

The Role of Ergonomics and Workplace Design in Enhancing Well-being at Work.

Le rôle de l'ergonomie et de la conception du lieu de travail dans l'amélioration du bien-être au travail.

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Abstract :

The well-being of employees is a central concern for organizations striving to create healthier and more productive work environments. This systematic literature review investigates the crucial link between employee well-being and the fields of ergonomics and workplace design. Recognizing that well-being encompasses physical and psychological aspects, this study delves into the multifaceted dimensions of how workplace well-being can be optimized through ergonomic interventions and thoughtful workplace design. A comprehensive review of existing literature was conducted, drawing on a wide range of scholarly articles, research papers, and empirical studies. The search included psychology, ergonomics, occupational health, and organizational behavior databases to identify key findings and trends related to the intersection of well-being, ergonomics, and workplace design. The review demonstrates the profound impact of ergonomic considerations and workplace design on employee well-being. Ergonomically optimized workspaces can reduce the risk of musculoskeletal disorders, enhance physical comfort, and improve overall physical health.

Furthermore, well-designed workplaces that consider factors like lighting, noise, and layout can significantly influence employees' psychological well-being, greater job satisfaction, reduced stress levels, and improved mental health. Understanding the symbiotic relationship between well-being, ergonomics, and workplace design is crucial for organizations seeking to create environments that promote employee health and productivity. By synthesizing current research, this review provides valuable insights into how ergonomic interventions and thoughtful workplace design can enhance overall well-being at work. These findings offer a foundation for organizations and researchers to explore innovative strategies for optimizing the

work environment to support employee well-being and organizational success.

Keywords: Well-being; Workplace design; Employees' health; psychological well-being.

Résumé :

Les organisations qui s'efforcent de créer des environnements de travail plus sains et plus productifs accordent une grande importance au bien-être des employés. La relation cruciale entre le bien-être des employés et les domaines de l'ergonomie et de la conception du lieu de travail est examinée dans cette revue systématique de la littérature. Cette étude se concentre sur les aspects complexes de la manière dont les interventions ergonomiques et une conception réfléchie du lieu de travail peuvent optimiser le bien-être au travail, car le bien-être englobe à la fois des aspects physiques et psychologiques. Une analyse complète de la littérature existante a été effectuée en utilisant une variété d'articles universitaires, de travaux de recherche et d'études empiriques. Pour identifier les principales conclusions et tendances liées à l'intersection du bien-être, de l'ergonomie et de la conception du lieu de travail, la recherche a utilisé des bases de données en psychologie, ergonomie, santé au travail et comportement organisationnel. La revue montre que les considérations ergonomiques et la conception du lieu de travail ont un impact significatif sur le bien-être des employés. Les espaces de travail ergonomiquement conçus peuvent réduire le risque de troubles musculosquelettiques, améliorer le confort et promouvoir la santé physique générale. De plus, les lieux de travail bien conçus qui tiennent compte de choses comme l'éclairage, le bruit et la disposition peuvent avoir un impact significatif sur le bien-être psychologique des employés, favorisant une plus grande satisfaction au travail, une réduction des niveaux de stress et une amélioration de la santé mentale. Les organisations qui cherchent à créer des environnements favorisant à la fois la santé et la productivité des employés doivent comprendre la relation symbiotique entre le bien-être, l'ergonomie et la conception du lieu de travail. Cette revue synthétise les recherches actuelles et offre des perspectives utiles sur la manière dont les interventions ergonomiques et une conception réfléchie du lieu de travail peuvent améliorer le bien-être général au travail. Ces résultats donnent aux organisations et aux chercheurs une base pour explorer des stratégies innovantes pour optimiser l'environnement de travail pour soutenir le bien-être des employés et le succès organisationnel.

Mots-clés : Bien-être ; Conception du lieu de travail ; Santé des employés ; Bien-être psychologique.

