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ERGONOMIC AWARENESS AND EMPLOYEE PERFORMANCE AMONG STAFF IN CONSTRUCTION INDUSTRY AT JOHOR BAHRU

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ABSTRACT

Ergonomic is the science and practices of designing jobs and enhancing the fit between the employees who perform the work and the physical demands of the work environment. Moreover, the application of ergonomics will be able to enhance employee performance. Therefore, this research was carried out to identify the relationship between ergonomic awareness and employee performance among staff in the construction industry in Johor Bahru. The objective of this study was to identify the level of ergonomic awareness in the construction industry and the level

of employee performance. The entire population of office employees in the construction industry in Johor Bahru, with a total of 357 persons, and only 123 office workers, had been chosen to be the respondents for this research. Descriptive statistics and Pearson correlation analyzed the data obtained by using the Statistical Package for the Social Science 23.0 (SPSS version 23.0). The result of the study shows the level of ergonomic awareness in the construction industry is moderate, and also the level of employee performance. In addition, there is a positive relationship between ergonomic awareness and employee performance among office employees in the construction industry and a high correlation between ergonomic awareness and employee performance

Keywords: *parenting styles; social skills; child development*

1.0 INTRODUCTION

Ergonomic awareness and worker performance are two critical aspects that play an important role in improving efficiency and safety in the workplace, especially in the construction industry which is known for its challenging and high-risk work environment (Ishwarya & Rajkumar, 2021). In Johor Bahru, a rapidly developing city, the construction industry is the main pillar of infrastructure and economic development. However, the industry also faces various challenges related to worker safety and well-being, including ergonomic issues that are often overlooked (Kim et al., 2022).

Ergonomics refers to the study of the interaction between workers and their work environment, with the aim of optimizing human well-being and overall system performance (Afroz & Haque, 2022). In the context of the construction industry, ergonomic awareness involves the understanding and application of ergonomic principles in planning and managing the workplace to reduce the risk of injury and increase worker productivity. Employees who are aware of the importance of ergonomics tend to practice proper work techniques, use equipment in a safe manner, and reduce excessive physical strain (Koirala & Nepal, 2022).

Employee performance refers to the effectiveness and efficiency of employees in performing their duties (Latip et al., 2022). High performance is not only important to ensure the smooth operation and success of construction projects, but also to maintain competitiveness in an increasingly competitive industry. Factors such as training, motivation, and working conditions play an important role in determining employee performance. In this context, ergonomic awareness can be considered as one of the factors that influence the performance of employees, because an ergonomically designed work environment can increase comfort, reduce fatigue, and reduce the risk of injury.

Further research by Mustafa Maballaghi (2016) suggests that a well-executed ergonomic plan integrates safety, quality control, and production to enhance performance. In contrast, Amna Riaz (2017) noted that poor ergonomics can lead to a low-standard environment that diminishes performance and demotivates employees. Additional studies, such as one by Punadi (2015), found that workplace facilities contribute to 41% of employee performance, underscoring the critical role

of supportive and comfortable workplace settings. This body of evidence forms the basis for examining the relationship between ergonomic awareness and employee performance specifically in the construction industry in Johor Bahru.

2.0 PROBLEM STATEMENT

The construction industry in Johor Bahru is one of the main sectors that contribute to economic and infrastructure development. However, the industry is also known for its challenging work environment and high risk of injury (Ishwarya & Rajkumar, 2021). Workers in this sector are often exposed to various ergonomic risks such as heavy physical loads, uncomfortable work postures, and the use of inappropriate equipment. This condition can lead to musculoskeletal injuries, fatigue, and decreased worker productivity (Gamayudha & Sultan, 2020). Therefore, ergonomic awareness becomes an important aspect that needs to be paid attention to to ensure the well-being and safety of workers.

