

A study on the impact of Ergonomics towards productivity

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Abstract- In today's fast-paced work environments, optimizing productivity has become a critical concern for organizations across various industries. One often-overlooked factor that significantly influences productivity is ergonomics—the science of designing the workplace to fit the worker. This study aims to investigate the level of understanding about ergonomics among the employees, to assess the current ergonomic practices and interventions implemented, to identify the specific ergonomic challenges and areas for improvement and to analyze the correlation between ergonomic interventions and key performance indicators (KPIs). It also examines individuals' perceptions of how ergonomics enhances their productivity. A sample of 115 employees were randomly selected for data collection. Various statistical methods including ANOVA, Factor analysis and chi-square tests were employed for data analysis. The findings highlight the significant role ergonomics in enhancing productivity of the employees. Clear associations were observed between demographic factors such as age, gender, and various aspects of ergonomic interventions in the workplace. The findings underscore the importance of considering demographic factors when implementing ergonomic interventions in the workplace. Significant correlations were found between ergonomics and various key performance indicators, indicating better ergonomic interventions are linked to better performance outcomes. Improved ergonomic conditions lead to decreased absenteeism, enhanced comfort, and increased productivity in completing task. The findings suggest that organizations should prioritize ergonomic initiatives to enhance employee productivity and promote organizational success. This study underscores the significance of incorporating ergonomic considerations into workplace design and management practices to foster a healthier, more productive workforce. By prioritizing ergonomics, organizations can not only optimize productivity but also cultivate a culture of well-being and efficiency conducive to sustainable growth and success in the modern business landscape.

Index Terms: Ergonomics, Productivity, Sustainable growth, Ergonomic challenges, Correlation, Key Performance Indicator (KPI), Organizational success.

I. INTRODUCTION

In today's fast-paced and competitive business landscape, organizations are constantly seeking ways to optimize efficiency, productivity, and employee well-being. One critical factor that significantly influences these aspects is the design of the workplace itself. Ergonomics, the science of designing and arranging products, systems, and environments to fit the needs of the people who use them, plays a crucial role in enhancing the quality of work and promoting overall well-being in the workplace. The field of ergonomics, which focuses on creating work environments that fit the capabilities and limitations of the human body, has emerged as a cornerstone in achieving these goals. The importance of ergonomics in the workplace cannot be overstated. It directly impacts the health, safety, and performance of employees, thereby influencing the overall quality of work produced. By understanding how ergonomic principles can be applied to various facets of the workplace, organizations can not only enhance the well-being of their employees but also improve productivity and organizational outcomes.

This study seeks to explore the impact of ergonomics in the workplace on achieving a better quality of work. It aims to delve into the various dimensions of ergonomics and how they contribute to creating a conducive work environment that fosters employee satisfaction, productivity, and overall organizational success.

II. OBJECTIVES OF THE STUDY

- To assess the level of understanding about ergonomics among the employees in the organisation.
- To assess the current ergonomic practices and interventions implemented.
- To identify the specific ergonomic challenges and areas for improvement within the work processes, equipment and facilities.

- To analyze the correlation between ergonomic interventions and key performance indicators (KPIs) such as reduced absenteeism, decreased injury rates, and increased efficiency in task completion.

Scope of the study

- The study will focus on examining the specific ergonomic practices and interventions implemented within the workplace environment. This includes ergonomic design of workstations, tools, equipment, and facilities, as well as ergonomic training programs provided to employees.
- The scope of the study will extend to evaluating the influence of ergonomic interventions on productivity and performance outcomes.
- The study will investigate the relationship between ergonomic initiatives and employee satisfaction, which includes exploring employee perceptions, attitudes, and experiences regarding ergonomic interventions, as well as their impact on job satisfaction, morale, and retention.

Need for the study

- In today's competitive business environment, organizations that prioritize employee well-being and create ergonomic work environments have a competitive advantage in attracting and retaining top talent.
- Employee satisfaction and well-being are crucial factors for organizational success. By investigating the impact of ergonomic measures on employee comfort, satisfaction, and morale, this study will provide insights to create a more supportive and conducive work environment that fosters employee well-being and engagement.
- Improving workplace ergonomics is important to enhance productivity and efficiency by reducing discomfort associated with poorly designed work environments. This study will help to understand how ergonomic interventions can positively impact productivity levels and contribute to overall organizational performance.

