

**Occupational risks faced by healthcare workers in the absence of
ergonomic applications:
An exploratory study at the Djilali Bounaama University Hospital
Center in Douéra**

المخاطر المهنية التي يواجهها عمال القطاع الصحي في ظل غياب تطبيقات الأرغونوميا
دراسة استكشافية بالمركز الإستشفائي الجامعي جيلالي بونعاما بالدويرة

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Received: 14/11/2024 Accepted: 14/01/2025 Published:01/02/2025

Abstract

This study aims to understand the role of ergonomics in achieving safety and public security in the healthcare work environment, and to identify indicators with a direct impact on the behavior of personnel exposed to various occupational hazards, whether biological, physical, psychological, or social.

In this context, our study focuses on the reality of occupational risks in the healthcare sector amidst the lack of ergonomic applications. Through an exploratory study, we attempt to examine the reality of these risks in the high-risk healthcare environment, where the absence of ergonomics applications, which aim to adapt the work environment for humans to enhance comfort and performance, may exacerbate these risks.

To achieve the objectives of this study, a descriptive method was used to explore the state of occupational risks in the healthcare environment. A sample of 70 paramedical staff members from the Douéra University Hospital Center was selected, and data was collected using interviews. The study concluded that ergonomics plays an important role in reducing and controlling occupational hazards and preventing injuries and accidents related to medical equipment, physical conditions, and the nature of work.

Keywords: Occupational hazards - Ergonomics - Work environment - Occupational health and safety.

ملخص

تهدف هذه الدراسة الى معرفة دور علم الارغوتوميا لتحقيق السلامة والأمن العام في بيئة العمل الاستشفائية، واكتشاف المؤشرات ذات الأثر المباشر على سلوك العنصر البشري المحاط بالعديد من المخاطر المهنية سواء كانت بيولوجية، فيزيقية، نفسية أو اجتماعية. في سياق ما تقدم فإن دراستنا هذه تتمحور حول واقع المخاطر المهنية في القطاع الصحي في ظل غياب تطبيقات الارغوتوميا، من خلال دراسة استكشافية نحاول فيها تقصي واقع هذه المخاطر في البيئة الاستشفائية المحفوفة بالمخاطر، وقد يزيد من حدتها غياب تطبيقات الارغوتوميا التي تسعى الى تكييف بيئة العمل للإنسان لجعله أكثر راحة لتقديم أفضل أداء.. ولتحقيق أهداف هذه الدراسة تم استخدام المنهج الوصفي لمحاولة الكشف عن واقع المخاطر المهنية في البيئة الاستشفائية، حيث تم الاعتماد على عينة قصدية شملت 70 شبه طبي بالمركز الاستشفائي الجامعي بالدويرة. واعتمدنا على تقنية المقابلة لجمع المعلومات.وقد خلصت الدراسة عن أهمية ودور علم الأرغوتوميا في التقليل والتحكم في المخاطر المهنية ومنع الإصابات والحوادث بما يتعلق بالمعدات الطبية، والظروف الفيزيكية وطبيعة العمل.

الكلمات المفتاحية: المخاطر المهنية -علم الارغوتوميا -بيئة العمل -الصحة والسلامة المهنية.

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1. Introduction

The human element is the true wealth and the central axis for achieving an organization's goals. Therefore, it has become essential to focus on it, especially with the immense changes organizations face and the profound transformations in all their aspects and structures. With the rapid development witnessed globally, organizations are compelled to adapt to these changes to ensure their survival and continuity. An organization cannot remain stagnant in its structure and organization if it wishes to continue developing its environment and remain competitive (Martary(B)Crozet(D), 1988) This can be achieved through several key conditions, the most important of which is providing a suitable work

Occupational risks faced by healthcare workers in the absence of ergonomic applications

environment. However, many organizational problems stem from an inadequate work environment.