Although the importance of ergonomics in the construction industry has been widely acknowledged, the level of ergonomics awareness among workers in Johor Bahru has not yet received the attention it deserves. Lack of sufficient awareness of ergonomic principles can result in unsafe and inefficient work practices, which in turn can affect employee performance (Susihono & Adiatmika, 2021). Poor employee performance not only has a negative impact on the success of construction projects but can also increase operating costs and affect the company's reputation (Faez et al., 2021).

Previous studies have shown that there is a positive relationship between ergonomic awareness and employee performance in various industries (Attia et al., 2023; El-Sherbeeny et al., 2023; Ganesh, 2022; Olabode, Adesanya & Bakare, 2017) . In Malaysia, there is a lack of detailed acts, regulations, or guidelines explaining the implementation of ergonomics, as stated by Md Sirat Rozlina (2012). Furthermore, Rosnah Mohd Yusuff (2015) discovered a significant gap in ergonomic knowledge among stakeholders, leading to a general unawareness of ergonomic standards and implementation strategies. Despite the relatively safer conditions of office settings compared to construction sites, office workers are still susceptible to musculoskeletal disorders, which represent the most common occupational diseases in Malaysia, affecting 15% of the workforce as reported by the Social Security Organization (SOCSO) (Erna Faryza, 2015). This study focuses on assessing the relationship of ergonomic awareness on employee performance among staff in the construction industry in Johor Bahru, aiming to measure the awareness level of ergonomics and the performance level of these employees.

3.0 LITERATURE REVIEW

3.1 Workplace Environment

The office environment, as defined by Kingsley (2012) and Basalamah (2021), is a space specifically designed for the completion of tasks, where a comfortable and effective work setting is crucial for employee performance. Bushiri (2014) emphasizes the critical role of the workplace environment in influencing employee

performance, and Sinnapan (2017) further supports this by noting that companies provide workplaces tailored to the nature of the tasks performed. This customization ensures employees feel comfortable, thereby enhancing their effectiveness. Moreover, the physical aspects of the workplace, including office layout and design, play a significant role in facilitating knowledge sharing and idea exchange, which in turn boosts employee motivation and productivity (Rasool et al., 2021; Nanzushi, 2015).

Bushiri (2014) asserts that an optimized physical office environment significantly enhances employee productivity. Conversely, an inadequate office setting can lead to reduced productivity and employee dissatisfaction. Factors such as air quality, noise levels, and additional employment perks, like free childcare or adequate parking, significantly impact the office atmosphere (Kingsley, 2012). Kingsley (2012) also notes that these factors are integral to maintaining a productive office environment. Furthermore, a well-designed office not only reflects the organization's values and objectives but also directly affects employee performance by influencing their health and preventing injuries (Manu, 2015).

The diverse elements of an office environment, such as furniture, noise, lighting, and temperature, play pivotal roles in employee health and performance, as outlined by Kingsley (2012) and Hamidi et al. (2020). Proper ergonomic practices in furniture selection can prevent musculoskeletal disorders, emphasizing the need for adjustable desks and chairs (Amna Riaz, 2017; Manu, 2015). Noise levels must be managed to reduce job-related stress, particularly among female employees who are more affected by this factor (Amna Riaz, 2017; Manu, 2015). Additionally, appropriate lighting and temperature settings are essential for maintaining comfort and preventing strain and fatigue, which can detract from productivity (Hamidi et al., 2020; Amna Riaz, 2017; Manu, 2015).

Ergonomics plays a foundational role in designing effective workspaces by addressing the compatibility of work practices and the physical workplace with employee capabilities. This alignment helps minimize risks associated with workplace injuries and illnesses, such as musculoskeletal disorders (MSDs). The concept, originating from the Greek words for 'work' and 'natural laws,' aims to eliminate workplace hazards, enhancing productivity and the quality of work life (Rosnah Mohd Yusuff, 2015; Segun Oluwaseun Olabode, 2017). Effective ergonomic design is not only about physical adjustments but also involves understanding the psychological and organizational elements that contribute to a holistic approach to workplace wellness and efficiency (Kingsley, 2012; Nabila Adnan, 2015).

