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WORKLOAD AND LOWER LIMB PAIN AMONG PHYSICAL THERAPY INTERNS IN A PRIVATE UNIVERSITY IN THE PHILIPPINES

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Abstract

Background. Research on lower limb pain and its risk factors among physical therapists is limited. Physical Therapy interns may be particularly vulnerable due to the clinical training demands. This study determined whether internship workload contributes to lower limb pain among Physical Therapy Interns at Silliman University during Academic Year 2022–2023.

Methods. A descriptive-correlational design was employed to examine the association between internship workload and lower limb pain among 53 Level IV Physical Therapy interns. Data were collected using a self-administered questionnaire distributed online. The instrument underwent

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content validation using Lawshe's method and reliability testing through Cronbach's alpha. Google Forms data were subjected to statistical analysis.

Results. Findings revealed a significant relationship between the level of lower limb pain and workload in local affiliation centers ($p < .05$). No significant association was found between lower limb pain and either physical demands or types of interventions performed. This suggests that increased patient load is associated with a higher risk of developing lower limb pain among interns, while the nature of interventions or physical intensity appears less influential which highlight the need for internship programs to consider patient assignment and workload management to prevent musculoskeletal strain. The findings indicate that increased patient load, rather than the type or physical intensity of interventions, is associated with lower limb pain among Physical Therapy interns. This suggests that cumulative workload and prolonged exposure may contribute more to musculoskeletal strain than specific clinical tasks. Internship programs should therefore consider balanced patient assignments and preventive strategies to reduce the risk of pain and support interns' occupational health.

Conclusion. Higher patient load is significantly associated with increased lower limb pain among Physical Therapy interns, whereas physical demands and types of interventions are not. These findings emphasize the importance of workload management during clinical training and highlight the need to explore other contributing factors to lower limb pain in healthcare trainees.

Keywords: *Lower limb pain, physical therapy interns, internship workload, musculoskeletal risk, descriptive–correlational study, Philippines*

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Research Highlights

What is the current knowledge?

- Research on lower limb pain (LLP) among physical therapists and interns remains limited, despite known musculoskeletal risks in healthcare professions.
- Physical Therapy interns may be vulnerable to musculoskeletal strain due to clinical training demands and cumulative workload exposure.
- Existing literature commonly associates musculoskeletal pain in healthcare workers with repetitive movements, sustained postures, and physically demanding tasks.
- There is limited evidence specifically examining how different components of internship workload (e.g., patient load vs. physical task demands) relate to lower limb pain among PT interns.

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What is new in this study?

- Identifies patient load—rather than physical demands or types of interventions—as the significant factor associated with lower limb pain among PT interns.
- Demonstrates that cumulative workload exposure may be more influential than task-specific physical intensity in pain development.
- Provides internship-specific evidence from a Philippine university setting, contributing localized data to a limited body of literature.
- Offers a baseline for workload management strategies in clinical training programs to reduce lower limb pain risk.

INTRODUCTION

Musculoskeletal disorders (MSDs) remain a major occupational health concern in healthcare, with prevalence rates consistently high among nurses, medical technologists, and physical therapists (PTs). These conditions are commonly associated with ergonomic and physical risk factors, including heavy lifting, awkward postures, prolonged standing, and repetitive movements. Although the axial region (neck and low back) and upper limbs have been studied extensively, lower limb pain (LLP) has received comparatively little attention despite its significant impact on work performance and quality of life.

Among various working populations such as nurses, industrial workers, and service personnel, the prevalence of LLP has been reported to range between 16% and 50% (Mohd Yusoff et al., 2017). Within healthcare, they added that MSD prevalence in nurses exceeds 70%. While PTs face similar risks, evidence regarding LLP in this group remains limited. A review reported that 55% of PTs experience musculoskeletal pain, with the low back being the most common site, whereas hip and thigh complaints were less frequent and under-researched (Kakaraparthi et al., 2021). Importantly, up to 16% of PTs first develop MSDs during their student years (Desai & Jain, 2020), indicating that musculoskeletal health concerns emerge early in training.

Internships are an essential component of PT education, providing supervised clinical experience. However, interns are routinely exposed to physically demanding tasks such as assisting in patient transfers, demonstrating therapeutic exercises, and prolonged standing or walking during treatment sessions. These repetitive and strenuous activities may predispose interns to MSDs, including LLP. Persistent pain can compromise both student well-being and clinical performance, with potential long-term consequences for their professional careers.