1. Introduction:

In the dynamic modern workplaces, companies are giving significant importance to the well-being of their personnel. The emphasis on psychological well-being is guided by research that has predominantly concentrated on two fundamental components: contentment with one's present circumstances, assessed through factors like job and life satisfaction, and the existence of psychological distress, such as anxiety, depression, and irritation (House, 1980; Liu et al, 2023). The significance of giving priority to the well-being of employees is underscored by the potential adverse outcomes of inadequate well-being, which can result in or exacerbate intentions to quit a job, particularly among young employees (Chen et al, 2023; Chu, Guo, 2023). The psychological well-being component assesses the level of well-being among various categories of employees inside companies by evaluating their job satisfaction (Ambhore, Ofori, 2023; Cvenkel, 2020b). The degree of well-being and contentment that young employees experience significantly influences their commitment to firms, and poor working conditions increase the likelihood of employee turnover. This highlights the crucial significance of firms in cultivating supportive and conducive environments for overall well-being.

Ensuring the well-being of employees is crucial for enhancing their professional efficiency and personal satisfaction. Neglecting it could lead to increased employee turnover, more costs for recruiting new staff, and a decline in the organization's reputation. It is crucial to note that both the type of the job and the psychosocial and physical working conditions have a significant impact on the development of psychological well-being (Kalakoski et al, 2020). Hence, organizations might utilize the potential of both ergonomics and job design to tackle these difficulties. Ergonomics, by adjusting work conditions to accommodate the human element, enhances effectiveness, efficiency, and health, ultimately improving total well-being (Cybis et al, 2007). Concurrently, customizing job design to accommodate the varied requirements of individuals fosters mental health and overall well-being in the workplace (Cvenkel, 2020a). Organizations that aim to attract and retain talented individuals while also maximizing the performance and satisfaction of their staff must prioritize the combination of these factors. Organizations can cultivate a workplace culture that emphasizes employee well-being by comprehending and tackling the various aspects of work. This will lead to a more resilient, satisfied, and productive workforce. The researchers conducted a

systematic literature review to explore how ergonomics and work design can improve the overall well-being of workers, which offers a thorough evaluation of the available literature to highlight key results, methodological trends, and possible future research directions in the pursuit of better ergonomics and job design practices in the workplace. Additionally, it seeks to investigate the intricate relationships between employees' psychological health, job satisfaction, ergonomics, and job design and how these factors impact their overall well-being in different organizational contexts.

2. Methodology

2.1. Establishing the Literature Base:

The current research involved conducting a systematic literature review to explore the complex relationship between well-being at work, job design, and ergonomics. This methodology ensures the reliability of information published in scientific articles by eliminating authors' biases and subjective article selection (Becheikh et al, 2006). This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines (PRISMA) methodology. The primary purpose of the PRISMA technique is to facilitate health research by encouraging a comprehensive and transparent assessment of publications on the analyzed topic due to its narrative approach, which sets it apart from conventional literature reviews (Liberati et al, 2009; Tranfield et al, 2003). This protocol provides a thorough structure that includes sequential processes and detailed points for additional elaboration. Thus, it is characterized as a four-stage classification designed to ensure a distinct path for researchers and streamline the progress of their systematic review (Liberati et al, 2009).

By employing a planned and systematic approach, the researchers could effectively explore a wide range of existing organizational and occupational psychology knowledge. We aimed to understand the intricate relationships and interactions among these crucial factors. The complex nature of this investigation required a meticulous analysis of academic literature, guaranteeing a thorough understanding of how well-being, job design, and ergonomics collectively contribute to the changing dynamics of the workplace. By carefully choosing specific keywords and thoroughly searching well-regarded academic databases such as Science Direct and Scopus, the study's objective was to comprehensively gather a broad range of viewpoints and valuable information in the literature. This

review serves as an initial step in our effort to combine, examine, and simplify the vast amount of material accessible, thereby enhancing our understanding of the aspects that impact well-being in modern work settings. The methodological approach involved a series of essential procedures to guarantee a thorough understanding of the current knowledge base:

2.2. Research questions, databases, and choice of words:

To facilitate the search for papers in databases and choose the most significant ones for research, we have formulated two questions that need to be answered:

How may ergonomics improve workplace well-being?

