

Symptomatic And Functional Outcomes Of Workplace Exercise Programs

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Abstract

This review aims to evaluate the impact of workplace exercise programs on the prevention of Work-Related Musculoskeletal Disorders (WMSDs) and to analyze their effects on the physical and mental health of employees. The study adopted a narrative, qualitative, and exploratory approach, including publications between 2015 and 2025 in Portuguese and English, retrieved from SciELO, PubMed, and Springer Nature databases. The selected studies address physical activity interventions within occupational contexts and their symptomatic and functional outcomes. The current work environment—characterized by long working hours, inadequate postures, and repetitive movements—significantly contributes to the development of musculoskeletal issues, directly impacting workers' quality of life and professional performance. Evidence shows that workplace exercise programs are feasible, low-cost, and easily implemented strategies with the potential to reduce injuries, improve psychological well-being, increase motivation, and reduce absenteeism. Broader programs that combine physical activities with mental health actions demonstrate even more positive results. Therefore, the inclusion of physical exercise programs as part of workplace health policies is recommended, focusing on preventing WMSDs and promoting workers' overall health.

Keywords: Physical exercise, workplace, occupational health, quality of life, mental health.

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I. Introduction

Work-Related Musculoskeletal Disorders (WMSDs) are conditions affecting muscles, tendons, joints, and nerves. They are often associated with repetitive movements, dysfunctional postures, and physical overload. However, these conditions are multifactorial, involving psychosocial, organizational, environmental, and individual aspects that directly influence the risk of worker illness. Recent studies indicate that organizational factors such as excessive workload, low autonomy, rigid goals, and inadequate environments are among the main determinants of WMSDs in the current context (1).

These disorders cause persistent pain, functional limitations, and represent one of the leading causes of sick leave and disability in the workplace (2). Occupational factors such as complex psychophysiological demands, determined by multiple working conditions, increase the vulnerability to injuries, especially in sectors such as agriculture, construction, and manufacturing. Beyond physical consequences, WMSDs are also associated with psychosocial impacts, including stress, anxiety, and depression, directly affecting workers' well-being and productivity (3).

Data from Brazil's Ministry of Social Security indicate that, in 2023, more than 2.5 million workers applied for sick leave through the National Social Security Institute (INSS), of which approximately 30% (about 750,000 cases) were related to musculoskeletal conditions - 51,543 cases of herniated disc and 49,964 of low back pain-making these the leading causes of temporary disability in the country (4).

Multidisciplinary interventions, including workplace exercise programs (labor gymnastics), meditation practices, and ergonomic adjustments, have proven effective in preventing and managing WMSDs (5,6). The implementation of public policies, such as Brazil's National Health Promotion Policy (PNPS), also contributes to the adoption of healthy practices in occupational settings (7).

Thus, this study aims to analyze the effectiveness of workplace exercise programs in preventing WMSDs and promoting physical and mental health among workers, emphasizing their impacts on well-being and quality of life.

II. Methods

This study was conducted through a narrative literature review with a qualitative and exploratory approach, aiming to compile and critically analyze recent scientific evidence on the benefits of workplace exercise programs for the physical and mental health of workers. The literature search was performed in the SciELO, PubMed, and Springer Nature databases, covering studies from 2015 to 2025. The following descriptors were used in Portuguese and English, combined with Boolean operators (AND, OR): 'workplace exercise' OR 'labor gymnastics'; 'mental health' AND 'work'; 'physical health' AND 'work'; 'workplace exercise' AND 'mental health'; 'workplace exercise' AND 'physical health'. After the initial search, a screening and selection process was performed. Duplicated articles and those that did not describe exercises performed directly in the workplace, or that did not address physical or mental health outcomes, were excluded. Data analysis followed a qualitative approach, highlighting key findings from selected studies focused on the effectiveness of workplace exercise programs and their impacts on the prevention of WMSDs and the promotion of workers' overall health. Artificial Intelligence (AI) resources were used in a limited and supportive manner for reference formatting (Vancouver style) and grammatical revision, without altering the scientific content. All decisions regarding article selection, data interpretation, and final writing were the sole responsibility of the authors, ensuring academic and scientific integrity.

III. Results

The following table summarizes various studies that analyzed the effects of workplace exercise programs and ergonomic interventions on workers' functional and symptomatic health. Aspects such as methodology, clinical outcomes, and intervention efficacy were considered. The data reinforce the importance of preventive programs within occupational contexts.

