DOI: 10.4025/arqmudi.v29i1.75892

ARQUIVOS DO MUDI

ARTIGO ORIGINAL

Persistence of pain: analyzing musculoskeletal pain intensity in physiotherapy students before and after clinical internship

Persistência da dor: análise da intensidade da dor musculoesquelética em estudantes de fisioterapia antes e após o estágio clínico

Persistencia del dolor: análisis de la intensidad del dolor musculoesquelético en estudiantes de fisioterapia antes y después de la pasantía clínica

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Submissão: 16 fev 2025

Aceite: 16 mar 2025

ABSTRACT. Introduction: musculoskeletal pain is a common complaint among university students, especially those enrolled in physically demanding programs such as physiotherapy. **Objective:** to assess pain intensity in final-year physiotherapy students before and after their clinical internship. **Methods:** a cross-sectional study conducted with 41 participants. Data were collected through a questionnaire and analyzed using descriptive statistics. **Results:** the results showed that the mean Numerical Pain Scale pain score was 4.11 (±1,91) in Collection 1 and 4.27 (±1,99) in Collection 2, indicating moderate pain. Additionally, there was an increase in students reporting moderate pain after the internship. **Conclusion:** pain levels did not significantly decrease throughout the semester. They may have shown a slight tendency to increase, highlighting the need for further research on academic and physical factors that may contribute to this condition.
Descriptors: Pain; Student health; Universities.

RESUMO. Introdução: a dor musculoesquelética é uma queixa comum entre estudantes universitários, especialmente aqueles matriculados em cursos fisicamente exigentes, como a fisioterapia. **Objetivo:** avaliar a intensidade da dor em estudantes do último ano de fisioterapia antes e depois do estágio clínico. **Métodos:** estudo transversal realizado com 41 participantes. Os dados foram coletados por meio de um questionário e analisados por estatística descritiva. **Resultados:** os resultados mostraram que a média do escore de dor na Escala Numérica de Dor foi de 4,11 (±1,91) na Coleta 1 e 4,27 (±1,99) na Coleta 2, indicando dor moderada. Além disso, houve um aumento no número de estudantes relatando dor moderada após o estágio. **Conclusão:** os níveis de dor não diminuíram significativamente ao longo do semestre. Eles podem ter apresentado uma leve tendência de aumento, ressaltando a necessidade de mais pesquisas sobre fatores acadêmicos e físicos que possam contribuir para essa condição.
Descritores: Dor; Saúde do estudante; Universidades.

RESUMEN. Introducción: el dolor musculoesquelético es una queja común entre los estudiantes universitarios, especialmente aquellos inscritos en programas físicamente exigentes, como fisioterapia. **Objetivo:** evaluar la intensidad del dolor en estudiantes de último año de fisioterapia antes y después de su internado clínico. **Métodos:** estudio transversal realizado con 41 participantes. Los datos se recopilaron mediante un cuestionario y se analizaron con estadísticas descriptivas. **Resultados:** los resultados mostraron que la media de la puntuación del dolor en la Escala Numérica del Dolor fue de 4,11 (±1,91) en la Recolección 1 y 4,27 (±1,99) en la Recolección 2, lo que indica un dolor moderado. Además, hubo un aumento en el número de estudiantes que reportaron dolor moderado después del internado. **Conclusión:** los niveles de dolor no disminuyeron significativamente a lo largo del semestre. Pueden haber mostrado una ligera tendencia al aumento, lo que resalta la necesidad de más investigaciones sobre factores académicos y físicos que puedan contribuir a esta condición.
Descriptores: Dolor; Salud del estudiante; Universidades.

INTRODUCTION

Musculoskeletal pain (MSP) is a common condition resulting from repetitive trauma or direct injuries to the musculoskeletal system, significantly affecting individuals' daily activities[1]. Approximately 27 million adults in Brazil experience MSP, highlighting its relevance as a public health concern[2]. Physiotherapy professionals, including interns, are particularly vulnerable due to the physical demands of their academic training and clinical practice[3,4].

