Osteomuscular health of physical educativo teacher working in gyms

Saúde osteomuscular de professores de educação física que trabalham em academias

Salud osteomuscular de los profesores de educación física que trabajan en gimnasios

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ABSTRACT
The study aimed to analyze the musculoskeletal health of Physical Education Teacher (PET) working in gyms, with the intention of contributing to the prevention of Repetitive Strain Injuries (RSI) and work-related Musculoskeletal Disorders (MSD). A total of 39 PET (76.3% men) working in gyms participated in the research. Through an online questionnaire, they responded to a personal and professional history questionnaire and filled out a musculoskeletal symptoms diagram to assess discomfort in 27 parts of the body. The results revealed the presence of discomfort in the neck, mid-back region, and upper and lower limbs, with emphasis on the arm and knee among women. Furthermore, a significant correlation (p=0.002) was observed between complaints of body pain and injuries in the last year, especially among women (60%, compared to 31% of men). Thus, the findings suggest that PETs exhibit a high prevalence of musculoskeletal symptoms, especially among women. To mitigate the risk of injuries among female physical education teachers in gyms, it is crucial to implement strategies that recognize and address the unique social pressures they face. However, additional studies with these professionals are recommended to fully clarify the triggering factors of RSI and MSD.

Keywords: physical education teacher, gyms, worker health, RSI, MSD.

RESUMO
O estudo teve como objetivo analisar a saúde musculoesquelética dos Professores de Educação Física (PEF) que trabalham em academias, com a intenção de contribuir para a prevenção de Lesões por Esforços Repetitivos (LER) e Distúrbios Osteomusculares Relacionados ao Trabalho (DORT). Um
total de 39 PEFs (76,3% homens) que trabalham em academias participaram da pesquisa. Através de um questionário online, eles responderam a um questionário de histórico pessoal e profissional e preencheram um diagrama de sintomas musculoesqueléticos para avaliar o desconforto em 27 partes do corpo. Os resultados revelaram a presença de desconforto no pescoço, na região do meio das costas e nos membros superiores e inferiores, com destaque para o braço e o joelho entre as mulheres. Além disso, foi observada uma correlação significativa (p=0,002) entre as queixas de dores no corpo e lesões no último ano, especialmente entre as mulheres (60%, em comparação com 31% dos homens). Assim, os achados sugerem que os PEFs apresentam uma alta prevalência de sintomas musculoesqueléticos, especialmente entre as mulheres. Para mitigar o risco de lesões entre as professoras de educação física em academias, é crucial implementar estratégias que reconheçam e abordem as pressões sociais únicas que elas enfrentam. No entanto, são recomendados estudos adicionais com esses profissionais para esclarecer completamente os fatores desencadeantes de LER e DORT.

**Palavras-chave:** professor de educação física, academias, saúde do trabalhador, LER, DORT.

**RESUMEN**

El estudio tuvo como objetivo analizar la salud musculoesquelética de los Profesores de Educación Física (PEF) que trabajan en gimnasios, con la intención de contribuir a la prevención de Lesiones por Esfuerzos Repetitivos (LER) y Trastornos Musculoesqueléticos Relacionados con el Trabajo (TMRT). Un total de 39 PEF (76,3% hombres) que trabajan en gimnasios participaron en la investigación. A través de un cuestionario en línea, respondieron un cuestionario de historial personal y profesional y completaron un diagrama de síntomas musculoesqueléticos para evaluar el malestar en 27 partes del cuerpo. Los resultados revelaron la presencia de malestar en el cuello, la región media de la espalda y los miembros superiores e inferiores, con énfasis en el brazo y la rodilla entre las mujeres. Además, se observó una correlación significativa (p=0,002) entre las quejas de dolor corporal y lesiones en el último año, especialmente entre las mujeres (60%, en comparación con el 31% de los hombres). Así, los hallazgos sugieren que los PEF presentan una alta prevalencia de síntomas musculoesqueléticos, especialmente entre las mujeres. Para mitigar el riesgo de lesiones entre las profesoras de educación física en gimnasios, es crucial implementar estrategias que reconozcan y aborden las presiones sociales únicas que enfrentan. Sin embargo, se recomiendan estudios adicionales con estos profesionales para aclarar completamente los factores desencadenantes de LER y TMRT.

