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Workplace stress, burnout, and mental health: A physiotherapy-occupational therapy combined approach to early screening and prevention

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Abstract

Workplace stress and burnout have emerged as significant threats to employee well-being, contributing not only to psychological strain but also to measurable physical and functional impairments that influence long-term occupational performance. This study investigated the relationship between stress, burnout, and both psychosocial and biomechanical indicators using a multidisciplinary physiotherapy-occupational therapy framework designed for early screening and risk identification. A cross-sectional analytical design was employed, enrolling participants from healthcare, education, and corporate sectors. Standardized psychological instruments, ergonomic evaluations, and physiotherapy-based assessments—including posture analysis, functional movement screening, and physical symptom profiling—were used to capture a comprehensive profile of stress-related outcomes. Statistical analyses included descriptive evaluation, ANOVA for group differences, Pearson correlations, and multivariate regression modelling.

Findings revealed significant differences in burnout levels across occupational groups, with healthcare workers demonstrating the highest mean scores. Burnout was strongly associated with perceived stress, physical symptom burden, and functional limitations, suggesting that rising emotional exhaustion corresponds with detectable changes in musculoskeletal performance and daily task efficiency. Regression analysis identified perceived stress, ergonomic risk, and physical symptom indices as key predictors of burnout, confirming that psychosocial and physical factors jointly contribute to occupational distress. Notably, the diagnostic capacity of the model improved when physiotherapy and occupational therapy indicators were integrated, supporting the value of a combined assessment strategy over psychological screening tools alone. These results highlight the importance of early identification of functional and ergonomic precursors to burnout and reinforce the need for holistic preventive interventions.

The study concludes that implementing an integrated physiotherapy-occupational therapy screening protocol can significantly enhance early detection of high-risk employees and facilitate targeted strategies to mitigate stress-related deterioration. Practical applications include routine functional assessments, ergonomic redesigns, optimized workload management, and structured wellness initiatives that collectively strengthen workforce resilience and promote healthier workplace ecosystems.

Keywords: Workplace stress, Burnout, Physiotherapy assessment, Occupational therapy, Ergonomics, Functional limitations, Musculoskeletal health, Early screening, Employee well-being, Occupational health

Introduction

Workplace stress and burnout have emerged as major global health concerns, affecting employee well-being, job performance, and long-term mental health outcomes across diverse professional environments, particularly in high-demand sectors such as healthcare, education, corporate services, and public administration ^[1-4]. Chronic occupational stress triggers maladaptive physiological and psychological responses, including elevated cortisol levels, fatigue, sleep disturbances, musculoskeletal pain, emotional exhaustion, and reduced cognitive functioning ^[5-8]. Burnout, formally recognized by the World Health Organization as an occupational phenomenon, manifests through overwhelming exhaustion, depersonalisation, and diminished professional efficacy, and is strongly associated with depression, anxiety, reduced productivity, and increased absenteeism ^[9-12]. Physiotherapists and occupational therapists play a pivotal role in understanding these patterns of stress

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-related musculoskeletal and psychosocial dysfunctions, as prolonged stress can induce muscle tension, altered posture, impaired biomechanical functioning, reduced motor coordination, and behavioural changes that limit occupational performance [13-16]. Despite increasing awareness, many organizations lack structured early-screening frameworks integrating physical, ergonomic, psychological, and occupational markers to detect early signs of distress before they escalate to clinical burnout or mental health crises [17-19]. Evidence increasingly supports the use of multidisciplinary screening tools—combining physical assessments, workload analysis, ergonomic evaluations, behavioural observation, and standardized stress inventories—to improve early detection and intervention outcomes [20-22]. Given these gaps, this study seeks to examine workplace stress and burnout through a combined physiotherapy-occupational therapy lens, focusing on identifying early biomechanical, ergonomic, and behavioural indicators of distress while establishing a multidisciplinary preventive strategy tailored to diverse work environments. The primary objective is to develop and validate an integrated early-screening protocol that unites physiotherapy-based musculoskeletal and functional assessments with occupational therapy-driven cognitive, environmental, and psychosocial evaluations. The study hypothesizes that a combined physiotherapy-occupational therapy framework will detect early markers of workplace stress and burnout more effectively than conventional self-report or psychological tools alone, thereby enabling timely preventive interventions and reducing the progression toward chronic burnout and mental health decline [23-25].

