

Human Resource Management from the Perspective of Ergonomical Requirements at the Workplace

Ionela Stanca Petruta
Denisa Mihaela Şulă
Liliana Nicolae Ştefan

University of Craiova, Faculty of Economics and Business Administration
stancaionela94@yahoo.com
denisamihaelas@yahoo.com
lili.stefan@yahoo.com

Abstract

This paper investigates the crucial role of human resource management within the scope of ergonomic workplace requirements and its effect on the well-being of employees and organizational output. When organizations embed ergonomics within their human resource management strategies, they stand to bolster job satisfaction, productivity, and overall employee health. Managing personnel in the workplace hinges significantly on human resource management, where the integration of ergonomic principles is essential to crafting an optimal work environment. The article emphasizes the necessity of human resource management in light of ergonomic needs and probes into the benefits arising from such a symbiotic approach. This research aims to comprehensively analyze the ergonomic aspects encountered in a variety of work environments, considering human resource management. This involves the investigation and deep understanding of the interaction between human factors and work environments, without being limited to a specific sector of the economy.

Key words: ergonomics, workplace, workload, management, human resources

J.E.L. classification: M11

1. Introduction

Human resource management is a vital component of managing people at work, with the main objective of ensuring a qualified, motivated and efficient workforce. In today's context, where employees spend more and more time at work, aspects related to their comfort, safety and well-being are becoming increasingly important. Thus, the integration of ergonomic requirements in human resources management becomes essential to create a healthy and productive work environment. Ergonomics is an interdisciplinary science that focuses on the relationship between man and his work environment. It focuses on adapting the workplace to the characteristics and needs of employees, in order to maximize their comfort, safety and efficiency. Ergonomic requirements in the workplace include aspects such as ergonomic design of the work space, correct use of equipment and tools, adequate lighting, temperature control and organization of the work space. Since employees spend an average of about a third of their lives at work, the conditions in which they perform their activities have a significant impact on their health, satisfaction and performance. A poor work environment can lead to health problems such as musculoskeletal disorders, fatigue, stress and decreased productivity. Therefore, human resource management must integrate ergonomic requirements to ensure that the workplace is adapted to the needs and capabilities of employees.

Approaching the management of human resources from the perspective of ergonomic requirements involves the implementation of strategies and practices that promote an ergonomic work environment. Regular assessment of ergonomic requirements enables the identification and resolution of ergonomic issues, while appropriate recruitment and selection ensures that employees are matched to the physical and ergonomic requirements of the job. Also, by providing training and

ergonomics training, employees are educated about good ergonomic practices and ways to prevent work-related ailments. Promoting a health and safety culture in the workplace is also an important aspect in human resource management based on ergonomic requirements. By implementing policies and programs that promote employee health and safety, including aspects related to ergonomics, organizations demonstrate their commitment to employee well-being. This may include facilitating access to ergonomic equipment and furniture, promoting regular breaks and exercise, and implementing stress management and posture improvement programs. To be successful in implementing this type of management, it is important that organizations pay special attention to ergonomic aspects in their recruitment, selection and training processes. Identifying candidates who fit the physical and ergonomic requirements of the job, as well as providing appropriate training and ergonomics training, are key to developing an ergonomically aware and prepared workforce.

Communication and employee engagement are also critical to successful implementation. Organizations should create an environment where employees feel comfortable giving feedback, sharing problems, and contributing ideas to improve working conditions. By creating an open dialogue and actively involving employees in the decision-making process, organizations can benefit from multiple perspectives and identify effective solutions for improving workplace ergonomics. Employee communication and involvement is another crucial aspect in approaching human resource management from the perspective of ergonomic requirements. Creating a work environment where employees feel free to provide feedback and suggestions on ergonomic aspects, as well as their active involvement in the process of improving working conditions, are key elements. Employees should be encouraged to participate in discussions and offer suggestions for improving ergonomics, as they are the ones who directly interact with the work environment and can bring valuable insights. By implementing these human resource management strategies based on ergonomic requirements, organizations can achieve a number of significant benefits. These include improving employee satisfaction and engagement, reducing absenteeism and staff turnover, increasing productivity and quality of work, reducing workplace accidents and health problems, as well as increasing the organization's reputation as an employer concerned with employee well-being.