In Silliman University, anecdotal reports suggest that LLP is frequently experienced by PT interns, second only to low back pain. Despite this observation, no published studies have specifically examined LLP among PT interns in the Philippines or its relationship to workload in clinical affiliation centers. Addressing this knowledge gap is important, as unrecognized or unmanaged pain may escalate into chronic conditions and reduce the quality of patient care.

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Therefore, this study investigates the relationship between LLP and internship workload among Level-IV PT interns in Silliman University, Philippines. Specifically, it evaluates whether patient load, physical demands, and therapy interventions contribute to the occurrence of LLP.

LITERATURE REVIEW

Clinical internship represents a critical phase in physical therapy (PT) education, providing students with structured, supervised exposure to real-world clinical practice. In the Philippines, the Physical Therapy Internship Program is mandated under Article VI, Section 13 of CHED CMO No. 55, Series of 2017, which stipulates a one-year clinical training period with a maximum of eight hours per day inclusive of all related activities. The internship aims to develop humane and scientifically competent physiotherapists capable of responding to evolving healthcare needs. During this period, interns are expected to manage diverse patient populations across neurological, musculoskeletal, cardiopulmonary, pediatric, and geriatric settings, engaging in tasks that range from patient evaluation to intervention and documentation.

Despite its educational value, clinical internship may expose students to substantial physical demands. Interns often perform repetitive manual techniques, prolonged standing, patient transfers, and sustained postures for extended periods. Such exposures may contribute to the development of musculoskeletal pain (MSP), including lower limb pain (LLP). The World Health Organization defines musculoskeletal pain as pain affecting muscles, bones, ligaments, joints, tendons, or related structures, often resulting from repetitive movements, awkward postures, prolonged static loading, or forceful exertions. Population-based data further demonstrate the widespread nature of MSP. In the United States, 36.5% of adults reported lower limb pain within a three-month period, underscoring the public health significance of this condition (Lucas et al., 2019).

Among healthcare professionals, the prevalence of musculoskeletal pain is notably high. A systematic review by Jacquier-Bret and Gorce reported an overall prevalence exceeding 75% across health professions, with physical therapists exhibiting an average prevalence of 55%. Although lower limb pain is less frequently reported than low back pain, it remains clinically significant, with prevalence estimates among physical therapists reaching 18% for hip/thigh, 21% for knees, and 11% for ankles/feet. Similarly, Kakaraparthi et al. (2021) documented an 83.8% 12-month incidence of musculoskeletal pain among Saudi Arabian physical therapists, while Chen et al. (2022) reported prevalence rates ranging from 6.1% to 75.2% among Taiwanese PTs. These findings highlight the occupational vulnerability of physical therapists despite their expertise in ergonomics and injury prevention.

Evidence from related healthcare professions further illustrates the magnitude of lower limb pain. Li (2017) reported that 74% of U.S. inpatient nurses experienced musculoskeletal discomfort in at least one lower limb region within a 12-month period, with lower limb pain ranking third after low back and neck pain. Mohd Yusoff et al. (2017) similarly found that more than half of healthcare workers in a Malaysian district hospital reported lower limb pain lasting more than one day in the previous year, often associated with prolonged walking and standing. Work-related factors such as high patient volume, repetitive movements, sustained standing, lifting, kneeling, and stair climbing have consistently been identified as risk factors (Ezzatvar et al., 2019; Kakaraparthi et al., 2021; Chen et al., 2022).

Importantly, musculoskeletal pain has implications beyond discomfort. Getie et al. (2021) demonstrated that ankle and foot pain among nurses was associated with reduced work performance. Longitudinal evidence from Bláfoss et al. (2021) further indicates that moderate to severe knee pain significantly increases the risk of long-term disability among eldercare workers. These findings suggest that early manifestations of lower limb pain, if unaddressed, may progress to chronic conditions with functional and occupational consequences.

While existing literature establishes the high prevalence of musculoskeletal pain among healthcare workers, several gaps remain. First, lower limb pain has received comparatively less attention than low back pain, particularly within the physical therapy profession. Second, most available studies focus on licensed practitioners rather than students or interns undergoing intensive clinical training. Third, although workload factors such as patient volume and repetitive tasks have been identified as potential risks, limited research has specifically examined how distinct components of internship workload—such as patient load, physical demands, and types of interventions—contribute to lower limb pain among PT interns.

Given the physically demanding nature of internship and the limited body of evidence focusing on lower limb pain in this population, further investigation is warranted. Understanding the relationship between workload characteristics and lower limb pain among PT interns may inform preventive strategies within academic and clinical training programs, ultimately promoting occupational health early in professional development.

