

The extent of the impact of ergonomics on the mental health of workers

مدى تأثير الأرغوميا على الصحة النفسية للعمال

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ملخص:

تغيرت تصورات الصحة والصحة النفسية بشكل كبير في السنوات الأخيرة، وأصبح موضوع الصحة النفسية في بيئة العمل يشكل مصدر اهتمام متزايد بين المتخصصين. ومع ذلك، يصعب الربط بشكل قاطع بين العمل ومشاكل الصحة العقلية، إذ يمكن أن تكون هناك عوامل متعددة أخرى تلعب دوراً في نشوء تلك المشاكل. لكن بما أن العمل هو النشاط الأساسي للبشر، فمن المنطقي أنه يؤثر على توازنهم النفسي. تركز علوم بيئة العمل على الأفراد في المجال المهني، مع السعي لتكييف العمل ليلبي احتياجاتهم، وقدراتهم وطموحاتهم.

الكلمات المفتاحية:

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Abstract :

In the last ten years the concepts of health and mental health have been considerably modified and mental health at work is becoming an important interest of the «specialist» in this field. However, it is difficult to establish with certainty the cause and effect between work and mental health problems since many other factors could possibly be responsible for the onset of those problems. Since work constitutes the principal activity of the human being it is reasonable that it could affect its mental equilibrium. Ergonomics deals with the person at work with the aim of better adapting the work to his needs, capacities and aspirations.

Keywords:

Ergonomics, Mental Health, Work Environment, Workers, Adaptation, Needs

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Introduction

Over the past few decades, the world has witnessed rapid social, economic, and technological transformations that have profoundly affected lifestyles and work patterns, prompting a rethinking of traditional concepts of health, especially mental health in the workplace. Whereas work was previously seen as a source of income and a means of social integration and self-fulfillment, it has also come to be viewed as a potential source of stress, tension, and psychological disorders. This has made mental health in the workplace a central issue in contemporary discourse on psychology, public health, sociology, and occupational science.

The World Health Organization defines mental health as “a state of well-being in which an individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community.” Considering that work occupies the largest portion of an adult's time, its impact on psychological and mental balance cannot be ignored. With the increasing pressures associated with the globalized labor market, ongoing organizational changes, and heightened performance demands, it has become necessary to address the complex relationship between work and mental health as a contemporary issue with multiple dimensions.

Despite growing recognition of the importance of this relationship, attempting to identify precise causal links between working conditions and mental health problems remains complex due to the interplay of multiple social, personal, and environmental factors. Psychological and social factors surrounding work—such as task load, role ambiguity, professional conflicts, lack of appreciation, or job insecurity—may contribute to the development of anxiety, depression, or even burnout, but the effects vary depending on the individual characteristics and personal predispositions of workers.

In this context, ergonomics has emerged as a field of knowledge concerned with understanding the interaction between humans and their professional environment, seeking to adapt work to better suit the physical and psychological abilities, needs, and aspirations of individuals. Ergonomics is not limited to mechanical or physiological aspects, but delves into the study of psychological, social, and organizational factors that affect the quality of professional life. This discipline aims to design work environments that reduce sources of stress and strain, while promoting the well-being and productivity of workers.

From here, this paper raises key questions:

- How does work, as a major daily activity, affect individuals' mental health?

- What factors are associated with poor psychological adjustment within the work environment?
- How can occupational science contribute to the prevention of psychological risks and support professional well-being?

Research into these issues is not an intellectual luxury, but a practical necessity dictated by contemporary challenges, where rates of anxiety, depression, and occupational burnout are increasing across various sectors, making mental health at work a fundamental concern for any organization aspiring to success and sustainability.

1-Mental health at work

“The concept of mental health is difficult to grasp in its entirety, given the scope and complexity of its application” (Pocreau, 1983, p. 189). The concept encompasses all dimensions of the human being and the social and cultural system in which he or she develops. While mental health concerns the individual, it also encompasses the local community and the society to which he or she belongs.

<<Different models of mental health have been applied over time. Thus, from the <<abnormality>>model, and through a concept based on adaptation and maladjustment, we arrive at the development of a model based on the realization of human potential” (Joshi, 1983, p. 91).