Limitations

- The study only assumes that the information was given by the employees without any bias.
- Conducting a comprehensive study on the impact of ergonomics in the workplace requires sufficient time for data collection, analysis, and interpretation. Time constraints is a major limitation.

III. REVIEW OF LITERATURE

Makhbul et al. (2022) explained, ergonomics is the design of a workplace, equipment, product, environment, and staff policies that take into account the biomechanical, physical, and psychological needs of employees. This improves the effectiveness and productivity of the work system while making sure the worker is safe, healthy, and happy.

Capodaglio (2022) mentioned ergonomics means taking steps to make manual handling tasks, activities, objects, and tools, as well as the design of the work environment, better fit the needs of the worker. It has been used a lot in Italy's business sector.

Akinbola & Popoola (2019) Organizational culture, organizational structure, desk heights in relation to the monitor and keyboard, improper sitting, lighting, workflows, space in the workspace, design, and temperature can all affect how productive and committed employees are. Taking these things into account when it comes to ergonomics practices in an organization helps employees do their jobs better, improves the overall performance of the organization, and makes the business more profitable.

Ravindran, D. (2019) stated proper ergonomic design is necessary to prevent repetitive strain injuries and other musculoskeletal disorders, which can develop over the time and can lead to long-term disability. Ergonomics improvements improve quality and operators' productivity. Usually, ergonomics evaluations are performed by ergonomists, while workplace layouts are designed by planning engineers, and the results are often unsatisfactory and do not improve productivity. So, a study of ergonomic factors or facilities affecting workers in an industry is important.

Chowdhury & Chakraborty (2017) stated in India, small businesses and the unorganized sector know very little about ergonomics, a good work environment, and the right way to stand and sit at work. Musculoskeletal disorders (MSDs) are always present in small industries where manual work is done. Due to how poorly designed workplaces are in India, the number of people who get sick from their jobs is growing at an alarming rate. According to this study, people who know everything there is to know about ergonomics at work don't always use the ergonomics built into their workstations.

Dimberg et al., (2015) argued for an office to meet ergonomics standards, it needs to use the most up-to-date technology to make sure employees are comfortable. Replacing this technology costs a lot of money for the company. Regular training in the workplace can help employees learn how they can make a big difference in ergonomics.

IV. RESEARCH METHODOLOGY

Research design

The type of research chosen for the study is descriptive research. In descriptive research various parameters will be chosen and analyzed. Descriptive research design is a type of research design that aims to systematically obtain information to describe a phenomenon, situation, or population.

Methods of data collection

This paper is solely based on the primary data. Self-administered questionnaires have been used to collect the data. The questionnaire method was employed while the data was collected.

Sample size

The sample size of the study is 115 respondents.

Tools used for data analysis

- One-way Anova
- Chi-Square
- Factor Analysis

V. DATA ANALYSIS AND INTERPRETATION

One- way Anova

Hypothesis Statement

H0: There is no significant relationship between age and impact of ergonomics in productivity.

H1: There is significant relationship between age and impact of ergonomics in productivity.

Table No: 5.1- Age and Productivity

		Sum of Squares	df	Mean Square	F	Sig.
Ergonomics impacts the quality of work/productivity in the workplace	Between Groups	5.91	3	1.97	3.21	.026
	Within Groups	68.18	111	.61		
	Total	74.09	114			

Inference

From the above table, the calculated significant value is 0.026, that is below than the 0.05 (5% level of significance). Hence H0 is rejected and H1 is accepted. Therefore, it is inferred that there is significant relationship between age and increase in productivity due to ergonomic interventions.

Hypothesis Statement

H0: There is no significant relationship between gender and the extent of experiencing discomfort or pain.

H1: There is significant relationship between gender and the extent of experiencing discomfort or pain.

Table No: 5.2- Gender and discomfort

		Sum of Squares	df	Mean Square	F	Sig.
Rate the extent to which you experience discomfort or pain (Such as back pain, neck pain, eye strain, etc) while working at your desk.	Between Groups	2.09	2	1.04	.97	.381
	Within Groups	120.31	112	1.07		
	Total	122.40	114			

Inference

From the above table, the calculated significant value is 0.381, that is above 0.05 (5% level of significance). Hence H0 is accepted and H1 is rejected. Therefore, it is inferred that there is no significant relationship between gender and the extent of experiencing discomfort or pain.

