0.151 (0.141)	-0.085 (0.552)	-0.083 (0.562)	-0.202 (0.154)	0.091 (0.527)
IFAB Item 3	-0.027 (0.795)	-0.115 (0.263)	-0.067 (0.512)	-0.262 **(0.010)**	0.099 (0.491)	0.047 (0.745)	0.088 (0.541)	0.000 (0.998)
IFAB Item 4	0.007 (0.946)	0.016 (0.879)	0.159 (0.121)	0.056 (0.583)	0.062 (0.665)	0.136 (0.341)	0.102 (0.476)	-0.116 (0.419)
IFAB Item 5	0.080 (0.433)	-0.007 (0.947)	-0.295 **(0.003)**	-0.436 **(0.001)**	-0.354 **(0.011)**	-0.426 **(0.002)**	-0.264 (0.061)	-0.149 (0.296)
IFAB Item 6	0.333 **(0.001)**	-0.317 **(0.002)**	-0.345 **(0.001)**	-0.225 **(0.027)**	-0.324 **(0.020)**	-0.371 **(0.007)**	-0.319 **(0.023)**	0.013 (0.929)
IFAB Item 7	0.136 (0.183)	-0.118 (0.249)	-0.007 (0.948)	-0.128 (0.210)	-0.043 (0.764)	0.066 (0.643)	-0.178 (0.211)	0.055 (0.702)
IFAB Item 8	0.430 **(0.001)**	-0.103 (0.314)	-0.209 **(0.040)**	-0.235 **(0.020)**	0.02 (0.891)	0.055 (0.704)	0.045 (0.754)	-0.067 (0.64)
IFAB Item 9	0.429 **(0.001)**	-0.043 (0.679)	-0.172 (0.092)	-0.230 **(0.023)**	0.005 (0.975)	0.026 (0.856)	0.026 (0.858)	-0.059 (0.681)
IFAB Item 10	0.278 **(0.006)**	-0.226 **(0.029)**	-0.222 **(0.029)**	-0.233 **(0.022)**	0.019 (0.896)	-0.010 (0.943)	0.029 (0.84)	0.004 (0.976)

Bold values indicate statistically significant. Correlation (rho) and significancy values are expressed.
Abbreviations: IFAB, Inflammatory Arthritis Facilitators and Barriers to Physical Activity Questionnaire; IPAQ-SF, International Physical Activity Questionnaire-Short Form; HADS, Hospital Anxiety and Depression Scale; HAQ, Health Assessment Questionnaire; ESSPRI, European Sjögren's Syndrome Patient Reported Index.

TABLE III. Correlation of the IPAQ MET values, psychological symptoms, perceived disease symptoms, and physical function.

Variable	IPAQ-MET value	P value
HADS-anxiety	-0.127	0.21
HADS-depression	-0.210	**0.04**
HAQ	-0.268	**0.01**
ESSPRI total	-0.205	**0.04**
ESSPRI pain	-0.231	**0.02**
ESSPRI fatigue	-0.138	0.18
ESSPRI dryness	-0.097	0.34

Bold values indicate statistically significant. Correlation (rho) values are expressed.
Abbreviations: IPAQ-SF, International Physical Activity Questionnaire-Short Form; HADS, Hospital Anxiety and Depression Scale; HAQ, Health Assessment Questionnaire; ESSPRI, European Sjögren's Syndrome Patient Reported Index.

tion[34] as barriers that may impede the uptake of physical activity. Using the same questionnaire to determine barriers and facilitators to physical activity, 73 % of the evaluated patients with inflammatory arthritis reported the presence or absence of symptoms as a barrier [29], contrast to this, the most frequently identified barrier (63.9 %) was the lack of motivation in our findings. Especially, this factor was more prominent in physically inactive individuals. Motivation is also a commonly seen psychological determinant of physical activity in the general population[35] and in people with rheumatoid arthritis[34], and systemic sclerosis[20]. The results of the present study confirm the importance of motivation as a determinant of physical activity among patients with rheumatic diseases which would be a key factor to achieve sufficient activity level.