By examining in detail ergonomic aspects in different work environments, this research aims to highlight the importance of human resource management in ensuring a healthy, safe and productive work environment. It will explore how ergonomic requirements can be integrated into staff recruitment, selection and training processes, the implementation of health and safety policies, and the promotion of an organizational culture focused on employee well-being.

The study will be carried out on different fields and sectors of activity, with the aim of obtaining a comprehensive perspective on ergonomic aspects in various working environments. This includes, but is not limited to, industries such as manufacturing, services, healthcare, IT, construction and more. By examining the diversity of work environments, how ergonomic requirements are applied and integrated into human resource management practices in these areas will be identified and analyzed. Through this study, a significant contribution will be made to the understanding of the importance of ergonomic aspects in human resource management. The results obtained will provide valuable guidelines and recommendations for organizations regarding the improvement of workplace ergonomics, both in terms of employee health and safety, and in terms of increasing performance and productivity. Hence, this study serves as a valuable addition to the disciplines of human resource management and ergonomics, offering an in-depth exploration of ergonomic elements across diverse work settings and showcasing strategies for their effective incorporation and management. By fostering a profound comprehension of this intricate interplay between human resource management and ergonomics, organizations can foster work environments that are healthier, safer, and more efficient for employees, consequently contributing to their sustained success.

2. Literature review

Research and investigations in the realm of human resource management and ergonomics have proven that embedding ergonomic requisites within human resource management techniques can yield manifold organizational and personal gains.

A significant advantage of human resource management grounded in ergonomic demands is the enhancement of employee satisfaction and dedication. When employees feel comfortable and safe at work, they become more motivated and engaged in their activities. This can lead to an increase in loyalty to the organization, a decrease in turnover and a strengthening of the organizational culture (Pausch, 2017).

Reducing absenteeism and staff turnover is another significant benefit. Employees who work in an ergonomic and comfortable environment are less prone to accidents and developing work-related health problems. Absenteeism related to musculoskeletal disorders and other health problems can therefore be significantly reduced, ensuring business continuity and minimizing costs associated with absenteeism and staff turnover (Rusu, 2001).

Increasing productivity and quality of work is an important goal of any organization. Good workplace ergonomics can help improve employee performance and efficiency. By eliminating the physical discomfort and fatigue caused by an inadequate work environment, employees can work more efficiently and deliver higher quality results.

Another consequence of human resource management based on ergonomic requirements is the reduction of accidents and health problems at work. By identifying and correcting ergonomic risk factors, accidents such as falls, bumps or sprains can be prevented, as well as musculoskeletal conditions such as carpal tunnel syndrome or back pain. This protects not only the employees, but also the organization from potential compensation and litigation costs (Lehmann, 2018).

In addition, human resource management oriented to ergonomic requirements can contribute to improving the image of the organization. By promoting the health and safety of employees and creating a friendly and healthy work environment, the organization becomes known as an employer concerned with the well-being and development of employees. This can attract talent and increase appeal to potential employees. Also, a positive image in terms of human resource management and ergonomics can strengthen relationships with customers, business partners and other stakeholders, thus enhancing the reputation and long-term success of the organization (Brangier, 2019).

To successfully implement human resource management based on ergonomic requirements, it is important that organizations follow certain steps and adopt specific strategies. First of all, the assessment of ergonomic requirements must be a regular and systematic process, through which ergonomic risk factors are identified and assessed in the different fields of activity and workplaces. This may involve collecting job data, ergonomically assessing equipment and evaluating employee feedback.

Based on the assessment results, appropriate corrective measures can be developed and implemented. These may include purchasing ergonomic equipment and furniture, modifying the design and layout of workplaces, organizing and planning tasks to minimize excessive physical and mental demand, and promoting and facilitating recovery and relaxation activities for employees (Calum, 2018).

An essential component of human resource management based on ergonomic requirements is ensuring effective communication and close collaboration between different departments and teams in the organization. This enables the exchange of information, the identification of specific needs and the implementation of customized solutions. Active participation and solicitation of employee feedback in the decision-making process and enhancement of working conditions is also a critical factor for the successful adoption of ergonomic standards.

Merging ergonomic standards within human resource management bestows plentiful organizational and personal advantages. By embracing a methodical approach and engaging all involved parties, organizations can foster a healthy, secure, and productive work environment that motivates employees to deliver superior results, thereby contributing to the organization's success. (Păun, 2006).