This new dynamic conception of mental health is interesting above all in that it respects the uniqueness of the individual and promotes his or her continuous growth in the society in which he or she develops. Mental health thus becomes the ability to develop and realize oneself in accordance with one's personality. All activities in a person's life can enable them to realize their potential. Work, the primary human activity, seems to occupy a special place in achieving this goal. “In terms of time and energy, work is the most time-consuming part of existence, whether we like it or not” (Vinet, 1984, 26).

If we add to the time devoted to work itself, including transportation and meals, the time devoted to studying in preparation for work, as well as retraining and refresher courses, we can say that more than half of life is devoted to work. From a very early age, children are encouraged to think about what they will do when they grow up. In our social and cultural context, work, in addition to its economic function, remains the main source of a person's identity: it determines social status. New values based on individual fulfillment and development contribute to the increasing importance of work as a social activity (Vinet, 1984, p. 29).

But does work enable people to realize their potential?

On the contrary, work seems to be increasingly dehumanized and alienating. Automation has had the effect of replacing manual tasks with cognitive tasks that require constant vigilance: instead of mastering the manufacturing process, the operator merely monitors it. Instead of mastering the manufacturing process, the operator merely monitors it, but must remain alert to intervene in case of system failure (Levi, 1979, p. 31). People's opportunities to use all their physical, intellectual, and cognitive abilities in their work are diminishing. With new technologies, workers complain of being isolated from each other. The gap between workers' expectations and what their work offers them is widening, leading to increasing job dissatisfaction (Dolan and Arsenault, 1980; Vinet, 1984, p. 186).

It is generally accepted that there are three types of human needs:

1.1. Needs related to the physical existence of the individual: the need for sufficient income, housing problems, health problems, etc. An individual is considered an expatriate when he or she is forced to satisfy these needs on his or her own. An individual is considered an expatriate when they are forced to satisfy these needs on their own.

1.2. The need for job security and job choice.

1.3 The need for self-respect and personal prestige.

These needs are satisfied if the job is suited to the worker's mental and physical abilities, if the task is meaningful to them, if the worker can control the task, if the task is socially important, and finally, if it allows the worker to achieve self-actualization.

If all these needs are satisfied, work is seen as rewarding. Conversely, failure to satisfy these needs leads to dissatisfaction, which can take positive forms such as aggression, or negative forms such as job instability, absenteeism, and requests for job changes. Alienation appears to be the most serious form of negative dissatisfaction. Along with alienation come psychosomatic disorders and illness (Bugard, 1974, p. 302).

Therefore, not only does work often fail to meet the goals of "personal fulfillment," but it can also contribute to the deterioration of mental health. There are many professionals interested in work, including industrial engineers, industrial psychologists, sociologists, anthropologists, occupational physiologists, and ergonomists. Each of these disciplines contributes in its own way to shaping human work. Ergonomics attempts to identify all the effects of work on the person performing it.

2. What is ergonomics?

The term ergonomics, or work environment, is relatively new: it was coined and first used by an Englishman named Murrel. and was officially adopted in 1949, when the first ergonomic engineering association, the Ergonomic Research Association, was founded, bringing together English psychologists, physiologists, and engineers interested in the problems of adapting work to humans" (Laville, 1976, p. 5).

Although ergonomics is still relatively undeveloped in Quebec, it is attracting growing interest, particularly among those concerned with occupational health and safety.

Ergonomics is primarily concerned with adapting work to people, adapting facilities and work methods to the physical and mental capacities of workers. It is a discipline that draws on all scientific knowledge relating to human beings as a whole. The human-machine system is one of the concepts on which ergonomics is based.

The term "machine" should be understood in its broadest sense, meaning 'task' or "work to be done." The "human-machine" system is a way of approaching the relationship between humans and their work. Ergonomics is concerned with all types of work, not just tasks in which the worker encounters a machine.

Fraser (1983) defines a "human-machine system" as "a group of men and machines (or a single man and a single machine) working together to perform a specific function. "The worker in the workshop may not only be a component of a larger system involving an entire process, but also the human component of a system involving a single individual and a single tool." However, the human-machine system cannot be considered independent of the environment in which it exists. "Humans, machines, and the environment interact with each other. Humans exist in and interact with the environment; their work and requirements drive them to define and modify the machines they use; and machines, in turn, modify or define human activities. "Humans and machines form a system that interacts with the environment just as machines themselves do by modifying the nature of the environment and integrating themselves into it, while the environment defines the nature of the machine." (Fraser, 1983, p. 6).

