

# ERGONOMICS

## AND OCCUPATIONAL HEALTH: PREVENTING INJURIES AND PROMOTING PHYSICAL HEALTH IN THE NURSING WORKPLACE

ERGONOMÍA Y SALUD OCUPACIONAL: PREVINIENDO LESIONES Y PROMOViendo LA SALUD FÍSICA EN EL TRABAJO DE ENFERMERÍA

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### ABSTRACT

This paper addresses the importance of ergonomic risks in nursing that impact the workplace, focusing primarily on repetitive tasks such as patient handling, awkward postures, and continuous movements that lead to musculoskeletal disorders and absenteeism from the workplace. Through a literature review and data collection from various descriptive studies, the impact of working conditions on the health of nurses is evaluated. The research focuses on identifying risks in different areas of nursing, analyzing worker interaction, tasks, equipment, and the environment to understand the causes of injuries. The results reflect a high incidence of musculoskeletal disorders among nursing staff, including those who perform patient handling and repetitive movements. Actions such as ergonomics education and the promotion of active breaks are also highlighted. The discussion highlights the need to integrate preventive measures, such as the need to incorporate ergonomic practices into work environments, not only to reduce injuries but also to improve the well-being of healthcare workers. Finally, it is concluded that implementing an ergonomics and occupational health approach is essential to protecting nursing workers. Implementing training programs, appropriate equipment, and adaptation are crucial to reducing risks and improving their well-being at work.

### Keywords:

Ergonomics, nursing, disorders, risks, well-being.

### RESUMEN

El presente trabajo aborda la importancia de los riesgos ergonómicos en enfermería que impactan en el ámbito laboral, enfocándose principalmente en las tareas repetitivas como la, movilización de los pacientes, posturas forzadas y movimientos continuos que derivan a trastornos músculo esqueléticos y ausentismos en los puestos de trabajo. A través de una revisión literaria y recopilación de datos de diversas investigaciones descriptivas, para evaluar el impacto de condiciones laborales en la salud de los enfermeros. El desarrollo de la investigación se centra en identificar riesgos en diferentes áreas de enfermería, analizando la interacción trabajadora, tarea, equipo y entorno, para comprender así las causas de las lesiones. Los resultados reflejan una alta incidencia de trastornos musculoesqueléticos en el personal de enfermería, en aquellos que realizan movilizaciones de pacientes y movimientos repetitivos, se destacan también las acciones tomadas como educación sobre ergonomía y la promoción de pausas activas. La discusión destaca la necesidad de integrar medidas preventivas como la necesidad de insertar practicas ergonómicas en los entornos del trabajo, no solo para reducir lesiones sino para mejorar el bienestar de los trabajadores de salud. Así finalmente se concluye implementando un enfoque ergonómico y salud ocupacional son esenciales para proteger a los trabajadores de enfermería, implementando programas de capacitación, equipos adecuados y adaptación es crucial para reducir riesgos y mejorar su bienestar laboral.

### Palabras clave:

Ergonomía, enfermería, trastornos, riesgos, bienestar.



## INTRODUCTION

Ergonomics and occupational health have become fundamental components in the promotion of safe and healthy work environments, particularly in professions that involve high physical and psychosocial demands, such as nursing. Theoretically, ergonomics has been defined as the study of individual behavior within the work environment, emphasizing the interactions between workers, their tasks, and the surrounding conditions. Over time, multiple investigations have expanded this definition to incorporate the assessment of various occupational risks, including physical, mechanical, chemical, biological, psychosocial, and environmental hazards. Among these, the evaluation and prevention of risks in healthcare settings, especially those inherent to nursing practice, have received considerable attention due to their direct impact on worker health and patient safety (Elizalde Ordoñez et al., 2024).

From a nursing perspective, the application of ergonomic principles involves three interrelated dimensions: the ergonomic design of workplaces, the organization of work processes, and the body positions adopted by professionals during patient care. Proper attention to these aspects can prevent injuries, reduce fatigue, and promote both physical and mental well-being. Ergonomic interventions in healthcare settings are therefore not only a matter of worker protection but also of ensuring quality care, minimizing errors, and optimizing productivity (Elizalde Ordoñez et al., 2024).

Globally, occupational risks continue to present significant challenges. According to the World Health Organization, in "several countries, more than half of workers lack protection, and there are no mechanisms for enforcing occupational health and safety standards. The risks with the greatest burden of disease were trauma, noise, and ergonomic risks" (Fierro Vasco et al., 2022). These findings highlight the urgent need to implement structured occupational health policies and ergonomic programs, particularly in professions such as nursing, where physical workload and psychosocial stressors converge.

In Ecuador, nursing professionals are exposed daily to multiple hazards that interact with their work routines in hospital environments. These occupational risks include repetitive lifting, patient transfers, prolonged standing, awkward postures, and exposure to potentially harmful substances or stressful situations. Such conditions increase the likelihood of work-related accidents, musculoskeletal disorders, and other health problems directly related to professional practice (Elizalde Ordoñez et al., 2024). The cumulative effect of these risk factors not only undermines the well-being of nurses but also has organizational implications, including increased absenteeism, reduced job satisfaction, and decreased overall efficiency in healthcare delivery.