Workplace ergonomics entails tailoring the work setting to meet the attributes and requirements of the employees, with the aim of enhancing comfort, safety, and productivity in performing tasks. Ergonomics concerns itself with the adaptation of the work environment to suit the features and needs of employees. Ergonomic stipulations encompass the ergonomic design of the workspace, appropriate usage of equipment, suitable lighting, temperature regulation, organization of the workspace, and the encouragement of regular pauses and physical activity. These requirements contribute to employee comfort, reducing the risk of accidents and improving performance. Human

resource management has the responsibility to implement and promote ergonomic requirements in the workplace. By identifying employee needs and integrating them into policies and practices, HRM can create an enabling work environment that promotes employee health and performance. This may include recruiting and selecting the right employees for specific tasks, providing appropriate training and ergonomics training, monitoring working conditions and ensuring that they are adapted to the needs of employees (Pitariu, 2014).

Implementing an approach based on ergonomic requirements in human resource management brings a number of benefits. These include improving employee satisfaction and engagement, reducing absenteeism and staff turnover, increasing productivity and quality of work, reducing workplace accidents and health problems, and increasing the organization's reputation for concern for employee welfare.

In order to integrate ergonomic requirements into human resource management practices, it is important to adopt a number of strategies. These may include (Schmauder, 2020):

- evaluation of ergonomic requirements: carrying out periodic evaluations of workplaces to identify and solve problems related to ergonomics;
- appropriate recruitment and selection: selecting the right candidates for specific tasks, considering ergonomic aspects;
- ergonomics training and education: providing training and education to employees on good ergonomic practices, correct posture and proper use of equipment;
- promotion of health and safety culture: Implementation of policies and programs to promote health and safety in the workplace, including aspects related to ergonomics;
- communication and involvement: creating a work environment where employees feel free to provide feedback and suggestions on ergonomic aspects, and their active involvement in the process of improving working conditions.

Human resource management based on ergonomic requirements is an essential aspect in ensuring a healthy, safe and efficient working environment. Integrating ergonomic principles into human resource management practices brings significant benefits to both the organization and employees, including improving employee satisfaction and engagement, reducing absenteeism and staff turnover, increasing productivity and quality of work, reducing workplace accidents and health problems. work, as well as increasing the image and reputation of the organization. By adopting suitable strategies and fostering a culture of health and safety, organizations can establish a work environment that promotes employee growth and exceptional performance. The application of human resource management grounded in ergonomic demands necessitates a systematic approach, which includes periodic evaluation of ergonomic needs, suitable personnel selection and training, the promotion of a health and safety culture, employee involvement and communication, as well as ongoing monitoring and evaluation of the results achieved (St-Vincent, 2011).

The constant monitoring and evaluation of the obtained results is an important stage in the implementation of human resources management based on ergonomic requirements. By collecting and analyzing relevant data, organizations can assess the effectiveness of implemented measures and identify potential problems or additional needs. This process of continuous monitoring and evaluation allows for the constant adjustment and improvement of human resource management practices to ensure an ergonomic and efficient work environment.

3. Research methodology

The purpose of this research consists in the detailed study of the ergonomic aspects present in different work environments from the perspective of human resources management, without being limited to a certain sector of the economy. The investigation aimed to analyze how ergonomics influences the work environment in different fields, thus providing a comprehensive perspective of its applicability within various economic organizations.

As part of this research effort, 250 managers from Romania were questioned, coming from four organizations active in the fields of medicine, scientific research, production and industry. This approach allowed obtaining a representative sample for the diversity of economic fields.

The study took place between December 2022 and March 2023, being a meticulous process that involved the use of a detailed questionnaire sent by e-mail to the participants. In this study, the sampling was simple random, so that the results are as close as possible to the reality on the ground. The questionnaire was thoughtfully designed and structured to ease the process of identifying and analyzing the primary ergonomic requirements that are commonly found across different work environments.

E1. Ergonomic design of the work space: this entails arranging furniture, equipment, and other elements in a manner that aligns with the employees' needs. Chairs, tables, monitor stands, and other items should be adjustable in height and offer appropriate support for the back, neck, and wrists.

E2. Risk assessment and continuous improvement: it is important to carry out periodic ergonomic risk assessments in the workplace and to identify potential problems or deficiencies in the design and organization of the workspace. Based on these assessments, corrective measures can be implemented and workplace ergonomics can be continuously improved.

