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RESEARCH / ARAŞTIRMA

Leisure Time Physical Activity Level and Musculoskeletal Pain Perception of Primary School Teachers

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ABSTRACT

Objective: Work-related musculoskeletal problems, particularly myofascial pain, are common among teachers, with prevalence rates ranging from 39% to 95%. This study aims to examine the relationship between leisure time physical activity and musculoskeletal pain in primary school teachers, taking into account the confounding effects of workload during working hours and sedentary behavior.

Material and Methods: The study included 38 primary school teachers with a mean age of 43.58±9.12 years. Sociodemographic data (age, gender, weight, height, experience, standing hours, daily TV and phone use) were recorded; sedentary behavior was calculated by summing TV and phone use, workload by multiplying working days and daily hours. Pain was assessed with the modified Numeric Rating Scale, and physical activity with the Godin Leisure-Time Exercise Questionnaire.

Results: Pain intensity showed a weak correlation with total leisure-time physical activity (rho:-0.337, p:0.039) and vigorous activity (rho:-0.341, p:0.036); after adjusting for workload and sedentary behavior, these correlations slightly strengthened (total activity rho:-0.377, p:0.024; vigorous activity rho:-0.360, p:0.031). Similarly, pain-related distress also showed a weak correlation with total (rho:-0.352, p:0.035) and vigorous physical activity (rho:-0.360, p:0.031) after adjustment.

Conclusion: The study demonstrated a relationship between physical activity levels and pain perception in primary school teachers. Physical activity is thought to have a potential protective role against pain. The current study supports the need for interventions aimed at reducing pain in sedentary professions, including primary school teachers.

Keywords: Myofascial pain, physical activity, sedentary behavior, work-load.

Sınıf Öğretmenlerinin Serbest Zaman Fiziksel Aktivite Düzeyi ve Kas İskelet Ağrısı Algısı

ÖZET

Amaç: İşle ilgili muskuloskeletal sistem problemleri, özellikle miyofasyal ağrı, öğretmenler arasında yaygın olup, prevalans oranları %39 ile %95 arasında değişmektedir. Bu çalışma, ilkokul öğretmenlerinde serbest zaman fiziksel aktivite ile kas-iskelet sistemi ağrısı arasındaki ilişkiyi, çalışma saatlerindeki iş yükü ve sedanter davranışın karıştırıcı etkilerini dikkate alarak incelemeyi amaçlamaktadır.

Gereç ve Yöntem: Çalışmaya, yaş ortalaması 43,58±9,12 yıl olan 38 ilkokul öğretmeni dahil edildi. Katılımcıların yaş, cinsiyet, kilo, boy, mesleki deneyim yılı, ayakta çalışma süresi, günlük televizyon izleme ve telefon kullanma süreleri gibi sosyodemografik verileri kaydedildi. Sedanter davranış, televizyon izleme ve telefon kullanma sürelerinin toplamı ile, iş yükü ise çalışma günleri ile günlük çalışma saatlerinin çarpımıyla hesaplandı. Ağrı düzeyi modifiye Sayısal Değerlendirme Skalası ile, fiziksel aktivite düzeyi ise Godin Boş Zaman Egzersiz Anketi ile değerlendirildi.

Bulgular: Ağrı şiddeti ile toplam boş zaman fiziksel aktivite skoru (rho:-0,337, p:0,039) ve şiddetli fiziksel aktivite skoru (rho:-0,341, p:0,036) arasında zayıf düzeyde korelasyon gösterildi; iş yükü ve sedanter davranış için düzeltme yapıldığında bu korelasyonlar biraz daha güçlendi (toplam aktivite rho:-0,377, p:0,024; şiddetli aktivite rho:-0,360, p:0,031). Benzer şekilde, ağrıya bağlı sıkıntı düzeyi ile toplam (rho:-0,352, p:0,035) ve şiddetli fiziksel aktivite (rho:-0,360, p:0,031) arasında da düzeltme sonrası zayıf düzeyde korelasyon gözlendi.

