



## Effects of musculoskeletal pain on sleep disorder and quality of life in school aged children who are new to sports

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### Abstract

Children who are new to sports may experience unusual physical stress, which may lead to musculoskeletal pain. The presence of pain may impair sleep and quality of life in children in varying age groups. Therefore, effects of musculoskeletal pain on sleep disorder and quality of life in younger and older school aged children who are new to sports investigated in this study. The study is conducted on children between 6-16 ages who are new to sports. Sociodemographic and sport-specific characteristics was questioned with a 10-question case form, sleep disorders were questioned with the Sleep Disturbance Scale for Children, and quality of life evaluated using the Pediatric Quality of Life Inventory. It was determined that 68% of the children starting to swimming had a musculoskeletal pain, and shoulder pain was the most common pain (30%). There was a statistically significant relationship between pain severity, quality of life, and sleep disturbance scores ( $p<0.05$ ). There was a significant difference in sleep disturbance scores between younger children and older children ( $p<0.05$ ). Sleep disturbance was observed less frequently in older children than in younger children. It was concluded that musculoskeletal pain is frequently experienced in children who are new to swimming sport, the pain is most common in the shoulder region, less frequently in the elbow, knee, back, and waist regions, and the presence of pain adversely affects sleep and quality of life in children. It was concluded that participation in sports at an early age may be a risk factor for sleep disorders.

**Keywords:** Child athlete, musculoskeletal system, sleep disorder, quality of life

### *Spora yeni başlayan okul çağı çocuklarda kas iskelet sistemi ağrularının uyku bozukluğu ve yaşam kalitesi üzerine etkileri*

#### Öz

Spora yeni başlayan çocuklar, kas-iskelet ağrısına yol açabilecek alışılmış üstünde fiziksel stres yaşayabilirler. Kas iskelet sisteminde ağrının varlığı farklı yaş gruplarındaki çocuklarda uyku ve yaşam kalitesini bozabilir. Bu nedenle bu çalışmada spora yeni başlayan okul çağındaki küçük ve büyük çocuklarda kas-iskelet ağrısının uyku bozukluğu ve yaşam kalitesi üzerine etkisi araştırıldı. Çalışma, spora yeni başlayan 6-16 yaş arası çocuklar üzerinde yürütüldü. Sosyodemografik ve spora özgü özellikler 10 soruluk vaka formu ile sorgulandı. Uyku bozuklukları Çocuklar İçin Uyku Bozukluğu Ölçeği, yaşam kalitesi Pediyatrik Yaşam Kalitesi Envanteri ile değerlendirildi. Yüzme sporuna başlayan çocukların %68'inde kas-iskelet ağrısı şikâyeti olduğu, en sık (%30) omuz bölgesinde ağrı varlığı rapor edildiği görüldü. Ağrı şiddeti, yaşam kalitesi ve uyku bozukluğu skorları arasında istatistiksel olarak anlamlı ilişki olduğu belirlendi ( $p<0,05$ ). Küçük çocuklar ve büyük çocuklar arasında uyku bozukluğu skorlarında anlamlı fark olduğu belirlendi ( $p<0,05$ ). Büyük çocuklarda uyku bozukluğu küçük çocuklara oranla daha az sıklıkla görüldü. Sonuç olarak yüzme sporuna yeni başlayan çocuklarda kas-iskelet ağrısının sıklıkla yaşandığı, ağrının en çok omuz bölgesinde, daha az sıklıkla dirsek, diz, sırt ve bel bölgesinde olduğu ve ağrı varlığının uyku ve yaşam kalitesini olumsuz yönde etkilediği sonucuna varıldı. Erken yaşta spora katılım uyku bozuklukları için bir risk faktörü olabileceği kanısına varıldı.

