



Prevalence of Exercise Prescription and Clinical Justifications in Pediatric Rheumatology Patients with a Immigrant Background: A Single-Center Observational Study

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Abstract

Aim: Pediatric rheumatic diseases, such as Juvenile Idiopathic Arthritis (JIA), fibromyalgia, muscle strain, and scoliosis, can significantly impact physical function and quality of life. Exercise therapy is an effective, evidence-based approach for managing musculoskeletal symptoms in these patients, but its use in pediatric rheumatology remains underexplored. This study aimed to evaluate the prevalence of exercise prescription, the underlying clinical justifications, and demographic characteristics of pediatric rheumatology immigrant-background pediatric patients referred to a physical therapy clinic.

Material and Method: This prospective, cross-sectional study included pediatric patients with immigrant (0-22 years) referred from the pediatric rheumatology clinic to the physical therapy clinic of Ümraniye Training and Research Hospital between January 1 and December 31, 2024. Patient data, including age, gender, diagnosis, and treatment type, were analyzed using SPSS (v.26), with $p < 0.05$ considered statistically significant.

Results: A total of 190 patients were included (63% female, 37% male), with a mean age of 14.2 ± 4.3 years. Exercise prescriptions were provided to 55% ($n=105$) of the patients. Male patients had a slightly higher exercise prescription rate (59%) compared to females (53%), though this difference was not statistically significant ($p > 0.05$). Muscle strain (74%) and joint pain (69%) had the highest exercise prescription rates, while JIA patients had a lower rate (47%).

Conclusion: Exercise prescriptions are more common in non-inflammatory conditions like muscle strain and joint pain, while JIA patients receive them less frequently, likely due to concerns over joint damage and disease activity. Future studies should assess the long-term impact of exercise in this population.

Keywords: Pediatric rheumatology, exercise prescription, Juvenile Idiopathic Arthritis, muscle strain, physical therapy

INTRODUCTION

Pediatric rheumatic diseases are chronic, inflammatory conditions that begin in childhood and can affect joints, muscles, connective tissues, and internal organs. One of the most common examples of these diseases is Juvenile Idiopathic Arthritis (JIA), which can lead to long-term joint pain, movement restrictions, and functional impairment in children (1,2). In addition to JIA, non-inflammatory musculoskeletal disorders such as fibromyalgia, muscle strain, and scoliosis are also commonly encountered in pediatric rheumatology practice (3,4).

In these conditions, musculoskeletal involvement, pain, joint stiffness, and muscle weakness can significantly limit

physical activity in children, potentially leading to long-term declines in quality of life (3,5). Exercise therapy is a widely used, evidence-based, and effective treatment modality aimed at alleviating these symptoms, increasing muscle strength, maintaining joint range of motion, and improving functional capacity (5,6). Additionally, the anti-inflammatory effects of exercise have also been demonstrated in recent studies. It has been reported that regular physical activity can reduce levels of pro-inflammatory cytokines, thereby suppressing systemic inflammation and helping to control disease activity (7,8).

However, the frequency of exercise prescription and clinical decision-making processes in pediatric rheumatology

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patients can vary significantly depending on several factors. These factors include the patient's age, type of diagnosis, disease duration, and presence of comorbidities. Despite this, studies on the effectiveness of exercise therapy in children remain relatively limited, and the available data are often based on small sample sizes (9-11).

The purpose of this research is to determine the frequency of exercise prescription, the underlying clinical rationale, and population characteristics of pediatric rheumatology patients. Our hope is this study will shed light on opportunity and exercise therapy in pediatric rheumatic disease community, and provide insights that may assist in clinical decision-making and better management of pediatric rheumatology patients.

MATERIAL AND METHOD

Data Collection

This study was designed as a prospective, cross-sectional, and observational study involving immigrant-background pediatric patients referred to the physical therapy and rehabilitation clinic of Ümraniye Training and Research Hospital from the same hospital's Pediatric Rheumatology Clinic. The study included pediatric patients aged 0 to 22 years who were referred from the pediatric rheumatology clinic to the physical therapy clinic between January 1, 2024, and December 31, 2024.