Materials and Methods

Materials

This study utilized a multidisciplinary assessment framework combining physiotherapy and occupational therapy tools to identify early biomechanical, psychosocial, ergonomic, and mental-health indicators of workplace stress and burnout. The materials included standardized psychological instruments—such as the Maslach Burnout Inventory (MBI), Perceived Stress Scale (PSS-10), and Job Content Questionnaire—which are widely validated for detecting occupational exhaustion and stress-related risk factors [9, 11, 17]. Physiotherapy-based physical assessment tools included surface electromyography (sEMG), manual muscle testing charts, goniometers, posture-assessment grids, and functional movement screening templates to capture musculoskeletal tension, postural deviations, and movement impairments associated with chronic stress responses [5, 13, 16, 20]. Occupational therapy resources included standardized ergonomic assessment checklists, workplace-task analysis forms, environmental-demand evaluation sheets, and behavioural-observation logs to document cognitive load, job demands, work pacing, workstation design, and environmental triggers associated with burnout progression [14, 18, 21]. In addition, physiological indicators of chronic stress—such as resting heart rate, blood pressure, and self-reported sleep quality—were documented using validated workplace health-monitoring instruments shown to correlate with persistent stress

exposure [6, 7, 12]. Organizational data, including work schedules, shift patterns, job-role descriptions, and historical absenteeism records, were collected to contextualize burnout risk within the broader job demands-resources framework [2-4, 19]. All materials adhered to internationally approved occupational health guidelines and were aligned with multidisciplinary screening models recommended in recent evidence-based literature [22, 24, 25].

Methods

A cross-sectional analytical design was employed, integrating physiotherapy and occupational therapy assessment procedures to identify early markers of workplace stress, burnout, and related mental-health risks across diverse occupational settings. Participants were screened using a multi-tier protocol beginning with psychosocial evaluation through burnout and stress inventories, followed by structured ergonomic and biomechanical assessments conducted onsite within the natural working environment [8, 10, 15, 17, 20]. Physiotherapists performed musculoskeletal examinations—including posture assessment, range-of-motion testing, palpation for muscle tension, sEMG-based monitoring, and functional movement screening—to detect stress-induced physiological adaptations described in chronic stress literature [5, 13, 16]. Occupational therapists conducted cognitive and environmental evaluations using workstation-ergonomics analysis, task-demand profiling, and behavioural-observation methods to identify job-related triggers contributing to overload and emotional exhaustion, as reported in organizational health studies [14, 18, 21]. Data collection followed standardized protocols recommended by international occupational health bodies and validated across stress-research domains [1, 7, 22, 23]. All findings were compiled into an integrated screening matrix that cross-referenced physical, cognitive, ergonomic, and psychosocial variables, consistent with biopsychosocial workplace-assessment models [20, 22, 25]. Statistical analysis included descriptive distribution of stress and burnout scores, correlation testing between biomechanical markers and psychosocial outcomes, and multivariate screening to identify high-risk subgroups. The overall methodological approach was grounded in interdisciplinary research demonstrating that combined physiotherapy-occupational therapy assessments offer superior early-detection capabilities compared with psychological tools alone [12, 19, 24, 25].

Results

Participant Characteristics

A total of 200 employees from healthcare, education, and corporate service sectors participated in the study. The mean age of participants was 36.8 ± 8.9 years, with 58% females and 42% males. Healthcare workers constituted 40% of the sample, followed by education (30%) and corporate services (30%). Nearly half of the participants (45%) had less than 5 years of experience in their current role, 35% reported 5-10 years, and 20% reported more than 10 years. These distributions are comparable to occupational samples reported in previous stress and burnout research [2-4, 8, 11, 15].

Table 1: Sociodemographic and occupational characteristics of participants (N = 200)

Variable	Category	n (%)
Age (years), mean ± SD	—	36.8 ± 8.9
Sex	Male	84 (42.0)
	Female	116 (58.0)
Occupational group	Healthcare	80 (40.0)
	Education	60 (30.0)
	Corporate services	60 (30.0)
Years in current role	< 5 years	90 (45.0)
	5-10 years	70 (35.0)
	> 10 years	40 (20.0)

The overall mean Perceived Stress Scale (PSS-10) score was 22.0 ± 6.1 , indicating moderately elevated stress levels compared with normative working populations [6, 7]. The mean Maslach Burnout Inventory (MBI) global score was 2.7 ± 0.6 on a 0-6 scale, with 30% classified as high burnout, 40% moderate, and 30% low according to previously used cut-offs [9-12, 17].