**Anahtar Kelimeler:** Çocuk sporcu, kas iskelet sistemi, uyku bozukluğu, yaşam kalitesi

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## INTRODUCTION

The benefits of participation in sports in childhood are well known in terms of improved physical fitness and skills, regular healthy physical activity, development of self-confidence, experience of goal setting, self-discipline, development of reasoning ability, reduction of stress, and ability to develop strong bilateral relations (Baltacı & Tedavi, 2008). In the process of selecting sportive activities for children, the elements of exercise prescription, such as the intensity, duration, and frequency of the exercise should be determined accurately and carefully. Exercises should include many motoric elements such as strength, endurance, speed, coordination, and they should not be unidirectional. As there are many positive contributions of children's participation in sports, it should not be overlooked that poorly structured and non-individualized programs can cause injuries. As a matter of fact, it was reported that increased participation in sports in children also increases injuries (Jones et al., 2001; Watson et al., 2019; Black et al., 2021). An extraordinary exercise tempo with participation in sports and displaying sports performances different from daily activities may especially affect the musculoskeletal system. According to the results of the research studies, the most common injuries during sports activities in children have been reported to include ankle, knee, hand, elbow, wrist, calf, head, neck, and clavicle (Adirim & Cheng, 2003). Although the lower extremities are injured more frequently, upper extremity problems have also been reported frequently in sports branches that frequently involve overhead activities such as throwing, racquet sports, and swimming (Anderson, 2002; Ergen, 2004).

Participation in sports activities in children is extremely beneficial in terms of filling free time with beneficial activities, reducing screen addiction and protecting and improving general health. However, musculoskeletal pain that may arise has the potential to negatively affect sleep and quality of life in children. Positive effects of sports on the quality of life of children have been reported (Moeijes et al., 2019), but it is thought that musculoskeletal pain that may be experienced in children who are new to sports may have effects on sleep and quality of life. Swimming is a sport that can be enjoyed both recreationally and competitively by children. It has been known for many years that swimming improves muscular endurance and cardiovascular health in children (Clarke & Vaccaro, 1979; Wasfy et al., 2019). However, musculoskeletal pain that may occur due to reasons such as insufficient warming up, faulty body mechanics, and insufficient flexibility should not be ignored during the adaptation period until the necessary stabilization and dynamism for swimming are acquired in children who are new to swimming as a sport.

Recent studies have shown that participation in sports has beneficial effects on sleep quality and quality of life in children, regardless of the presence of musculoskeletal pain (Moeijes et al., 2019; Potter et al., 2020; Rosa et al., 2021). However, in children who are new to sports, it should also be taken into account that the unusual physical stress and unfamiliar body mechanics required by sports can cause strain on the musculoskeletal system. In the available literature, no study has been found on musculoskeletal pain and its effects in children after participating in sports.

Children who are new to sports experience an unusual physical stress. This study was planned with the hypothesis that this physical stress may cause musculoskeletal pain and that pain may affect the child's sleep quality and quality of life. For this reason, the study aimed to examine the presence of musculoskeletal pain and the effect of pain on sleep status and quality of life in children who are new to sports. Another question of this research is how pain, sleep disturbance and quality of life will be affected in younger children who start sports earlier than in older children.

## **METHOD**

### **Research group**

The study was carried out in children aged 6-16 years who have been swimming regularly within the previous 3 months. The sample size of the study was calculated using the G-Power 3.1.7 package program (Heinrich-Heine-Universität, Dusseldorf, Germany) with a type I error of 0.05 and a type II error of 0.2. The power of the test was determined as 0.8. Based on the Visual Analogue Scale (VAS) value, the minimum number of subjects to be included in the study was determined to be 27 in order for a 1-unit difference to be significant. Children aged 6-16 who participated in regular swimming for a maximum of 3 months before the study were included in the study. 62 participants enrolled in the study. Children who participated in sports for more than 3 months (n=2), were diagnosed with a chronic disease or had regular drug use were excluded from the study. Children who wanted to leave the study voluntarily and who could not complete the questionnaires were excluded from the study. The study was completed with 60 participants

Ethics committee approval required for conducting the study was obtained from the Inonu University Health Sciences Non-Interventional Clinical Research Ethics Committee (Date: 14, December 2021; Decision No: 2021/2857). The study was conducted in accordance with the Principles of the Declaration of Helsinki. Parents/Guardians of the children included in the study were informed in detail about the study and their written consent was obtained.

### **Data collection tools**

#### **Evaluation of sociodemographic characteristics**

Age, height, weight, age of starting sports, duration of participation in sports (month/day), frequency of participation in sports (day/week), presence of musculoskeletal pain and localization of pain, duration of pain, and pain level were questioned with a 10 questions physical format case report form at the beginning of the research procedure.

Regarding the age of the participating children, their date of birth was questioned as day/month/year and noted on the basis of 'year'. Height was measured with a stadiometer and weight was measured with a 0.5 kg precision balance.

#### **Assessment of pain**

Pain assessment was attained by marking the painful area on the visual body diagram and the pain level was questioned using the VAS. Using a 10 cm line scale for pain severity according to the VAS, "no pain" was rated as 0 points and "worst pain imaginable" was rated 10 points (Hawker et al., 2011). Pain localization was determined by asking them to mark their painful areas on the body diagram (Staud et al., 2006).