Physiotherapy programs require extensive training, following the guidelines set by the Ministry of Education (MEC) in Brazil, which mandates 4,000 hours of coursework. The MEC is the governmental body responsible for regulating and overseeing higher education standards in the country. Internships, constituting 20% of the total course hours, contribute to students' physical and emotional overload[5]. Despite their knowledge of injury prevention and treatment, many students fail to apply these principles to themselves, continuing their activities despite pain and discomfort due to academic obligations and clinical responsibilities[6]. The repetitive movements, prolonged postures, and ergonomic challenges inherent to physiotherapy training increase the risk of developing MSP, which can lead to chronic conditions, fatigue, and psychological distress[7,8].

The National Health Promotion Policy (PNPS) emphasizes integrating health promotion strategies into the academic environment to mitigate these risks[9]. Preventive measures such as ergonomic education, workload adjustments, and psychosocial support have been recommended to improve students' well-being and reduce professional dropout rates[10]. Given the significant impact of musculoskeletal disorders on physiotherapy students, this study aims to assess the intensity of pain experienced by final-year physiotherapy students at Unicesumar University before and after the clinical internship, using the Numerical Pain Scale (NPS).

METHODS

This is a quantitative, descriptive, and cross-sectional study conducted at Unicesumar University in Maringá, PR, in compliance with Resolution 510/2016 and with approval from the institution's ethics committee by protocol number 5.616.656.

The initial sample consisted of 44 individuals, including students of both sexes and any age group, who were in the final year of their undergraduate physiotherapy program and voluntarily agreed to participate in the study after correctly completing the Informed Consent Form (ICF). However, by the time of the second data collection, the sample was reduced to 41 participants. This decrease occurred due to specific enrollment circumstances in the second semester of the course, which led to the exclusion of specific individuals based on the study's established criteria.

Students were excluded if they had interrupted academic enrollment, enrollment issues during any data collection period, permanent musculoskeletal injuries, degenerative musculoskeletal diseases, cancer, or continuous use of analgesics or anesthetics. Data was collected through a paper questionnaire completed by the participants, which included the question: "Do you feel pain in any part of your body right now?" If the individual responded "yes" or "no," they were then required to indicate their level of pain using the NPS, also included in the questionnaire. The NPS is a simple and widely used tool to assess pain intensity. It consists of a scale from 0 to 10, where 0 represents "no pain" and 10 indicates "the worst pain imaginable." Patients are asked to rate their pain based on their perception at the moment." This tool is simple and widely used to assess the intensity of subjective symptoms, especially in clinical research[1].

Data collection occurred in two phases:

- Phase 1 (Collection 1): At the beginning of the first semester of the 2024 academic year, before the start of internships.
- Phase 2 (Collection 2): At the end of the first semester of the 2024 academic year, after completing internships.

The collected data were analyzed using descriptive statistics to summarize and interpret the findings. The analysis was performed using Microsoft Excel software, facilitating the organization, calculation, and visualization of the results.

RESULTS

Table 1 refers to the first phase of data collection, conducted at the beginning of the first semester of the 2024 academic year, before clinical internships at the physiotherapy clinic. The sample consisted of 14 male and 30 female individuals (n=44), classified according to the pain level reported on the NPS.

It was observed that, at the mild pain level (NPS between 1 and 3), six men and ten women reported experiencing pain at this intensity (n=16). At the moderate pain level (VAS between 4 and 6), eight men and 17 women reported this pain level (n=25), making it the most frequent category among both sexes. At the severe pain level (NPS between 7 and 9), no men (n=0) reported pain, whereas three women (n=3) experienced pain at this intensity at that time.

The predominance of women in the sample was reflected in the higher number of pain reports across all intensity categories (n=30), suggesting a more excellent perception or sensitivity to pain among female participants.

Table 1. Distribution of pain intensity among final-year physiotherapy students. Phase 1. Maringá, Paraná, Brazil (n=44).

