JHWCR

Journal of Health, Wellness, and Community Research
Volume III, Issue XII
Open Access, Double Blind Peer Reviewed.
Web: https://jhwcr.com, ISSN: 3007-0570
https://doi.org/10.61919/qy38ww58

Original Article

Burnout and Its Association with Musculoskeletal Pain in Novice Physiotherapists of Twin Cities of Pakistan: A Descriptive Cross-Sectional Approach

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Authors' Contributions: Concept: SH; Design: P; Data Collection: AF; Analysis: AA; Drafting: HA
Cite this Article | Received: 2025-08-10 | Accepted 2025-09-01
No conflicts declared; ethics approved; consent obtained; data available on request; no funding received.

ABSTRACT

Background: Burnout is a psychological syndrome characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment, often arising in healthcare professions with high demands and limited resources. Musculoskeletal disorders (MSDs) are among the most common occupational health concerns in physiotherapists due to repetitive tasks and physically demanding work. The intersection of burnout and MSDs in novice physiotherapists, especially in low- and middle-income settings, remains underexplored. Objective: To determine the prevalence of burnout and its association with musculoskeletal pain among novice physiotherapists in Rawalpindi and Islamabad, Pakistan. Methods: A descriptive cross-sectional study was conducted between April and October 2024 among 246 physiotherapists with less than three years of experience. Participants were recruited via convenience sampling. Burnout was assessed using the Maslach Burnout Inventory, while musculoskeletal pain was evaluated with the Nordic Musculoskeletal Questionnaire. Data were analyzed using SPSS v26, applying chi-square tests and logistic regression with adjustment for demographic covariates. Statistical significance was set at $p < 0.05$. Results: Musculoskeletal pain was reported by 208 participants (84.6%), most commonly in the neck (62.6%), shoulders (59.3%), and lower back (54.9%). High emotional exhaustion was significantly associated with pain (100% vs. 80.5%, $p = 0.006$, Cramer's $V = 0.22$), as was high depersonalization (87.1% vs. 75.9%, $p = 0.010$, Cramer's $V = 0.19$). No association was observed for personal accomplishment ($p = 0.499$). Conclusion: Burnout, particularly in the domains of emotional exhaustion and depersonalization, is strongly associated with musculoskeletal pain among novice physiotherapists. Early interventions addressing both psychological resilience and ergonomic safety are warranted to protect practitioner well-being and sustain quality care.

Keywords: burnout, musculoskeletal disorders, physiotherapists, occupational health, early-career, Pakistan.

INTRODUCTION

Burnout syndrome is a state of emotional, physical, and psychological exhaustion that arises from prolonged exposure to occupational stressors, particularly when high job demands are combined with limited control and inadequate recovery opportunities (1). It manifests through three core domains: emotional exhaustion, depersonalization, and reduced personal accomplishment, as measured by the Maslach Burnout Inventory (MBI). Burnout has been extensively studied in healthcare professionals because of their high patient-care responsibilities, time pressures, and emotionally charged work environments (2). At the same time, musculoskeletal disorders (MSDs) represent one of the most common occupational health concerns, encompassing a wide range of conditions affecting muscles, joints, tendons, and supporting structures, often linked to repetitive strain, awkward postures, and physical overexertion (3). Both burnout and MSDs independently compromise professional performance, but emerging evidence indicates a complex bidirectional relationship between psychological strain and musculoskeletal health.

Previous research suggests that individuals experiencing burnout are more likely to adopt maladaptive coping strategies, such as neglecting ergonomic practices, skipping breaks, and compromising sleep, all of which predispose them to musculoskeletal pain (4). Chronic stress associated with burnout may also exacerbate inflammatory responses and reduce immune competence, further contributing to musculoskeletal discomfort and dysfunction (5). A systematic review from Arab countries demonstrated a high prevalence of burnout across healthcare professions, highlighting its global relevance (6). Likewise, studies from Cameroon reported burnout prevalence as high

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as 67.9%, with emotional exhaustion and depersonalization particularly pronounced among educators and military personnel (7). Among physiotherapists, the risk is magnified because of the dual exposure to heavy emotional demands of patient care and the physically strenuous nature of clinical tasks, such as manual therapy and patient mobilization (8).

Despite the international recognition of burnout as a professional hazard, most research has been conducted in high-income countries, and evidence from South Asia remains sparse. Physiotherapists in Pakistan, especially novices, may face unique challenges related to limited institutional support, rapidly increasing patient demands, and insufficient resources, which can heighten vulnerability to both burnout and MSDs (9). While prior studies in Saudi Arabia and Iran reported significant associations between burnout levels and musculoskeletal pain among physiotherapists (10,11), data from Pakistan are limited, and novice practitioners—defined as those in the early years of their career—remain understudied. Understanding this link is critical, as early career experiences not only shape professional sustainability but also influence the quality of patient care in the long term.