METHODOLOGY

Design

This cross-sectional descriptive–correlational study examined the association between workload in local clinical affiliation centers and lower limb pain among Level IV Physical Therapy (PT) interns at Silliman University. As a non-experimental design, no variables were manipulated. Data were collected at a single point in time, and statistical analyses were limited to determining the presence and strength of associations. Accordingly, causal inferences regarding whether workload caused lower limb pain cannot be established and should not be interpreted from the findings.

Environment and Participants

The study was conducted at the Angelo King Building–Institute of Rehabilitative Sciences, Silliman University, Dumaguete City, Negros Oriental, during Academic Year 2022–2023. The target population comprised all Level IV PT student interns enrolled in the Clinical Internship Training Program (CITP).

Inclusion criteria were: (1) officially enrolled Level IV PT interns of CITP 2022–2023, and (2) completion of or current participation in at least one rotation in a local affiliation center. Exclusion criteria were: (1) history of medically diagnosed lower limb conditions or severe pre-internship lower limb pain/dysfunction, and (2) refusal to participate. A total enumeration sampling strategy was

implemented to reduce selection bias within the accessible population. There were 53 interns who met the eligibility criteria and completed the survey.

Although total enumeration sampling was used to include all eligible interns within the accessible population, the resulting sample size is relatively small for correlational analysis and may limit statistical power. Consequently, the possibility that certain associations, such as the relationship between physical demands and lower limb pain, were not detected due to insufficient sample size cannot be ruled out. The interpretation of non-significant findings should therefore be made cautiously, recognizing the potential for Type II error inherent in studies with limited sample sizes.

As a single-institution study conducted within a specific academic and clinical training environment in Dumaguete City, Negros Oriental, the findings primarily reflect the local internship context of the university. Thus, generalization of results to other institutions, geographic regions, or internship systems should be avoided. The study's objective was not to establish population-level inference but to explore workload–pain associations within the defined setting. Future multi-center studies with larger samples are recommended to enhance external validity and confirm whether similar patterns exist in other physical therapy internship programs.

Data were collected using a self-administered questionnaire assessing internship workload and lower limb pain. As the study relied on self-reported measures, the possibility of recall bias and reporting bias is acknowledged. To minimize recall bias, participants were instructed to report experiences within a defined and recent internship period. Anonymity and confidentiality were emphasized to reduce social desirability bias and encourage honest responses.

Given that participants were drawn from a single institution and the sample size was relatively small, the findings may have limited external validity and may not be generalizable to other PT internship programs or institutions. The results should therefore be interpreted within the specific academic and clinical context of Silliman University. Future studies employing multi-institutional samples, larger sample sizes, and longitudinal or experimental designs are recommended to enhance generalizability and explore potential causal relationships.

Data Collection and Instruments

Data were collected using a researcher-developed survey distributed electronically via Google Forms through respondents' institutional email accounts. The questionnaire required less than 20 minutes to complete. Prior to full deployment, the instrument underwent expert validation by three licensed physical therapists using Lawshe's Content Validity Ratio and Index. The content validity index (CVI) reached 1.0, indicating excellent validity. Reliability testing was conducted through a pilot study with nursing interns, yielding acceptable Cronbach's alpha values.

The final questionnaire consisted of three sections: demographic information (age, sex, affiliation center, comorbidities); workload-related variables including patient load, frequency of physical demands, and type of therapeutic intervention, assessed using a 5-point Likert scale (0 = not at all to 4 = all the time); and lower limb pain assessment**,** measured using the Visual Analog Scale (VAS) scored "0=no pain, 10=worst imaginable".

Data Analysis

Responses were coded in Microsoft Excel and analyzed with statistical software. Descriptive statistics were used to summarize demographic and workload characteristics. Pearson's product–moment correlation coefficient was applied to assess the strength and direction of relationships between workload variables and reported lower limb pain. A scatter plot was also generated to visualize significant associations.

Ethical Considerations

The protocol was reviewed and approved by the Silliman University Research Ethics Committee. Participation was voluntary and informed consent was obtained electronically before pre-survey. Confidentiality and anonymity were maintained throughout the study. Identifiable information was not retained, and all data were securely stored and permanently deleted on May 15, 2023, using electronic data wiping.