E3. Training and awareness: employees should receive adequate training in good ergonomic practices and be aware of their importance to their health. This may include information on correct posture, safe lifting techniques and other relevant issues.

E4. Work space organization: a neat and organized work environment helps minimize stress and confusion. The workspace should be large enough for employees to move around comfortably and have easy access to necessary equipment and documents.

E5. Task management and work organization: appropriate distribution of tasks and work planning in a way that reduces excessive demands on employees can help prevent overwork and stress in the workplace. An analysis of tasks and a fair distribution of them can be helpful in this regard.

These elements are considered key to understanding and improving ergonomics in the work environment, each having a significant role in how workers interact with their environment and carry out their activities. By analyzing these elements in different contexts, we aimed to gain a clearer and deeper picture of the ergonomic aspects that can influence efficiency, safety and health in the workplace.

In this way, the research aimed to highlight how ergonomics can be implemented and optimized in different work contexts.

The objective of the questions formulated in the questionnaire was to analyze the degree to which the key elements of ergonomics in the work environment are put into practice, instead of checking the theoretical knowledge in this field of the study participants. This approach means that the questionnaire questions were designed to identify and assess how the essential components of ergonomics are actually implemented in the workplace. This means trying to understand to what extent these principles are applied in practice in different organizations, and not to check the theoretical knowledge of the respondents. Our approach aimed to highlight potential discrepancies between what is known in theory and what is actually implemented in practice. Therefore, the questionnaire was a useful tool to explore how ergonomics is understood and implemented in the real workplace context. Even though the theoretical knowledge of the participants is important, the purpose of this research was to highlight the actual application of ergonomics and to better understand the challenges this entails in different work environments. This hands-on assessment gave us a more realistic and relevant perspective on how ergonomics are integrated into daily work processes.

In the complex context of the social economy, problems related to the facilitation of economic decision-making are often caused by multi-criteria decision-making processes. For this reason, in our research study, we adopted the maximum global utility method. Modeling strives to efficiently and scientifically exploit the available information base. Procedures that attempt to imitate the rational way of substantiating decisions form, in varying degrees of complexity, the conceptual core of modeling. In more detail, in the socio-economic world we are trying to model, decision-making processes involve the evaluation of a series of diverse and often contradictory criteria. These multi-criteria decisions can pose significant challenges, especially when information is incomplete or uncertain. Therefore, we chose to use the maximum global utility method in our research study. This method aims to find the solution that provides the highest total value or utility, taking into account all relevant criteria. Modeling, in this context, represents an attempt to use the available information as effectively as possible, by applying rigorous scientific methods. Imitating rationality in decision-

making that is, trying to reproduce how a person would make decisions if they had all the necessary information and could perfectly evaluate all options is a central part of this process. In various forms of complexity, this principle underlies many decision-making models. The stages of implementing the global utility method include the following:

Step 1. The utility matrix is created, which includes the following elements:

$$x_{ij}, i = 1, \dots, r \text{ si } j = 1, \dots, n. \quad (1)$$

The calculation of each element of the matrix, for the maximum criterion, is done by the following formula:

$$x_{ij} = u_{ij} = \frac{x_{ij} - x_{i \min}}{x_{i \max} - x_{i \min}}, \quad (2)$$

on the other hand, for each minimum criterion, the matrix elements are calculated using the following formula:

$$x_{ij} = u_{ij} = \frac{x_{i \max} - x_{ij}}{x_{i \max} - x_{i \min}}, \quad (3)$$

where: x_{ij} = the value assigned to indicator i in relation to indicator j ;

$x_{i \max}$ = the lowest value observed for indicator i ;

$x_{i \min}$ = the highest value found for indicator i .

Step 2. For each project, the global utility is estimated as the sum of the products between the elements of the utility matrix (the column vector associated with the project) and the importance coefficient assigned to each indicator.

$$UG_j = \sum_{i=1}^r \alpha_i u_{ij}, \text{ unde } \sum_{i=1}^r \alpha_i = 1 \quad (4)$$

Step 3. The project with the highest global maximum utility is selected V_j .

$$\max \{UG_j\} \Rightarrow V_j \quad j = 1, \dots, n \quad (5)$$

To differentiate and select between the decision variants V_i (where there are n variants) and to choose the best offer, taking into account several evaluation criteria simultaneously ($C_j, j=1, \dots, n$), the global utility method is used maximum. This method focuses on identifying the most favorable combination of attributes (characteristics specific to a variant), thus representing the essence of the multiattribute problem. In more detail, when faced with a number of options or decision variants, each with its own sets of attributes or characteristics, the problem becomes one of identifying the best combination of these attributes. This process of evaluating and choosing the best combination of attributes constitutes the multiattribute problem.