Sonuç: Çalışmada sınıf öğretmenlerinde fiziksel aktivite düzeyleri ile ağrı algısı arasında ilişki olduğu gösterilmiştir. Fiziksel aktivitenin ağrı için potansiyel koruyucu bir rolü olabileceği düşünülmektedir. Mevcut çalışma sınıf öğretmenlerinin de içinde bulunduğu sedanter mesleklerde ağrı azaltmaya yönelik müdahalelere duyulan ihtiyacı desteklemektedir.

Anahtar Kelimeler: Miyofasyal ağrı, fiziksel aktivite, sedanter davranış, iş yükü.

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1. Introduction

Work-related health burdens caused by musculoskeletal problems are among the most significant health issues in the working population (1,2). In teachers, the prevalence of these problems can range from 39% to 95%, with myofascial pain being one of the most commonly reported musculoskeletal issues (1,3). Teaching is not only a mentally demanding profession but also involves a considerable physical workload. A study has reported that the average weekly working hours for teachers worldwide is approximately 38.80 hours, while this duration is around 30.70 hours in Turkey (4,5). In addition to these working hours, teachers are also required to dedicate extra time for lesson preparation. Prolonged working conditions can lead to extended periods of standing, maintaining static postures for long durations, and increased mental workload. These factors contribute to the development of musculoskeletal pain in teachers, negatively impacting their occupational performance and quality of life while also placing an additional burden on the healthcare system (1,3,4).

Teachers are particularly vulnerable to developing myofascial pain syndrome (MPS) due to the physical and psychological demands of their profession. Prolonged static postures, repetitive movements such as writing on boards, grading papers, and using digital devices, combined with high levels of occupational stress, contribute to muscular overload resulting in myofascial pain (6). Studies indicate that neck and shoulder pain are highly prevalent among educators, with many reporting symptoms consistent with MPS, including localized tenderness, referred pain, and muscle stiffness (7). The chronicity of these symptoms can negatively impact work performance and quality of life, leading to increased absenteeism and reduced teaching effectiveness (8). Furthermore, inadequate ergonomic conditions in classrooms and excessive screen time exacerbate musculoskeletal strain, increasing the risk of MPS (9). Addressing these issues through ergonomic interventions, postural education, and stress management is crucial for preventing myofascial pain in teachers.

Despite the prolonged standing periods in teachers' professional lives, it has been noted that a sedentary lifestyle is prevalent among them during leisure time (10). Previous studies conducted in the adult population have identified sedentary behavior as a risk factor for myofascial pain, whereas physical activity has been emphasized as a protective factor (11,12). When examining studies investigating the relationship between physical activity and myofascial pain in the teacher population, one study reported a positive association between high occupational physical activity and pain, while physical activity outside of work was negatively associated with pain (3). On the other hand, multiple studies have suggested that, in teachers, physical activity may be protective against pain, whereas sedentary behavior could be a risk factor (1–3).

Previous studies have not sufficiently accounted for confounding factors such as workload and sedentary behavior, particularly in primary school teachers who have longer working hours than subject teachers in Turkey (3,13–15). Given that pain can be influenced by various factors—including cultural aspects, long working hours, sedentary lifestyle, and physical workload—further research is needed to clarify the relationship between physical activity and musculoskeletal pain in this population (3,13–16). Therefore, this study aims to examine the relationship between physical activity and musculoskeletal pain in primary school teachers, taking into account the confounding effects of workload during working hours and sedentary behavior.

2. Materials and Methods

2.1.Study Design and Participants

In this cross-sectional study, the sample size was calculated using the G*Power software. Based on previous studies that reported an odds ratio and identified a significant association, a moderate effect size was assumed (16,17). The calculation was performed with a power of 80%, a significance level of α = 0.05, an alternative hypothesis correlation of pH1 = 0.40, and a null hypothesis correlation of pH0 = 0.00. The analysis indicated that a minimum of 37 participants would be required to detect the assumed effect size. The post-hoc power analysis conducted after the completion of the study revealed that the study had a statistical power of 81%. The study was conducted between 26 December 2024 and 10 March 2025. Data collection was carried out through an online survey disseminated via social media platforms including WhatsApp, Facebook, and Instagram, with the survey link shared through social media groups and individual communication channels. Participants were required to be employed as primary school teachers in Turkey, to participate voluntarily, to be actively working, and to have at least six months of professional experience. In contrast, individuals who were not actively working or who were retired were excluded from the study.