NPS*	Male (n=14)	Female (n=30)
Without pain (0)	0	0
Mild pain (1 a 3)	6	10
Moderate pain (4 to 6)	8	17
Severe pain (7 a 9)	0	3
Unbearable pain (10)	0	0

*NPS: Numerical Pain Scale.

Table 2 refers to the second phase of data collection, conducted at the end of the 2024 academic semester, after completing the clinical care period at the physiotherapy clinic (end of the internship). At this stage, the sample consisted of 13 male and 28 female individuals (n=41), classified according to the pain level reported on the NPS.

At the mild pain level (NPS between 1 and 3), according to the data in Table 2, eight men and five women reported experiencing pain at this intensity (n=13). For the moderate pain level (NPS between 4 and 6), five men and 20 women indicated this pain intensity (n=25), making it the most frequent category among both sexes during this data collection phase. Regarding the severe pain level (NPS between 7 and 9), no men (n=0) reported severe pain, while three women (n=3) experienced pain at this intensity.

Table 2. Distribution of pain intensity among final-year physiotherapy students. Phase 2. Maringá, Paraná, Brazil. (n=41).

NPS*	Male (n=13)	Female (n=28)
Without pain (0)	0	0
Mild pain (1 a 3)	8	5
Moderate pain (4 to 6)	5	20
Severe pain (7 a 9)	0	3
Unbearable pain (10)	0	0

*NPS: Numerical Pain Scale.

The data analysis from both collection phases revealed the distribution of pain levels on the NPS among participants. In phase 1, the mean pain score was 4.11 points, with a standard deviation of 1.91, indicating that most individuals experienced moderate pain. In phase 2, the mean NPS score slightly increased to 4.27, with a standard deviation 1.99, demonstrating that most participants reported moderate pain levels. However, there was an increase in the number of individuals experiencing pain at this level compared to Collection 1.

The results also indicate that there was no significant reduction in the average pain intensity between the two collection phases. Instead, there was an increase in the prevalence of reported

symptoms. The variation in pain, as reflected by the standard deviation, increased slightly, suggesting that pain perception was heterogeneous among participants. The percentage analysis indicated a negative variation of -3.76%, which suggests that pain levels not only persisted but may have shown a slight upward trend in the evaluated sample.

DISCUSSION

This study's findings indicate that most final-year physiotherapy students experienced moderate pain levels, as assessed by the VAS, in both data collection phases. The mean pain intensity slightly increased from 4.11 in phase 1, 1 to 4.27 in phase 2, suggesting that pain symptoms remained prevalent after completing the clinical internship. Additionally, there was an increase in the number of individuals reporting moderate pain, reinforcing the persistence of this symptom throughout the academic semester. The variability in pain perception also increased, as indicated by the standard deviation, suggesting individual differences in the response to physical and academic demands. These results highlight the need for further investigation into the potential contributing factors, such as workload, stress, and postural habits, that may influence pain perception in physiotherapy students.

Supervised clinical practice is a fundamental component of physiotherapy education, yet it exposes students to various risk factors that can lead to musculoskeletal pain. In this study, a significant prevalence of pain was observed among physiotherapy students, with a higher incidence among women. This finding aligns with previous research on the relationship between academic practice and the development of musculoskeletal discomfort.

Studies on the impact of supervised internships on students' health indicate that as interns engage in practical activities, there is a growing tendency for increased musculoskeletal pain, particularly in activities that require static postures and repetitive movements[11]. Our study also observed this trend, with participants reporting a notable increase in pain across both data collection periods. Musculoskeletal symptoms during internships may be attributed to inadequate ergonomic factors, such as treatment table height, equipment arrangement, and lack of rest between activities, all identified as risk factors for musculoskeletal disorders[9]. Additionally, the burden of responsibilities and intense workload during internships are frequently cited in the literature as aggravating factors for musculoskeletal pain[12].