Nursing staff face a demanding combination of physical, cognitive, and emotional requirements that makes them particularly vulnerable to ergonomic risks. The manual handling of patients sustained awkward postures during care, repetitive movements, and extended work hours contribute to the high prevalence of musculoskeletal disorders observed in this population. These conditions negatively affect not only the physical health of nurses but also their psychological well-being, highlighting the critical need for preventative interventions. Addressing these challenges requires a comprehensive approach that integrates ergonomic principles into hospital design, work organization, training programs, and policy implementation, creating safer and more sustainable work environments for healthcare professionals.

Thus, understanding and mitigating ergonomic risks in nursing is not merely a theoretical concern but a practical necessity for protecting the health of professionals, improving patient care, and promoting sustainable work practices. As healthcare systems continue to evolve, integrating occupational health and ergonomic strategies into nursing practice represents a critical investment in both human and institutional resources.

## DEVELOPMENT

Research in this area seeks to identify the main ergonomic risk factors present in different nursing settings. Interactions between workers, tasks, equipment, and the physical environment are analyzed to understand how they contribute to the development of injuries, especially neck pain, back pain, and shoulder pain in the upper and lower limbs.

Ergonomic risk refers to the probability of suffering an unwanted event at work, and among the most frequent associated factors are postural load, repetitive tasks, carrying weights, inadequate furniture, maintained postures, posture time, nursing is constituted as a fundamental pillar within the health team, therefore it is a job in which the human instrument is its main resource, absenteeism represents unscheduled absences from work due to absences and medical leaves, the causes that lead to absenteeism can be related to various factors and be classified into occupational disease, social, cultural and personality factors (Marín Vargas & González Argote, 2022).

Occupational risk management will be central. Occupational nurses must identify and assess occupational risks, implementing preventive strategies to minimize them. Occupational mental health will also gain importance, as occupational nurses can regain a crucial role in promoting employee mental health and well-being. Ergonomics and postural health will also be notable aspects, preventing posture-related injuries and providing recommendations on safe practices.

Empowering occupational nurses within occupational health teams is an important process to strengthen their

role as nurses and patients and contribute to promoting the health and well-being of workers. Here are some ways to empower yourself in this field: gain specialized knowledge, seek training and educational opportunities in occupational nursing, and stay up to date with new research, practices, and standards within occupational health (Alonso Jiménez, 2023).

The contribution made by Pesántez Calle et al. (2023), a large part of the nursing staff spends more than 4 hours walking and almost all of them come to manifest cervical or dorsolumbar symptoms; as well as in the feet and legs whose pain prevents them from performing their work adequately, considering that the majority highlight a high ergonomic risk. On the other hand, Agua Barre et al. (2023), point out musculoskeletal injuries and point out that in relation to risk factors there is a general consensus ensuring that lifting weight improperly causes injuries at the muscular, joint and even bone level, locating that the most frequent symptoms in Nursing staff in Ecuador reside in the joints, tendons, ligaments and bones.

Findings and data consistently show a high percentage of nurses who consider patient mobilization and transfer to be the highest-risk tasks. Improper postures maintained during work hours, along with prolonged periods and repetitive movements, are also determinants of change in the development of occupational pathologies. A high rate of pain and musculoskeletal injuries is observed among nursing staff, highlighting the urgency of addressing these issues.

Gualán Cartuche & Reinoso Avecillas (2023), highlight that musculoskeletal diseases are the most common in Nursing staff, who have a higher incidence of back pain and neurological problems due to the manual handling of patients; conditions at the lumbar level, ankles and feet, neck, back, knees, shoulders and wrists being these the most frequent areas with a high risk index for these professionals, including short-term mediation, these authors propose that the prevention of ergonomic risks can form greater harmony between the individual and their work, while Nursing professionals are of great benefit in this regard due to the risks to which they are exposed and those that are obsolete.

The results highlight the urgent need to implement preventive and corrective measures in nursing work environments. The lack of adequate ergonomics training, care overload, and insufficient technical resources, such as mobility aids, are important challenges to address. The discussion highlights the direct relationship between unfavorable ergonomic conditions and worker health.

## CONCLUSIONS

At the end of the systematic review of ergonomic risks linked to occupational health in nursing professionals in Ecuador, the risks of poor posture, inefficiency of adequate equipment for patient mobilization and high demand are considered, which generates a greater workload, thus making the insertion of educational programs and training for professionals the most accessible way to prevent these risks, this includes increasing physical activity with controlled exercises to reduce musculoskeletal conditions.

The implementation of effective ergonomics and occupational health is essential to protect nursing staff from injuries and promote their physical health and well-being. The implementation of ergonomic training and intervention programs that include the provision of appropriate equipment and adaptation to workstations, as well as the implementation of physical activity such as active breaks, is essential to reduce the incidence of musculoskeletal disorders and absenteeism in the workplace and improve the quality of work life of nursing staff.

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### **Conflicts of Interest:**

The author declares no conflicts of interest.

### **Author Contributions:**

Adriana Estefanía Pinta-Cacoango: Conceptualization, data curation, formal analysis, investigation, methodology, supervision, validation, visualization, writing – original draft, and writing, review, and editing.