Table 1. Multicomponent Workplace Interventions and Their Functional, Symptomatic, and Occupational Health Promotion Outcomes
(Source: Prepared by the authors)

No.	Intervention	Functional Outcome	Methodology	Symptomatic Outcome	Efficacy
1	Multicomponent workplace interventions for musculoskeletal disorder prevention	40% reduction in medical leave cases and improved workplace posture	Systematic review of 18 randomized controlled clinical trials	Reduction of symptoms such as low back pain (55%) and neck pain (48%)	High efficacy validated by scientific evidence
2	Labor gymnastics for healthcare professionals in hospital settings over 3 months	Improved occupational quality of life in 80% of cases	Systematic review with PRISMA criteria	Reduced cervical (35%) and lumbar pain (40%) and lower emotional overload	High efficacy with $\geq 70\%$ adherence and institutional support
3	Workplace exercise program for university employees	Improved physical conditioning and increased quality of life	Clinical trial with pre- and post-intervention evaluation	Significant stress reduction and improved energy levels	High observed efficacy
4	Workplace physical exercise intervention for WMSD prevention	Improved functional capacity and occupational performance	Systematic review with meta-analysis	Significant reduction in musculoskeletal disorders	Scientifically proven efficacy
5	Structured workplace exercise programs	Increased motivation and job performance	Systematic review and meta-analysis of clinical trials	Reduced anxiety, depression, and stress	High efficacy in regular and supervised programs
6	Exercise interventions focused on workers' mental health	Improved interpersonal relationships and emotional balance	Meta-analysis focused on occupational settings	Reduced mental fatigue and burnout symptoms	Effective in high-stress environments
7	Multicomponent health promotion interventions (physical, psychological, and digital)	Improved physical activity, sedentary behavior, and overall well-being	Systematic review with meta-analysis	Reduced stress, mental symptoms, and cardiometabolic indicators	Moderate to high efficacy, especially in combined and in-person interventions

8	Interventions to reduce sitting time at work	Improved posture and increased standing time	Cochrane review	Reduced fatigue and lower limb discomfort	Moderate efficacy depending on participant adherence
9	Labor gymnastics program in industrial settings	Improved postural habits and energy levels	Longitudinal study with workers	Reduced musculoskeletal complaints and greater engagement in healthy practices	High efficacy with continuous participation
10	Exercise-based programs to reduce musculoskeletal pain	Reduced pain and improved mobility	Systematic review and meta-analysis	Pain relief in upper and lower limbs	High efficacy in symptom reduction
11	Targeted workplace exercises for office workers	Improved trunk and upper limb function	Systematic review	Reduced neck and low back pain	Moderate efficacy for specific interventions
12	Resistance training in the workplace	Increased muscle strength and functional capacity	Randomized clinical trial	Reduced musculoskeletal pain and improved work ability	High efficacy especially for chronic pain
13	"Take a Stand!" program to reduce sitting time	Increased physical activity and reduced sedentary behavior	Cluster-randomized clinical trial	Reduced fatigue and improved focus	Proven efficacy through environmental strategies
14	Integration of workplace health promotion programs	Overall lifestyle and health improvement	Literature review	Reduced chronic disease risk factors	High efficacy when combined with institutional policies

IV. Discussion

The analysis of selected studies demonstrates that workplace exercise programs consistently yield benefits for both the prevention of Work-Related Musculoskeletal Disorders (WMSDs) and the improvement of workers' overall health. Numerous systematic reviews report gains such as increased physical capacity, reduced muscle pain, decreased absenteeism, and positive impacts on mental health, including reductions in stress, anxiety, and burnout (1,2,4,5,6,8).

The current public health paradigm prioritizes health promotion and disease prevention rather than merely treating illnesses. Under this framework, workplace exercise programs not only enhance employees' physical and mental well-being but also strengthen productivity and foster a healthier work environment (4,5,6). When combined with ergonomic interventions and psychological support, results are amplified, as shown in multicomponent interventions (4,7,10).

Such integration promotes holistic worker care that considers physical, mental, and organizational aspects. These programs align with modern occupational health principles emphasizing preventive interventions to improve life quality and productivity (7,10).

Public policies, such as Brazil's National Health Promotion Policy (PNPS), provide regulatory support encouraging workplace health promotion strategies. Although PNPS does not directly mention workplace exercises, its principles support the inclusion of such initiatives as part of broader occupational health promotion efforts (7).

Program success depends on several factors: worker participation, managerial support, exercise frequency, and adaptation to team needs (2,9). Tailoring exercises to specific work characteristics yields better outcomes (2,4,9). Despite methodological differences, all studies indicate workplace exercises effectively prevent musculoskeletal disorders (2,9,6).

These interventions are easy to implement, low-cost, equipment-free, and adaptable to different work settings (5,6). This accessibility is particularly valuable for workers with limited time to exercise outside work (5,8). In a context where productivity and health must coexist, such practices are increasingly embraced by employers and health professionals (4,6,8).

Nevertheless, there remains a shortage of long-term, high-quality studies to assess the sustainability of these benefits (2,7,11,14). Many current studies are short-term, limiting understanding of lasting effects (11,14). Future research should evaluate these programs across various sectors and compare different exercise modalities (2,9,14). Technological resources such as apps and videos may complement interventions, especially in remote or hybrid work models (14).

V. Conclusion

The reviewed studies confirm that workplace exercise programs effectively prevent Work-Related Musculoskeletal Disorders (WMSDs) and promote workers' physical and mental health. Reductions in

musculoskeletal pain, stress, and anxiety, as well as improvements in functional capacity and productivity, were reported across occupational settings. These practices stand out for being accessible, low-cost, adaptable, and safe. When combined with multicomponent strategies and institutional support, additional benefits are achieved. Future research should explore long-term effects and the effectiveness of integrated and personalized workplace exercise models.

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