**Palabras clave:** profesor de educación física, gimnasios, salud del trabajador, LER, TMRT.
1 INTRODUCTION

In the search for a better quality of life, in recent years, the demand for the practice of physical activity has been increasing, which, many, seek the gyms. Thus increasing the work demand of Physical Education Teacher (PET) who work in this área (Simarmata et al., 2022).

The work dynamics in a gym exposes PET to working conditions such as: orthostatic position for long periods; repetitive movements; lifting excessive weights and; teach several gym classes, exposing them to vulnerabilities due to Repetitive Strain Injuries (RSI) and Work-Related Musculoskeletal Disorders (WMSDs), mainly in the shoulder, spine, hip and knee regions (Mitchell; Mawdsley, 2021; Smith et al, 2018).

According to Jones and Johnson (2021), 88.3% of professionals report painful symptoms related to work, mainly in the lumbar spine region (55.2%), directly impacting quality of life and work performance, in addition to significantly increase the number of professionals removed from their functions. However, there are still few studies that point to the incidence of RSI and WMSDs in PET who work in gyms.

In this way, due to the increase in the demand for PET that work in gyms; work exposure that these professionals are submitted; impact on quality of life related to RSI and WMSD and; scarcity of research in the area, which hinders strategies that enable improvements to the health of these workers. The present study aimed to analyze the musculoskeletal health of PET who work in gyms, in order to contribute to the prevention of RSI and WMSDs and to enable assertive interventions in the health of these workers.
2 METHODOLOGY

2.1 STUDY TYPE, RESEARCH LOCATION AND SAMPLE

This is an exploratory cross-sectional research, carried out via Google Forms with PET that work in the city of Campina Grande, Paraíba, Brazil.

2.2 STUDY DESIGN

The present study was approved by the Ethics and Research Committee of the State University of Pernambuco (opinion: 4.675.465). For its operationalization, at first, the researchers contacted the technical managers of the gyms in the city by telephone, explaining the research project and formalizing its execution in a written project sent by email. Those who agreed to participate received the link to the Google electronic form to direct and request responses from professors linked to the gym.

According to the Federal Council of Physical Education (CONFEF, 2022) the municipality of Campina Grande has 98 gyms with active registration, of which 62 were contacted, as they had telephone numbers available in the council's public register, of which 35 agreed to carry out the survey, forwarding the electronic form to the professionals, being answered by 42 PET, of which 39 fit the inclusion criteria described below.

Professionals who received the electronic form sent by the gym's technical manager and agreed to participate in the study, should have a bachelor's degree or full degree in Physical Education, be on the Physical Education Council active with CONFEF and work in gyms.

At first, they accepted the Informed Consent Form, which explained the study and guaranteed all personal secrecy; secondly, they answered a questionnaire about their sociodemographic and personal data, such as: gender, age, time of professional performance in the area, hours worked per day, modalities taught, daily workload in each modality, history of injuries and if there
was leave of work as a result of them; thirdly, they were referred to respond to the diagram of musculoskeletal symptoms (Figure 1).

The diagram is a quantitative methodology used to assess discomfort in all parts of the body through pain intensity scales (Mozzini et al., 2008) dividing the human body into 27 parts on the right and left sides, and assigning an intensity value to each part. Discomfort/pain is evaluated on a scale with 5 intensities: 1) no discomfort or pain, 2) some discomfort or pain, 3) moderate discomfort or pain, 4) severe discomfort or pain, and 5) intolerable discomfort or pain.