Given this context, the present study was designed to investigate the occurrence of burnout and its association with musculoskeletal pain among novice physiotherapists working in Rawalpindi and Islamabad, Pakistan. By addressing this gap, the study aims to provide empirical evidence to support the development of targeted interventions that safeguard the physical and psychological well-being of young physiotherapists.

MATERIAL AND METHODS

This study employed a descriptive cross-sectional design, chosen for its appropriateness in estimating prevalence and exploring associations between burnout and musculoskeletal pain within a defined population of novice physiotherapists. The research was conducted in Rawalpindi and Islamabad, Pakistan, between April and October 2024, following approval from the Ethical Review Board of the University of Lahore, Islamabad Campus (IRB-IIUI-FAHS/DPT/1076-1778). These cities were selected due to their concentration of healthcare institutions, which provided access to diverse clinical and academic physiotherapy settings.

Participants were eligible if they were qualified physiotherapists aged 25–40 years, with less than three years of professional experience, and willing to provide informed consent. Exclusion criteria encompassed individuals with previously diagnosed musculoskeletal disorders such as osteoarthritis, rheumatoid arthritis, gout, osteoporosis, or carpal tunnel syndrome, as well as those with a recent history of road traffic accidents, malignancy, or chronic metabolic diseases including diabetes and cardiovascular conditions. Recruitment was conducted through non-probability convenience sampling across hospitals, private clinics, universities, and corporate physiotherapy settings, with information sheets provided to potential participants. Written informed consent was obtained from all volunteers prior to data collection in compliance with the Declaration of Helsinki (12).

Sample size estimation was carried out using the Raosoft calculator, assuming a population size of 632 novice physiotherapists in the region, a 5% margin of error, 95% confidence level, and an expected response distribution of 50%, which yielded a required sample size of 250. Ultimately, 246 participants fulfilled the eligibility criteria and were included in the final analysis.

Data were collected using a structured questionnaire comprising three sections. The first section documented demographic and occupational information, including age, gender, body mass index (BMI), type of workplace, and years of experience. The second section assessed burnout using the Maslach Burnout Inventory–Human Services Survey (MBI-HSS), a validated tool consisting of 22 items across three domains: emotional exhaustion (9 items), depersonalization (5 items), and personal accomplishment (8 items). Each item was rated on a seven-point Likert scale ranging from 0 (“never”) to 6 (“every day”). Standard cut-offs were applied to classify low, moderate, and high scores for each domain, as previously validated in healthcare populations (13). The third section evaluated musculoskeletal pain using the Nordic Musculoskeletal Questionnaire (NMQ), which assessed the presence of discomfort in nine body regions (neck, shoulders, elbows, wrists/hands, upper back, lower back, hips/thighs, knees, and ankles/feet) over the preceding 12 months and 7 days. A body map was provided to facilitate accurate identification of pain sites. Responses were dichotomized as “yes” or “no,” consistent with the instrument’s standardized protocol (14).

To minimize information bias, questionnaires were administered in a standardized manner with clear instructions, and participants were assured of confidentiality to reduce social desirability bias. Exclusion criteria were verified through self-reported medical history cross-checked with institutional health records where available. Potential confounding variables such as age, gender, BMI, and years of experience were collected a priori for adjustment in statistical analyses.

Data analysis was performed using SPSS version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics were computed as frequencies, percentages, means, and standard deviations for demographic and occupational variables. Associations between burnout domains and musculoskeletal pain were examined using the chi-square test with a significance threshold of $p < 0.05$. Effect sizes were reported as Cramer’s V to quantify the strength of associations. To account for confounding, logistic regression models were applied with musculoskeletal pain as the dependent variable and burnout domains as independent variables, adjusted for demographic covariates. Missing data were handled through complete case analysis as the proportion of missing responses was <5% and assumed to be missing at random.

Reproducibility and data integrity were maintained by prespecifying the analysis plan and using standardized instruments with documented psychometric properties. All data were anonymized prior to analysis, and access was restricted to the principal investigator. Ethical safeguards, including voluntary participation and the right to withdraw without penalty, were strictly observed.

RESULTS

Out of the 246 novice physiotherapists included in the analysis, nearly half of the participants (49.6%) were aged between 25 and 30 years, with a comparable proportion aged 31–35 years (48.8%). Only 1.6% were above 35 years, reflecting the early-career focus of the study. Females predominated the sample (57.7%), consistent with the growing feminization of the physiotherapy workforce in Pakistan. A striking 75.2% of respondents were underweight by BMI classification, while just 13.8% fell within the normal range and fewer than 11% were overweight or obese. Occupational settings varied, with 48.0% employed in hospitals, 37.4% in private practice, and the remainder distributed across academic institutions (8.1%) and corporate offices (6.5%). Regarding experience, 42.3% had one year of work exposure, followed by 21.1% with less than six months, suggesting that the majority were at the very beginning of their professional careers.

