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PROPOSAL OF ADAPTED PHYSICAL EXERCISES TO ALLEVIATE OCCUPATIONAL DISEASES SUFFERED BY COMPUTER WORKERS AT THE UNIVERSITY OF PHYSICAL CULTURE AND SPORTS SCIENCES (UCCFD): "MANUEL FAJARDO"

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Abstract: *The general objective of this work is to adapt to the context of the IT department at the University of Physical Culture and Sports Sciences (UCCFD): "Manuel Fajardo," contributing to the alleviation of occupational illnesses among its employees. To mitigate these problems, the study recommends proper work organization, ergonomic design of facilities and equipment, and adapted physical exercises to alleviate occupational illnesses in IT professionals. These exercises focus on strengthening and stretching the body areas most affected by prolonged computer use, as well as improving posture and reducing stress, thereby enhancing their quality of life and work performance.*

Key words: *occupational illnesses, IT, physical exercises.*

1. Introduction

The history of computing is fascinating and complex, intertwined with the technological and scientific advancements of the last few centuries. From its origins to the present day, computing has evolved exponentially, transforming every aspect of our lives. Its history and evolution continue at a breakneck pace. Topics such as artificial intelligence, machine learning, and augmented and virtual reality are defining the future of technology.

The evolution of work in the field of information technology and the increased use of computers have transformed not only how work tasks are performed, but also working conditions, communication, and productivity. As the intensive use of technology increases, concerns about occupational health also arise, leading to a stronger focus on ergonomics and employee well-being. Organizations are beginning to implement programs to mitigate the risk of occupational diseases.

Occupational diseases constitute a problem whose management is

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complicated by multiple determinants, and due to this complexity, it often remains invisible.

The International Labour Organization (ILO) has played a fundamental role in the identification and regulation of occupational diseases. Since its creation in 1919, ILO has promoted health and safety at work, developing standards and guidelines to protect workers [5].

The ILO was founded in 2003, and April 28th is designated World Day for Safety and Health at Work, an annual campaign to promote safe, healthy, and decent work. One of the ILO's key documents is the "Safety and Health for Workers Convention" (Convention No. 155), which establishes basic principles for the prevention of occupational hazards. ILO also publishes reports and statistics on occupational diseases, helping countries identify problems and develop effective strategies to address them. [6]

The World Health Organization (WHO) also plays a crucial role in the identification and management of occupational diseases globally [18].

Although its primary focus is public health in general, the WHO recognizes that working conditions can have a significant impact on workers' health.

The 2019 Constitution of the Republic of Cuba, in Article 69, stipulates that the State guarantees the right to safety and health at work through the adoption of appropriate measures for the prevention of accidents and occupational diseases.

Law 116/13, the Labor Code), [8] recognizes in Article 24 that occupational safety and health conditions must be agreed upon as part of the individual employment contract. It also establishes, in Chapters IV and V, special protection for women during pregnancy and maternity, as well as for young people between fifteen and eighteen years of age, with respect to whom Chapter XI outlines the obligations of workers and trade unions in fulfilling the objectives related to this issue.

Workers' health is a serious issue today, especially in sectors where exposure to adverse ergonomic conditions and occupational diseases is high. IT staff, mostly professionals who spend hours in front of a computer screen, are a clear example of a group vulnerable to various health problems.

Ergonomics education also plays a fundamental role in preventing illness among IT staff. Workers should be informed about the importance of proper furniture and equipment placement [16].

Additionally, it is important to promote healthy lifestyle habits both inside and outside the workplace. Regular physical activity, maintaining a balanced diet, and adequate hydration are factors that can prevent the deterioration of IT workers' health [7].

Occupational diseases in IT professionals represent a complex problem, the proper identification, prevention, and treatment of which are hampered by various workplace, organizational, and regulatory factors.

The difficulties in addressing these illnesses stem from several factors:

1. Multiple causes: occupational illnesses often have simultaneous work-related and non-work-related causes, complicating their diagnosis and prevention.
2. Clinical nonspecificity: many symptoms are not exclusive to an occupational illness, hindering clear identification.

3. Long latency periods: some illnesses take time to manifest, making it difficult to link them to work activity.
4. Inadequate ergonomic conditions: poor workspace design and insufficient breaks contribute to the development of injuries [4].
5. Lack of training and knowledge: both computer workers and students often have limited knowledge about these illnesses and their prevention.

To mitigate these problems, proper work organization, specific training, ergonomic design of facilities and equipment, and specialized physical exercise programs to strengthen affected muscles and prevent injuries are recommended [1], [2], [10].

