



ANALYSIS OF THE ACTIVITY AND ITS CONTRIBUTION TO THE IDENTIFICATION OF THE WORK DEMANDS OF AN OCCUPATIONAL HEALTH NURSE

Ruby Pereira da Silva Branco ^{1*}

Claudia Olläy²

Flavio Kanazawa³

Abstract

Activity ergonomics focuses on human activity, and more specifically, on activity situated in action. Ergonomists appropriated the concept developed by Activity Analysis Theory and situated it in action, which allowed a new perspective on work activity. The study aimed to analyze the activity of an Occupational Health Nurse, identify the demands in the work process and propose ergonomic recommendations to improve working conditions. It is a qualitative study, of the case study type, of a descriptive and analytical nature and is guided by having been developed based on the experience of the postgraduate student in Ergonomics, with the application of self-analysis of work activity. Data collection was carried out from May to June 2021, through self-observation of the process, tasks and work activities; on-site observation of the workplace and collection of organizational information. Based on the worker's perception of the stress experienced while implementing the internal coronavirus care protocol, the task of "COVID-19 Telecare" was chosen for analysis. Physical, mental, environmental and organizational demands were identified, as well as cognitive overload, related to the need for systematic execution and continuous attention to the task. The stress reported by the worker is related to the risk factors observed and their causes with the organizational issues of the work process. The recommendations concern adjustments to the flow of tasks and the work team.

Keywords: Ergonomics; Activity Analysis; Ergonomic Work Analysis; Organizational Ergonomics; Occupational Nursing.

1. INTRODUCTION

Ergonomics allows us to make a systemic approach to aspects of human activity, and it is necessary for ergonomists to analyze work considering physical, cognitive, social, organizational, and work environment aspects, among others. In general, it can be understood as a discipline that aims to transform work, in its different dimensions, adapting it to the characteristics and limits of the human being (ABRAHAAO, et al., 2009).

¹ SENAC University Center, Postgraduate in Ergonomics. * rubyapsbranco@gmail.com.

² SENAC University Center, Postgraduate in Ergonomics.

³ SENAC University Center, Postgraduate in Ergonomics.



Through Ergonomics, it is possible to understand which physiological and psychological mechanisms are involved in the production process of an organization, being, in Brazil, regulated by Regulatory Standard No. 17 (NR), which aims to establish parameters that allow the adaptation of working conditions to the psychophysiological characteristics of workers, aiming to provide the performance of work in a safe way, with comfort and efficiency in performance (MTPS Ordinance No. 3,751, of November 23, 1990).

Compared to industrialized countries, the introduction of Ergonomics in Brazil occurred late in the mid-1960s, allowing it to receive diverse influences. If it was initially associated with product engineering, in the 1970s, it emerged as the "Ergonomics of the Activity" to collaborate in facing problems related to working conditions, in the face of the large number of accidents of this nature (FILHO & LIMA, 2015).

The ergonomics of activity is centered on human activity, and more specifically, on activity situated in action. The ergonomists appropriated the concept developed by the Theory of Activity Analysis, and placed it in action, which enabled a new look at the work activity.

The knowledge generated is obtained through ergonomic work analysis (AET) that seeks to identify determinants of each activity, through the analysis of the objectives established by the person; characteristics of the materials and tools used; characteristics of people and the context of use. Through this, it is possible to identify factors in the organization of work that directly impact the physical and mental health of workers (STICCA, 2017).

According to Vilela et. al. (2015), the AET is a method that makes it possible to know about the functioning of the human being in a real work situation, making it possible to understand its determinants, being applied in this study to the activity of a professional in the area of Occupational Nursing.

According to the National Association of Occupational Nurses (ANENT), Occupational Health Nurses in Brazil perform activities related to occupational hygiene, safety and medicine, and are part of study groups for the protection of workers' health and safety. Their responsibilities include varied tasks related to the prevention of occupational diseases and accidents and the promotion of health at work.

In practice, this professional sometimes assumes multitasks that involve managerial, assistance, investigative, educational actions and currently, in the pandemic, they are directly linked to the development of activities related to COVID-19 prevention protocols in the companies where they work, carrying out epidemiological surveillance, guidance, case identification, monitoring of the evolution of cases, among others.



The primary demand of this study originated from a study developed in a postgraduate course in Ergonomics, which proposed the self-analysis of the work activity, in this case, of an Occupational Health Nurse. Subsequently, the complaints of stress on the part of the other nurses of the institution, as well as the identification of failures in

processes related to the COVID protocol adopted by the company, characterized the secondary demand, directing the study to the need to understand more comprehensively the relationship between the problem evidenced and its relationship with work.

The objective of this study was to analyze the activity of an occupational health nurse, identify ergonomic requirements (risk factors) in the work process and propose recommendations for improving working conditions.