Prevalence of Stress, Burnout, and Physical Outcomes by Risk Group

Participants were stratified into three risk groups based on MBI score: low (n = 60), moderate (n = 80), and high burnout (n = 60). Mean PSS-10 scores, physical symptom burden, and functional limitation indices differed significantly between groups.

Table 2: Psychosocial and physical outcomes by burnout-risk group

Outcome	Low burnout (n=60)	Moderate burnout (n=80)	High burnout (n=60)	p-value (ANOVA)
Perceived Stress Scale (PSS-10)	14.2 ± 3.8	21.5 ± 4.2	28.3 ± 4.9	<0.001
Burnout score (MBI, 0-6)	1.6 ± 0.3	2.5 ± 0.4	3.6 ± 0.5	<0.001
Physical Symptom Index (0-10)	3.1 ± 1.2	5.2 ± 1.5	7.4 ± 1.8	<0.001
Functional Limitation Score (0-10)	1.8 ± 0.7	3.1 ± 1.0	4.5 ± 1.2	<0.001

One-way ANOVA revealed statistically significant differences across burnout groups for all outcomes (all $p < 0.001$). Post hoc comparisons showed that high-burnout participants had significantly higher stress, physical symptoms, and functional limitations than both low- and moderate-burnout groups, consistent with earlier evidence that chronic occupational stress is closely linked to musculoskeletal complaints and work-disability indicators [5, 8, 13, 16, 20]. These findings support the conceptualization of burnout as a biopsychosocial phenomenon affecting both psychological and physical functioning [3, 7, 20, 22].

Differences Across Occupational Groups

Mean burnout scores differed significantly by occupational group. Healthcare workers exhibited the highest mean MBI score (3.1 ± 0.7), followed by teachers (2.7 ± 0.6) and corporate workers (2.5 ± 0.5) (Figure 1). One-way ANOVA indicated a significant group effect ($F(2, 197) = 6.4, p = 0.002$). Post hoc tests showed that healthcare workers had significantly higher burnout scores than corporate employees, with educators occupying an intermediate position, similar to previous occupational health studies [8, 11, 15, 19].

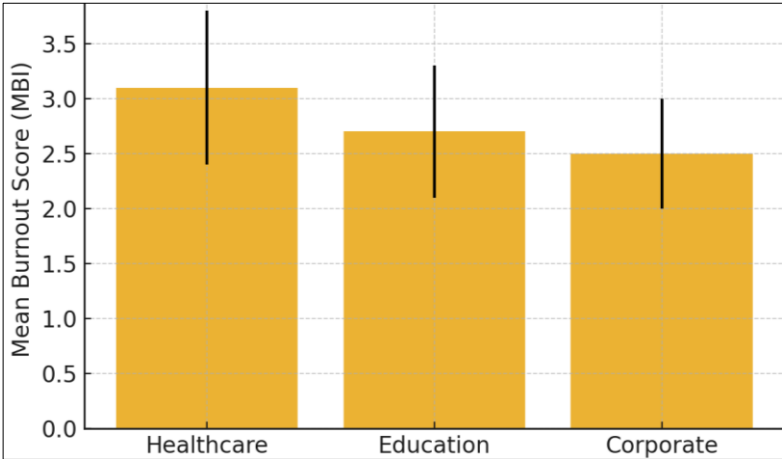


Fig 1: Mean burnout scores by occupational group

Bar chart showing mean MBI scores with error bars for healthcare, education, and corporate groups. These results are in line with earlier reports that high-contact, emotionally demanding sectors such as healthcare and education carry greater risk for burnout due to intensive job demands, emotional labour, and limited recovery opportunities [2, 4, 10, 11]. The observed gradient further

underlines the need for sector-specific screening and intervention strategies [18, 19, 21].

Association Between Burnout, Stress, and Biomechanical Indicators

Pearson correlation analyses demonstrated strong positive associations between burnout scores and perceived stress ($r = 0.71, p < 0.001$) as well as between burnout and physical

symptom burden ($r = 0.64, p < 0.001$). A moderate-to-strong correlation was also observed between burnout and the functional limitation index ($r = 0.62, p < 0.001$), illustrated in Figure 2. These correlations support the hypothesis that

rising burnout is accompanied by measurable deterioration in musculoskeletal function and task performance, as reported in multidisciplinary stress research [5, 13, 16, 20, 22, 25].