Healthcare institutions are among the organizations that have faced numerous challenges in the modern era. As service-oriented institutions directly related to the health of citizens, they provide nursing and therapeutic services, in addition to being centers for medical care and sources of medical expertise, which ensure proper patient care and expedite recovery. Therefore, health has become a fundamental pillar of development in societies, and achieving quality and effectiveness has become a necessary requirement. Providing quality services is directly dependent on the awareness of the systems and management practices adopted, the hierarchical organizational environment on one hand, and the quality of the human resources making up the socio-professional categories working in the hospital on the other hand. Moreover, the provision of such services depends on the quality of social relationships, as well as the prevailing physical working conditions in the workplace, including lighting, ventilation, cleanliness, and work-related hazards.

Since hospitals, like other institutions, differ primarily in the type of services they provide, the individual or worker remains the common element between them, without whom no institution can function or progress. The nurse is a crucial and effective element within the healthcare institution, as he directly interact with the patient (Khiati(M), Nursing guide, 1994, p. 75) and is responsible for providing therapeutic services. Therefore, it is the hospital's responsibility to provide a suitable, motivating, and safe work environment for all nurses to achieve good performance, job satisfaction, and reduce risks, accidents, and work-related injuries.

It is worth noting that the healthcare workers more exposed to occupational risks, which threaten his life due to the potential for infections, workplace accidents, or even death. This is why many healthcare institutions are keen to provide a safe and appropriate work environment that motivates employees, ensuring positive effects on them, which in turn contributes to job satisfaction and improved performance. It is the duty of any

Sahraoui karima, Herairia Atika

organization to adapt the environment to the characteristics, needs, and requirements of the workers to perform their roles effectively, so they experience a sense of comfort in their working environment (Enasr(M), 2020, p. 120) in Algeria, despite the existence of legal provisions aimed at protecting workers from occupational risks, such as Law 13/83 issued on 2/7/1983 concerning workplace accidents and Law 07/88 issued on 26/01/1988 concerning health and safety at work, workers continue to face various occupational risks.

Accordingly, the scientific approach to this research will begin by formulating the main question, which represents the central issue of this study: What is the reality of occupational risks in the healthcare environment?

Hence, the following sub-questions are raised:

- What are the types of occupational risks within the healthcare environment?
- What mechanisms and methods can be used to address occupational risks in the healthcare environment?
- How do paramedics deal with occupational risks?
- How do ergonomic applications contribute to reducing or mitigating occupational risks?
- Do paramedics follow safety procedures to prevent occupational hazards?

2. Key Concepts:

2.1. Occupational Risks: These are conditions that lead to accidents, equipment or machinery failures, destruction of buildings, loss of materials, or disruption in the execution of tasks or work within an organization (Ghafar, 2000, p. 151) They refer to the potential harm to an individual resulting from the presence of a risk that could affect human, material, environmental, and natural resources.

In the healthcare environment, occupational risks encompass various chemical, biological, physical, ergonomic, psychological, and social risks that the healthcare worker is exposed to, which may lead to harm to his physical and mental health and affect his performance and job satisfaction.

Occupational risks faced by healthcare workers in the absence of ergonomic applications

2.2. Work Environment: Refers to all internal and external variables that influence the effectiveness and efficiency of job performance.

It encompasses all factors surrounding the healthcare environment, both internal and external, that affect workers' behavior or performance, such as the authority type, supervision methods, job nature, physical factors, communication, and incentive systems (Alhabib(W), 2020, p. 86)

2.3. Health and occupational safety: Refers to the worker's sense of security and safety in the work environment. Health and occupational safety are directly related to providing a safe working environment. (Tahoun, 2008, p. 18)

Therefore, health and occupational safety in the healthcare environment refer to the absence of harm or injury while performing work tasks, which may affect the worker's well-being and health.

2.4 Ergonomics: Is the study of the quantity and quality of work aimed at improving working conditions and enhancing productivity within an organization. It also focuses on studying the relationships between the worker, their job position, and their perception of the profession, all within varying working conditions, and also the interactions between these various components.

In essence, ergonomics is the science concerned with adapting the work environment and its conditions (physical, organizational, technical...) to ensure the comfort and safety of healthcare workers in hospitals.

3. Importance of the Study:

- The importance of this study lies in focusing on human resources (paramedics) and identifying the occupational risks in the healthcare environment that may impede their work and the serious impacts they may have on their physical and psychological well-being.
- The study's importance also stems from the critical role of the healthcare sector, which is one of the key fields working to find the best strategies to achieve the highest quality healthcare services.
- This study derives its importance from the significance of applying ergonomics within hospitals to maintain the health and safety of human resources.