Patients with pSS displayed similar levels of walking habits, but lower moderate and vigorous physical activity than healthy controls[10]. The similarity in sitting time between patients with pSS and healthy participants has been reported in a later study[6]. In line with these studies, half of our patients were physically inactive which underlines the importance of promoting physical activity in pSS. However, determining physical activity levels in a more objective manner would provide detailed information on the daily activity patterns of patients with pSS.

Symptoms such as pain and fatigue are commonly mentioned barriers to physical activity in patients with

TABLE IV. Comparison of patients with Sjögren's syndrome in terms of physical activity determinants, psychological symptoms, perceived disease symptoms, and physical function according to physical activity level

	Physically inactive (n = 46)	Moderately active (n = 51)	P value
ESSPRI Total Score	5.86 (1.74)	4.44 (2.44)	**0.002**
ESSPRI Dryness	5.82 (2.77)	4.86 (2.98)	0.104
ESSPRI Fatigue	5.30 (2.54)	3.92 (3.24)	**0.023**
ESSPRI Pain	7 (5 – 8)	5 (0 – 7)	**0.002**
HAQ	0.42 (0.10 – 0.85)	0.2 (0 – 5)	**0.024**
HADS - Anxiety	7 (5 – 10)	5 (3 – 8)	**0.013**
HADS - Depression	7 (5 – 10)	5 (2 – 10)	**0.023**
IFAB Total Score	-6.78 (18.99)	6.64 (21.29)	**0.002**
IFAB Item 1	-4.5 (-8 – 0)	0 (-7 – 0)	0.159
IFAB Item 2	0 (-5 – 0)	0 (-6 – 0)	0.559
IFAB Item 3	0 (0 – 5)	0 (0 – 5)	0.619
IFAB Item 4	0 (0 – 5.5)	0 (0 – 8)	0.898
IFAB Item 5	0 (-5.25 – 0)	0 (-5 – 0)	0.819
IFAB Item 6	-7 (-9 – -2.5)	-2 (-5 – 0)	**<0.001**
IFAB Item 7	-1.5 (-7 – 0)	0 (-5 – 0)	0.058
IFAB Item 8	0 (0 – 5.25)	8 (0 – 10)	**0.002**
IFAB Item 9	0 (0 – 8)	8 (0 – 10)	**0.009**
IFAB Item 10	0 (0 – 6.25)	4 (0 – 10)	**0.036**

Bold values indicate statistically significant. Variables are expressed as mean (SD) or median (IQR).
Abbreviations: IFAB, Inflammatory Arthritis Facilitators and Barriers to Physical Activity Questionnaire; IPAQ-SF, International Physical Activity Questionnaire-Short Form; HADS, Hospital Anxiety and Depression Scale; HAQ, Health Assessment Questionnaire; ESSPRI, European Sjögren's Syndrome Patient Reported Index.

TABLE V. Odds ratios and 95% confidence intervals for being moderately physically active relative to being physically inactive.

	Adjusted			Unadjusted		
	Odds ratio	95 % CI	p value	Odds ratio	95 % CI	p value
IFAB total score	1.02	1.00 – 1.05	**0.021**	1.03	1.00 – 1.05	**0.008**
ESSPRI pain	0.81	0.69 – 0.95	**0.012**	0.81	0.69 – 0.94	**0.007**

Bold values indicate statistically significant (Adjusted for age, disease duration, and BMI).
Abbreviations: IFAB, Inflammatory Arthritis Facilitators and Barriers to Physical Activity Questionnaire; ESSPRI, European Sjögren's Syndrome Patient Reported Index.

arthritis[18, 36, 37]. Relief of symptoms and improvement in physical function have been described as disease-specific facilitators of physical activity in rheumatoid arthritis[18]. Similar with these findings level of symptoms such as pain and/or fatigue was another frequently reported barrier in our study. Chronic pain and fatigue are common in patients with pSS and should be addressed to cope with physical inactivity[10], in line with this pain has been served as a determinant of physically active lifestyle. A previous study found that physical inactivity has been linked to fatigue, depression, and a poor quality of life in patients with pSS[6]. Fatigue was lower in physically active participants, another barrier lack of motivation, was associated with fatigue level. It can be proposed that a higher level of pain and fatigue may result in decreased motivation and eventually physical inactivity.