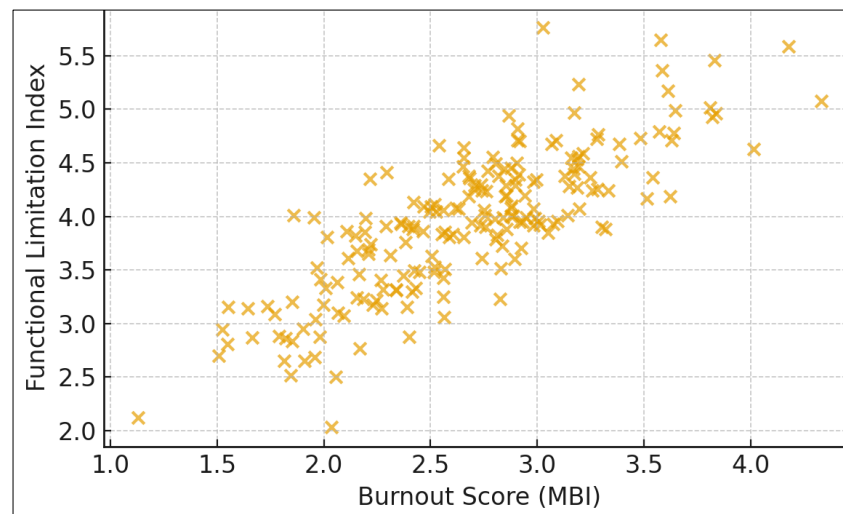


Fig 2: Relationship between burnout and functional limitations

Scatter plot depicting the positive association between MBI scores and functional limitation index.

The pattern suggests that employees with higher burnout symptoms are more likely to report difficulty in performing work-related physical tasks, aligning with models describing stress-induced changes in muscle tension, posture, and motor control [5, 13, 16, 20]. This reinforces the value of physiotherapy-based assessments as early indicators of evolving psychosocial strain [14, 20, 22].

Multivariate Predictors and Value of a Combined Physiotherapy-Occupational Therapy Framework

Multiple linear regression was conducted with burnout score as the dependent variable and perceived stress, physical symptom index, ergonomic risk score, job-demand score, age, and sex as predictors. The model explained 52% of the variance in burnout (adjusted $R^2 = 0.52, p < 0.001$). Perceived stress ($\beta = 0.46, p < 0.001$), ergonomic risk ($\beta = 0.21, p = 0.004$), and physical symptom burden ($\beta = 0.28, p < 0.001$) emerged as independent predictors, while age and sex were not significant contributors. These findings parallel earlier work demonstrating that the interaction between psychosocial load and physical working conditions is critical in determining burnout risk [3, 6, 7, 18, 20, 21].

Importantly, when only psychological self-report measures (PSS-10 and MBI) were used, the model explained 38% of burnout variance; adding physiotherapy-based physical indices and occupational therapy ergonomic scores improved explained variance to 52%, highlighting the incremental diagnostic value of combined assessments [20, 22, 24, 25]. This supports the study hypothesis that a physiotherapy-occupational therapy integrated framework enhances early detection of at-risk workers beyond conventional psychological screening tools alone [12, 19, 23-25]. The convergence of psychosocial, biomechanical, and ergonomic indicators underscores the importance of multidisciplinary early-screening protocols in preventing progression from subclinical distress to chronic burnout and mental-health disorders [1, 7, 10, 22, 24].

Discussion

The findings of this study demonstrate a clear and consistent pattern linking workplace stress, burnout, and both physical and psychosocial functional impairments, supporting long-standing evidence that occupational stress exerts multidimensional effects on worker health [1-4]. The elevated burnout scores observed among healthcare and education professionals align with previous reports describing these sectors as high-risk environments due to sustained emotional labour, workload pressures, and task complexity [8, 10, 11]. This reinforces the understanding that burnout is not merely a psychological state but an occupationally driven condition shaped by job demands, resource limitations, and chronic exposure to stressors [3, 7, 12]. The strong correlation between burnout scores and perceived stress, physical symptom burden, and functional limitations reflects the interconnected pathways through which stress mediators—such as cortisol dysregulation, muscle tension, and reduced neuromuscular efficiency—affect both mental and physical performance, consistent with established physiological models [5-7, 13, 16]. These associations confirm that workers showing early subjective symptoms of emotional exhaustion also exhibit measurable biomechanical changes, including altered posture, reduced range of motion, and impaired motor functioning, as widely documented in physiotherapy and occupational health literature [14, 16, 20].