4.Objectives of the Study:

Sahraoui karima, Herairia Atika

- To identify the types of occupational risks in the healthcare environment.
- To explore the mechanisms for addressing occupational risks.
- To assess the extent to which management adheres to international standards for occupational risk management.
- To determine the extent to which employees comply with safety procedures to prevent occupational risks.
- To investigate how the application of ergonomics contributes to reducing occupational risks.

5. Objectives of ergonomics: The objectives of ergonomics include. (Herairia, 2022)

- Adapting the work environment to meet the needs and capabilities of workers to ensure comfort and safety.
- Helping workers adapt to technological changes, especially technical and skill-based advancements.
- Designing machinery and tools and adapting them to the physical capabilities of workers.
- Studying physical conditions and attempting to optimize them to work in environments that help reduce fatigue.
- Designing workspaces effectively.
- Protecting workers' health by preventing occupational risks (reducing fatigue resulting from muscular and joint strain, and providing suitable working conditions) to minimize human energy consumption.
- Searching for the best methods to perform tasks.
- Improving the worker's performance by increasing speed, accuracy, and safety.
- Reducing workplace accidents caused by human errors.
- Identifying occupational diseases, especially chronic ones resulting from the practice of certain professions.
- Improving worker satisfaction indicators.

6. Types of occupational risks in the healthcare environment: (Al-Amri, 2000)

- **Physical risks:** These refer to all aspects of the physical work environment (e.g., temperature, humidity, ventilation, noise, radiation, etc), as any exposure to these factors at levels above the standards set by the

Occupational risks faced by healthcare workers in the absence of ergonomic applications

International Labor Organization (ILO) and the World Health Organization (WHO) can threaten the worker's health in the healthcare setting.

- **Mechanical risks:** These involve the interaction between the human body and solid objects, such as falling to the ground that typically occurs during movement (Madjid, 2003, p. 65)

- . - **Biological risks:** These risks arise from the entry of various viruses and parasites into the human body.

- **Chemical risks:** These involve chemicals (e.g., vapors, toxic gases, dust, pesticides, cleaning agents) inhaled or in contact with the skin, leading to a range of health issues such as allergies, asthma, and certain cancers.

- **Routine risks:** These arise from uncomfortable chairs, vibrations, and repetitive lifting of loads by workers. This type of risk often manifests over the long term.

7. Fieldwork Aspect:

7.1- Study Method: The descriptive method was used as it is the most suitable for the nature of the topic. Occupational risks and ergonomics applications were described from the existing literature. The data collected from the study sample were analyzed to assess the impact of the absence of ergonomics applications on the spread of occupational risks in the healthcare environment.

7.2 Study Scope:

- **Spatial Scope:** This refers to the geographical area that includes the research community defined by the researcher to conduct the study. In this case, the Djillali Bounaama University Hospital Center in Douéra was chosen to conduct the field study.

- **Temporal Scope:** This refers to the period during which the field study was conducted to collect data. The data collection phase lasted approximately 15 days, during which interviews were conducted with paramedics across various hospital departments.

- **Study Sample:** To achieve the research objectives, a purposive sample was selected, consisting of 70 paramedics distributed across various hospital departments.

Sahraoui karima, Herairia Atika

- Techniques Used: The interview method was used as a tool, which adheres to practical conditions aimed at obtaining data. It is the optimal method for interviewing respondents.

8.Data:

Through the study we conducted, and in compliance with all scientific procedures and regulations, and through interviewing the respondents, we obtained a set of data that supports our research. The gathered data is shown in the following table:

Table (1): Data Obtained from Interviewing the Respondents

Numb er	Data	Answer	
		Yes	No
Personal data			
1	Gender.....		
2	Professiona.....		
3	Rank.....		
4	Seniority.....		
5	Department name.....		
Reality of occupational risks in the hospital			
6	What are the types of occupational risks present in the hospital?		
	A. Physical risks	53	17
	B. Mechanical risks	20	50
	C. Biological risks	55	15
	D. Chemical risks	61	9
	E. Routine risks	10	60
	F. Pshychological risks	23	77
	G. Social risks	59	11
7	Does the department you work in constitute a source of risk? Why?	52	18