#### **Assessment of sleep disturbance**

The Sleep Disturbance Scale for Children (SDSC) was used to assess sleep quality and impairment in children and adolescents. The original scale was developed by Bruni et al. (1996). The Turkish validity and reliability study of the scale was first performed by Ağadayı et al. (2020). The SDSC is a Likert-type scale that investigates sleep disorders in children aged 6-16 years that have occurred in the last 6 months. In the scale, the child's sleep disorders are questioned in 26 items and 6 sub-dimensions. Problems about initiating and maintaining sleep are assessed with items 1, 2, 3, 4, 5, 10, 11; sleep disorders are assessed with items 13, 14, 15; disorders of arousal reactions are assessed with items 17, 20, 21; sleep-wake transition disorders are assessed with items 6, 7, 8, 12, 18, 19; excessive sleepiness disorders are assessed with items 22, 23, 24, 25, 26; and, excessive sweating during sleep is assessed with items 9 and 16. The answer options vary from never (1 point) to always (5 points). The score range of the scale is 26-130. High scores are interpreted in favor of sleep disturbance (Bruni et al., 1996).

### **Assessment of quality of life**

Quality of life for children was examined using the Pediatric Quality of Life Inventory (PQOLI), which was originally developed by Varni et al. (1999). The Turkish validity and reliability study of the questionnaire for the 8-12 age group was performed by Memik et al. (2008), and the validity reliability for the 13-18 age group was performed again by Memik et al. (2007). This scale was prepared for four different age groups, namely, 2-4, 5-7, 8-12, and 13-18. The scale prepared for the 8-12 age group has a parent and child form. The parent form is filled by the caregiver and the child form is completed separately and simultaneously by the child. The scale developed for the 13-18 age group has a parent and adolescent form. The parent form is filled by the caregiver, and the adolescent form is completed separately and simultaneously by the adolescent included in the study. Scoring of the 23-item scale is done in 3 domains. The total score of the scale, the total score of physical health, and the total score of psychosocial health, which consists of calculating the item scores evaluating emotional, social, and school functionality, are calculated separately. Items are scored between 0 and 100. The answer to the question is 0=100 if it is marked as never, 1=75 if it is marked as rarely, 2=50 if it is marked as sometimes, 3=25 if it is marked as often, and 4=0 if it is marked as almost always. The total score is obtained by summing the scores and dividing by the number of items filled. If more than 50% of the scale is not filled in, it is discarded. The higher the PQOLI total score, the better the health-related quality of life is (Varni, et al., 2001).

### **Creation of age groups**

Of the children aged 6-16 who participated in the study; Those aged 6-10 were grouped as 'young children' and those aged 11-16 were grouped as 'older children'.

### **Statistical analysis**

Data evaluation was performed by using SPSS 22.0 package program (IBM, Armonk, NY, USA). The Shapiro-Wilk test was used to test whether the data were normally distributed. Since the data do not show a normal distribution Spearman rank correlation coefficient was used in the correlation analysis and Mann-Whitney U test was used for the comparison between groups. The significance level (p) for comparison tests was set as 0.05.