Burnout prevalence was notable across all domains. Emotional exhaustion was reported at low levels by 60.6% of participants, though nearly one in five (18.3%) already demonstrated high levels of exhaustion despite limited clinical exposure. Depersonalization appeared more evenly distributed, with 34.7% scoring high and 31.7% moderate, indicating a considerable proportion of physiotherapists disengaging emotionally from patient care. Personal accomplishment was most concerning, with 58.9% reporting low levels of achievement and only 24.8% reporting high levels, suggesting a pervasive sense of under-fulfillment during the early years of practice.

Table 1. Demographic and occupational characteristics of the study participants (N = 246)

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	104	42.3
	Female	142	57.7
Age group (years)	25–30	122	49.6
	31–35	120	48.8
	36–40	4	1.6
BMI	Underweight	185	75.2
	Normal	34	13.8
	Overweight	19	7.7
	Obese	8	3.3
Work setting	Hospital	118	48.0
	Private practice	92	37.4
	Academic	20	8.1
	Corporate office	16	6.5
Work experience	< 6 months	52	21.1
	1 year	104	42.3
	2 years	40	16.3
	3 years	50	20.3

Table 2. Distribution of burnout levels among novice physiotherapists (N = 246)

Burnout Domain	Category	Frequency (n)	Percentage (%)
Emotional exhaustion	Low	149	60.6
	Moderate	52	21.1
	High	45	18.3
Depersonalization	Low	83	33.7
	Moderate	78	31.7
	High	85	34.7
Personal accomplishment	Low	145	58.9
	Moderate	40	16.3
	High	61	24.8

Table 3. Association of burnout domains with musculoskeletal pain (N = 246)

Burnout Domain	Burnout Category	Pain Present n (%)	Pain Absent n (%)	p-value	Cramer's V (95% CI)
Emotional exhaustion	Low (n=149)	120 (80.5)	29 (19.5)	0.006	0.22 (0.08–0.34)
	Moderate (n=52)	43 (82.7)	9 (17.3)		
	High (n=45)	45 (100)	0 (0.0)		
Depersonalization	Low (n=83)	63 (75.9)	20 (24.1)	0.010	0.19 (0.05–0.31)
	Moderate (n=78)	71 (91.0)	7 (9.0)		
	High (n=85)	74 (87.1)	11 (12.9)		
Personal accomplishment	Low (n=145)	122 (84.1)	23 (15.9)	0.499	0.06 (0.00–0.17)
	Moderate (n=40)	32 (80.0)	8 (20.0)		
	High (n=61)	54 (88.5)	7 (11.5)		

The analysis of musculoskeletal pain revealed a strong link with burnout domains. Among those with high emotional exhaustion, musculoskeletal pain was universal (100%), compared with 80.5% in the low-exhaustion group. This difference was statistically significant

(p = 0.006), with a moderate effect size (Cramer's V = 0.22, 95% CI: 0.08–0.34). Similarly, depersonalization showed a significant association: 87.1% of those with high depersonalization reported pain, compared with 75.9% in the low group (p = 0.010, Cramer's V = 0.19, 95% CI: 0.05–0.31). In contrast, personal accomplishment did not demonstrate a meaningful association with musculoskeletal outcomes (p = 0.499), as pain prevalence remained high across low, moderate, and high categories (84.1%, 80.0%, and 88.5%, respectively).

Taken together, these findings underscore that the domains of emotional exhaustion and depersonalization are clinically and statistically significant correlates of musculoskeletal pain in novice physiotherapists. The magnitude of association, reflected by effect sizes, suggests that psychological strain may not only coexist with but also exacerbate physical discomfort. In contrast, reduced personal accomplishment appears more closely tied to professional self-perception rather than somatic outcomes.