The elements of this complex system of human, machine, and environment interact in a state of dynamic equilibrium. Some differences are tolerated, but beyond a certain point, overload occurs at some point in the system. The source of overload usually lies in the physical or psychosocial environment or at the interface between humans and machines. Since the "machine" part of the system must be designed to withstand all expected overloads, the most noticeable effects will be felt by the weakest component

of the system, namely humans. It is the latter who will have to make the effort to adapt to their work.

One of the main tools in ergonomics is work analysis, which is the study of all the components of work and their interactions. “Its purpose is to analyze the real requirements and conditions of the task and to analyze the functions that are actually performed” (Laville, 1976, p. 24).

Although the concept of “increased workload” is frequently used in ergonomics literature, it is far from accurate. However, many authors make a distinction between constraint and commitment (Laville, 1976; Leplat, 1980; Sperandio, 1980).

Gender, health status, etc., while the constraint remains the same for everyone.

For the purposes of work analysis, the workload can be divided into several components: the physical demands of the job, mental load, environmental conditions (lighting, noise, temperature, etc.), work organization (schedules, distribution of breaks, rotation at the workstation, etc.), health and safety risks, psychosocial factors, etc. Some of these elements that make up work are easy to study, measure, and quantify, and their effects on health are well known. This is the case, for example, with physical and postural requirements and environmental conditions. On the other hand, mental workload is difficult to define and its effects remain poorly defined. “There is no task, however simple or mechanical, that does not involve cognitive processes” (Sperandio, 1980, p. 254).

The concept of mental workload encompasses all mental, intellectual, and cognitive activities related to performing work. This part of work analysis is much more complex, and the links between mental workload and other components of workloads are not always clear. Work environment science attempts to understand the effects of mental load on mental health in order to better adapt work to those who perform it.

3. Mental workload and mental health

When it comes to mental workload, we must distinguish between creative activities and those that primarily require alertness. Some promote the development of intelligence and knowledge, while others contribute nothing to intellectual abilities. “Mental load has two completely opposite effects depending on whether a person belongs to one socio-professional category or another: for some, it is a means of intellectual advancement; for others, it is cultural distortion” (Mothé, 1976, p. 169).

This assessment may not be true in all cases. There appear to be limits that must be respected in all forms of mental activity. Overwork among executives can cause mental fatigue in addition to the constant mental effort required to perform certain routine tasks. Mental fatigue is a largely unknown phenomenon, although all workers are aware of it. We now know the energy cost of mental work. The human central nervous system consumes at least 500 calories per day (Bellone, 1976, p. 196).

Mental load is related to the amount of information received and the decisions that must be made under time constraints. In many work situations, the problem seems to lie in considering human mental capacity to be unlimited. Job requirements are such that the human mind cannot tolerate any failure. How many accidents have been ruled as human error? We must remember that human mental capacities are as limited as physical ones. If the job involves requirements that do not allow for any distraction or forgetfulness, without leading to serious consequences for the health or safety of the people performing it, then this reality has been forgotten.

Often, the work is well designed from the outset, and the workload represents an acceptable burden on the worker. After some time, for the purpose of modernization or increasing the company's profitability, work equipment is replaced without proper assessment of the changes in workload that these changes will bring to the worker. Sometimes, because the new equipment is supposed to be easier to operate, the pace is increased or some small tasks are added. This leads to an increase in mental load, resulting in mental fatigue and adverse effects on the mental health of workers (Shahata, 2006, p. 2021).

There are no ways to measure mental workload. However, there are certain indicators that can help detect whether there is an excess or deficiency in mental workload, both of which have approximately the same effect on the mental balance of the worker. These clues can be physiological, psychological, or behavioral, but many of these indicators are subjective (Sperandio, 1980, p. 254).

The worker plays a leading role in the study or comforting intervention. Isn't he the one who knows best the work he does? Who feels exhausted, anxious, and frustrated? The initial assumption is that the worker is right; the work environment tries to modify the work so that it does not cause extreme fatigue, anxiety, and frustration. Workers have a great ability to identify the causes of their discomfort. (Bissonnette, 1985)

Robotic work is particularly eloquent on this subject. Operators have a great ability to describe the gap between the quality of work they would like to do, such as using polite phrases with customers, and the time constraints imposed on them. Cashiers say they feel as if they are being monitored by their cash registers, which have become so sophisticated that they record every action they take. The head cashier no longer dares to offer to replace the cashier for a few minutes because he feels uncomfortable working on someone else's number.