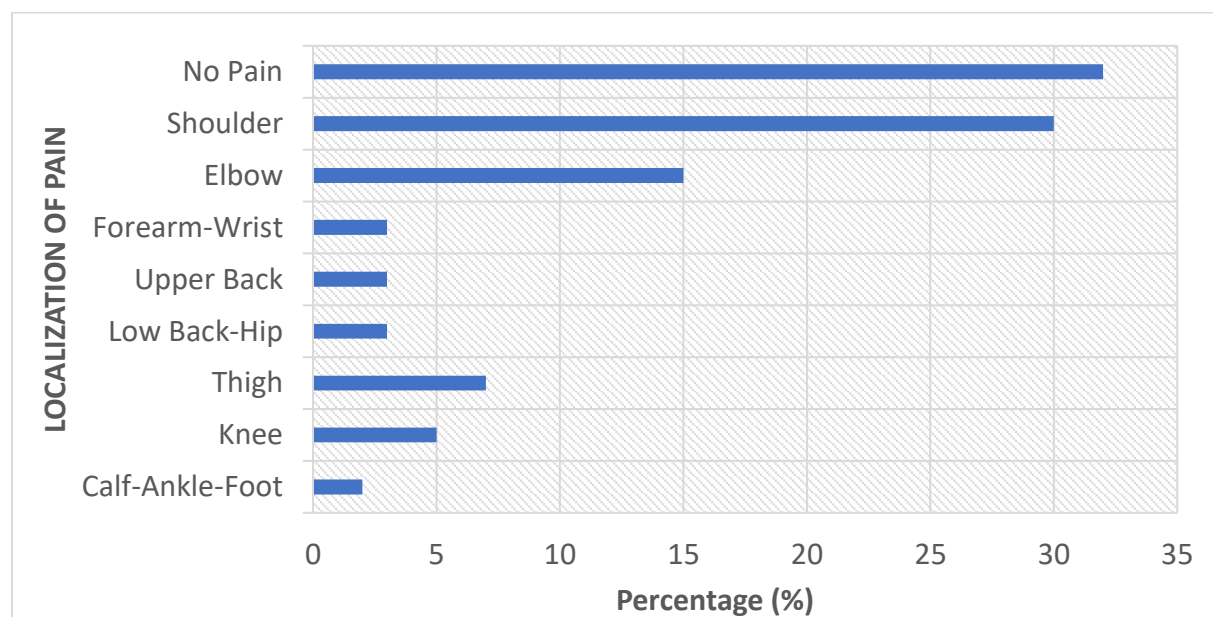
## FINDINGS

**Table 1. Descriptive and sport-specific characteristics of children participating in sports**

| Demographic Variables                | x ± sd / (min –max)      |    |
|--------------------------------------|--------------------------|----|
| Age (years)                          | 10.05 ± 2.54/ (6-15)     |    |
| Weight (kg)                          | 37.57± 12.10 (21- 65)    |    |
| Height (cm)                          | 1.40±0.23 (1.20-1.71)    |    |
| BMI (kg/m <sup>2</sup> )             | 18.50±3.06 (12.43-25.43) |    |
| Gender                               | Female (n=31, % 51.66)   |    |
|                                      | Male (n=29, % 48.34)     |    |
| Sport Specific Characteristics       | N                        | %  |
| Duration of Participation in Sports  |                          |    |
| 0-1 month                            | 45                       | 75 |
| 2-3 months                           | 15                       | 25 |
| Frequency of Participation in Sports |                          |    |
| 2-3 day/weeks                        | 48                       | 80 |
| 4-5 day/weeks                        | 12                       | 20 |
| Pain of Musculoskeletal System       |                          |    |
| Pain                                 | 41                       | 68 |
| No pain                              | 19                       | 32 |
| Duration of Pain                     |                          |    |
| <1 month                             | 30                       | 50 |
| 1-2 months                           | 9                        | 15 |
| 2-3 months                           | 2                        | 3  |

x: Main, sd: Standard Deviation, BMI: Body Mass Index, n: Number of participants, %: Percentage

Sixty athletes aged 6-16 and who have been swimming for the previous 3 months were included in the research. Of the children, 75% participated in sports within the previous 1 month and 80% were swimming 2-3 days a week. While 32% of the participants stated that they did not have any musculoskeletal pain, the rate of children who complained about musculoskeletal pain within 1 month of starting sports was 50% (Table 1).



**Figure 1. Pain localization of children who participated in sports**

It was reported that shoulder pain is the most common and pain in the calf-ankle-foot region is the least common in children who have just started swimming (Figure 1). All children participating in the study who had musculoskeletal pain marked only one painful area.

**Tablo 2. Correlation results of data**

| Variables                           |   | BMI    | Duration of Participation in Sports | Duration of Pain | VAS    | SDSC   | PQOLI  |
|-------------------------------------|---|--------|-------------------------------------|------------------|--------|--------|--------|
| Age                                 | r | 0,285  | 0,218                               | 0,132            | -0,002 | -0,113 | -0,231 |
|                                     | p | 0,028* | 0,094                               | 0,316            | 0,986  | 0,390  | 0,076  |
| BMI                                 | r |        | 0,086                               | -0,177           | -0,183 | -0,071 | -0,109 |
|                                     | p |        | 0,516                               | 0,176            | 0,162  | 0,588  | 0,405  |
| Duration of Participation in Sports | r |        |                                     | 0,255            | 0,167  | -0,209 | 0,032  |
|                                     | p |        |                                     | 0,049*           | 0,203  | 0,109  | 0,806  |
| Duration of Pain                    | r |        |                                     |                  | 0,726  | -0,111 | 0,329  |
|                                     | p |        |                                     |                  | 0,001* | 0,397  | 0,010* |
| VAS                                 | r |        |                                     |                  |        | 0,357  | 0,291  |
|                                     | p |        |                                     |                  |        | 0,005* | 0,024* |
| SDSC                                | r |        |                                     |                  |        |        | 0,182  |
|                                     | p |        |                                     |                  |        |        | 0,164  |