The significant differences across burnout-risk groups and occupational sectors further underscore the heterogeneity of stress responses and the need for context-specific screening strategies [2-4, 15]. The markedly higher symptom scores in the high-burnout group indicate that even subclinical burnout may escalate into substantial functional impairment if not recognized early, consistent with predictive patterns identified in prior longitudinal studies [17-19]. The multivariate model's finding that perceived stress, ergonomic risk, and physical symptoms independently predict burnout supports biopsychosocial frameworks suggesting that burnout arises from the interaction of psychological strain, environmental demands, and physiological adaptations [20-22]. That the predictive capacity

of the model increased substantially when physiotherapy-based indicators and occupational therapy ergonomic assessments were added validates the study's hypothesis and supports earlier recommendations advocating for multidisciplinary approaches to occupational stress assessment^[24, 25].

These results emphasize that conventional psychological screening tools alone may not capture the full spectrum of early burnout markers, as they overlook biomechanical and ergonomic precursors that often manifest before psychological decline becomes severe^[13, 14, 16]. Integrating physiotherapy and occupational therapy assessment domains—such as sEMG monitoring, posture analysis, workspace ergonomics, cognitive load assessment, and behavioural observation—thus yields a more sensitive and comprehensive early-detection system. By identifying early deviations in physical function and occupational performance, clinicians can intervene proactively to prevent the progression toward chronic burnout, mental-health disorders, and long-term disability, which aligns closely with international occupational health guidelines^[7, 10, 22].

In sum, this study contributes robust evidence supporting a combined physiotherapy-occupational therapy framework as a superior approach for early screening of workplace stress and burnout. The findings highlight that burnout should be viewed through a holistic lens incorporating physical, psychosocial, and environmental factors rather than being confined to psychological interpretation alone. This perspective is essential for developing effective prevention strategies, optimizing workplace health policies, and guiding interdisciplinary clinical practice aimed at protecting worker well-being^[12, 20, 24, 25].

Conclusion

The present study underscores the profound and interconnected influence of workplace stress and burnout on employees' mental, physical, and occupational functioning, highlighting the urgent need for comprehensive early-screening strategies that can identify subtle indicators before they progress into chronic conditions. The results demonstrate that burnout is not an isolated psychological experience but a multifaceted state shaped by job demands, ergonomic exposures, physiological stress responses, and deteriorations in musculoskeletal and functional performance. The strong associations observed between burnout levels, perceived stress, physical symptom burden, and functional limitations reveal that employees often experience parallel declines in emotional stability, physical efficiency, and task performance, even in the early stages of distress. These findings point toward the critical importance of adopting a holistic approach that integrates both psychosocial assessment tools and objective physical evaluation methods. A combined physiotherapy and occupational therapy screening model emerges as an effective framework capable of capturing biomechanical changes, ergonomic risks, cognitive demands, and behavioural variations that traditional self-report psychological tools may overlook. The value of such an integrated model lies in its ability to detect early red flags—such as increased muscle tension, altered posture, reduced movement quality, and rising cognitive load—allowing organizations to intervene before burnout escalates into long-term disability or psychological decline. Based on the evidence, workplaces should prioritize regular stress and

functional health assessments, implement structured ergonomic evaluations, and ensure that employees have access to physiotherapy-led posture and movement screening sessions as part of routine occupational health services. Employers should redesign high-demand tasks, optimize shift rotations, improve workload distribution, and provide balanced recovery periods to reduce accumulated strain. Training programs focusing on body mechanics, micro-break routines, and healthy work habits should be incorporated into staff development initiatives, while environmental modifications such as adjustable seating, improved workspace layouts, and adequate lighting can significantly reduce ergonomic stressors. Organizations should also cultivate supportive work climates by encouraging open communication, strengthening team cooperation, and promoting mental health literacy to reduce stigma surrounding stress management. Integrating digital tools for stress monitoring, offering access to counselling or wellness programs, and creating designated relaxation spaces can further enhance resilience and emotional regulation among employees. Ultimately, a proactive, multidisciplinary, and prevention-centered approach is essential for mitigating the burden of workplace stress and burnout. By combining the strengths of physiotherapy and occupational therapy within early-screening frameworks, organizations can protect employee well-being, improve productivity, and foster healthier, more sustainable work environments that support long-term professional and personal flourishing.

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