3.2 Employee Performance

An employee is typically seen as an organizational member who contributes to achieving the organization's goals through their performance (Ying, 2012). Performance encompasses the actions and behaviors of employees within their roles. Sabine Sonnentag (2001) differentiates performance into two aspects: behavioral, which involves the actions taken by the individual in their work situation, and outcome, which refers to the results of these behaviors. Orogbu Lilian Obiageli (2015) extends this definition to include the judgment and evaluation processes, not

just actions. The concept of employee performance includes achieving set targets within specified timeframes, improvements in production, ease of adopting new technologies and having highly motivated workers, all of which contribute significantly to an organization's productivity and success (Nassazi, 2013; Kingsley, 2012).

Rabindra Kumar Pradhan (2017) introduced the Triarchy Model of Employee Performance, which categorizes performance into three dimensions: task, adaptive, and contextual performance. This model is particularly useful in assessing job productivity and quality within an organization. Task performance examines the core job responsibilities explicitly stated in the job description, emphasizing the importance of technical knowledge and the ability to handle multiple assignments with minimal supervision. As defined by Audrey (2012), adaptive performance involves an individual's ability to adjust to new environments and dynamic situations, requiring flexibility and interpersonal skills to effectively manage unpredictable work conditions. Contextual performance, according to Patrice (2012), includes voluntary activities that go beyond specific tasks or goals, such as cooperative behaviors that contribute to team dynamics and organizational culture, thereby enhancing productivity and effectiveness (Bhardwaj & Kalia, 2021).

This study utilizes the Triarchy Model developed by Rabindra Kumar Pradhan (2017) to measure employee performance, which is segmented into task, adaptive, and contextual dimensions. This multidimensional approach provides a comprehensive evaluation of employee productivity and quality, crucial for understanding and enhancing organizational effectiveness. The model's application in this research aims to capture the nuanced aspects of performance that collectively influence the organization's operational success.

4.0 METHODOLOGY

This study employs a quantitative research design utilizing descriptive surveys to investigate the relationship between ergonomic awareness and employee performance among construction industry staff in Johor Bahru. Khanday et al. (2023) describes research design as a procedural plan adopted by the researcher to effectively address the research problem. The choice of quantitative methods, particularly structured questionnaires, allows for precise measurement of variables and systematic data collection aligned with the study's objectives. The survey was conducted with 123 staff members, chosen through convenience sampling from a total population of 357, based on Krejcie and Morgan’s sampling table (1970).

The research instrument, a questionnaire, was divided into three sections: demographic information, ergonomic awareness, and employee performance. The ergonomic awareness section, adapted from a previous study, comprised six aspects—safety, health, cost, complaint, comfort, and training—rated on a five-point Likert scale ranging from 'not aware' to 'extremely aware'. Employee performance was assessed using the Triarchy Model of Employee Performance by Rabindra Kumar (2017), which includes task, adaptive, and contextual performance, also evaluated on a five-point Likert scale from 'highly disagree' to 'highly agree'. This structured approach ensures that the data collected is both relevant and robust, providing a clear basis for analysis.

Data from the study were analyzed using SPSS software version 23.0, with methods including descriptive statistics to assess demographics and ergonomic awareness and Pearson correlation to explore the relationship between ergonomic awareness and employee performance. Descriptive statistics provide a straightforward interpretation of data through frequency distribution, mean scores, and percentages, while Pearson correlation helps quantify the strength of the relationship between studied variables, offering insights into how ergonomic factors influence performance in the construction industry. This comprehensive approach to data collection and analysis ensures the reliability and validity of the study's findings, supporting its contributions to understanding employee performance dynamics in construction settings.