BMI: Body Mass Index, VAS: Visual Analog Scale, SDSC: Sleep Disturbance Scale for Children, PQOLI: Pediatric Quality of Life Inventory, r: Spearman rank correlation coefficient, \*p<0.05; There is a statistically significant relationship between the variables.

According to the analyses performed, a statistically significant low-level positive correlation was found between age and BMI (p<0.05). There was a statistically significant low level positive correlation between the duration of performing sports (months) and the duration of pain (p<0.05). A statistically significant positive correlation was found between the duration of pain and the VAS score (p<0.05). A statistically significant positive correlation was found between the duration of pain and the quality-of-life score (p<0.05). A statistically significant positive correlation was found between the VAS score and the SDSC score (p<0.05). A statistically significant low-level positive correlation was found between VAS score and PQOLI score (p<0.05) (Table 2).

**Table 3. Comparison of data according to age group of children who are new to sports**

| Features<br>(N=60) | Younger Children<br>(N=33) | Older Children<br>(N=27)     | Mann<br>Whitney<br>U test | p value |
|--------------------|----------------------------|------------------------------|---------------------------|---------|
|                    | x±sd<br>Median (Min-Max)   | Mean±sd<br>Median (Min- Max) |                           |         |
| Age                | 8.18±0,24<br>8 (6-10)      | 12.33±0.29<br>12 (8-15)      | 19.0                      | 0.000*  |
| VAS                | 2.87±0.44<br>3 (0- 7)      | 2.88±0.49<br>2 (0- 9)        | 445.0                     | 0.994   |
| SDSC               | 34.42±0.79<br>34 (22-40)   | 40.44±1.83<br>39 (27-65)     | 279.0                     | 0.013*  |
| PQOLI              | 11.33±1.11<br>11 (0-22)    | 8.26±1.16<br>8 (0-24)        | 329.0                     | 0.083   |

VAS: Visual Analog Scale, SDSC: Sleep Disturbance Scale for Children, PQOLI: Pediatric Quality of Life Inventory, \*Mann Whitney U test, p<0.05; Statistically significant difference

There was a statistically significant difference between the age and SDSC scores of younger and older children (p<0.05, Table 3). There was no statistically significant difference between VAS and PQOLI scores of younger and older children who are new to sports (p>0.05, Table 3).

## DISCUSSION AND CONCLUSION

In the study, the presence of musculoskeletal pain in children who were new to swimming and the relationship of this pain with sleep and quality of life were examined. Two-thirds of the children participating in the study stated that they experienced musculoskeletal pain in certain parts of their bodies. Pain was observed in the first 1 month in 50% of the children. Pain localization was highest in the shoulder region with a rate of 30%. The frequency of pain in the calf-ankle-foot regions and back, waist, and forearm pain was less frequent. Starting sports at an early age seems to be a risk factor for sleep disorders compared to starting at a later age. Although shoulder pain associated with swimming has been well documented, the population examined in studies mostly consists of adult athletes (Cuillo, 1986; Weldon & Richardson, 2001; Bhardwaj et al., 2023). Resources related to musculoskeletal pain such as shoulder, waist, and lower extremities in children or adolescent athletes, especially in children who are new to sports, are quite limited. De Oliveira et al. (2017) investigated the prevalence of shoulder pain and influencing factors in 310 adolescent handball and judo athletes aged 10-19 years. They stated that shoulder pain has a high prevalence in these sports and affects the upper extremity range of motion and function. Similarly, we also concluded that the incidence of shoulder pain is the most common pain type in children who were new to swimming. Low back and back pain have also been the subject of research in children participating in sports. Mogensen et al. (2007) conducted a



prevalence study of musculoskeletal pain in 439 adolescents aged 12-13 who participated in sports in different branches such as gymnastics, ball sports, swimming, riding, running, cycling, skating, and combat sports. They stated that the incidence of back and low back pain in martial arts and neck pain in riding and football is more common than in children who do not participate in sports. They concluded that there was no significant difference in the prevalence of low back and back pain in children participating in sports from other branches, including swimming, when compared with children who did not participate in sports. Similarly, Muntaner-Mas et al. (2018) reported that participation in sports did not make a significant difference on low back pain as a result of their study in 2032 children aged 10-12 years who played football and basketball. In these studies, it was seen that their participation durations were different than the periods we found in our study. In addition, there were differences in terms of the sports branches of the participants. In our study, children who have just started swimming (time to participate in sports <3 months) were examined in terms of musculoskeletal pain. However, similar to these studies, we concluded that only 6% of the participating children reported pain in regions including the back, waist, and hips.