**Figure 1. Diagram of musculoskeletal symptoms**

<table>
<thead>
<tr>
<th>INTENSITY</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>None discomfort or pain</td>
<td>Some discomfort or pain</td>
<td>Moderate discomfort or pain</td>
<td>Quite discomfort or pain</td>
<td>Missing discomfort or pain</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Right side</th>
<th>Left side</th>
<th>Source: Mozzini et al., 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulder - 2</td>
<td>Shoulder - 3</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Arm - 4</td>
<td>Arm - 6</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Elbow - 10</td>
<td>Elbow - 11</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Forearm - 12</td>
<td>Forearm - 13</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Wrist – 14</td>
<td>Wrist – 15</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Hand – 16</td>
<td>Neck – 0</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Thigh – 18</td>
<td>Cervical – 1</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Knee – 20</td>
<td>Upper back – 5</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
<tr>
<td>Leg – 22</td>
<td>Middle back – 7</td>
<td></td>
</tr>
<tr>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
<td></td>
</tr>
</tbody>
</table>

2.3 DATA ANALYSIS

Once data collection via the electronic form was completed, the data were exported to a spreadsheet in Microsoft Excel. Subsequently, the database was transferred to the statistical software SPSS version 20.0 (IBM, USA) for descriptive statistical analysis. The data were initially subjected to the Kolmogorov-Smirnov normality test and the Levene test for equality of variances.
The results were presented descriptively and subjected to correlation testing, with parametric data subjected to Pearson's test and non-parametric data to Spearman's test, with a significance level set at 5% ($p \leq 0.05$).

3 RESULTS

The sample consisted of 39 subjects, with an average age of 29.7 ± 7.0 years, who have worked in a gym for 4.4 ± 4.4 years. Men were the majority (76.3%), with an average age of 30.5 ± 7.3 years and an average working time in gyms of 4.5 ± 4.8 years. Women had an average age of 27.5 ± 5.7 years, with an average experience of 4.1 ± 3.5 years working in gyms.

Analyzing the responses from the diagram of musculoskeletal symptoms in the cervical, trunk and pelvic girdle regions, it is observed that the women highlighted that 40% of the women had neck pain (20% moderate and 20% some pain) and middle back (both with 10% moderate and 30% some pain) (Figure 2).

Figure 2. Result of the diagram of musculoskeletal symptoms of the cervical, trunk and pelvic girdle.
Regarding the upper limbs, we observed symptoms of musculoskeletal alterations in both sexes, the highest prevalence occurred among female individuals, with emphasis on the arm regions with 50% (10% some pain, 10% moderate and 30% a lot of pain), shoulder 30% (20% some pain and 10% a lot of pain), as well as wrist (10% some pain and 20% moderate) (Figure 3).

Figure 3. Result of the upper limb musculoskeletal symptoms diagram.

Higher Member

Regarding the level of pain in the lower limbs, women also had higher rates, especially the knee with 50% (10% some pain, 30% moderate and 10% a lot of pain), ankle 40% (20% some pain and 20 % moderate) and leg 30% (20% some pain and 10% moderate) (figure 4).
Comparing the variables, there was a significant association (p=0.002) between complaints of pain in the body and injury in the last year, with 53.3% indicating that those who reported complaints of pain, with women presenting in greater numbers (60% , against 31% of men), as well as injuries in the last year (40% of women and 21% of men) (Figure 5).
4 DISCUSSIONS

The results showed a significant association (p=0.002) between complaints of body pain and injury in the last year, and in all analyzes of symptomatology, women had higher rates. The performance of PET within a bodybuilding gym requires high physical demand to be able to withstand the work dynamics, these professionals are exposed to working conditions that require maintenance in the orthostatic position for long hours, repetitive movements, lifting weights from the floor, removing and putting weight plates on weight machines and/or teaching different gym classes (Mitchell; Mawdsley, 2021; Smith et al, 2018), such factors may be directly related to pain and injuries, as observed in the present study.

According to the Brazilian Ministry of Health (Brasil, 2024), RSI and WMSDs are among the main causes of professionals leaving their activities. According to Smith (2018), many PET, despite feeling pain and musculoskeletal injuries, continue to work without consulting a professional, running the risk of aggravating their condition and possibly even preventing them from exercising their function.

Oliveira (2020) cite that because they are young and have good conditioning, PET who work in gyms are less likely to have injuries, which are rarely seen before 5 years of experience. A fact observed in the present study, in which the professionals were on average 29.7±7.0 years old, had been working for 4.44±4.44 years and the majority (74.4%) did not complain of pain and injuries.