5.0 RESULTS AND FINDING

5.1 Respondent Demographics

This study surveyed 123 employees from the construction industry in Johor Bahru, revealing diverse demographic characteristics such as gender, age, marital status, work experience, ethnicity, and job position. The age distribution showed a predominance of individuals between 30 and 40 years, with females representing a significant majority at 68% of respondents. Most participants were married (62.9%) and had significant work experience, with 41.2% having less than five years and many others surpassing a decade in the industry. Ethnically, Chinese employees were the majority at 55.7%, followed by Malay and Indian. Additionally, most respondents held staff positions, indicating a broader involvement at this level than executive roles. These demographics reflect a diverse and experienced workforce with a notable representation of women, suggesting a progressive shift toward gender equality in the construction sector in Johor Bahru

5.2 Level of Ergonomic Awareness

Table 1: Level and Mean Average Score for Ergonomic Awareness

Aspect Of Ergonomic	Mean Score	Level
1. Health	3.48	Moderate
2. Safety	3.52	Moderate
3. Comfort	3.54	Moderate
4. Cost	3.43	Moderate
5. Complaint	3.42	Moderate
6. Training	3.22	Moderate
Overall Mean Score	**3.45**	**Moderate**

The study conducted within the construction industry in Johor Bahru assessed ergonomic awareness across various dimensions—Health, Comfort, Cost, Complaint, Safety, and Training—with all areas showing moderate mean scores, ranging from a low of 3.22 in Training to a high of 3.54 in Comfort. These scores

indicate a foundational but not in-depth understanding of ergonomic principles. The highest score in Comfort suggests that employees are relatively aware of and satisfied with the ergonomic setups that directly affect their physical ease at work. Conversely, the lowest score in Training points to a significant gap in the formal education and application of ergonomic principles, indicating a need for more robust training programs that could help employees optimize their work environments effectively.

Safety scored the highest among the aspects after Comfort, with a mean of 3.52, reflecting a better grasp of safety practices than other ergonomic aspects, yet still categorized as moderate, highlighting room for improvement (Nabila Huda Adnan et al., 2015). This moderate awareness across all categories underscores the necessity for targeted interventions such as improved ergonomic training and clearer communication of ergonomic benefits. Such efforts are essential not only for elevating the overall ergonomic awareness but also for enhancing workplace safety and productivity. Addressing the deficiencies in training, in particular, could significantly mitigate ergonomic hazards and promote a safer, more comfortable working environment for employees.

5.3 Level of Employee Performance Among Staff

Table 2: level and Average Mean Score for Employee Performance

Dimension	Mean Score	Level
Task Performance	3.56	Moderate
Contextual Performance	3.42	Moderate
Adaptive Performance	3.39	Moderate
Overall Mean Score	**3.46**	**Moderate**

The study assessed employee performance within the construction industry in Johor Bahru, focusing on three performance dimensions—Task, Contextual, and Adaptive—with each scoring moderately overall. Task Performance emerged as the highest at 3.56, suggesting that employees can handle their direct responsibilities, yet there is room for improvement (Rabindra Kumar Pradhan et al., 2017). Contextual and Adaptive Performance, with scores of 3.42 and 3.39, respectively, indicate that while employees can support their colleagues and adjust to workplace changes, these areas could benefit from enhanced training. The overall mean score of 3.46 across all dimensions reflects a competent workforce but not excelling, indicating the need for programs that could further elevate their capabilities and productivity.

On examining the individual dimensions, it becomes apparent that while task performance is relatively strong, indicating effective management of job responsibilities, adaptive performance is less developed, highlighting a challenge in coping with organizational changes and varied job roles. Adaptive performance is crucial for navigating the rapidly changing work environment; enhancing this

capability through targeted training could lead to significant improvements. To boost employee performance across the board, the organization could benefit from implementing developmental programs that focus on improving adaptability and teamwork, thus fostering a more dynamic and efficient workforce capable of sustaining high performance and commitment.