How might job design enhance workplace well-being?

To thoroughly investigate the key knowledge domains pertaining to our research issue, we ran searches in databases that are widely recognized for their extensive coverage of science, engineering, health, and related fields. We conducted a targeted search using databases that specifically contain articles, conference papers, and book chapters, with a special focus on Scopus and ScienceDirect. Furthermore, to guarantee comprehensive research, we meticulously traced the sources cited in the selected papers and extensively explored pertinent literature.

We conducted a systematic search for articles that included the keywords 'well-being at work,' 'ergonomics,' and 'job design' throughout the text. Trying to investigate the relationship between well-being at work and both ergonomics and job design as shown in (Fig. 1) and using Boolean combinations, we selected the research equation to be 'well-being at work' AND (ergonomics OR 'job design'). The selection of this search technique was deliberately made to embrace a wide range of research publications.

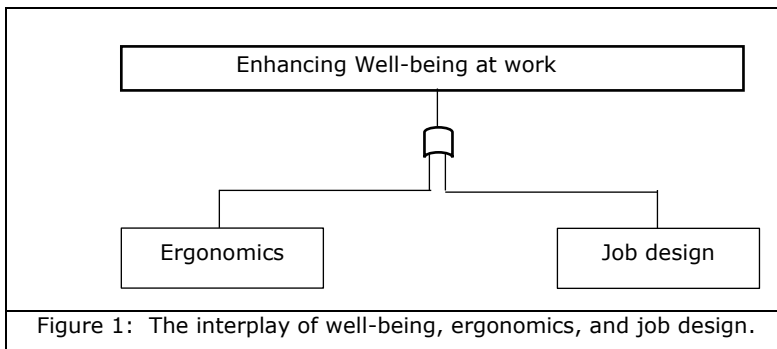
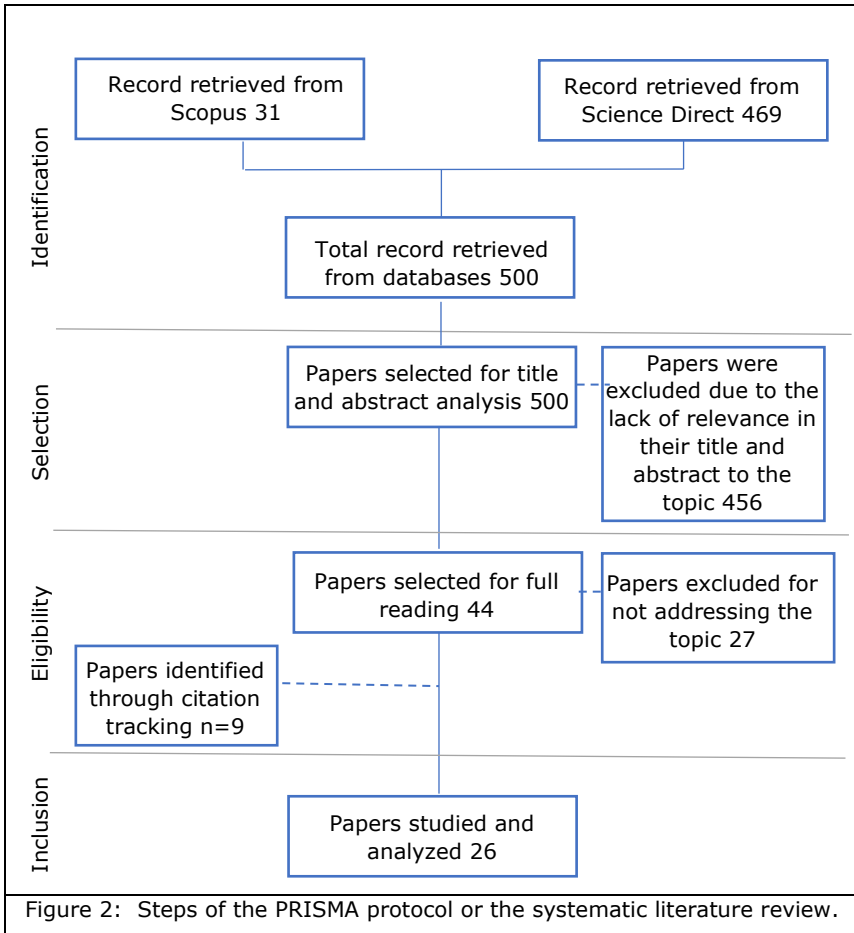