In summary, the problem of occupational diseases in computer workers is complex due to the interaction of technical, organizational, clinical and educational factors that require a comprehensive and multidisciplinary approach for their prevention and effective management.

The history of the emergence of occupational diseases in Cuba reflects a continuous process of recognition, legislation, and preventive action.

Cuba officially recognizes 35 occupational diseases related to physical, chemical, biological, and ergonomic agents present in the workplace.

In Cuba, as in other countries, IT workers can face a range of occupational illnesses related to their work environment.

Although the IT sector in Cuba is still developing and may not be as large as in other places, the health problems associated with computer work are significant. The most common illnesses that can affect IT professionals in Cuba are:

1. Musculoskeletal Disorders (MSDs): These include conditions such as:
   - ✓ Carpal tunnel syndrome.
   - ✓ Tendinitis.
   - ✓ Lower back pain.
2. Eye Strain.
3. Work-related stress and burnout.
4. Psychological problems.
5. Problems related to sedentary behavior.
6. Sleep disorders.
7. Repetitive strain injuries (RSIs).
8. Respiratory problems.

To mitigate these risks, it is important that both employers and employees adopt preventive measures, such as proper ergonomics in the workplace, regular breaks for stretching, and good time management to avoid burnout.

Problem Situation: In our institution, the benefits of physical activity and the negative influence of sedentary behavior and inactivity are well-known, but there is a lack of attention to occupational illnesses among IT workers. While this has a theoretical basis, the workers do not recognize it as a necessity for promoting health and improving quality of life, given their limited knowledge on the subject.

Scientific Problem: How can physical exercise alleviate the occupational illnesses suffered by IT workers at the University of Physical Culture and Sports Sciences (UCCFD): “Manuel Fajardo”?

Objectives: To adapt physical exercises to the context of the IT department at the University of Physical Culture and Sports Sciences (UCCFD): “Manuel Fajardo” that contribute to alleviating the occupational illnesses of its workers.

2. Material and Methods

The diagnosis of occupational diseases allows for the development of prevention strategies, contributing to improved health, quality of life, and work performance, by integrating Cuban scientific expertise and the institution's training potential. The development of physical exercises adapted to the context of the computerization department at the University of Physical Culture and Sports Sciences (UCCFD), aimed at alleviating occupational diseases among workers, is a proposal that strengthens the theoretical foundations of occupational disease prevention and improves the quality of life of IT workers.

2.1. The Scientific Methods used for the research were:

Theoretical Level

- ✓ Historical-Logical: To delve into the history and emergence of the problematic situation and the scientific problem.
- ✓ Analytical-Synthetic: To understand the elements of the problem's nature, allowing for a deeper understanding of the theoretical components and the processing of the results obtained from the application of the research instruments.
- ✓ Inductive-Deductive: This approach combines the movement from the specific to the general, enabling generalizations, with the movement from the general to the specific.

Empirical Level

Documentary Analysis: This was used to compile the main theoretical and methodological foundations related to occupational diseases that can affect IT personnel, ways to prevent them, and the physical, prophylactic, and educational potential of physical activity. [9], [11], [12].

- ✓ **Unstructured Observation**: This allowed us to identify existing risks in the work environment that can generate visual fatigue and musculoskeletal disorders.
- ✓ **Survey:** This allowed us to assess the knowledge of IT workers that can lead to occupational diseases. It also revealed the occupational diseases they suffer from, as well as the correct postures they should adopt when working at computers.

The statistical-mathematical method used was percentage calculation to quantitatively process the data obtained from the survey.

POPULATION AND SAMPLE: The population and sample coincide, being 100% of the computer workers at the UCCFD to whom the survey was applied.

3. Results and Discussions

At the University of Physical Culture and Sports Sciences (UCCFD): "Manuel Fajardo," the IT area is structured as follows:

- ✓ IT Directorate: 1 Specialist "B" in IT.
- ✓ Technological Management Department:
  - 1 Specialist "B" in IT
  - 8 IT Technicians

An exploratory study was conducted with the diagnostic intention of understanding:

- ✓ Working Conditions
- ✓ Symptoms presented by IT staff in the last 6 months.
- ✓ Identified Risk Factors

- ✓ Knowledge and Prevention

Observation Results: Through unstructured observation carried out on several occasions in the IT area, it was perceived that there are risks in the work environment that can mainly generate visual fatigue and musculoskeletal disorders. It should be noted that the furniture where the workers are located does not meet all the necessary conditions for the tasks they perform, which require them to spend long hours in front of computers.

- ✓ Small chairs.
- ✓ Tables in poor condition.
- ✓ Limited workspace.
- ✓ Inadequate lighting.
- ✓ Inadequate technology.

