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Prevalence of Work-Related Musculoskeletal Disorders Among Academic Staff in Medical Faculties: A Narrative Review

Dalia Mohamed Fouad Abd-Al-Rhman[1]*, Tarek Abd El-Hafeez Abd-Al-Rhman Hamdan[2], Mohammed Mostafa Mohamed Mohamed[3], Marwa Mahmoud Mahfouz Mahmoud[4].

[1] Demonstrator at Faculty of Physical Therapy for Basic Science, Faculty of Physical Therapy, Deraya University, Minia, Egypt.

[2] Professor of Computer Science, Computer Science Department, Faculty of Science, Minia University, Minia, Egypt.

[3] Assistant Professor of Physical Therapy for Biomechanics, Biomechanics department, Faculty of Physical Therapy, Sphinx University, Assuit, Egypt.

[4] Assistant Professor of Physical Therapy for Basic science, Basic Science department, Physical Therapy, Deraya University, Minia, Egypt.

Abstract:

Background: Work-related musculoskeletal disorders (WMSDs) are a prevalent yet underrecognized occupational hazard among academic staff, particularly in medical faculties, due to prolonged static postures, repetitive tasks, and suboptimal ergonomic conditions. The main of the current is to synthesize current evidence on the prevalence, risk factors, and impacts of WMSDs among academic staff in medical faculties, and to critically evaluate prevention strategies at both individual and institutional levels.

Methods: A narrative review of literature sourced from PubMed, Scopus, and Google Scholar was conducted, focusing on studies addressing WMSDs in academic or university environments.

Results: WMSDs affect 60%–75% of academic staff, with the neck, shoulders, and lower back being most impacted. Key risk factors include extended sedentary work, poor ergonomics, psychosocial stress, and insufficient physical activity. Female gender and increasing age further elevate risk. While various interventions exist, their efficacy varies based on institutional support and adherence.

Conclusion: WMSDs among academic faculty are widespread but largely preventable. The integration of ergonomic design, regular physical activity, educational initiatives, and comprehensive workplace policies is essential to reducing their burden and enhancing long-term occupational health.

Keywords: Musculoskeletal disorders; Academic staff; Medical faculties; Ergonomics; Occupational health; Risk factors; Prevention strategies.

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Introduction:

Work-related musculoskeletal disorders (WMSDs) are among the most prevalent occupational health conditions worldwide, affecting millions of employees across diverse work sectors. These disorders refer to injuries or dysfunctions involving muscles, nerves, tendons, ligaments, joints, or spinal structures, which are caused or exacerbated by occupational exposure to biomechanical and psychosocial stressors. According to the World Health Organization, WMSDs significantly impact workplace productivity and quality of life globally, with increasing burden in both high- and low-income countries[1].

While WMSDs have been widely documented in manual labor and clinical healthcare settings, there is growing recognition of their prevalence in academic environments, particularly among teaching staff in medical faculties[2]. Faculty members often endure prolonged sitting or standing during lectures, excessive computer use, and repetitive tasks related to teaching, grading, and research writing. These repetitive exposures are associated with the development of musculoskeletal pain and dysfunction, particularly in the neck, shoulders, lower back, and wrists[3].

A global systematic review found the overall prevalence of musculoskeletal disorders among teachers to be as high as 68%, with the neck and lower back reported as the most common sites of discomfort[4]. Regionally, a Nigerian study among university academic staff reported a WMSD prevalence of 71.9%, with high occurrences in the lower back, shoulders, and wrists[5]. Another cross-sectional study among staff in Malaysian universities identified a similar burden, with over 60% of participants reporting neck and back pain, largely linked to static postures and prolonged screen use[6].

Recent occupational studies highlight that academic staff in medical faculties may be at heightened risk due to added responsibilities, including laboratory supervision, clinical demonstrations, and electronic health record documentation[7]. The emergence of remote teaching modalities, especially during the COVID-19 pandemic, has further intensified sedentary behaviors and increased reliance on non-ergonomic home office setups—contributing to a spike in musculoskeletal complaints among educators[8].

Despite this evidence, institutional ergonomics programs and occupational health strategies remain underdeveloped in many academic institutions. Faculty members often lack access to ergonomics training, workplace evaluations, or preventive interventions tailored to their specific needs[9]. These gaps not only contribute to individual morbidity but also impact organizational efficiency through increased absenteeism, reduced productivity, and diminished academic engagement[10].

This narrative review aims to investigate the prevalence of WMSDs among academic staff in medical faculties, identify the primary occupational risk factors, evaluate the individual and institutional consequences, and propose evidence-based prevention strategies suitable for university settings.

