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Qualitative Study of the Relationship between Ergonomics and Psychological Factors on Work Productivity

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Abstract
This qualitative study discusses the relationship between ergonomic application and psychological factors in relation to work productivity. In various industrial and organizational contexts, ergonomics has been shown to reduce physical and mental workload, ultimately improving employee comfort and performance. On the other hand, psychological factors such as work stress, job satisfaction, motivation, and social relationships significantly influence employees' perception of their productivity. By analyzing literature from 15 national and international journals, this study finds that ergonomic approaches integrated with attention to psychological aspects lead to positive impacts on productivity.The study suggests that organizations should not only focus on the physical aspects of job design but also the mental and emotional well-being of employees holistically.

Keywords: Ergonomics, Psychology, Work Productivity, Work Environment, Work Efficiency

Introduction

Work productivity has become a crucial focus in the modern industrial world. Companies and organizations compete to improve employee performance to achieve maximum efficiency. However, increased productivity cannot be achieved simply by increasing the workload or reducing rest periods. In this context, ergonomics and work psychology are two complementary pillars. Research by (Faradilla et al., 2019)highlights how appropriate ergonomic interventions can reduce the mental workload of operators, thereby increasing work comfort and productivity. Similarly, findings by (Hashiguchi et al., 2020)show that psychological factors, such as stress and perception of workload, are strongly influenced by age and work experience, and have a direct impact on perceptions of productivity in construction projects in Japan. Furthermore, coworker relationships *are* also an important aspect discussed in the journal "The Effect of *Ergonomic Psychology* and *Coworker Relationships* on Employee Performance." In an increasingly collaborative workplace, interpersonal communication is a determining factor in creating synergy and work comfort, which ultimately supports productivity(Pujianto, 2024).

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Method

This study employed a literature review with a qualitative approach. Data were collected from 15 scientific journals covering the topics of ergonomics, workload, work psychology, and productivity. The journal selection process was based on topic relevance, publication year (2015–2023), and publication quality (indexed by DOAJ, Sinta, and Scopus). The analysis was conducted using a thematic approach, categorizing the articles into themes: physical ergonomics, cognitive ergonomics, work psychology, mental/physical workload, and perceived productivity. The research stages included:

1. Data Collection: Identifying and collecting journals relevant to the topics of ergonomics, psychological well-being, and work productivity.
2. Data Reduction: Filtering and summarizing relevant information to understand the relationships between the variables.
3. Data Presentation: Organizing information in the form of key themes that describe the relationship between ergonomics, psychological well-being, and work productivity.

Result and Discussion

Physical Ergonomics and the Work Environment

A physically ergonomic work environment has been shown to have a direct impact on work performance. In a study of production laboratories, lighting, temperature, and noise significantly correlated with work comfort(Mukhtar et al., 2024). This was further confirmed by a study of small industrial centers (Mayasari, 2016), where ergonomic work tool design increased work efficiency by up to 20%. Furthermore, the journal "Ergonomic Analysis of the Physical Work Environment in Production Laboratories" showed that inappropriate physical workspace design can lead to fatigue and decreased productivity, especially when lighting and temperature do not meet work comfort standards. This study emphasizes the importance of measuring the comfort index and rearranging the workspace layout to improve efficiency (Mukhtar et al., 2024).

Cognitive Ergonomics and Mental Load

Cognitive ergonomics encompasses the design of work systems that consider employees' mental load. A study by (Faradilla et al., 2019).Shows how interventions in work posture, tool layout, and work time adjustments can reduce cognitive fatigue. Meanwhile, research on *VDT (Visual Display Terminal*) workers emphasizes the importance of screen settings, viewing distance, and break times in reducing eye strain and mental stress (Adam et al., 2023).Another study (Hartati et al., 2022)in the journal Analysis of the Effects of Physical and Mental Workload on Employee Productivity shows that the combination of physical and mental workload has a significant impact on work performance, with mental workload tending to have a greater impact on decreased concentration and work accuracy.