RESULTS

Level of Lower Limb Pain by Affiliation Center

Interns reported varying levels of lower limb pain across centers (Table 1). The highest average pain was reported at NOPH (Mean = 3.11, Moderate Pain)**,** followed by Valencia CBR (Mean = 2.32 Mild Pain)**.** Overall, the composite mean score was 2.02 (Mild Pain)**,** suggesting that most interns experienced only mild lower limb pain during rotations.

Table 1.

Level of Lower Limb Pain by Affiliation Center

Affiliation Center	Weighted Mean	Verbal Interpretation	Rank
SUMC	2.13	Mild Pain	4
NOPH	3.11	Moderate Pain	1
ACEDD	2.30	Mild Pain	3
SUMMC CBR	1.39	Mild Pain	6
Valencia CBR	2.32	Mild Pain	2
Valencia OPD	1.07	Mild Pain	7
IRSFC	1.79	Mild Pain	5
Composite Mean	2.02	Mild Pain	

Relationship Between Lower Limb Pain and Patient Load

Correlation analysis revealed a significant relationship between patient load and lower limb pain (Table 2).

- Decked patients**:** $r = .756$ (high correlation), t = 2.583 > t-critical (2.571), $p < .05$.
- Assisted patients**:** $r = .802$ (high correlation), t = 2.997 > t-critical, $p < .05$.

Both findings indicate that higher patient load is significantly associated with increased lower limb pain. Interestingly, pain levels were more strongly correlated with assisted patients than with decked patients, contrary to expectations.

Table 2.

Relationship Between Lower Limb Pain and Patient Load

Patient Load	*r*	Description	t-value	t-critical	Interpretation	Decision
Decked Patients	.756	High Correlation	2.583	2.571	Significant	Reject H_0
Assisted Patients	.802	High Correlation	2.997	2.571	Significant	Reject H_0

Relationship Between Lower Limb Pain and Physical Demands

As shown in Table 3, correlations between physical demands and lower limb pain ranged from low to high ($r = 0.335– 0.717$). However, none reached statistical significance, as all t-values were below the critical threshold (2.571).

Thus, the null hypothesis was accepted. Physical demands such as squatting, standing, lifting, carrying, and prolonged sitting were not significantly associated with lower limb pain among interns, though repetitive lifting showed the strongest correlation.

Table 3.

Relationship Between Lower Limb Pain and Physical Demands

Physical Demand	*r*	Description	t-value	t-critical	Interpretation	Decision
Squats	.660	Moderate	1.964	2.571	Not Significant	Accept H_0
Standing	.652	Moderate	1.923	2.571	Not Significant	Accept H_0
Lifting	.717	High	2.300	2.571	Not Significant	Accept H_0
Carrying	.708	Moderate	2.242	2.571	Not Significant	Accept H_0
Sit-to-Stand Transition	.584	Moderate	1.609	2.571	Not Significant	Accept H_0
Static Sitting	.335	Low	0.795	2.571	Not Significant	Accept H_0

Relationship Between Lower Limb Pain and Therapy Interventions

Analysis showed no significant relationship between therapy interventions and lower limb pain (Table 4).

- Active interventions**:** $r = .195$ (negligible), $t = 0.445 < 2.571$.
- Passive interventions**:** $r = .600$ (moderate), $t = 1.667 < 2.571$.

Although passive interventions were moderately correlated with pain, neither reached significance.

Table 4.

Relationship Between Lower Limb Pain and Therapy Interventions

Therapy Intervention	*r*	Description	t-value	t-critical	Interpretation	Decision
Active	.195	Negligible	0.445	2.571	Not Significant	Accept H_0
Passive	.600	Moderate	1.667	2.571	Not Significant	Accept H_0

DISCUSSION

This study examined the association between internship workload and lower limb pain among Level IV Physical Therapy interns. The findings demonstrated a significant positive relationship between patient load and self-reported lower limb pain, indicating that interns who managed more patients were more likely to report higher pain scores. Notably, assisted patient exposure showed a stronger correlation with pain than decked patient exposure, suggesting that cumulative participation in patient care—even without primary responsibility—may contribute to musculoskeletal strain. These results align with previous research identifying higher caseloads and increased workload as risk factors for musculoskeletal symptoms among healthcare professionals (Ezzatvar et al., 2020; Chen et al., 2022), reinforcing workload volume as a meaningful contributor to lower limb discomfort.