Figure 1: The interplay of well-being, ergonomics, and job design.

2.3. Article Screening and Review:

During the identification stage, an initial search in the two databases, Scopus and Science Direct, retrieved 500 articles. During the selection step, papers were screened using two criteria: examination of titles and abstracts.

Upon thoroughly examining the titles and abstracts of the initial 500 publications, 456 were deemed ineligible and subsequently excluded. Thus, a total of 44 items were endured. After thoroughly reviewing the complete papers, 27 were eliminated, and nine documents were obtained through citation-tracking, resulting in 26 publications, as indicated in the figure below (fig 2). During the selection stage, the papers must provide a positive answer to at least one of the research topics and investigate the correlation between MSD and well-being in the workplace. After a comprehensive evaluation of the previously selected 44 papers, these 26 articles were chosen as the final papers for the review due to their high relevance to the research issue.



3. Results:

3.1. Ergonomics' Ripple Effect on Workplace Well-being:

The term "ergonomics" originates from the Greek words "ergon," meaning work, and "nomos," meaning law (Cañas et al, 2011). According to de Souza Raymundo, Rotta, (2019), ergonomics is a field of study that examines the interaction between humans and the concepts and methods used to enhance the well-being of professionals during work performance. Ergonomics seeks to enhance the comfort and safety of the workplace Wisner, (1987) while also improving the quality of life for employees and preventing muscular illnesses (Iida, de Guimarães, 2016). These problems occur when employees perform tasks and often assume many non-ergonomic postures. Repetitive movements in certain positions have the potential to

induce musculoskeletal disorders (MSDs), such as those affecting the neck, shoulder, elbow/forearm, hands/wrists, and fingers (Genaidy et al, 2005; de Souza Raymundo, Rotta, 2019). Musculoskeletal issues of this nature are recognized to affect the well-being of employees and the economy significantly (Boorman, 2010). Ergonomics aims to optimize productivity and performance by tailoring work to the needs and capabilities of individuals, thereby promoting their well-being and health (Cybis et al, 2007).

Kalakoski et al, (2020) conducted a groundbreaking study that established the basis for comprehending the relationship between the physical workplace and the psychological well-being of employees. Their research, conducted in four public employment institutions in the United States and Canada, utilized a thorough self-administered questionnaire to investigate physical and psychosocial working conditions, satisfaction levels, and psychological distress. The results highlighted the unique characteristics of employees' evaluations of their physical surroundings, underlining the importance of comprehensive workplace health promotion and stress reduction initiatives that target both the physical and psychological aspects of job design. Vink et al, (1995) introduced a methodical technique to improve working conditions in office environments, explicitly targeting the reduction of mental and physical workload. This study assesses the efficacy of a systematic method for diminishing office burden, specifically emphasizing management's dedication and the workers' involvement. The technique encompassed identifying problems, generating ideas, conducting tests, and making decisions. Most workplaces implemented organizational interventions based on ergonomic recommendations to optimize the workplace. These interventions included adjusting seat height to individual measurements for optimal comfort and posture, setting desk height to accommodate elbow height, using document holders and back support devices, positioning screens and documents for optimal viewing, and placing the keyboard for ergonomic typing. Although it took around one year, the method was deemed valuable. Covering the same topic, Kroemer Elbert et al, (2018) emphasize the importance of ergonomic workstation design, accommodating a spectrum of body sizes, postures, and activities. The dynamic nature of workspaces, enabling individuals to move seamlessly among comfortable poses, is posited as central to fostering well-being (Kroemer Elbert et al, 2018).