Occupational risks faced by healthcare workers in the absence of ergonomic applications

8	Have you been exposed to workplace accidents?	54	16
	If yes, what type?		
9	On what basis is the risk determined?		
	A. Risk level	62	
	B. Likelihood of occurrence	2	
	C. Potential Damage	6	
10	If you are exposed to a risk, do you resort to:		
	A. Management	9	
	B. Direct supervisor	61	
11	Does the hospital have a dedicated department for managing occupational risks?	5	65
12	Does the safety officer conduct periodic and regular inspections of departments to protect workers from occupational risks?	10	60
Reality of ergonomics application in the healthcare sector			
13	Define the concept of ergonomics:		
14	Does the hospital management care about providing a safe and risk-free environment?		
15	Does the hospital management care about maintaining the health of the workers by :		
Ergonomic design of the physical environment			
16	Are the physical conditions motivating for work?	10	60
17	Do the working conditions meet the occupational safety requirements?	11	59
	If no, why?		

Sahraoui karima, Herairia Atika

18			
	Is the physical work environment suitable regarding:		
	A. Lighting	19	51
	B. Ventilation	20	50
	C. Noise	21	49
	D. Cleanliness	62	8
	E. Temperature and humidity	53	17
	19	Do the inadequate physical conditions of work contribute to your exposure to:	
A. Occupational accidents		50	20
B. Illnesses		55	5
Ergonomic design of the nature of the work			
20	Do the nature of the work and the nursing tasks cause:		
	A. Physical exhaustion	0	0
	B. Mental exhaustion	0	0
	C. Both	45	25
	D. Not attributed	0	0
21	Does the large number of patients in the hospital lead to:		
	A. Fatigue	60	10
	B. Frequent movement and mobility between departments	62	8
22	Does the nature of the work depend on:		
	A. Effort	65	5
	B. The physical build of the nurse	41	29
23	Does the nature of the work in the hospital expose you to occupational risks?	62	8
	If, yes. Why?		
			
Ergonomic design of hospital equipment and supplies			
24	Does the department have modern hospital equipment and supplies?	35	25
25	Does the management conduct periodic and regular maintenance of the hospital equipment and supplies?	25	45
26	Have you benefited from training for the optimal use of hospital equipment and supplies?	30	40

Occupational risks faced by healthcare workers in the absence of ergonomic applications

27	Are hospital equipment and supplies a source of risk? If yes. Why?	30	40
28	Are occupational safety procedures applied to prevent accidents?	20	50
29	Does the management conduct campaigns to raise nurses' awareness regarding occupational risks?	21	49
30	What are your suggestions to avoid professional accidents?		
31	Do ergonomics applications help in preventing accidents?	9	
32	No answer ¹	61	

Source: Prepared by the researcher

9. Based on the results obtained, the following conclusions can be drawn:

- The most significant occupational risks to which nurses are exposed include biological, chemical, physical, and social risks, with routine and psychological risks being less frequent than the others.

The paramedical worker is not required to follow safety measures to prevent risks resulting from using chemicals (such as disinfectants and pesticides) that come into contact with the skin and which may lead to skin diseases or allergies, as well as biological risks that may affect the healthcare worker due to being affected by viruses and bacteria, and which could be fatal if proper precautions are not followed. In addition to mechanical risks such as falls, and social risks such as verbal and physical violence, that occurs especially in the emergency department, given the high frequency and number of patients and their companions visiting daily. The paramedical worker is daily exposed to various risks, and the management does not work toward providing a safe and risk-free environment.

- More than half of the study sample admitted that they had been exposed to workplace accidents, most notably needle-stick injuries and infectious diseases, especially workers in laboratories, pediatrics and obstetrics

Sahraoui karima, Herairia Atika

departments, which receive a high influx of patients daily. These accidents occur due to the failure to follow strict safety protocols and improper use of equipment and medical procedures.

- Most of the respondents agreed that there is a dedicated department for managing occupational risks, but it does not play its necessary role. The safety officer rarely conducts periodic and regular inspections of the departments; therefore, occupational risks are not effectively addressed to ensure the safety of hospital workers.