Causes of Work-Related Musculoskeletal Disorders:

The development of work-related musculoskeletal disorders (WMSDs) among academic staff in medical faculties is driven by a complex interplay of physical, ergonomic, organizational, and psychosocial factors. These factors often coexist and interact, resulting in cumulative biomechanical stress that predisposes individuals to chronic discomfort and injury[11].

Prolonged Static Postures: One of the most significant contributors to WMSDs in academia is the extended duration of static postures. Medical faculty members often spend long hours seated while preparing lectures, grading assignments, attending meetings, or conducting research. Similarly, during clinical instruction or classroom teaching, faculty may stand in place for prolonged periods[12]. These sustained positions can lead to decreased blood circulation, increased muscle fatigue, and static loading of the spinal structures—particularly the cervical and lumbar spine. Over time, this can result in pain, stiffness, and degenerative changes in postural muscles and intervertebral discs[13]. Recent studies has reported that neck flexion and prolonged sitting at work were significant predictors of neck pain among office workers, which parallels the physical demands faced by academic staff[14].

Repetitive Movements: Academic roles frequently involve tasks that require repetitive upper limb movements, such as typing on keyboards, using a mouse, and handwriting. These repetitive motions, especially when performed over long durations without rest, can lead to microtrauma and overuse injuries. Common manifestations include carpal tunnel syndrome, lateral epicondylitis, and tendinitis of the shoulder or wrist extensors[15]. These conditions are exacerbated in environments lacking ergonomic tools such as split keyboards or vertical mice. Chronic repetitive strain often goes unnoticed in early stages, resulting in delayed diagnosis and treatment[16].

Non-Ergonomic Workstations: Improper workstation design is a prevalent issue among university staff offices. Many faculty members work at desks that do not support neutral postures—such as desks that are too high or too low, chairs lacking lumbar support, and monitors positioned incorrectly. Such poor ergonomics force individuals into awkward positions that place undue stress on the musculoskeletal system[17]. For example, viewing a monitor positioned too low or high may lead to forward head posture, resulting in increased tension in the cervical extensors and upper trapezius muscles. Over time, this can contribute to chronic neck and upper back pain. Moreover, many institutions still underfund ergonomic redesigns, leaving faculty members to self-manage workstation comfort[18].

High Workload and Time Pressure: Medical faculty are burdened with a wide range of responsibilities, including teaching, clinical supervision, research publication, and administrative duties. The cumulative workload often leads to mental stress and physical strain. Time constraints force educators to work for prolonged periods without adequate rest or movement, exacerbating physical fatigue and increasing the risk of WMSDs[19]. High mental demand and pressure to publish have also been associated with greater musculoskeletal pain, possibly through increased muscular tension and poor body awareness during work. Psychosocial stress, although intangible, plays a crucial role in the physical well-being of workers[20].

Lack of Movement and Microbreaks: A sedentary workflow without intermittent breaks is detrimental to musculoskeletal health. Faculty members often remain in fixed positions for hours, especially during administrative or online teaching tasks. Lack of movement decreases synovial fluid circulation in joints and leads to localized muscle fatigue[21]. This accelerates the onset of discomfort and reduces tissue recovery time. The absence of structured microbreaks—short pauses involving posture changes or stretching—has been correlated with increased reports of upper limb and spinal pain. Interventions that incorporate scheduled movement routines or active breaks have shown promising results in reducing discomfort in sedentary populations[22].

Poor Physical Conditioning: Academic roles are predominantly sedentary, which may lead to general deconditioning of musculoskeletal structures. Weakness in core stabilizing muscles, reduced flexibility, and poor postural endurance contribute to an inability to maintain neutral spine alignment. This predisposes staff to compensatory postures and mechanical overload during simple daily tasks[23]. Inadequate physical activity outside work also limits musculoskeletal resilience, increasing susceptibility to both acute injuries and chronic pain syndromes. This highlights the need to integrate wellness programs that promote exercise among academic professionals[24].

Use of Laptops Over Desktops: Laptop use has become widespread among faculty for its portability and convenience. However, when used without external accessories, laptops encourage compromised ergonomics—specifically, poor neck positioning due to the low screen height and cramped shoulder posture from built-in keyboards[25]. Argus reported that laptop users had a higher prevalence of neck, shoulder, and wrist discomfort compared to desktop users, especially in prolonged work scenarios[26]. In addition, laptop users are more likely to work in suboptimal environments such as couches or beds, further worsening their posture[27].

Risk Factors for Work-Related Musculoskeletal Disorders among Academic Staff:

Work-related musculoskeletal disorders (WMSDs) among academic staff in medical faculties are influenced by a combination of demographic, occupational, environmental, and behavioral risk factors. While the causes describe the direct mechanisms of injury, risk factors highlight who is more vulnerable and under what conditions. Understanding these can help identify high-risk individuals and guide the development of targeted prevention strategies[28].

