



## THE IMPORTANCE OF PSYCHOSOCIAL ASPECTS AND THE URGENT IMPLEMENTATION OF COGNITIVE ERGONOMICS IN THE PREVENTION OF OCCUPATIONAL DISEASES

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### Abstract

The topic of cognitive ergonomics is driven by organizations' neglect of employees' mental health in the workplace. While physical health is prioritized, mental health is often undervalued, even though it is equally crucial for work efficiency. The lack of recognition of cognitive ergonomics can be attributed to the prevalence of physical ergonomics and the absence of mental health policies in companies. Competition and the pursuit of profit often override concern for workers' well-being.

Cognitive ergonomics, which focuses on mental processes, is essential to providing comfortable and safe working conditions. However, its importance is still underestimated. Academic studies on the topic are scarce, highlighting the need for more research and preventive actions. The introduction of cognitive ergonomics in the workplace can be done by including professionals specialized in organizational psychology in the occupational health and safety teams.

Although there is little literature on the subject, it is crucial to recognize and value cognitive ergonomics to promote workers' mental health. Its implementation can bring significant improvements to work environments, contributing to the prevention of occupational diseases and ensuring the well-being of employees.

**Keywords:** psychosocial aspects; cognitive ergonomics; mental health; prevention; occupational diseases.

### 1. INTRODUCTION

The motivation for choosing the topic of cognitive ergonomics is based on the lack of attention paid by organizations to the care and preservation of the mental health of their employees in the workplace. Human health is a factor of extreme priority, whether physical or mental. The degree of concern should be analyzed in the same proportion, as both are necessary for carrying out any type of activity. If there is any imbalance, the individual will not be able

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to fully and efficiently perform his tasks and, consequently, deliver favorable results for the company.

It is perceived that there is a lack of knowledge or devaluation of cognitive ergonomics by Brazilian organizations, in addition to the lack of an OSH (Occupational Health and Safety) policy focused on the mental health of workers in corporate management or operational areas (shop floor). One of the hypotheses for this is that when ergonomic risks are presented, most of the time, physical ergonomics is the most "prestigious" because it has greater *status* and relevance for companies, because many professionals and managers think only that this is related to activities that require greater physical and postural efforts.

Another issue may also be that companies are not required to present projects or plans to promote mental health and QWL (Quality of Life at Work) as organizational guidelines/regulations to be complied with. The culture of prevention in the country is little discussed and implemented in organizations. What we see is an OSH policy structure and organizational guidelines that are based on ensuring health and safety for employees only for the purpose of complying with legal requirements, which are mandatorily established by inspection bodies. As a result, competitiveness and profitability are elements that continue to prevail and stand out as a priority in several Brazilian economic activities.

Therefore, how to introduce cognitive ergonomics in work spaces and how can it contribute significantly to the prevention of occupational diseases in the context of mental aspects? Therefore, the general objective is to identify, through academic publications, the number of studies carried out with the theme: cognitive ergonomics, psychosocial aspects and mental health/occupational safety/occupational disease with proposals or solutions for improvements, aiming at health promotion and disease prevention. As a methodology, a systematic review of literature adapted based on articles and journals from academic journals located in the google scholar database was used in this work.

## 2. DEVELOPMENT

Ergonomics is a very old science and studied in several areas of knowledge such as Medicine, Engineering, Psychology, Industrial Design, among others. In the field of study of Occupational Health and Safety, it is not as recognized as it should be due to its main importance and is directly linked to the prevention of diseases and accidents whose predominant risks are physical, chemical, biological and accidents.



The fact is that importance and concern should be observed in equal proportion. With the advancement of technology and work management models, there is an exponential trend in cases of occupational diseases related to the work environment that focuses on the precepts of cognitive ergonomics and, consequently, gradually affects the mental health of workers.

Ergonomics aims at the adaptation of work to man and his psychophysiological characteristics and, in this sense, it constantly seeks to provide comfortable, safe and productive conditions to workers in work spaces. Working conditions, according to NR 17, include "aspects related to the lifting, transport, and unloading of materials, the furnishing of workstations, work with machines, equipment, and hand tools, comfort conditions in the work environment, and the organization of work itself" (BRASIL, 2021).