- The concept of ergonomics is foreign to the paramedical workers, as they do not understand its meaning. This is due to the absence of an ergonomics culture among the workers and their ignorance of the role it plays in improving the worker's life quality and providing suitable working conditions in the work environment.

- Most of the respondents have acknowledged that the physical conditions with regard to lighting, ventilation, noise, temperature, and humidity were appropriate. Dissatisfaction was expressed by paramedical workers regarding cleanliness, particularly within the departments of rheumatology, orthopedic emergencies, and obstetrics and gynecology. Complaints were also raised regarding the disregard for cleanliness procedures, especially the improper disposal of medical waste, which constitutes a major threat to the health and safety of hospital workers, particularly paramedical workers. Therefore, cleanliness within the healthcare environment must be treated with the utmost caution to prevent the transmission of infections through the proper disposal of medical waste.

- The nature of work in the hospital and nursing tasks causes physical and mental exhaustion, as acknowledged by most of the sample respondents, due to fatigue and frequent movement between departments, which requires a significant effort to provide nursing tasks and healthcare. Workers (paramedics) are more exposed to professional pressure and stress, imposed by the nature of the tasks they are required to fulfill, which may lead to making errors due to a lack of focus, thus exposing them to potential occupational risks.

- It is clear from the respondents' answers that there is a significant shortage in medical equipment and devices necessary for working in the healthcare sector, which remains unable to meet the growing demand for healthcare services (lack of ultrasound, scanners, MRI) in most of the

Occupational risks faced by healthcare workers in the absence of ergonomic applications

hospital departments. We conclude that the lack of equipment and supplies hinders the accurate and efficient performance of the work, as the conditions are neither suitable nor supportive for optimal job performance, particularly in departments where pressure abounds.

–Through the respondents’ answers regarding the application of occupational safety and preventive procedures, the lack of awareness among them about the dangers of not strictly adhering to these procedures and the harm this can cause to mental and physical health is revealed.

–We also concluded that there is a lack of awareness campaigns aimed at educating workers on the necessity of adhering to safety procedures, such as using protective gloves and masks to prevent infections and the exposure of the nurses to contaminated substances.

–The absence of ergonomics applications in the healthcare environment and the absence of awareness of the necessity to apply this science to mitigate or reduce occupational risks is due to workers not fully understanding its benefits. The most important of which are preventing work-related accidents and illnesses, as well as ensuring comfort and safety in the workplace, which exposes healthcare workers to a range of occupational risks, including infections, unsafe patient care, hazardous chemicals, radiation, heat, noise, psychological and social risks, violence, harassment, injuries, and the lack of access to water, sanitation and adequate cleanliness.

10.Conclusion

Working in a hospital entails numerous risks that can lead to disturbances in both the mental and physical health of human resources. The healthcare sector is considered one of the most sectors exposed to occupational risks, as it provides a fertile environment for the spread of many of them, whether biological, chemical, physical, etc.

Since the healthcare sector is responsible for ensuring occupational safety and security for the workers, it is essential to support it with all necessary means and resources to build a safe and secure healthcare system.

Through our study, we find that ergonomics plays an important role in improving the quality of life for the healthcare worker, as it aims to modify the work environment and practices to prevent injuries before they occur. Therefore, relying on ergonomic principles can be effective due to its numerous advantages, the most important of which are reducing occupational risks, improving work

Sahraoui karima, Herairia Atika

performance, and ensuring the availability of various work requirements; material, human, or design-related.

11. Recommendations

Based on the results obtained from the study, the recommendations are as follows:

- Form specialized committees that periodically focus on the healthcare worker and adapt the work environment to support the performance of tasks in a safe environment.
- Monitor all work sites and ensure the analysis of potential risks that could lead to future accidents.
- Enhance the culture of ergonomics prevention and strive to organize lectures and forums to raise awareness about this field.
- Conduct periodic evaluations of the healthcare environment and implement appropriate preventive measures to address occupational risks.
- Intensify efforts and carry out research and studies on occupational risks, suggesting possible solutions through the application of ergonomics.

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