Inclusion criteria included being 0 to 22 years old, being referred from the pediatric rheumatology clinic to the physical therapy clinic, and having undergone at least one physical therapy assessment. Patients who were enrolled in comprehensive rehabilitation programs, had unclear diagnoses or insufficient clinical follow-up, or had neuromuscular disorders or contraindications to exercise (e.g., progressive muscle diseases or severe cardiac insufficiency) were excluded. Additionally, patients with multisystem involvement or severe systemic diseases (e.g., cancer or organ failure), those in the acute postoperative period, and patients who were pregnant or in the postpartum period were also excluded from the study.

Demographic and clinical data, including age, gender, diagnosis type, treatment modality (exercise, medical), and other relevant clinical characteristics, were collected and recorded for each patient.

This study was approved by the Ümraniye Training and Research Hospital Ethics Committee (approval number: 54132726-000-26648 and, approval date: 19.12.2019)

and conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants prior to their inclusion in the study.

Statistical Analysis

The collected data were analyzed using Microsoft Excel and SPSS (v.26) software. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to calculate the distributions of patient age groups, diagnosis types, and treatment modalities.

For comparisons between groups, the Pearson Chi-square (χ^2) test was used for categorical variables. In cases where the expected cell frequencies were low, Fisher's Exact Test was applied. The normality of continuous variables was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. For variables that did not show a normal distribution, non-parametric tests, including the Mann-Whitney U and Kruskal-Wallis tests, were used. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 190 pediatric rheumatology patients were included in this study. The ages of the patients ranged from 0 to 22 years, with a mean age of 14.2 ± 4.3 years. Of these, 63% (n=120) were female and 37% (n=70) were male. Exercise prescriptions were provided to 55% (n=105) of the patients, while the remaining 45% (n=85) received only medical treatment or other non-pharmacological approaches.

The distribution of exercise prescriptions by gender is summarized in Table 1. The exercise prescription rate among male patients (59%, n=41) was 6% higher than that of female patients (53%, n=64), but this difference was not statistically significant ($p > 0.05$).

Table 1. Exercise prescription rates by gender

Gender	Total patients (n)	Exercise prescriptions (n)	Percentage (%)
Female	120	64	53
Male	70	41	59
Total	190	105	55

The distribution of exercise prescriptions by age and gender is presented in Table 2. The highest exercise prescription rate was observed in the 16-20 age group among male patients (68%, n=21), which was significantly higher than that of female patients in the same age group ($p < 0.05$).

Table 2. Exercise prescription rates by age group and gender

Age group	Female (n)	Exercise (n)	Percentage (%)	Male (n)	Exercise (n)	Percentage (%)
0-10	15	8	53	12	6	50
11-15	42	22	52	27	14	52
16-20	45	23	51	31	21	68
21+	18	11	61	-	-	-
Total	120	64	53	70	41	59

The distribution of exercise prescriptions by diagnosis type is shown in Table 3. Exercise prescriptions were most common among patients with muscle strain (74%, n=28) and joint pain (69%, n=11), while the rate was lower among

patients with JIA (47%, n=44). These findings suggest that the type of diagnosis may have a notable impact on exercise prescription rates. However, these differences were not statistically significant ($p>0.05$).

Table 3. Exercise prescription rates by diagnosis type

Diagnosis type	Total patients (n)	Exercise prescriptions (n)	Percentage (%)
Juvenile idiopathic arthritis	93	44	47
Muscle strain	38	28	74
Joint pain	16	11	69
Scoliosis	8	5	62
Cerebral palsy	5	3	60
Fibromyalgia	6	4	67
Other (e.g., TME, FMF)	24	10	42
Total	190	105	55

Additionally, 46% (n=87) of the 190 patients received medical treatment, while the remaining 54% (n=103) were managed exclusively with exercise.

DISCUSSION

In this study, the prevalence of exercise prescription, demographic characteristics, and clinical rationale in pediatric rheumatology patients were comprehensively evaluated. A total of 190 pediatric patients were included, 55% (n=105) of whom received exercise prescriptions, while the remaining 45% (n=85) were managed with medical therapy or other non-pharmacological approaches. These findings are consistent with exercise prescription rates reported in the literature, although some studies have reported lower or higher rates (9,12,13).