The maximum global utility method is a valuable tool in this context because it allows us to consider all these attributes simultaneously, evaluate them according to their relative importance, and choose the variant that provides the highest total value or "utility" based on these multiple criteria. This method involves the conversion of all numerical values a_{ij} (expressed in specific measurement units) and qualitative characteristics into utilities u_{ij} , that is, into numerical (dimensionless) values located in the range $[0, 1]$. The fundamental assumption for a correct application of the weighted sum method is the independence of the criteria. The variant with the highest synthetic utility indicates the best option. Explained in more detail, the method of maximum global utility requires a process of normalization or conversion of all values and characteristics into a common form - the utilities. These utilities are dimensionless numerical values, meaning they can be directly compared regardless of the units of measurement or the initial nature of the features. The assumption of criterion independence is central to this method. This means that each criterion or attribute is evaluated separately, without being influenced by the other criteria. In this way, we can calculate a total value or synthetic utility for each variant, by weighted addition of the utilities for each criterion.

The variant with the highest synthetic utility—that is, the variant that provides the greatest value when all criteria and their relative importance are considered—is considered the best option.

4. Findings

Our research study is based on the examination of ergonomic features present in various work contexts. Our approach to data analysis treats it as a system consisting of five essential components that best describe ergonomics in the work environment:

- E1. Ergonomic design of the work space;
- E2. Risk assessment and continuous improvement;
- E3. Training and awareness;
- E4. Work space organization;
- E5. Task management and work organization.

Table no. 1 illustrates the information base of the study, indicating the percentage of importance that managers assign to each ergonomic component.

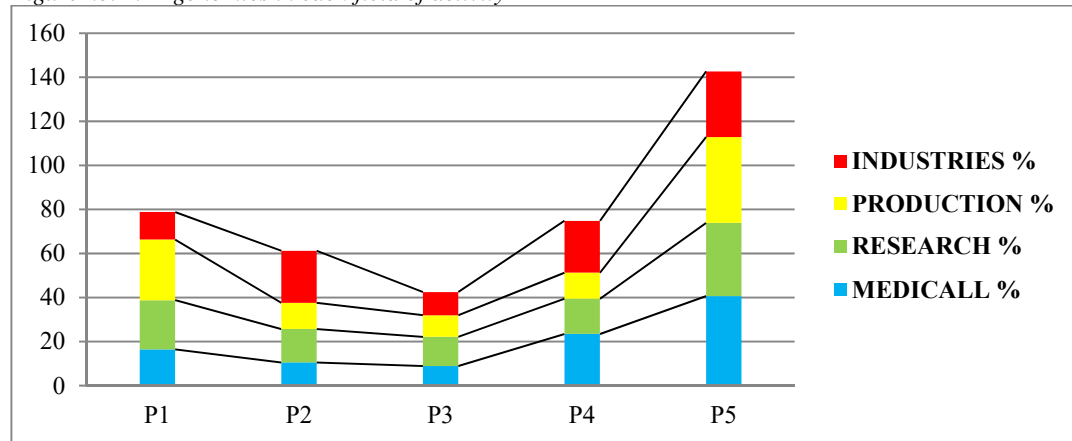
Table no. 1. Percentage of ergonomics components

ERGONOMICS COMPONENT	FIELD OF ACTIVITY			
	MEDICAL % (v1)	RESEARCH % (v2)	PRODUCTION % (v3)	INDUSTRY % (v4)
E1 (p1)	12,15	12,65	47,5	32,8
E2 (p2)	9,55	18,17	19,91	33,31
E3 (p3)	6,8	23,24	19,18	18,94
E4 (p4)	13,18	12,45	8,95	16,75
E5 (p5)	46,32	23,25	36,78	19,98

Source: the author's own concept

The obtained results, however, take into consideration first E5. Task management and work organization, and, lastly, E3. Training and awareness (Figure no.1).

Figure no. 1. Ergonomics in each field of activity



Source: the author's own concept

The implementation of the calculation algorithm involved the following stages:
Step 1 - making the array of units containing xij elements (Figure no. 2).