In contrast, no statistically significant associations were found between lower limb pain and specific physical demands such as squatting, prolonged standing, lifting, carrying, or sitting. Although some variables demonstrated moderate correlations, these did not reach statistical significance. While interns' age or presumed physical conditioning might partially explain this pattern, such factors were not objectively measured in the present study and therefore cannot be confirmed. Other possible explanations include limited variability in task exposure, shorter duration of clinical exposure compared to full-time clinicians, or insufficient statistical power to detect smaller associations.

Similarly, therapy intervention type (active or passive) was not significantly associated with pain. This suggests that overall workload exposure may exert a stronger influence on symptom reporting than specific therapeutic modalities. However, because biomechanical load and task intensity were not directly measured, interpretations regarding mechanism should remain cautious.

The significant association between patient load and pain underscores the importance of workload management in internship settings. Balanced caseload allocation and scheduled recovery periods may help reduce musculoskeletal strain among interns. Nonetheless, given the cross-sectional design, causal relationships cannot be established. Pain may also be influenced by unmeasured factors such as physical activity outside clinical duties or individual ergonomic practices. Furthermore, reliance on self-reported measures and the single-institution sample limit generalizability.

Future research should employ longitudinal or prospective designs to clarify temporal relationships between workload and symptom development. Multi-institutional studies with larger samples and objective workload or biomechanical assessments would strengthen causal inference and reduce reliance on speculative explanations. Incorporating physical capacity and ergonomic measures may also help identify modifiable protective factors within PT internship programs.

CONCLUSION

A significant association was found between patient load and lower limb pain among Level IV Physical Therapy interns, with assisted patient exposure showing the strongest correlation. No significant relationships were observed between pain and specific physical demands or intervention types. These findings identify patient load as a key workload-related factor linked to musculoskeletal discomfort in internship settings and underscore the importance of structured caseload management to support intern occupational health.

RECOMMENDATIONS

In line with the data gathered, decked and assisted patients have greater relationships in contributing to the LLP of the Level IV PT student interns, thus we recommend that:

Limitations on the number of assisted patient loads should be imposed in order to reduce the number of patients handled per day per intern. Patients should also be equally decked among interns. Moreover, local affiliation centers who have a greater patient census should be allotted more interns compared to those with lesser patient loads to ensure that interns will have similar patient loads. These steps will decrease the risk of LLP that may be caused by increased patient loads.

The researchers suggest that the different factors could be of another external source aside from the internship rotation demands itself. In line with this, a future research study should examine those probable external factors to expand the scope and to be able to perhaps recommend a better coping mechanism in terms of alleviating the lower limb pain acquired during, after, and/or throughout the internship. Moreover, future researchers could focus on one of the local affiliation centers and explore other possible factors for the occurrence LLP based on the specifics demands of the center. Since this study only dealt with the local affiliation center, future researchers could also widen the scope to include affiliation centers outside of Negros Oriental.

List of Abbreviations

CITP - Clinical Internship Training Program
LLP - Lower Limb Pain
MSD - Musculoskeletal Disorders
MSP - Musculoskeletal Pain
PTs - Physical Therapists

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Declarations

Ethics approval and consent to participate
This study was approved by the Silliman University Ethics Review Board (approval date: April 2023). All participants provided written informed consent prior to data collection. Data were anonymized and stored securely in compliance with Republic Act No. 10173 (Data Privacy Act of 2012).

Consent for publication
All participants provided explicit written consent for publication of de-identified data, quotes, images, or case details in this manuscript. No identifiable information appears in the submitted work.

Availability of data and materials
The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request. Raw data access may be restricted due to participant privacy under RA 10173.

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Declaration of Generative AI and AI-assisted Technologies
The authors acknowledge the use of ChatGPT-4 to improve language clarity, assist with grammar checking and help organize literature review. The prompts used are “Please proofread this text for grammar and clarity while preserving academic tone". The output from these prompts was used to enhance grammatical accuracy, improve sentence structure, and organize initial thoughts. While the authors acknowledge the usage of AI, the authors maintain that they are the sole authors of this article and take full responsibility for the content therein, as outlined in COPE recommendations and journal policies.

Competing interests
None declared.

Author’s contributions
- Conceptualization: CAS, RBE, MSBA, RRMR, JFJR, LJBB, GSFD
- Methodology: CAS, RBE, MSBA, RRMR, JFJR, LJBB, GSFD
- Formal Analysis: CAS, RBE, MSBA, RRMR, JFJR
- Writing – Original Draft: CAS, RBE, MSBA, RRMR, JFJR, LJBB, GSFD
- Visualization: CAS, RBE, RRMR
- Project Administration: CAS, MSBA, RRMR, JFJR, LJBB, GSFD

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