Age and Years of Service: Advancing age has consistently been associated with a higher risk of developing WMSDs. Aging results in physiological changes such as reduced muscle elasticity, joint degeneration, and slower tissue repair, which predispose older individuals to musculoskeletal complaints even with moderate workloads[29]. Furthermore, academic staff with longer years of service are more likely to have accumulated exposure to ergonomic risk factors such as prolonged sitting and repetitive tasks. A cross-sectional study conducted in Nigeria reported a significantly higher prevalence of WMSDs in university staff over the age of 45 and among those with more than 15 years of service[30].

Gender: Gender differences in the prevalence and distribution of WMSDs have been reported across multiple studies. Female staff members often report a higher frequency and intensity of musculoskeletal pain compared to their male counterparts[31]. These disparities may be influenced by biological differences in musculoskeletal structure, hormonal factors, lower average upper body strength, and higher likelihood of dual work roles (professional and domestic). In some cultures, women may also face psychosocial stressors that contribute to physical strain[32].

Physical Inactivity: A sedentary lifestyle—common among academic professionals—is a major risk factor for WMSDs. Lack of physical activity contributes to deconditioning of postural and stabilizing muscles, reduced joint flexibility, and poor overall musculoskeletal resilience[33]. Faculty members who do not engage in regular exercise are more likely to develop chronic back, shoulder, and neck pain. Moreover, physical inactivity delays recovery from repetitive microtrauma caused by work-related tasks[34].

Psychosocial Stress: Occupational stress—resulting from high workloads, job insecurity, or interpersonal conflicts—can exacerbate musculoskeletal symptoms through increased muscle tension and altered posture[35]. Chronic stress also affects the hypothalamic-pituitary-adrenal (HPA) axis, leading to systemic inflammatory responses and decreased pain thresholds. A longitudinal study suggested that workers exposed to high job demands and low control had a significantly higher risk of developing WMSDs, particularly in the upper extremities and spine[36].

Poor Ergonomic Awareness and Training: Lack of knowledge about proper ergonomics and safe work habits is a critical contributor to WMSDs in academia. Academic staff often receive little to no training in posture correction, workstation setup, or the importance of taking breaks. A survey conducted among university workers found that less than 30% had received any form of ergonomics education or support[37]. Without such awareness, faculty may unknowingly adopt harmful postures or routines that place excessive stress on their musculoskeletal system.

Long Working Hours and Inadequate Rest: Prolonged working hours, especially without sufficient rest breaks, increase the risk of WMSDs by limiting recovery time and promoting cumulative fatigue. Academic responsibilities often extend beyond traditional working hours to include grading, research, and clinical duties, reducing opportunities for muscle relaxation. Studies indicate that working more than 8 hours a day is significantly associated with higher rates of neck and back pain among educators[38].

Body Mass Index (BMI): Overweight and obesity have been associated with greater incidence of WMSDs. Excess body weight imposes additional biomechanical loads on weight-bearing joints and muscles, especially in the lower back and knees[39]. Moreover, high BMI is often linked with sedentary behaviour and lower physical fitness, compounding the risk of injury[40].

Work Environment and Furniture Design: Academic environments with outdated or poorly maintained furniture increase the physical strain placed on staff. Non-adjustable chairs, desks at inappropriate heights, and poorly lit workspaces contribute to awkward postures and repetitive stress. A Malaysian study highlighted that over 60% of university staff worked in settings without proper ergonomic furniture, and those individuals had a significantly higher rate of WMSDs[41].

Prevention Strategies for Work-Related Musculoskeletal Disorders:

Preventing work-related musculoskeletal disorders (WMSDs) among academic staff in medical faculties requires a multi-faceted approach that integrates ergonomic interventions, organizational policies, education, and personal health practices. As most risk factors are modifiable, implementing targeted preventive measures can significantly reduce WMSD prevalence and improve occupational health outcomes[42].

Ergonomic Workstation Design: Proper ergonomic design remains the foundation of musculoskeletal disorder (MSD) prevention in academic environments. This includes adjusting desk and chair heights, ensuring lumbar support, aligning monitors at eye level, and using external keyboards and mice when laptops are involved[43]. Compared to other interventions, workstation adjustments provide immediate, passive benefits without requiring behavioral change. However, implementation may be uneven across institutions due to budget constraints or lack of ergonomic expertise. Moreover, faculty in shared workspaces or working remotely may lack the autonomy or resources to optimize their setups. In contrast to stress management or exercise programs, which are active strategies requiring time investment, ergonomic redesigns are low-effort but high-cost at scale[44].