Data analysis suggests that female participants exhibit greater susceptibility to musculoskeletal pain. The prevalence of pain found in this study aligns with previous research investigating health sciences students. One study highlights that due to biomechanical and hormonal characteristics such as lower muscle mass and greater joint flexibility, women are more prone to experiencing pain in work and study environments that involve continuous physical exertion, as is

the case for physiotherapy interns. This vulnerability may be exacerbated by repetitive tasks, improper postures, and the additional burden of extracurricular activities[13].

Another study also observed that, beyond biological differences, academic and work environments may contribute to overload among women, who tend to engage in multiple responsibilities, increasing their risk of injury. These findings are consistent with the data obtained in our study, in which women reported higher pain intensity at moderate levels, not only during internships but also due to other daily activities[14].

While influencing the observed pain prevalence, the predominance of female participants in the sample is consistent with patterns found in various studies on physiotherapy students. Research conducted by Gorce et al.[12] indicated that women have a higher predisposition to musculoskeletal pain symptoms compared to men, which can be attributed to both hormonal factors and differences in body composition, such as lower muscle mass and more fragile joints.

Beyond gender-related characteristics, the organization of the internship environment plays a crucial role in the manifestation of musculoskeletal pain. The literature consistently highlights that workplace and clinical practice ergonomics—including equipment arrangement, treatment table height, and rest breaks—are key determinants of musculoskeletal health among interns. In the studies by Lopes et al.[15] and Fernandes and Salgueiro[16], this perspective is reinforced, suggesting that the implementation of ergonomic training programs can significantly reduce the incidence of pain among students, emphasizing the importance of continuous education for injury prevention.

The heterogeneity of the data, particularly regarding pain intensity and variation between sexes, reflects the complexity of the studied phenomenon. Despite this diversity, most participants reported experiencing pain, which underscores the inherent risk factors of internships, such as repetitive movements and improper postures. These factors are well-documented in studies like those of Gorce et al.[12] and Nogaroto et al.[9], which highlight that the combination of repeated physical exertion and a lack of adequate ergonomic support are significant contributors to musculoskeletal pain in physiotherapy interns.

The nature of the internship requires activities such as bending and twisting the trunk, transferring patients, and performing manual therapy, all of which strain the musculoskeletal system. This reinforces the need for public and academic policies to safeguard interns' health[12].

Implementing health education programs, including training on ergonomics and prevention of repetitive strain injuries, is essential to reducing the prevalence of musculoskeletal pain among students. Such programs should be integrated into physiotherapy curricula, emphasizing postural health promotion and preventive practices. Increasing students' awareness of occupational risks and

encouraging proper postural habits could significantly reduce musculoskeletal pain cases, contributing to the development of healthier professionals[9].

Although the results of this study provide valuable data on the prevalence and intensity of musculoskeletal pain among physiotherapy students, some limitations should be acknowledged. While representative of the studied group, the sample is relatively small and predominantly female, which may have influenced the observed pain prevalence. Additionally, the use of the VAS to assess pain intensity, despite being a widely used instrument, may not fully capture the complexity of the pain experience due to its subjective nature. The lack of analysis of other variables, such as lifestyle habits, age, and pre-existing conditions, limits understanding of the risk factors associated with musculoskeletal pain in this population.

To enhance the validity and generalizability of the findings, future studies should include larger and more diverse samples and more detailed analyses of individual factors contributing to musculoskeletal pain in physiotherapy students. Further research should also expand the analysis to include additional variables that may impact musculoskeletal health, such as diet, physical activity levels, and sleep quality.

CONCLUSION

This study demonstrated a high prevalence of musculoskeletal pain among physiotherapy students during supervised internships, with women reporting greater pain intensity, which increased as activities progressed.

The results suggest that factors such as the physical demands of internship activities, repetitive movements, and improper posture during patient care are key determinants of musculoskeletal pain manifestation and may contribute to its worsening over time.

The findings also highlight the urgent need for health promotion and prevention strategies to minimize the impact of musculoskeletal pain during academic training. To safeguard the health of future physiotherapy professionals, implementing educational programs on ergonomics, promoting proper posture, and raising awareness about the risks of physical overload should be a priority in higher education institutions.

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