5.4 To Identify The Relationship Between Ergonomic Awareness and Employee Performance Among Staff

Table 3: Relationship between Ergonomic Awareness and Employee Performance

No.	Relationship	Result	Strength Of Relationship
1	Relationship between Ergonomic Awareness and Employee Performance	0.872**	High correlation

***Correlation is significant at the 0.01 level (2-tailed).*

The study conducted in the construction industry in Johor Bahru utilized Pearson correlation analysis to explore the relationship between ergonomic awareness and employee performance. Results indicated a significant and robust positive correlation, evidenced by a correlation coefficient of 0.872, which was significant at the 0.01 level (2-tailed). This high correlation suggests that improved ergonomic awareness is closely linked to better employee performance, underlining the pivotal role of ergonomic practices in enhancing productivity and efficiency in the workplace. The strong correlation reinforces the importance of ergonomic training and initiatives as vital components of human resource development strategies aimed at boosting overall job effectiveness among construction industry workers in Johor Bahru.

Furthermore, the study highlights various aspects of ergonomic awareness, particularly safety—that significantly impact employee performance. Kim IJ (2017) noted that while construction industries often prioritize productivity, they overlook safety and health issues, leading to increased medical and compensation costs from musculoskeletal disorders (MSDs). By focusing on safety, organizations can prevent accidents and simultaneously enhance productivity and employee satisfaction, demonstrating that a well-implemented ergonomic strategy contributes substantially to safety and performance outcomes (Faez et al., 2021).

Overall, the findings suggest that a well-established ergonomic environment within an organization not only promotes better performance but also supports effective training programs. High levels of ergonomic awareness can significantly improve employee performance, aligning with Selamat's (2016) research, which emphasized a strong link between ergonomic conditions and job performance. The study by Koirala and Nepal, 2022 also supports this. This study confirms that employees with heightened ergonomic awareness will likely exhibit enhanced work performance, highlighting the critical need for organizations to invest in ergonomic education and environment optimization to foster a productive and safe workplace.

6.0 CONCLUSION AND RECOMMENDATION

The research conducted among employees in the construction industry in Johor Bahru has elucidated a definitive correlation between ergonomic awareness and employee performance, with significant findings pointing towards a moderate but foundational understanding of ergonomic principles across various dimensions. Despite satisfactory performance levels, there is room for improvement, especially in training and adaptive performance areas. The high correlation between ergonomic awareness and enhanced job performance underscores the necessity for integrated ergonomic practices within the workplace to foster a safer environment and heightened productivity and job satisfaction. This study reaffirms the pivotal role of ergonomic training and implementation in enhancing the overall effectiveness of employees in the construction sector, signaling a progressive shift towards a more informed and health-conscious workforce in Johor Bahru.

Therefore, based on the findings, this study proposes two recommendations to organizations; firstly, construction companies in Johor Bahru need to develop comprehensive ergonomic training programs. These initiatives should cover basic ergonomic principles and emphasize their practical application in day-to-day operations. The programs need to be customized to address the specific gaps in training identified by the study, mainly where ergonomic awareness was found to be lacking. By enhancing employees' understanding of optimizing work environments, companies can significantly reduce workplace risks and boost efficiency and comfort.

Furthermore, there is a pressing need for construction firms to implement strategies that improve employees' adaptability and teamwork skills. This could be achieved through regular workshops and team-building activities that enhance flexibility, problem-solving abilities, and resilience. Emphasizing scenario-based training could also be beneficial, equipping employees to handle better the evolving demands and challenges of the construction sector. These measures will improve employees' performance in their current roles and prepare them for various job requirements, fostering a more dynamic and capable workforce.

Author Contribution

Ismail, F., Chan, S. W., Mohd Rosli, N. A. and Mohd Yusof, F., focused on the writing process involved the introduction, discussion on idea organization, language style review, and final draft editing, all of which were collectively carried out and completed by all parties involved.

Conflict of Interest

This manuscript has not been published elsewhere, and all authors have agreed to its submission and declare no conflict of interest regarding the manuscript.

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