Figure no. 2. Matrix of units

$$\begin{bmatrix} 0.26 & 0.66 & 1.00 & 0.00 \\ 1.00 & 0.65 & 0.90 & 0.00 \\ 0.00 & 1.00 & 0.21 & 0.38 \\ 0.99 & 0.36 & 0.00 & 1.00 \\ 0.00 & 0.68 & 0.15 & 1.00 \end{bmatrix}$$

Source: the author's own concept

Step 2 - Determination of global utilities for each individual organization (Table no. 2):

Table no. 2. Results obtained from the calculation of global utilities

GLOBAL UTILITY	RESULT
MEDICAL	2,85
INDUSTRY	4,64
PRODUCTION	3,76
RESEARCH	3,28

Source: the author's own concept

Step 3 - According to Table no. 2, the analysis of global utilities indicates that the organization with the highest global utility comes from the industrial domain.

Thus, after applying the algorithm for the method of maximum global utilities, we can conclude that the organization in the industrial sector made the best evaluation of the ergonomic aspects at the workplace. More broadly, the results of this study suggest that the analyzed industrial organization paid particular attention to ergonomic aspects in its work environment. This is evident in the high value of global utility calculated for this organization, indicating that it has effectively implemented and adhered to ergonomic principles. This study is a valuable model for other organizations looking to improve workplace ergonomics.

5. Conclusions

The application of the algorithm of the maximum global utilities method and the conclusion that the organization in the industrial sector has best evaluated the ergonomic aspects in the workplace paves the way for a wider development of the subject. This conclusion can stimulate a series of researches and actions in various fields:

1) *Improving ergonomic practices*: organizations in other sectors can study and better understand the approaches and strategies used by the industrial sector organization to assess and implement ergonomic aspects in the workplace. This can lead to the development and adoption of better and more efficient practices within their own organizations, thus helping to improve working conditions and overall performance.

2) *Knowledge transfer and cross-sector collaboration*: finding that the industrial sector organization has excelled in workplace ergonomics assessment can open doors for knowledge sharing and cross-sector collaboration. Organizations in other fields can learn from the experiences and good practices of the industrial sector organization, adapting them to their own context and developing partnerships to collectively improve ergonomics and working conditions.

3) *Education and training*: the conclusion that the organization in the industrial sector achieved the best result in the evaluation of ergonomic aspects can underline the importance of adequate education and training in this area. This can stimulate the development and implementation of ergonomics training and education programs for managers and employees in various sectors, promoting a better understanding of ergonomic principles and practices and facilitating their correct application in the work environment.

3) *Focusing on the well-being and health of employees*: the focus on the excellent ergonomic assessment of the organization in the industrial sector emphasizes the importance of ensuring a safe and healthy work environment for employees. It can encourage and inspire other organizations to pay more attention to ergonomic aspects, implement preventive measures and promote employee well-being, thus helping to reduce accidents and work-related health problems.

Hence, the finding that the industrial sector has excelled in assessing the ergonomic aspects of the workplace serves as an opportunity for learning, knowledge sharing, and ongoing enhancements in the realm of workplace ergonomics. By exploring more deeply the reasons that led to the success of the industrial sector organization in ergonomic assessment, key factors and effective strategies can be identified that can be applied in various industries. It is also important to assess the direct impact of good ergonomic practices on organizational performance and employee satisfaction. Further studies can be conducted to measure the economic benefits, increased productivity, reduced absenteeism and workplace accidents associated with the implementation and compliance of ergonomic principles.

The development of research in the field of workplace ergonomics can contribute to the development of new techniques, tools and approaches to optimize working conditions and improve the well-being of employees. It can also provide useful information for the development of policies and regulations to support the implementation of ergonomic practices and promote a safe and healthy work environment.

Finally, the conclusion that the organization in the industrial sector has best evaluated the ergonomic aspects in the workplace is a starting point to improve working conditions and promote good practices in all fields and sectors. Continued research and collaboration between organizations and ergonomics experts can help create a more efficient, safe and healthy work environment for all employees.

Finally, this conclusion provides a clear direction for future research. It would be interesting to explore in depth why the industrial sector organization was able to evaluate ergonomic aspects so well and to determine whether these practices can be adapted and applied in other contexts. It would also be useful to assess the direct impact these good ergonomic practices have had on organizational performance and employee satisfaction.

6. References

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