2.2. Outcome Measurements

Within the study, sociodemographic characteristics such as age, gender, weight, height, years of experience, hours spent standing during work, hours of television watched per day, and hours of phone usage per day were recorded. To determine the intensity of sedentary behavior, the duration of television watching and phone usage was summed, while workload was assessed by multiplying the number of working days by the daily working hours. Subsequently, participants' pain perception was evaluated using the modified version of Numeric Rating Scale (18). In addition, the participants' levels of physical activity were assessed using the Godin Leisure-Time Exercise Questionnaire (19,20).

2.2.1.Pain Perception

Participants' pain perception was assessed using a form developed by the researchers following a literature review (16,18). The assessment evaluated the intensity of pain experienced in the past seven days, the degree of discomfort caused by the pain, and its impact on occupational performance using the widely used, valid, and reliable Numerical Rating Scale (16,18). Participants were asked to rate their pain on a scale from 0 (no pain) to 10 (severe pain), with half-point increments permitted (18,21).

2.2.2. Physical Activity

Participants' physical activity levels were assessed using the Godin Leisure-Time Physical Activity Questionnaire (GLTPAQ), developed by Godin and Shephard, with the Turkish version adapted by Sari and Erdogan (19,20). This questionnaire was designed to classify the types of physical activities/exercises performed by adults and to determine their activity levels. In the GLTPAQ, activity types are categorized into three subgroups: 'vigorous,' 'moderate,' and 'light.' The questionnaire is practical and easy to complete. The frequency and type of activities performed weekly were used as criteria to calculate the physical activity/exercise score: total score = vigorous (9 METs × number of days per week) + moderate (5 METs × number of days per week) + light (3 METs × number of days per week). In the total score calculation, participants are classified as active (>24), moderately active (14–23), or inactive (<14) based on their total score (19).

2.3. Statistical Analysis

IBM SPSS Statistics (Version 25.0, Armonk, NY: IBM Corp.) software was used for data analysis. The normality of the data distribution was assessed using the Shapiro-Wilk test. Due to nonparametric conditions, the Spearman correlation coefficient was used to determine the direction and strength of the relationship between leisure-time physical activity level and musculoskeletal pain perception. Initially, a bivariate correlation analysis was conducted to examine the unadjusted relationship between leisure-time physical activity level and musculoskeletal pain perception. Subsequently, to account for potential confounding factors, additional analyses were performed by adjusting separately for workload, sedentary behavior, and the combination of both. Correlation levels were interpreted as follows: 0.00–0.10 as negligible, 0.10–0.39 as weak, 0.40–0.69 as moderate, 0.70–0.89 as strong, and 0.90–1.00 as very strong (22). The threshold for statistical significance was set at p≤0.05.

2.4. Ethical Aspect of the Research

Ethical approval for the study was obtained from the Izmir Katip Celebi University Social Research Ethics Committee (Decision No: 2024/22-08, Date: 25.12.2024). The study was conducted in accordance with the Declaration of Helsinki. Participation was voluntary, and only individuals who read the study information and provided consent were granted access to the survey questions.

3. Results

The study included 38 primary school teachers with a mean age of 43.58±9.12 years. The participants had an average of 20.24 ±10.22 years of experience. While the mean pain intensity was 2.82±2.43, their physical activity levels were recorded as 26.34±17.56. Sociodemographic characteristics, pain perception, and physical activity levels of the participants are presented in Table 1.

Analysis of the relationship between pain perception and physical activity levels revealed a significant but weak correlation between pain intensity and both the total leisure-time physical activity score (rho:-0.337, p:0.039) and the vigorous physical activity score (rho:-0.341, p:0.036).

After adjusting for workload and sedentary behavior, a significant but weak correlation was observed between pain intensity and both the total leisure-time physical activity score (rho:-0.377, p:0.024) and the vigorous physical activity score (rho:-0.360, p:0.031). Additionally, a significant but weak correlation was found between pain-related distress and both the total leisure-time physical activity score (rho:-0.352, p:0.035) and the vigorous physical activity score (rho:-0.360 and p:0.031). Detailed information on the relationship between pain perception and leisure-time physical activity levels is presented in Table 2.