1. Job Conditions

100% of the workers report that they lack ergonomic furniture.

100% report that they take active breaks or regular rest periods during the workday.

2. Indicate if you have experienced any of the following symptoms in the last 6 months:

The main symptoms experienced in the last 6 months are related to back pain (60%), neck and shoulder pain (70%), eye strain (70%), frequent headaches (60%), anxiety or work-related stress (70%), and a sedentary lifestyle (60%). They also report other illnesses they suffer from, such as: Asthma (20%), High blood pressure (10%), Diabetes (10%), and Scoliosis (10%).

3. Identified Risk Factors

The main risk factors are associated with performing repetitive hand and wrist movements and maintaining static postures for prolonged periods (100%). Additionally, they consider the work pace to be high (60%) and feel pressured to meet tight deadlines or goals (70%).

4. Knowledge and Prevention

60% of IT workers are unaware of the health risks associated with prolonged computer use, 100% have not received any training courses in ergonomics or prevention of occupational diseases, nor do they apply preventive measures such as exercises and furniture adjustment, although they do take active breaks, 70% believe that the entity does not promote the prevention of occupational risks.

3.1. Adapted physical exercises to help alleviate occupational illnesses in IT workers

The most effective physical exercises for alleviating and/or preventing occupational illnesses in IT professionals focus on strengthening and stretching the body areas most affected by prolonged computer work, as well as improving posture and reducing stress [3], [15], [17].

These physical exercises, along with education on ergonomics and healthy habits, effectively contribute to alleviating and/or preventing musculoskeletal injuries, eye strain, and other common problems in IT professionals, improving their quality of life and work performance.

To adapt physical exercises aimed at alleviating occupational illnesses suffered by IT workers, it is essential to follow a methodology that considers the characteristics of the work and individual needs [14].

Steps to design physical exercises for occupational health.

1. ***Initial diagnosis***

Evaluate current health conditions and occupational risks. This includes identifying the most common

musculoskeletal ailments, levels of physical activity, postural habits, and work-related stress factors.

2. ***Defining Clear and Measurable Objectives***

Establish specific, achievable goals with a defined timeframe. Objectives should be aligned with the prevention of musculoskeletal disorders and the improvement of overall well-being.

3. ***Designing Physical Exercises***

- ✓ Hand and Finger Exercises: Mobilizations and stretches to prevent tendinitis and carpal tunnel syndrome, such as opening and closing the hands, finger stretches, and wrist rotations.
- ✓ Arm and Shoulder Exercises: Shoulder rotations, raises, and stretches to prevent bursitis and muscle contractures, strengthening the muscles used during typing and mouse use.
- ✓ Neck and Back Exercises: Cervical stretches, lateral flexions, and gentle rotations to relieve tension and prevent neck and lower back pain. Exercise to correct posture are also recommended, keeping the spine aligned in front of the computer.
- ✓ Frequent active breaks during the day to avoid stiffness and fatigue: Taking short breaks every 30 minutes to perform these exercises helps reduce muscle and eye fatigue, promoting circulation and decreasing accumulated stress [13].
- ✓

4. ***Implementation and Resources***

Define appropriate schedules and spaces for carrying out activities without interfering with work tasks.

5. ***Fostering a Culture of Well-being***

Promote active participation and mutual support among colleagues to maintain motivation.

This approach can be effective in alleviating and/or preventing musculoskeletal disorders and improving overall health in work environments, optimizing productivity and reducing absenteeism.

4. Conclusions

Work in the IT sector has grown significantly in recent years, leading to an increase in the number of people spending long hours in front of a computer. This prolonged exposure to screens and digital devices can cause physical and mental health problems in IT workers, making it necessary to implement physical exercises to alleviate and/or prevent occupational illnesses in this sector.

The assessment revealed that the furniture where work is done does not meet all the necessary conditions for the work performed by employees, who must spend long hours in front of computers, leading to discomfort and occupational illnesses. The most frequent symptoms among IT workers are musculoskeletal disorders (back, neck, and shoulder pain), as well as eye strain, frequent headaches, anxiety or work-related stress, and a sedentary lifestyle. Furthermore, these workers are unaware of the health risks associated with prolonged computer use, have not received any training in ergonomics or occupational health and safety, and do not implement preventive measures such as exercises and furniture adjustments, although they do take active breaks.

To mitigate these problems, the IT Department of the University of Physical Culture and Sports Sciences (UCCFD) recommends proper work organization, ergonomic design of facilities and equipment, and physical exercises adapted to the context of the IT sector. These exercises focus on strengthening and stretching the body areas most affected by prolonged computer use, as well as improving posture and reducing stress, thereby improving their quality of life and work performance.

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