Workers often look for solutions that can improve their situation. In the film mentioned above, the secretaries organized themselves to diversify their tasks by creating a rotation at different workstations. Unfortunately, their initiative was not very well received. Work organization seems to play a particularly important role in improving work for the well-being of workers. For example, careful scheduling of breaks, whose frequency and duration are determined according to the work

performed, can reduce fatigue and create a more favorable working environment. Mental health is a growing concern in the workplace. Maintaining a balance between physical and mental activities, in an environment that promotes personal development, is an ongoing challenge for those who direct their energies toward better work organization (Bissonnette, 1985, p122).

4- The importance of ergonomics in preventing psychological risks and promoting occupational well-being

Ergonomics plays a fundamental role in preventing work-related psychological risks and promoting occupational well-being by seeking to adapt working conditions to human capabilities and needs rather than forcing people to adapt to an environment that may be stressful or psychologically unsuitable. Ergonomics views work not only as a physical or technical system, but also as a social and psychological structure that affects the mental balance of workers. From this perspective, this scientific field contributes to identifying dangerous psychological and social factors, such as task pressure, role ambiguity, lack of appreciation, lack of control over working conditions, or imbalance between effort and reward, all of which are scientifically documented as increasing the likelihood of anxiety, depression, and occupational burnout (Siegrist, 1996; Karasek & Theorell, 1990). In addition to analysis, ergonomics works to redesign working conditions to take into account the biological and psychological rhythms of the individual, through time management, the provision of comfortable tools and working environments, and the facilitation of breaks, thereby alleviating the effects of chronic stress (Daniellou, 2005).

This discipline also focuses on promoting worker participation in decision-making and empowering them to perform their tasks independently, which research has shown to be linked to higher levels of satisfaction and psychological effectiveness (Clot, 2010). Ergonomics also relies on multi-level prevention strategies: primary prevention, which involves improving workplace design; secondary prevention, which focuses on early detection of signs of mental breakdown; and tertiary prevention, which aims to reintegrate those affected psychologically into working life in a flexible and supportive manner (INRS, 2016). Through all these approaches, it is clear that occupational science is not just a technical tool, but a comprehensive humanistic approach that contributes to building a healthy and sustainable professional environment that respects the psychological dignity of workers and supports their mental balance in the face of the growing challenges of the contemporary professional world.

5. Suggestions for Occupational Psychologists and Employers

It takes both strategic organizational commitment and professional psychological guidance to create a psychologically safe workplace. Occupational psychologists and employers work in tandem to promote mental health, identify psychosocial hazards, and integrate well-being into the organization's culture and structure. People who

work in psychologically safe environments feel valued, supported, and free to voice their opinions without worrying about the repercussions (Edmondson, 1999). A multifaceted strategy combining evidence-based psychological interventions, participatory management, and ergonomic design is required to create such environments.

5.1. Leadership Commitment and Organizational Strategies

Employers ought to start by exhibiting a clear and ongoing dedication to the mental health of their workforce. This entails putting in place explicit regulations that acknowledge mental health as a crucial element of workplace performance and safety (World Health Organization [WHO], 2020). Healthy habits like work-life balance, emotional transparency, and boundary respect must be modelled by senior leaders. According to research, transformational leadership, which prioritizes empathy, vision, and individual consideration, dramatically improves organizational trust and employee well-being (Kelloway & Barling, 2010). Additionally, leaders ought to receive training on how to spot the early warning signs of stress, depression, or burnout, react compassionately, and appropriately refer people to professionals for support.

5.2. Interventions in Work Design and Ergonomics

To create work systems that reduce physical strain and cognitive overload, ergonomists and employers must work together. By striking a balance between job demands and employees' resources and capabilities, job redesign can lower psychosocial risks (Karasek & Theorell, 1990). This entails offering movable workstations, enhancing the lighting and acoustics, and making sure that the workload is distributed appropriately. Error rates and mental fatigue can be decreased by incorporating cognitive ergonomics, such as by streamlining intricate processes and interfaces (Dul et al., 2012). In addition to safeguarding physical health, these interventions also stop long-term stress and emotional fatigue, which are signs of psychological disorders.