Table 1. Sociodemographic characteristics, pain perception and physical activity level of the participants

		Mean ± SD/%(n) (n=38)	Median (IQR 25/75) (n=38)
	Age (year)	43.58 ± 9.12	43.50 (35.00/49.25)
	Gender		
	Female % (n)	55.30 (21)	-
	Male % (n)	44.70(17)	
	Weight (kg)	74.05 ± 13.23	73.00 (63.00/83.25)
	Height (cm)	166.71 ± 8.04	167.50 (160.00/170.75)
	BMI	26.67±4.82	25.77 (23.34/29.32)
	Years of Experience	20.24 ± 10.22	19.00 (10.75/25.25)
	Working Days per Week	4.95 ± 0.61	5.00 (5.00/5.00)
	Standing Hours per Day	5.46 ± 4.52	4.50 (3.00/6.00)
	TV Watching Hours per Day	1.59 ± 1.53	1.00 (0.50/2.50)
	Phone Usage Hours per Day	2.40 ± 1.22	2.00 (1.50/3.00)
PAIN	Pain Intensity	2.82 ± 2.43	2.00 (1.00/4.13)
PAIN	Pain-Related Distress	2.73 ± 2.63	1.75 (0.88/4.00)
PAIN	Impact of Pain on Occupational Performance	1.92 ± 2.23	1.00 (0.00/4.00)
GLTPAQ	Vigorous	9.95 ± 11.80	9.00 (0.00/11.25)
GLTPAQ	Moderate	8.82 ± 6.82	5.00 (5.00/15.00)
GLTPAQ	Light	7.58 ± 5.66	6.00 (3.00/12.00)
GLTPAQ	Total	26.34 ± 17.56	22.50 (13.50/36.75)

BMI: Body Mass Index, GLTPAQ: Godin Leisure-Time Physical Activity Questionnaire, IQR: Interquartile range, SD: Standard Deviation

Table 2. The relationship between leisure-time physical activity level and musculoskeletal pain perception

Adjustment			Pain Intensity	Pain-Related Distress	Impact of Pain on Occupational Performance
None	GLTPAQ-Vigorous	rho	-0.341*	-0.278	-0.244
		p	0.036	0.091	0.139
	GLTPAQ-Moderate	rho	-0.274	-0.269	-0.027
		p	0.095	0.102	0.872
	GLTPAQ-Light	rho	-0.011	0.066	-0.023
		p	0.949	0.695	0.890
	GLTPAQ-Total	rho	-0.337*	-0.260	-0.187
		p	0.039	0.115	0.261
According to Workload	GLTPAQ-Vigorous	rho	-0.350*	-0.349*	-0.256
		p	0.034	0.034	0.126
	GLTPAQ-Moderate	rho	-0.278	-0.282	-0.085
		p	0.096	0.091	0.617
	GLTPAQ-Light	rho	-0.086	-0.006	-0.075
		p	0.611	0.972	0.660
	GLTPAQ-Total	rho	-0.370*	-0.345*	-0.229
		p	0.024	0.036	0.173
According to Sedentary Behavior	GLTPAQ-Vigorous	rho	-0.332*	-0.337*	-0.262
		p	0.045	0.041	0.118
	GLTPAQ-Moderate	rho	-0.294	-0.295	-0.088
		p	0.077	0.077	0.606
	GLTPAQ-Light	rho	-0.113	-0.032	-0.103
		p	0.506	0.851	0.544
	GLTPAQ-Total	rho	-0.371*	0.350*	-0.241
		p	0.024	0.034	0.150
According to Workload and Sedentary Behavior	GLTPAQ-Vigorous	rho	-0.360*	-0.360*	-0.273
		p	0.031	0.031	0.107
	GLTPAQ-Moderate	rho	-0.279	-0.281	-0.076
		p	0.100	0.097	0.660
	GLTPAQ-Light	rho	-0.093	-0.013	-0.093
		p	0.588	0.940	0.591
	GLTPAQ-Total	rho	-0.377*	-0.352*	-0.240
		p	0.024	0.035	0.158