Regular Movement and Microbreaks: Frequent movement breaks—such as standing, walking, or performing light stretches every 30–60 minutes—help reduce static muscle loading and improve circulation[45]. While more cost-effective than structural changes, their success depends heavily on behavioral compliance and workplace culture. Academic roles, especially involving prolonged research or teaching preparation, often incentivize sustained sitting and mental focus, reducing adherence. Compared to ergonomic redesigns, microbreaks are more flexible and easily scalable through reminder software, yet may offer less impact in cases of severe ergonomic mismatch or pre-existing WMSDs[46].

Physical Activity and Exercise Programs: Programs promoting stretching, resistance training, and aerobic activity help improve musculoskeletal resilience and reduce chronic pain[47]. Compared to microbreaks, these interventions offer systemic benefits—enhancing cardiovascular, metabolic, and mental health—but require significant time and motivational investment. Institutions may offer yoga classes, gym memberships, or lunchtime walking clubs, but engagement rates vary, particularly among senior staff or those with demanding schedules. Unlike one-time ergonomic fixes, exercise regimens demand sustained participation to maintain effectiveness. However, when combined with ergonomic education, they yield synergistic benefits[48].

Ergonomics Education and Training: Training programs build knowledge about proper posture, workstation setup, and early signs of strain. When paired with physical interventions, such as adjustable furniture, ergonomics education significantly improves long-term outcomes[37]. However, in isolation, its effectiveness diminishes due to limited follow-through and workplace inertia. Compared to stress management or exercise, training is easy to scale via e-learning platforms, yet may not reach desired outcomes without administrative reinforcement and environmental support. Additionally, knowledge retention tends to decline over time, necessitating periodic refreshers.

Stress Management and Workload Regulation: Chronic stress leads to increased muscle tension, poor posture, and reduced recovery, indirectly contributing to WMSDs[49]. Interventions like workload redistribution, flexible scheduling, and mental health services aim to tackle root psychosocial contributors. Compared to physical interventions, stress-focused strategies address a broader set of risk factors, including burnout and emotional fatigue. However, they often lack immediate physical impact and face barriers such as stigma, underfunding, and institutional inertia. While stress programs are valuable adjuncts, they are not substitutes for ergonomic or exercise-based interventions[50].

Use of Assistive Technology: Technologies such as voice recognition software, ergonomic input devices, and document holders can significantly reduce repetitive strain[16]. Their effectiveness lies in minimizing biomechanical load without requiring behavior change, making them suitable for faculty with chronic WMSDs or accessibility needs. However, usability and cost remain major obstacles. For instance, voice recognition may be inaccurate in noisy environments, and specialized input devices may not integrate well with institutional IT systems. In comparison to exercise or training, assistive tools offer targeted relief but may not address broader postural or systemic issues[51].

Institutional Policy and Occupational Health Services: Among all strategies, policy-level changes provide the most sustainable and systemic impact. These include embedding ergonomic assessments in onboarding, offering rehabilitation services, and implementing early reporting systems for WMSDs[52]. However, institutionalization is slow and dependent on leadership buy-in, often resulting in reactive rather than preventive programs. Compared to individual-focused strategies like microbreaks or fitness classes, policy-based approaches promote equity and continuity but demand more coordination and cross-departmental effort. Long-term success hinges on integrating policy with education, infrastructure, and staff wellness programs[53].

Table 1: Comparative Analysis of Musculoskeletal Disorder Prevention Strategies among Academic Staff

Strategy	Cost	Scalability	Behavior Change Needed	Time Investment	Impact Scope	Limitations
Ergonomic Setup	High	Moderate	Low	Low	Local/Immediate	Costly, uneven access
Microbreaks	Low	High	High	Low	Local/Systemic	Low adherence
Exercise Programs	Moderate	Variable	High	High	Systemic	Low engagement
Training	Low	High	Moderate	Moderate	Systemic	Declines over time
Stress Management	Moderate	Moderate	Moderate	Moderate	Indirect/Systemic	Stigma, slow impact
Assistive Tech	Moderate –High	Low– Moderate	Low	Low	Local/Targeted	Cost, usability
Institutional Policy	High	High	Low	High (setup)	Broad/Systemic	Requires leadership

Conclusion:

The high prevalence of WMSDs among academic staff in medical faculties underscores the pressing need for multifaceted preventive strategies. This review highlights that while individual interventions—such as ergonomics, movement breaks, and exercise—offer tangible benefits, their effectiveness is amplified when supported by institutional commitment. Sustainable impact depends not only on modifying physical work environments but also on embedding ergonomic awareness, stress mitigation, and workload regulation into organizational culture. Prioritizing systemic change alongside personal health behaviors is critical to safeguarding the well-being and productivity of academic professionals.

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