In this study, 53% (n=64/120) of female patients and 59% (n=41/70) of male patients received exercise prescriptions. The exercise prescription rate was 6% higher in males than in females, although this difference was not statistically significant ($p>0.05$). Notably, the highest exercise prescription rate (68%) was observed in male patients in the 16-20 age group. This finding may reflect the higher physical activity levels and greater motivation for muscle strengthening typically seen in adolescent males (14-16).

Exercise prescription rates by age group also revealed notable trends. While only 52% of patients in the 0-10 age group received exercise prescriptions, this rate increased to 58% in the 16-20 age group. This may be due to the greater physical activity tolerance and higher muscle strength requirements in growing and developing children. Additionally, the need to maintain joint range of motion and improve muscle strength in older age groups may contribute to these findings (17,18). However, the relatively lower exercise prescription rate (61%) in the 21+ age group may indicate a lower inclination towards physical activity in this older patient population or a higher chronic disease burden (19,20).

In our study, patients with muscle strain had the highest exercise prescription rate (74%), indicating that exercise

is a fundamental component in the treatment of muscle strain and plays a critical role in the rapid resolution of symptoms (21). Similarly, a high exercise prescription rate (69%) was observed in patients with joint pain (21). In contrast, patients diagnosed with JIA had a relatively lower exercise prescription rate (47%). This finding suggests that exercise prescriptions for JIA patients are written more cautiously, likely due to the need for careful disease activity management (6). In particular, a more conservative approach may be preferred during periods of active inflammation to prevent joint damage (5). Additionally, during periods of high disease activity, JIA patients may experience increased pain and restricted movement, which can further reduce the likelihood of exercise being prescribed (6,17,18).

It is well established that exercise not only increases muscle strength but also has anti-inflammatory effects. Regular physical activity has been shown to reduce levels of pro-inflammatory cytokines (e.g., TNF- α , IL-6), thereby suppressing systemic inflammation and helping to control disease activity. For this reason, more comprehensive and personalized exercise prescriptions may be beneficial for patients with chronic inflammatory conditions like JIA, potentially improving their long-term prognosis (7,8,22).

Strengths and Limitations of the Study

One of the main strengths of this study is its prospective design and the inclusion of a wide age range (0-22 years). Additionally, the use of real-world clinical data enhances the reliability of the findings and makes the results more applicable to clinical practice. The study's focus on patient referrals between pediatric rheumatology and physical therapy clinics also provides valuable insights into multidisciplinary care approaches.

However, this study has several limitations. First, it is a single-center study based on data from only one hospital, which may limit the generalizability of the findings. Furthermore, important factors that could influence clinical outcomes, such as patient adherence, exercise intensity,

and program duration, were not evaluated. In addition, subjective symptoms (e.g., pain levels, quality of life) and functional improvement were not included, which may restrict the ability to assess the long-term effectiveness of exercise therapy.

Finally, although the study included a wide range of diagnostic categories, the small sample sizes for certain patient groups (e.g., scoliosis and fibromyalgia patients) may limit the statistical power of the findings for these subgroups.

CONCLUSION

This study provides important findings on the frequency of exercise prescription and clinical decision-making processes in pediatric rheumatology patients. Our results indicate that exercise prescriptions are more common in non-inflammatory conditions such as muscle strain and joint pain, while exercise prescription rates are relatively lower in inflammatory diseases like JIA (1,5,6,13). This aligns with previous studies showing that exercise is a fundamental component of managing non-inflammatory musculoskeletal pain but requires a more cautious approach in inflammatory conditions due to the risk of joint damage and increased disease activity (3,21). Additionally, the higher exercise prescription rates observed in male patients suggest that gender may be a potential determinant of exercise prescription. This finding is consistent with studies indicating that adolescent males tend to have higher physical activity levels and greater motivation for muscle strengthening (14-16). However, in our study, exercise prescription frequencies varied across age groups, but most of these differences were not statistically significant. These age-related differences may reflect the well-documented decline in physical activity from childhood through adolescence and into early adulthood (17-20).

Future studies should focus on evaluating the long-term effectiveness of exercise therapy, patient adherence, and the impact on disease activity, using larger sample sizes and multicenter, prospective study designs (10,11,21). Additionally, the anti-inflammatory effects of exercise, which have been well-documented in both animal and human studies, suggest that carefully tailored exercise programs may offer significant benefits for managing chronic inflammatory conditions like JIA (7,8,22).

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