The literature also examines the intricate interplay between ergonomic factors, musculoskeletal disorders (MSDs), and employee well-being.

Ceballos, Santos', (2015) study on musculoskeletal pain among teachers revealed its link to sociodemographic characteristics, health, and work well-being. They suggested interventions to improve coexistence, comfort, and pain reduction, emphasizing the need for understanding biological, ergonomic, occupational, and psychosocial mechanisms contributing to musculoskeletal pain. The findings suggested practical interventions to enhance coexistence between workers and improve comfort while reducing pain.

Ohlsson et al, (1995) established a correlation between musculoskeletal disorders (MSDs) and repeated tasks, which negatively affect the well-being of employees. On the other hand, Graf et al, (1995) focused on the significant problem of static working positions and unfavorable postures, especially in sedentary work environments. The study presented a new technique for categorizing and documenting sitting postural behavior, highlighting the need for proper seating that allows for substantial adjustments in position. Their findings emphasized the importance of designing tasks that align with anatomical and physiological limits and the significance of customizing chairs and workspaces to suit individuals, avoiding extreme spine positions. This aligns with the findings of Groenesteijn et al, (2012), who investigated the impact of specific chair characteristics on comfort ratings for different tasks. The practical knowledge gained from these studies can be used to improve chair comfort in office settings and reduce the occurrence of musculoskeletal disorders (MSDs).

In the realm of ergonomics, a multifaceted approach has been adopted to enhance human well-being and performance across diverse systems. Jones (2015) contributed a manufacturing-focused investigation grounded in the Balance Theory Model, which aimed to discern the impact of working conditions on musculoskeletal/ergonomic disorders. By identifying stressful working conditions and implementing targeted interventions, the study sought to improve workers' long-term health and well-being in a manufacturing facility. The results emphasized the pivotal role of managing working conditions to enhance employee health, aligning seamlessly with the overarching theme of the Balance Theory Model. This manufacturing-centric perspective complements broader

discussions in ergonomics, such as those by Hassall et al, (2015), which expanded the scope of human factors and ergonomics (HF&E), illustrating its evolution from a reactive stance to a proactive role in driving technological advances. Their study emphasized the broadened focus on group and organizational interactions, with HF&E playing a vital role in minimizing chronic illnesses, reducing stress, and improving safety and productivity. Complementing this, Eaves et al, (2015) employed a participatory ergonomics approach in the construction industry, engaging stakeholders to promote healthy aging and working behaviors among construction workers. The study highlighted the significance of involving end-users in the change process, emphasizing the valuable insights construction workers provide for shaping interventions that support healthy aging.

Additionally, Hoffmeister et al, (2015) proposed an Ergonomics Climate Assessment framework, emphasizing the balance between performance and well-being outcomes. Their study demonstrated that prioritizing both facets reduced employee work-related pain, offering a practical tool for organizations to assess and improve their ergonomics climate. Moreover, Kalakoski et al, (2020) delved into cognitive ergonomics interventions in office settings, utilizing a randomized trial to explore effective practices impacting work performance and well-being. Finally, Bey-Temsamani et al, (2022) contributed an innovative design for an overhead crane system, reducing operator forces and enhancing usability to improve ergonomic load handling, thereby emphasizing the importance of addressing ergonomic challenges for overall well-being in specialized work environments. These studies collectively underscore the integral role of ergonomics in fostering holistic well-being across various occupational settings.