According to the *International Ergonomics Association* (IEA), "ergonomics is the scientific discipline that deals with understanding the interactions between humans and other elements of a system" (IEA, 2020). From this point of view, it can also be understood as a science of work that guides systems and in parallel all aspects related to human activity, promoting a holistic approach to work (FERREIRA & MACHADO, 2020).

Ergonomics has three main types: physical, cognitive, and organizational. The best known and most commented on is physical ergonomics. Its definition is almost always understood as one that studies and focuses on the aspects of posture and movement of the worker. Physical ergonomics is related to the physical aspects of the worker. Anthropometry, biomechanics, and physiology are studies that guide the adequacy of tools, machines, and ranges to the anatomical characteristics of the individual (IEA, 2020).

Cognitive ergonomics is directly linked to the individual's mental processes. In this case, elements such as mental workload, attention, concentration and decision-making must not only be recognized in the corporate management of a company but also be remembered and observed in the operational areas (LIMA et al., 2015). The activities can even be considered as distinct, while one focuses on intellectual aspects and another is more intended for manual functions. However, both do not prevent you from triggering possible symptoms related to mental health. Thus, according to Santos et al. (2019), "it is not enough to be concerned only with the physical aspects of Ergonomics, but also with mental and social aspects associated with it" (p.44).

Organizational ergonomics, on the other hand, is focused on the relationship with socio-technical systems, involving processes, flows, operating policies, work projects, and also the organization of work (ROCHA, 2017).



Ergonomics is considered the basis of studies for other different areas such as Sociology of Work, Activity Clinic, Ergology and Psychodynamics of Work. Articulated together, these studies are richly developed through demands that present misalignment between workers, work environment, activities, and tasks (PAULA & PAULA, 2021). The work clinic has a broad view of work situations, within the parameters of the prescribed and the real. In this way, it is possible to investigate what plagues and what makes workers sick in the workplace.

According to Santos and Melo (2019), workplace gymnastics programs have physiological, social and, mainly, psychological benefits. The latter contribute to the improvement of the ability to concentrate at work, reinforce self-esteem and favor a change in routine. By providing relaxation and harmonization with the body and mind, it is possible to notice, in a short time, the reduction of fatigue, stress level and the stimulation of motivation and willingness to work.

As a strategy for preventing occupational mental illnesses, Zimmermann & Berni (2020) highlight that positive psychology can contribute to the prevention of suffering and illness, as it helps workers to "develop their strengths, in order to achieve a positive state of mental health based on positive emotions" (p. 190). This science highlights the psychological forces and positive emotions that over time help the individual in their relationships with co-workers and bosses, strengthening their qualities and improving their weaknesses, in order to promote favorable conditions of health and well-being and job satisfaction.

The methodology used in this article consists of a systematic review of adapted literature based on articles and journals from academic journals located in the google scholar database. Data collection was generated from publications carried out between 2019 and 2021. This research method aims to connect information from several studies on a topic, in order to summarize and simplify the scope of the subject in a given period.

To identify the articles with the intention of composing this study, a search was carried out with three descriptors related to occupational health and safety, resulting in a total of 625 studies, as shown in Table 1. To assist the search in an advanced and assertive way, the keywords "Psychosocial Aspects" and "NR17"; as well as, "Mental Health", "Occupational Safety" and "Occupational Disease" were combined using the Boolean operator resource AND.

Next, inclusion/exclusion criteria were established, with the purpose of making the research more refined. These choices were: the descriptors chosen could be found in the title, abstract, keywords of the work or in the body of the work; all publications should be in Portuguese; the publications should have been published in National Electronic Journals or



Annals of Congresses; Only scientific articles were considered (the flow of submissions is usually higher), and theses, dissertations, monographs, dossiers, essays were not included in the research. Therefore, as shown in table 2, based on the refinement, the selection of the research resulted in 30 academic studies.

Table 1 - Search for publications by keywords

Keywords	2019	2020	2021	Total
Cognitive Ergonomics (at work)	147	176	135	458
Psychosocial Aspects AND NR17 (at work)	6	14	12	32
Mental Health AND Occupational Safety AND Occupational Disease	47	45	43	135
<b>Total</b>	<b>200</b>	<b>235</b>	<b>190</b>	<b>625</b>

Source: Prepared by the authors themselves.