5.3. Encouraging Autonomy and Participation

When employees are granted autonomy and real opportunities to participate in decision-making, psychological safety is strengthened. Autonomy, competence, and relatedness are fundamental psychological needs that support intrinsic motivation and mental health, according to self-determination theory (Ryan & Deci, 2017). As a result, employers ought to support participatory management techniques that empower people and fortify group accountability for health and safety, such as frequent team meetings, consultation procedures, and employee-led problem-solving groups. By creating interactive workshops and evaluating team dynamics, occupational psychologists can support these procedures.

5.4. Support Networks and Policies for Mental Health

Preventive, supportive, and rehabilitative measures should all be part of a comprehensive mental health policy. Awareness campaigns, stress management classes, and resilience-building initiatives are examples of preventive measures. Peer support groups, employee assistance programs (EAPs), and private access to counselling are examples of supportive measures. For workers returning from absences due to mental health issues, rehabilitation guarantees a seamless reintegration. When creating and assessing these interventions, occupational psychologists are essential in making sure they are supported by research and suitable for the target culture (Leka & Jain, 2010). To track stressors and assess the long-term effects of interventions, psychosocial risk assessments should be carried out on a regular basis (Cox & Griffiths, 2010).

5.5. Establishing a Positive Culture in the Company

The underlying organizational culture has an impact on mental health in addition to formal policies. Promoting well-being and lowering stigma are two benefits of an inclusive, equitable, and transparent culture. At every level of the hierarchy, employers should encourage the values of diversity, emotional intelligence, and respect for one another. A sense of purpose and belonging is strengthened by recognition initiatives that honour effort and contribution (Schaufeli & Bakker, 2004). Occupational psychologists can help create team-based interventions, leadership coaching, and culture-change programs that improve psychological safety for all.

5.6. Ongoing Assessment and Research Cooperation

Lastly, workplace mental health promotion needs to be viewed as a continuous process of assessment and development by occupational psychologists and employers. Continuous modification of interventions should be guided by data collection on psychological outcomes, job satisfaction, and absenteeism. Working together with academic researchers can improve programs' scientific validity and facilitate the transfer of knowledge from theory to practice (Nielsen & Miraglia, 2017). The ultimate objective is to make psychological safety a strategic asset that is essential to human dignity and organizational sustainability.

Conclusion

Employers and union members "claim to have many other concerns and priorities besides mental health," according to a study done by Francine Bourneville (for the Canadian Mental Health Association, Quebec Chapter) among fifty businesses in the Montreal area with three hundred or more workers (Bourneville, 1984, p. 25). Despite being several decades old, this finding is still remarkably relevant today. The enduring cultural bias that prioritizes physical health and productivity metrics over emotional and psychological well-being is reflected in the lack of awareness surrounding mental health in the workplace. Instead of proactively creating environments that prevent psychological harm, many organizations still take a reactive approach to mental health, dealing with crises after they arise.

This gap is caused in part by the limited dissemination of information about the psychological risks of work, such as social isolation, monotony, excessive pace, or sensory overload. Even though ergonomics and occupational psychology have advanced, those who are most impacted by these conditions frequently aren't aware of how they affect their emotional equilibrium and cognitive functioning over time. Therefore, a crucial first step in changing attitudes and practices is spreading this information more widely among employers, workers, and legislators. Instead of being merely a formality, awareness should be incorporated into leadership development, organizational strategies, and daily management choices.

This realization marks the beginning of a more profound cultural change—a move toward a more compassionate view of labour. It challenges organizations to acknowledge that mental health is a shared and systemic responsibility rather than just an individual one. With its multidisciplinary approach that blends ergonomics, psychology, and social sciences, occupational science can offer important insights into rethinking workplace procedures and environments to promote productivity and well-being. But as Bourneville's observation subtly implies, the problem goes beyond scientific knowledge and touches on the fundamental principles and significance of labour in modern society.

It is necessary to challenge prevailing models of efficiency, competition, and control in order to rethink work in a more humane way. These models frequently overlook the psychological toll that labour takes. It entails viewing the workplace as a dynamic ecosystem where people's potential, inventiveness, and mental equilibrium are valued as essential resources. Employers, unions, legislators, and occupational psychologists must all work together to create a culture of respect, care, and inclusion in order to bring about such a change. In this way, fostering mental health at work is a deep ethical and societal commitment that shapes the future of work itself, rather than just being a technical or managerial issue.

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