Musculoskeletal pain in children can occur for various reasons and the presence of pain can also affect the child's quality of life and sleep quality. Recent studies have shown that participation in sports has positive effects on sleep and quality of life in children (Moeijes et al., 2019; Potter et al., 2020; Rosa et al., 2021). Moeijes et al. (2019) emphasized the importance of participating in any sport in terms of quality of life in children, regardless of the frequency of participation in sports. Rosa et al. (2021) also stated that the sleep quality of children and adolescent athletes participating in sports branches such as judo and ball sports was positively affected. Potter et al. (2020) also stated that 162 of 272 participants aged between 14 and 16 who participated in sports had good sleep quality. In the literature, no study was found on the presence of musculoskeletal pain and its effect on sleep and quality of life according to age group, especially in children who were new to sports. It was observed that the studies have mostly focused on the prevention of sports injuries in children (Davis et al., 2017; Räisänen et al., 2018; Emery & Pasanen, 2019). Today, children are increasingly participating in sports. In case of unprepared and uncontrolled participation in sports, the risk of injury may increase and musculoskeletal disorders are highly likely to occur. Participation in sports is a great way for the child's growth and development, socialization, and protection from bad habits; however, it can lead to musculoskeletal pain and injuries, as it also creates an unusual physical stress. As a matter of fact, according to our study results, musculoskeletal

pain, which is seen in 68% of children who have just started swimming, affects the quality of life and sleep quality negatively.

Study results have shown that 68% of children who have just started swimming experience musculoskeletal pain. Pain was reported most frequently (30%) in the shoulder region, less frequently in the elbow, thigh, knee, back and lumbar regions. The quality of life and sleep quality were also negatively affected in children who have just started swimming and who had musculoskeletal pain. The quality of life and sleep quality deteriorate as the severity of pain increases in children who are new to sports. The sleep disorder score was higher in children who participated in sports at an earlier age than in children who participated in sports at a later age. Although swimming is recommended as an ideal sport for the initial participating to sport for children, the incidence of musculoskeletal pain, especially shoulder pain seems to be high. Sleep disturbance increases and quality of life decreases in children with musculoskeletal pain. Participation in sports at an early age seems to be a risk factor for sleep disorders, although not for the severity of musculoskeletal pain.

### **Recommendations**

The results of the study show that musculoskeletal pain may occur in a significant proportion of children, who are new to sports, especially younger ones and this has the potential to affect sleep quality and quality of life. Although participating to sports activities is highly recommended in terms of many beneficial gains in children, it should also be taken into account that some undesirable effects such as musculoskeletal system pain may occur, especially during the adaptation process.

The incidence of musculoskeletal pain can be reduced in children who are new to sports with good warm-up strategies, appropriate loading, moderate progression, and individually created programs. Individualized programs should be created by considering multiple factors such as the child's age, gender, level of physical fitness, interests, and social status. Since musculoskeletal pain has the potential to affect sleep and quality of life more in younger children who have just started sports, training strategies should be determined in a more moderate way in young children.

## **GENİŞLETİLMİŞ ÖZET**

### **GİRİŞ**

Çocuklukta spora katılmanın faydaları, gelişmiş fiziksel uygunluk ve beceriler, düzenli sağlıklı fiziksel aktivite, özgüven gelişimi, hedef belirleme deneyimi, öz disiplin, muhakeme yeteneğinin