In a more technical realm, the journal on *"Online Framework for Cognitive Load Assessment"*(Lagomarsino et al., 2021)introduces a technology-based cognitive

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load quantification method to help managers understand workers' mental states in real-time.

A study by (Hartati et al., 2022)highlighted the impact of workload on employee productivity, particularly in the *plywood industry* . Using the *NASA-TLX method* and energy consumption measurements, this study showed that excessive workload can reduce employee efficiency and productivity. High workloads, both physical and mental, can cause fatigue that worsens performance and leads to decreased productivity. This shows the importance of good workload management in supporting employee long-term health and productivity (Hartati et al., 2022). Through the *NASA-TLX method* , this study shows how mental and physical stress caused by high workloads is directly related to increased fatigue.Decreased energy consumption also indicates a decrease in performance in work activities that require high precision and accuracy, as found in previous research by (Suryani & Yulius, 2015)on work stress in the construction industry.

Psychological Factors: Stress, Social Relationships, and Motivation

Work psychology plays a crucial role in influencing employee productivity. In addition to age and experience, which influence perceptions of productivity (Hashiguchi et al., 2020), emotional burden and psychodynamic stress also contribute significantly to decreased performance. Unmanaged stress can lead to decreased decision-making quality and increased anxiety in the workplace (Pratiwi et al., 2024). This explains how stress not only affects workers' mental health but can also disrupt their focus and ability to complete tasks efficiently.

In a different context, the journal " *What Happens When Software Developers Are (Un)happy* " (Graziotin et al., 2018)proves that the level of happiness and emotional well-being of IT workers has a direct impact on performance and productivity. Another study states that harmonious co-worker relationships contribute to reducing stress and improving performance (Adam et al., 2023). Conversely, work stress is one of the causes of decreased productivity, as discussed in the journal on the construction industry and stress (Suryani & Yulius, 2015). A study by (Suryani &Yulius, 2015)in the journal Employee Job Stress in the Construction Industry and Ergonomic Factors shows that high work pressure, if not supported by an ergonomic work environment, will accelerate the onset of work stress. This strengthens the finding that poor work design plays a role in increasing psychological tension and job dissatisfaction.

Furthermore, the journal "The Relationship between Physical and Mental Workload and Job Burnout" (Zulfiqar et al., 2017)states that excessive fatigue due to uncontrolled workloads, both physical and mental, is directly related to increased levels of burnout *and* work absenteeism. This implication is crucial for designing long-term ergonomic interventions.

Synergy Between Ergonomics and Occupational Psychology

The concept of synergy between ergonomics and work psychology is raised in the study *"ComFeel: Productivity is a Matter of the Senses Too"*(Constantinides et al., 2020), which emphasizes that sensory experiences (smell, lighting, color) directly affect

employee mood and work energy. The journal "Factors Related to UMI Employee Work Productivity" (Budianto et al., 2025)confirms that the perception of work comfort derived from the application of ergonomics is directly proportional to employee work enthusiasm. Lastly, the research *"Robot Trajectory Adaptation"*(Lagomarsino et al., 2022), while more technical, remains relevant in this context because it shows that robotic automation and adaptation to user ergonomics also reduces human physical fatigue and supports work productivity.

Conclusion

Based on the results of the literature review, it can be concluded that ergonomics and psychological factors are two complementary elements in increasing work productivity. Proper implementation of physical and cognitive ergonomics can reduce fatigue, increase comfort, and lower the risk of work injuries. Furthermore, psychological factors such as stress, motivation, job satisfaction, and the quality of social relationships in the workplace have been shown to significantly impact employee morale and performance. The integration of ergonomics and attention to psychological well-being has a positive impact on work efficiency. Therefore, organizations need to take strategic steps by designing work environments that address not only physical aspects but also support employees' overall mental and emotional health. This can be achieved through ergonomic work design, equitable workload management, and the creation of a supportive and inclusive work climate. This research suggests the need for a multidisciplinary approach in designing work systems, and encourages further research across various industrial sectors to develop interventions that can increase productivity sustainably without neglecting human well-being as a primary factor.

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