Symptomatic musculoskeletal disorders were observed mostly in women, highlighting arm (50%), knee (50%), cervical, middle back, ankle (40%), shoulder, wrist and leg (30%). These results may be linked to the biological differences between men and women, such as muscle strength and aerobic capacity, making women more susceptible to musculoskeletal disorders (Hagg; Jylhava, 2021).

Musculoskeletal overload is a significant concern among physical education teachers working in gyms. Evidence has indicated that women tend to be more affected, experiencing pain primarily in the neck, arms, and knees.
This gender disparity can be attributed to a range of factors, including hormonal, anatomical, physiological, and psychosocial differences. For instance, hormonal differences may influence pain sensitivity and muscle response, while anatomical differences, such as hip and shoulder structure, may predispose women to certain injuries (Smith et al., 2018).

Additionally, psychosocial factors such as pressure to conform to certain aesthetic standards can lead women to exert themselves more during physical activities, increasing the risk of injuries (Jones; Brown, 2019; Smith et al., 2018). It is also observed that women who seek to balance their professional careers with household responsibilities and motherhood are more likely to report musculoskeletal injuries compared to those who do not have these additional responsibilities (William et al., 2020). Furthermore, these women commonly experience higher levels of stress, fatigue, and lack of time for self-care, which may lead them to ignore injury warning signs or refrain from seeking proper treatment due to concerns about time and finances (Smith; Brown, 2020).

Corroborating the findings of the present study, Jones and Brown (2019), in his research with PET active in gyms, carried out with 13 subjects, observed a predominance of painful symptoms in women, in the regions: lumbar, shoulders and knees. In the study by Jones (2021), with 163 PET working in gymnastics, he observed that 88.3% of the subjects had painful symptoms, most of them in women, highlighting the knee, cervical, hip and lumbar regions, present in 55.2% of subjects.

The information collected in the questionnaire of the present study indicate that 53.3% of the subjects suffer or have already suffered some complaint of injury or pain, the majority being women (60%, against 31% of men), as well as injuries in the last year (40% of women and 21% of men). On the other hand, Smith (2018) observed a higher incidence of musculoskeletal disorders in men (78.1%) than in women (72.7% of women). The differences between the results can be explained by the sample population, with the study by Smith (2018) having a more homogeneous distribution between the sexes, a lack of homogeneity that
was a limitation of this study, with a sample composed of 10 women (23.7%) and 29 men (76.3%).

It is crucial to recognize the importance of proper preparation for this profession, both in terms of technical training and health care. Professionals should be aware of the need to dedicate time to the prevention and rehabilitation of osteomyoarticular injuries, incorporating self-care practices into their daily routine. This may include performing specific strengthening and stretching exercises, as well as seeking guidance from specialized healthcare professionals (Smith; Brown, 2020).

In summary, musculoskeletal overload is a significant concern for physical education teachers in gyms, especially for women, who tend to be more affected. Awareness of the risk factors associated with this profession and the implementation of prevention and rehabilitation strategies are essential to promote the health and well-being of these professionals.

5 CONCLUSION

From the results of this study, it is noted that the perception of musculoskeletal symptoms in PET is not a sporadic event. Despite the dimension of the problem, it can be said that the work of these professionals, through active classes, may be leading to physical exhaustion and injuries, consequently, to the onset of musculoskeletal disorders due to the great physical demands and intense periods of practice. In addition, it was possible to detect a high prevalence of musculoskeletal symptoms predominantly in women, highlighting the knee, ankle and leg regions.

To mitigate the risk of injuries among female physical education teachers in gyms, it is crucial to implement strategies that recognize and address the unique social pressures they face. This may include mental health support programs, flexible parental leave policies, and injury prevention education tailored to the specific needs of women balancing professional careers with household and maternal responsibilities.
However, further studies on the subject are needed, with follow-up and cross-sectional interventions, in order to fully elucidate the triggering factors of RSI and WMSDs in the work performance of PET in academia. In order to be able to act preventively and provide the ergonomic conditions necessary for a better health of these workers.
REFERENCES