gelişimi, stresin azalması ve güçlü ikili ilişkiler geliştirme yeteneği olarak sıralanabilir (Baltacı & Tedavi, 2008). Bunun yanında çocuklarda spora katılımın artmasının yaralanmaları da arttırdığı belirtilmektedir (Jones ve ark., 2001). Spora katılım ve günlük aktivitelerden farklı spor performansları sergileme ile birlikte sıra dışı bir egzersiz temposu özellikle kas-iskelet sistemini etkileyebilir. Ortaya çıkabilecek kas iskelet sistemi ağrıları çocuklarda uyku ve yaşam kalitesini olumsuz etkileme potansiyeline sahiptir. Spora başlama yaşı da kas-iskelet ağrısı yaşama ve bunun uyku bozukluğu ve yaşam kalitesine etkisi açısından etkili bir faktör olabilir. Bu noktada erken ya da ileri yaşlarda spora katılımın kas-iskelet ağrısı yaşanması ve bunun yaşam kalitesi ve uyku bozukluğuna etkisi merak uyandırmaktadır. Bu nedenle çalışmada spora yeni başlayan çocuklarda kas-iskelet ağrısı varlığının ve ağrının uyku durumu ve yaşam kalitesine etkisinin incelenmesi amaçlandı. Bu araştırmanın bir diğer sorusu da spora daha erken başlayan küçük çocuklarda, büyük çocuklara göre ağrı, uyku bozukluğu ve yaşam kalitesinin nasıl etkileneceğidir.

## YÖNTEM

Çalışma, son 3 aydır düzenli olarak yüzme sporuna katılan 6-16 yaş arası çocuklar üzerinde yürütüldü. Çalışmaya 62 çocuk katıldı, 2 katılımcı dahil edilme kriterini karşılamadığı için çalışma dışına tutuldu. Çalışma 60 katılımcı ile tamamlandı. Sosyodemografik özellikler, araştırma sürecinin başında fiziksel formatta hazırlanan bir olgu rapor formu ile sorgulandı. Ağrı değerlendirmesi görsel vücut diyagramında ağrılı bölge işaretlenerek elde edildi ve ağrı düzeyi VAS kullanılarak sorgulandı (Staud ve ark., 2006). Çocuklar ve ergenlerde uyku kalitesini ve bozukluğunu değerlendirmek için Çocuklar İçin Uyku Bozukluğu Ölçeği (ÇUBÖ) kullanıldı (Bruni ve ark., 1996). Ölçeğin Türkçe geçerlilik ve güvenilirlik çalışması ilk olarak Ağadayı ve arkadaşları (2020) tarafından yapılmıştır. Çocuklar için yaşam kalitesi, ilk olarak Varni ve arkadaşları tarafından geliştirilen Pediatrik Yaşam Kalitesi Envanteri (PYKE) kullanılarak incelenmiştir. (Varni ve ark., 1999). Anketin 8-12 yaş grubu için Türkçe geçerlilik ve güvenilirlik çalışması Memik ve ark. (2008) ve yine 13-18 yaş grubu için geçerlik güvenilirliği Memik ve arkadaşları (2007) tarafından tekrar yapılmıştır. Araştırmaya katılan 6-16 yaş arası çocuklardan; 6-10 yaş arası olanlar 'küçük çocuklar', 11-16 yaş arası olanlar 'büyük çocuklar' olarak gruplandı.

## BULGULAR

Araştırmaya son 3 aydır yüzme sporuna katılan 6-16 yaş arası 60 sporcu dahil edildi. Spora yeni başlayan çocukların önemli bir çoğunluğunda (%68) kas iskelet sistemi ağrısı olduğu belirlendi. Yüzmeye yeni başlayan çocuklarda en sık omuz ağrısı olduğu rapor edilirken (%30), daha az sıklıkla baldır-ayak bileği-ayak bölgesinde ağrının olduğu bildirilmiştir (Şekil 1). Yapılan analizlere göre ağrı süresi ile yaşam kalitesi skoru arasında istatistiksel olarak anlamlı pozitif korelasyon bulundu ( $p<0,05$ ). VAS skoru ile ÇUBÖ skoru arasında istatistiksel olarak anlamlı pozitif korelasyon bulundu ( $p<0,05$ ). VAS skoru ile PYKE skoru arasında istatistiksel olarak anlamlı düşük düzeyde pozitif

korelasyon bulundu ( $p<0,05$ ) (Tablo 2). Ağrı şiddeti arttıkça yaşam kalitesi ve uyku bozukluğu skorlarının negative etkilendiği görüldü. Küçük ve büyük çocukların yaşları ile ÇUBÖ puanları arasında istatistiksel olarak anlamlı fark bulundu ( $p<0,05$ , Tablo 3). Küçük yaş grubundaki çocuklarda uyku bozukluğu skorları büyük yaş grubundaki çocuklara oranla anlamlı yüksek bulundu. Spora yeni başlayan küçük ve büyük çocukların VAS ve PYKE puanları arasında istatistiksel olarak anlamlı fark yoktu ( $p>0,05$ , Tablo 3). Ağrı şiddetleri küçük ve büyük yaş grubundaki çocuklarda benzer seviyelerde olsa da uyku bozukluğuna etkileri küçük çocuklar açısından daha yüksek bulundu.