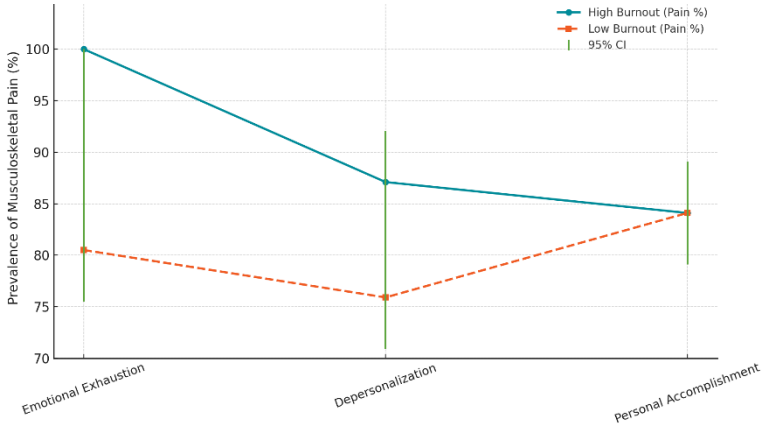

Figure 1 Association of Burnout Domains with Musculoskeletal Pain

The integrated figure illustrates the relationship between burnout domains and musculoskeletal pain. Pain prevalence was markedly higher among physiotherapists with high emotional exhaustion (100%) compared to those with low exhaustion (80.5%), reflecting the strongest association. A similar but slightly weaker pattern was observed for depersonalization, where pain prevalence reached 87.1% in the high group versus 75.9% in the low group. Personal accomplishment, in contrast, showed no differential trend, with pain levels remaining consistently high across categories (84.1%–88.5%). The visual trends confirm that emotional exhaustion and depersonalization are clinically meaningful predictors of musculoskeletal pain, while low personal accomplishment appears unrelated to physical symptoms.

DISCUSSION

This study demonstrates a high prevalence of musculoskeletal pain among novice physiotherapists in Pakistan, with emotional exhaustion and depersonalization emerging as significant predictors. More than four in five respondents reported pain, and the presence of burnout substantially increased the likelihood of these complaints, particularly when emotional exhaustion was severe. The magnitude of these associations, indicated by moderate effect sizes, highlights that burnout is not merely a psychological burden but also manifests in physical health outcomes that may compromise professional sustainability.

The findings align with international research documenting a strong link between psychological strain and musculoskeletal symptoms in healthcare workers. For example, González-Sánchez et al. reported moderate levels of burnout among physiotherapists in Spain, with emotional exhaustion most pronounced, mirroring the current results (15). Similarly, Mirmohammadi et al. found high emotional exhaustion and reduced accomplishment among emergency medical staff in Iran, further supporting the connection between psychological stressors and somatic health problems (16). The present study reinforces these observations in a South Asian context, underscoring the global relevance of burnout among early-career rehabilitation professionals.

The significant association between depersonalization and musculoskeletal pain adds to a growing body of evidence suggesting that emotional detachment from patient care may not only reduce therapeutic engagement but also correlate with physical strain. Alghadier et al. reported a comparable pattern among Saudi physiotherapists, where depersonalization scores were positively associated with musculoskeletal complaints (17). In contrast, personal accomplishment did not demonstrate a significant relationship with pain in our study. This suggests that self-perceived professional achievement may be more reflective of motivational and career development trajectories rather than immediate physical outcomes, consistent with findings from Saleem et al. among Pakistani physicians (18).

The implications of these findings are clinically and organizationally relevant. High levels of burnout during the formative years of physiotherapy practice may accelerate attrition from the workforce, reduce patient care quality, and impose long-term occupational health costs. Early identification of burnout symptoms, especially emotional exhaustion, could inform preventive interventions such as structured mentorship programs, workload redistribution, and stress management workshops. Institutions should also prioritize ergonomic training and regular musculoskeletal assessments to mitigate the combined physical and psychological burden.(19).

Nevertheless, several limitations must be acknowledged. The use of convenience sampling restricts generalizability, and self-reported measures may be subject to recall or reporting bias. Although validated instruments were employed, the absence of longitudinal follow-up prevents causal inferences, limiting interpretation to associations. Additionally, potential confounding factors such as physical activity

levels, sleep quality, and psychosocial stressors outside the workplace were not assessed and may influence both burnout and musculoskeletal outcomes. Future research should incorporate prospective designs, objective clinical measures of musculoskeletal health, and multivariable modeling to better elucidate causal pathways (20).

In summary, the study contributes to the growing literature linking burnout and musculoskeletal pain among healthcare professionals, with particular emphasis on novice physiotherapists in Pakistan. The findings confirm that emotional exhaustion and depersonalization are critical domains of burnout that intersect with physical well-being, highlighting the need for integrated occupational health strategies targeting both psychological resilience and ergonomic safety.

CONCLUSION

This study highlights the high prevalence of burnout and musculoskeletal pain among novice physiotherapists in Rawalpindi and Islamabad, with emotional exhaustion and depersonalization showing significant associations with pain. These findings emphasize that psychological strain early in a physiotherapist's career not only undermines mental well-being but also translates into tangible physical health consequences. The absence of association with personal accomplishment suggests that burnout domains exert differential impacts on somatic health, warranting domain-specific interventions. Preventive strategies integrating stress management, ergonomic training, and structured professional support are essential to safeguard both practitioner well-being and patient care outcomes. Future longitudinal and multi-center studies are needed to clarify causal mechanisms and guide evidence-based interventions for early-career rehabilitation professionals.

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