3.2. The Dynamic Impact of Job Design on Well-being:

Job design entails allocating job tasks to personnel within an organization, with a focus on defining specific assignments, procedures, and performance criteria. Optimizing job design is essential for attaining company objectives, cultivating motivation, and augmenting employee satisfaction. The Job Characteristics Model (JCM) outlines five key characteristics contributing to job satisfaction: skill variety, work identity, task significance, autonomy, and feedback (Norris, Porter, 2012).

These studies collectively contribute to understanding how job design impacts employee well-being across different

industries and contexts. They underscore the importance of considering intrinsic and extrinsic factors in designing jobs that promote engagement, satisfaction, and overall well-being. Chen et al, (2023) discovered that factors such as job autonomy, skill variety, task relevance, feedback, work connections, and work circumstances indirectly impacted retention intentions. The well-being of employees mediated this influence. Most research has focused on skill variety and autonomy, recognizing their significant influence on job satisfaction and occupational well-being.

Viotti, Converso, (2016) investigated the effects of skill discretion on psychological outcomes among nurses, which had direct positive effects on reducing emotional exhaustion, intention to leave, and enhancing affective well-being and job satisfaction. The study highlights the importance of balancing job demands and skill discretion for sustaining job well-being and worker retention. At the same time, Seppälä, Tuominen, (1992) explored the relationship between job characteristics, technology levels, and operator well-being; this study emphasized the importance of maintaining challenging and exciting jobs, focusing on skill development in advanced systems. The authors explained that these job challenges involve learning new skills, introducing job enlargement and increased system responsibility to avoid boredom and routinization, and addressing low mental strain symptoms.

While autonomy is considered a key factor for ensuring job satisfaction, Lantz et al, (2015) recommended a shift from autonomy to participation and proposed that team learning processes mediate the connection between participative decision-making, inter-team relations, and team proactivity. This study confirms that learning is essential for balancing the need for efficient production and employees' health and well-being at work. However, collaborative learning can enhance both team proactivity and occupational well-being; we cannot neglect the importance of supportive influence from mentoring, which is considered vital, as Jiang et al, (2020) stated (after investigating thriving at work, focusing on task identity, autonomy, and job satisfaction) that the quality of mentoring moderates the effects of task identity on thriving and job satisfaction. It provides theoretical insights into thriving and its antecedents while offering practical implications for job design and workplace well-being.

4. Conclusion:

Eventually, the thorough analysis of ergonomics and job design regarding employee well-being provides a holistic comprehension of the complex factors influencing modern work settings. Ergonomics prioritizes adapting work environments and tasks to suit individual skills, minimizes musculoskeletal illnesses, and enhances psychological well-being. The literature highlights the importance of a carefully planned workspace based on ergonomic principles in creating an environment where employees can flourish. It emphasizes the significance of organizations incorporating ergonomic practices to promote their workforce's overall well-being and satisfaction.

Concurrently, the examination of job design emphasizes its crucial function in the field of organizational psychology and management. Job design entails deliberate organization to foster a favorable work environment. The interdependence between job design factors illustrates that excellent job design offers a basis for meaningful duties. The relationship between job design and enhanced well-being at work is indisputable, highlighting the importance of aligning duties with individual preferences to foster a pleasant and satisfying work environment.

Combining ergonomic techniques and careful job design is a comprehensive strategy to improve employee well-being. Recognizing the interdependence between the physical and psychological elements in the workplace emphasizes the significance of adopting a holistic approach. As organizations aim to maximize the well-being of their workforce, incorporating ergonomics and job design emerges as a crucial approach to establishing work settings that not only avoid physical discomfort but also enhance employees' sense of fulfillment and happiness. An all-encompassing strategy based on ergonomic principles and careful job design is crucial for enhancing staff well-being and cultivating a favorable and flourishing workplace environment.

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