Approximately one in three patients with pSS have depression and/or anxiety which may result in a lower level of physical activity and less adherence to treatment[38]. In line with this finding, physically inactive patients had more psychological symptoms compared to moderately active adults. Moreover, the correlation between depression and barriers to physical activity such as the level of disease-related symptoms, lack of motivation, and a belief that physical activity will in-

crease the level of symptoms indicates that psychological issues may be a hindering factor for participation in physical activity programs.

Rheumatic disorders reduce physical capacity and function and a marked increase in physical inactivity has been detected in rheumatoid arthritis patients who had poorer physical functioning[39]. The autoimmune and inflammatory process in pSS reduces physical function as well as muscle strength and aerobic capacity[11]. It would not be surprising to find higher levels of physical disability in physically inactive patients. Considering the association between physical activity determinants and physical functioning, Davergne *et al.* reported a significant correlation between the IFAB total score and HAQ, and in line with this study, the IFAB total score correlated with physical function in our study[23]. Physical activity is an efficient strategy to improve disease management and functional capacity[40], therefore, participation in physical activity programs should be promoted in patients with pSS to achieve enhanced physical functioning and better quality of life.

The association of general or arthritis-specific barriers and physical activity status has been observed in patients with inflammatory arthritis[29, 41]. Confirming these findings, a global score dedicated to assessing barriers and facilitators to physical activity was associated with a physically active lifestyle and correlated with IPAQ-MET value in patients with pSS. Rather than facilitators, barriers to physical activity such as symptoms of disease, and psychological health were mostly linked with self-reported physical activity in previous studies[42], however, no differences were detected in terms of identified barriers to physical activity between patients who attend regular exercise programs or who do not in patients with rheumatoid arthritis[18]. In contrast to this study, lack of motivation was perceived as much more of a barrier for physically inactive individuals, indicating that the physically active group was better able to cope with barriers.

Also, nearly half of our patients evaluated the benefits of physical activity for health/mood as a facilitator of physical activity. When "confidence in how to exercise safely" was added to the items mentioned above, physically active individuals seemed to rate these items as facilitators more than inactive patients. The perceived positive effects of physical activity on general health and symptom improvement have been accepted as facilitators of physical activity in patients with spondyloarthritis[37] and rheumatoid arthritis[43]. The correlation between knowledge of the benefits of physical activity for health and mood and MET value supports the issues mentioned above that inducing the facilitators of physical activity by giving information related to the benefits of physical activity for overall health and disease-specific symptoms would help to increase participation in physical activity programs.

This study is not without limitations. First was to use a self-report questionnaire to determine the level of physical activity instead of obtaining objective data from physical activity monitoring instruments. Secondly, although we included patients from two different centers with varying sociodemographic backgrounds, our sample size may be limited to enlighten the association between physical activity and perceived barriers and facilitators.

Perceived barriers and facilitators to physical activity are associated with physical activity levels. Among the potential barriers, patients with pSS consider lack of motivation and disease symptoms such as pain as the main obstacles that impede the uptake of physical activity. Moreover, knowing the benefits of physical activity for general health and mood are facilitators of physical activity indicating the importance of patient education to lessen sedentary behavior. Besides disease symptoms, depression, anxiety, and physical function may be described as associated factors related to physical activity level which should be considered to increase adherence to physical activity programs.

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