*:p<0.05, GLTPAQ: Godin Leisure-Time Physical Activity Questionnaire

4. Discussion

The present study demonstrated a negative relationship between physical activity and pain perception among primary school teachers, indicating that higher levels of physical activity are associated with lower levels of perceived pain. Furthermore, when potential confounding factors such as workload, sedentary behavior, and the combination of workload and sedentary behavior were included in the analysis, the correlation coefficients increased. Although this indicates that the relationship between physical activity and pain perception became more pronounced after adjusting for these confounding factors, the strength of the association remained weak.

Studies investigating the relationship between physical activity and pain perception in teachers have generally calculated odds ratios and reported that individuals who engage in physical activity have a lower likelihood of experiencing pain (2,16). In addition, these studies have often compared individuals with high and low levels of physical activity, demonstrating that those with higher levels of physical activity report less frequent or less severe pain (4). Santos et al., in their study conducted among Brazilian teachers, found that teachers with higher levels of physical activity reported a lower frequency of pain (16). Similarly, Yue et al., in their study investigating low back and neck pain in teachers, demonstrated that physical activity was associated with a reduced prevalence of both low back and neck pain complaints (2). On the other hand, Furuta et al. did not find a significant difference in pain prevalence between teachers with high and low levels of physical activity (4). In the present study, a significant association was found between pain intensity and physical activity level, consistent with the findings of Santos et al. and Yue et al (2,16). The difference between the current findings and those of Furuta et al. may be attributed to the measurement methods and statistical analyses used. While the present study examined the relationship between the two variables, Furuta et al. compared pain prevalence between individuals with high and low levels of physical activity (23).

Regarding the relationship between sedentary behavior and pain, Yue et al. reported that using a computer for more than four hours per day, prolonged standing, and prolonged sitting postures are risk factors for pain (2). Similarly, studies conducted in adult populations have demonstrated that sedentary behavior is a risk factor for the development of pain (11,12). Another study involving teachers also showed that sedentary behavior increases the risk of pain (17). In the present study, when controlling for confounding factors, the relationship between physical activity levels and both pain intensity and pain-related distress became more evident. However, no association was found between physical activity and impact of pain on occupational performance. The current findings are thought to be due to participants experiencing low levels of pain intensity, as well as the assessment of its impact on occupational performance being conducted through a subjective evaluation tool, a subjective evaluation tool, which may have influenced the results. Additionally, sedentary behavior and workload have been shown to be important factors influencing pain perception in teachers.

The present study has several limitations. First, its cross-sectional design does not allow for the determination of a causal relationship between the two variables. The assessment of physical activity and pain using subjective methods, such as self-reported scales, represents another limitation of this study. Additionally, the relatively small sample size and the absence of teachers from different branches may be considered limitations affecting the generalizability of our research findings.

5. Conclusion

In conclusion, the present study identified a negative association between physical activity levels and pain perception in primary school teachers. These findings indicate that physical activity may play a protective role in this population and highlight the importance of considering physical activity interventions in future studies aimed at reducing pain in professionals who spend extended periods in static postures.

6. Contribution to the Field

This study suggests that leisure time physical activity may play a critical role in the prevention of perceived pain among primary school teachers therefore it should be considered as an important factor in workplace health promotion programs. Regular physical activity during leisure time can reduce the risk of musculoskeletal disorders commonly associated with teaching. Implementing strategies to encourage and support teachers in engaging in leisure time physical activities could potentially lead to decreased pain perception.

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Conflict of Interest

There is no conflict of interest regarding any person and/ or institution.

Authorship Contribution

Concept: MKA, ACK, ZA; Design: BOÜ, MKA, ACK; Supervision: MKA, ZA; Funding: -; Materials:-; Data Collection/ Processing: MKA, ACK, ZA; Analysis/Interpretation: MKA, ZA; Literature Review: BOÜ, MKA, ACK, ZA; Manuscript Writing: BOÜ, MKA, ACK; Critical Review: BOÜ, MKA, ZA.

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