Table 2 - Selection of articles by keywords after refinement

Keywords	2019	2020	2021	Total
Cognitive Ergonomics (at work)	8	8	5	21
Psychosocial Aspects AND NR17 (at work)	2	1	1	4
Mental Health AND Occupational Safety AND Occupational Disease	-	4	1	5
<b>Total</b>	<b>10</b>	<b>13</b>	<b>7</b>	<b>30</b>

Source: Prepared by the authors themselves.

### 3. RESULTS AND DISCUSSIONS

From the refinement of the data collected, a qualitative analysis of the academic articles was carried out. This analysis focused on the observation of the importance that the researchers presented in their studies on psychosocial aspects in parallel with occupational diseases from the point of view of mental health.

It can be observed that despite the excessive changes in the context of the modes of production and management of work follow an exponential trend, the theme "cognitive



ergonomics" has not kept up with this pace. The search for studies related to this theme between 2019 and 2021 signaled a total of 458 researches, with the highest number in 2020 (with 176), the year the COVID-19 pandemic began. Many studies were carried out at that time, in view of the concern with the emotional and psychological aspects that some workers felt with the rupture of the way of work. They started to perform their activities in the *Home Office modality* and this abrupt adaptation led them to have difficulties both in dealing with the 'new' and in dealing with the epidemiological issues that the country was experiencing.

Regarding the theme "psychosocial aspects", the selection of refined articles presents a very low number of publications, indicating that it is necessary to encourage many researchers, especially professionals in the area of Occupational Health and Safety, to develop studies enabling the prevention of occupational diseases for mental health. This will contribute to the recognition and appreciation of discussing issues involving cognitive ergonomics and alert companies that it is necessary to carry out specific programs to meet the demands of workers affected and sickened by diseases that until then were considered 'invisible' by society.

The scientific articles were published in Brazilian electronic journals in different areas of concentration. As expected, the articles related to the descriptor "cognitive ergonomics" have an interdisciplinary relationship with the courses or training of the researchers. Ergonomics is not a science of a specific area, it relates to different areas of knowledge and is inserted in a multifaceted context.

Regarding the courses/areas of training of the researchers who authored the selected articles, for the 3 descriptors used in the search for scientific studies, it was noted that Nursing and Psychology appeared in all of them. This denotes that these two fields of knowledge are considered as the pillar for the understanding and emergence of the factors that are intrinsically involved in illnesses (physical, mental or physical and mental) related to the social environment, but specifically, in the work environment, based on the conditions existing in these spaces.

Therefore, the concern for health, whether physical or mental, has always been and continues to be a major objective for these areas and its relevance continues to be essential to discuss and promote preventive actions of comfort, well-being and quality of life. In fact, Costa and Silva, Santos & Carvalho (2020) point out that "professionals involved in the area of mental health, such as psychologists, realize that there is a need to improve the management of occupational safety" (p.2), that is, actions that deal with workers' health cannot be limited or restricted.



In one of the selected articles, the association between psychodynamics of work and ergonomics was observed. The emphasis on this is quite interesting for the context of the dimension of the task, as the researchers are not from the area of Psychology and are not specialists in Health and Safety. Usually, the approach to areas that deal with workers' mental health is highlighted by Labor Clinics, which require a very deep understanding of work and subjectivity.

#### 4. CONCLUSIONS

Although there is little literature on cognitive ergonomics, it was possible to perceive that, through the analysis of the articles, at least it was mentioned as a type of ergonomics and that its association is directly linked to mental processes. It cannot be denied that its importance foresees intense improvements if it is applied, discussed, planned and implemented with due care and purpose within each work reality.

It is still necessary to do many actions for it to be recognized and valued. Even, start a new review of the NRs, as there is no significant mention in the legislation, more specifically in NR1 (GRO) and NR17 (Ergonomics), about the importance of cognitive ergonomics in the prevention of diseases with regard to the mental health of workers.

Cognitive ergonomics can be introduced in work spaces from the insertion of professionals with training in Psychology and specialization in Work Psychology and/or Organizational Psychology in OSH management teams or as support in People Management.

They are well aware of the pathologies that affect individuals and can assist in the demands, proposing interventions and QWL programs to reestablish workers in the work environment. This will contribute to better identifying environmental risks that are classified within the field of ergonomic risks. Therefore, it will also help to recognize them if the company requests an Ergonomic Work Analysis (AET).

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