Chi-square

Hypothesis Statement

H0: There is no significant relationship between Age and impact of Ergonomic interventions in maintaining proper posture.

H1: There is significant relationship between Age and impact of Ergonomic interventions in maintaining proper posture.

Table No: 5.3- Age and proper posture

	Value	df	Asymptotic Sig. (2-tailed)
Pearson Chi-Square	24.15	12	.019
Likelihood Ratio	25.31	12	.013
Linear-by-Linear Association	.21	1	.647
N of Valid Cases	115		

Inference

From the above table, the calculated significant value is 0.019, that is below than the 0.05 (5% level of significance). Hence H0 is rejected and H1 is accepted. Therefore, it is inferred that there is relationship between Age and impact of Ergonomic interventions in maintaining proper posture.

Factor analysis

Table No: 5.4- Factor analysis

Communalities	Initial	Extraction
The ergonomic interventions provided in my workplace have improved my overall comfort and well-being	.91	.81
Ergonomic interventions have made it easier for me to maintain proper posture throughout the workday	.75	.54
I feel that ergonomic interventions have contributed to a decrease in the number of injuries or accidents in the workplace	.99	.76
Absenteeism has decreased since the introduction of ergonomic interventions	.81	.63
Productivity in completing tasks has increased as a result of ergonomic interventions	.61	.15
Ergonomics impacts the quality of work/productivity in the workplace	.64	.08

Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.68	35.5%	35.5%	1.68	35.5%	35.5%
2	.90	19.1%	54.6%	.90	19.1%	54.6%
3	.69	14.6%	69.3%	.69	14.6%	69.3%
4	.60	12.8%	82.1%			
5	.47	9.9%	92.0%			
6	.38	8.0%	100.0%			

Inference

From the above table, we come to know that the following are the 3 major factors contributed to achievement of Key Performance Indicators.

- I feel that ergonomic interventions have contributed to a decrease in the number of injuries or accidents in the workplace.
- The ergonomic interventions provided in my workplace have improved my overall comfort and well-being.
- Absenteeism has decreased since the introduction of ergonomic interventions.

VI. FINDINGS

- There is relationship between age and increase in productivity due to ergonomic interventions.
- There is no relationship between gender and the extent of experiencing discomfort or pain.
- There is relationship between Age and impact of Ergonomic interventions in maintaining proper posture.
- The following are the 3 major factors contributed to achievement of Key Performance Indicators.
- I feel that ergonomic interventions have contributed to a decrease in the number of injuries or accidents in the workplace.
- The ergonomic interventions provided in my workplace have improved my overall comfort and well-being.
- Absenteeism has decreased since the introduction of ergonomic interventions.

VII. SUGGESTIONS

- Ensure regular evaluation and updates of ergonomic policies and procedures to address emerging issues and enhance effectiveness.
- Continuously monitor and evaluate the effectiveness of ergonomic interventions, using both qualitative and quantitative measures to assess their impact on various outcomes such as productivity, well-being, and injury rates.
- Strengthen communication channels and reporting mechanisms to encourage employees to comfortably report ergonomic issues to their supervisors or HR department, fostering a culture of transparency and support.
- Collaborate with ergonomic experts, occupational health professionals, and relevant stakeholders to leverage expertise and resources in designing and implementing effective ergonomic interventions tailored to the organization's needs.
- Promote employee engagement and participation in ergonomic initiatives through involvement in decision-making processes, feedback mechanisms, and opportunities for active involvement in designing ergonomic solutions tailored to their needs.

VIII. CONCLUSION

Based on the objectives and findings of the study, it is evident that by practicing ergonomics, employees tend to make fewer errors and have higher levels of energy. Employees who enjoy an ergonomic office feel a greater sense of satisfaction at work, which makes them more engaged and productive. This results in higher morale and a better corporate culture. In conclusion, the study highlights the positive impact of ergonomics in the workplace, providing valuable insights for organizations seeking to enhance employee well-being, productivity, and safety through ergonomic interventions. Moreover, it underscores the importance of continued efforts to update policies, foster awareness, and implement effective ergonomic measures tailored to the needs of diverse demographic groups

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