## TARTIŞMA VE SONUÇ

Çalışmada yüzme sporuna yeni başlayan çocuklarda kas-iskelet sistemi ağrısı varlığı ve bu ağrının uyku ve yaşam kalitesi ile ilişkisi incelendi. Ağrı lokalizasyonu %30 ile omuz bölgesinde en fazlaydı. Spora erken yaşta başlamak, geç yaşta başlamaya kıyasla uyku bozuklukları için risk faktörü gibi görünmektedir. Literatürde yüzme ile ilişkili omuz ağrısı iyi bir şekilde dökümanite edilmiş olsa da, araştırmalarda incelenen popülasyonun çoğunlukla yetişkin sporculardan oluştuğu görülmüştür (Cuillo, 1986; Weldon & Richardson, 2001; Bhardwaj ve ark., 2023). Çocuk veya adölesan sporcularda özellikle spora yeni başlayan çocuklarda omuz, bel, alt ekstremitte gibi kas-iskelet sistemi ağrıları ile ilgili kaynaklar oldukça sınırlıdır. Son zamanlarda yapılan araştırmalar, spora katılımın kas-iskelet sistemi ağrısı olup olmadığına bakılmaksızın çocuklarda uyku ve yaşam kalitesi üzerinde olumlu etkileri olduğunu göstermiştir (Moeijes ve ark., 2019; Potter ve ark., 2020; Rosa ve ark., 2021). Araştırmamıza ait sonuçlar, yüzme sporuna yeni başlayan çocukların %68'inde kas-iskelet ağrısı yaşadığını göstermiştir. Yüzmeye yeni başlayan ve kas-iskelet ağrısı şikayeti olan çocuklarda yaşam kalitesi ve uyku kalitesinin de etkilendiği sonucuna varılmıştır. Spora yeni başlayan çocuklarda ağrı şiddeti arttıkça yaşam kalitesi ve uyku kalitesi bozulmaktadır. Spora erken yaşta katılan çocuklarda uyku bozukluğu skoru, spora geç yaşta katılan çocuklara göre daha sık olarak belirlenmiştir. Sonuç olarak, yüzme branşı bazında spora yeni başlıyor olma çocuklarda kas iskelet sisteminde önemli oranda ağrıya yol açabilmektedir. Özellikle omuz ağrısı sıklıkla görülebilmektedir. Kas iskelet sisteminde ağrı varlığı spora yeni başlayan çocuklarda uyku ve yaşam kalitesini olumsuz etkilemektedir. Ağrı şiddeti arttıkça yaşam kalitesi ve uyku kalitesi daha da bozulmaktadır. Küçük yaşta spora başlıyor olma kas iskelet sistemi ağrısı varlığında uyku bozukluğu açısından büyük yaşta spora başlamaya kıyasla risk faktörü olarak görünmektedir. Bu bilgiler ışığında spora yeni başlayan çocukların kas iskelet sistemi ağrılarından korunmaları için uygun stratejiler geliştirilmeli, uygun antrenman, yeterli ısınma-soğuma, uygun ekipman kullanımı gibi yaralanmadan koruyan faktörlere dikkat çekilmelidir.

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|---|---|--|
| Fikir ve Kavramsal Örgü<br><i>Idea or Notion</i>                | Araştırma hipotezini veya fikrini oluşturmak<br><i>Form the research hypothesis or idea</i>         | Fatma KIZILAY                                    |
| Tasarım<br><i>Design</i>  | Yöntem ve araştırma desenini tasarlamak<br><i>To design the method and research design.</i>         | Fatma KIZILAY<br>Burak BUĞDAY                    |
| Literatür Tarama<br><i>Literature Review</i>                    | Çalışma için gerekli literatürü taramak<br><i>Review the literature required for the study</i>      | Fatma KIZILAY<br>Burak BUĞDAY                    |
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| Tartışma ve Yorum<br><i>Discussion and Commentary</i>           | Elde edilen bulguların değerlendirilmesi<br><i>Evaluation of the obtained finding</i>               | Fatma KIZILAY<br>Burak BUĞDAY                    |

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