2. WORKING METHOD

The study is qualitative, case study, descriptive and analytical in nature, and is guided by having been developed from the experience of the graduate student in Ergonomics, with the application of self-analysis of her work activity. According to Piana (2009), research cannot be developed without techniques and methodological instruments being properly applied, in order to allow the approximation to the object of study.

Data collection was carried out from May to June 2021, through self-observation of the work process, tasks and work activities; on-site observation of the workstation and survey of organizational information.

3. RESULTS AND DISCUSSION

The worker in question was admitted as a Junior Occupational Nurse through a selection process based on a technical interview, behavioral tests and specific knowledge, having been hired with a CLT contract and has a 44-hour workweek, held from Monday to Friday from 6 am to 3:43 pm, corresponding to the first shift.

Regarding the characterization of the worker under study, a summary of the main information is presented in Table 1.

Table 1. Data from the worker in the study.

Gender	Female
Age	34 years old
Marital status	Married woman
Offspring	01
Training	Bachelor and Degree in Nursing.



Education level	Postgraduate lato sensu level in Occupational Nursing and in Nursing in Cardiology and Hemodynamics. Currently studying Ergonomics.
Formative time	10 years and 11 months
Length of professional experience	10 years and 2 months
Current Role	Occupational Nurse Jr.
Time in the company	08 months
Time in Function	08 months

The study site team is composed of nurses and physicians, and of the total number of members, 67% have been with the company for less than 1 year, a factor that demonstrates the high turnover of these professionals. In the sector there are no nursing technicians or administrative professionals, so all activities are developed by nurses, whether administrative, service to the general public, low complexity or private to the category.

In relation to the tasks performed throughout the workday, it is evident that the worker has alternating postures, where part of the activities are performed standing, although the sitting position predominates throughout the shift. In short, it currently has the attribution of starting the journey of activities of the medical outpatient clinic by opening the building and preparing the environment for the day's activities (organization of materials and equipment, availability of printed materials). She starts the shift alone and remains so until 7:30 am, when two nurses arrive who perform administrative hours and the coordinating doctor.

In the company there is a protocol that establishes the obligation that every worker who is absent for 5 days or more, undergo an evaluation at the outpatient clinic, which is initially carried out by filling out a questionnaire that must be verified and analyzed by the nursing professional, temperature check in all cases, blood pressure and capillary glucose check in cases of hypertension and diabetes, respectively, and referral to the doctor when necessary.

Sometimes the worker arrives at the outpatient clinic and already finds people waiting in line, having to organize the sector quickly, deliver the forms, check vital signs, analyze the results and take action to refer the doctor, sanitize the materials used and separate the medical records, doing all this care alone. This routine occurs daily and is done until the end of the administrative shift entry time, ending at approximately 8:30 am, when activities at the workstation begin.

In this station, activities are developed for reading and processing e-mails, reproduction through scanning and photocopying of documents to team members (considering that there is only one machine and this is located on their desk), access to occupational health management systems for requesting and posting test results, recording medical certificates, issuance of



occupational health certificate, preparation of technical documentation and reports, nursing teleservice in the COVID protocol, telephone service to the areas, among others.

Due to the high number of tasks with variable frequency of completion, it was decided to organize them in table 2 below, in a categorized manner, in order to enable the analysis of the activity, which is proposed in this study.

Table 2 – Tasks performed by the study worker.

No	Tasks	Frequency	Workload
COVID Protocol Tasks			
1	Initial COVID screening service (away for 5 days or more)	Daily	2 hours
2	Teleservice COVID, Performing identification of cases, guidance and conduction of Same	Daily on demand	40 minutes / service*
3	Telephone service to customers (requests and doubts from workers, managers and areas)	Daily on demand	10 minutes/ Service**
4	Feeding statistical data into spreadsheets for managerial submission	Weekly	1 hour
5	Inspection in the area (temperature measurement and guidelines)	2 times a week	1 hour
Operational Tasks			
6	Verification and handling of internal emails and External	Daily	2 hours
7	Document handling	Daily	1 hour
8	Scheduling medical appointments	Daily	30 minutes
9	Exam routine (issuance of guides, printing, Results)	Weekly	5 hours
10	Certificate routine	Weekly	2 hours
11	Pre-occupational exam screening	Daily	1 hour
Care Tasks			
13	Clinical care	Monthly	1 hour
14	Urgent clinical care and emergency	Unscheduled	1 hour
Management and Planning Tasks			
15	Participation in strategic project meetings under your responsibility	2 times a week	4 hours



16	Health Service Waste Management	Monthly	30 minutes
17	Management meeting	Weekly	1 hour
18	Quality Management in Health Services	Weekly	2 hours

*The average number of daily cases treated by the worker is approximately 4, which corresponds to a total workload of 2 hours and 40 minutes dedicated to this task.

** Telephone calls take place simultaneously with other activities. An average of 35 telephone calls were mapped by the worker on the day.

For this study, the criterion adopted to define the activities analyzed was the demand originated from the complaint of the Occupational Health Nurse, in relation to the stress reported during the performance of activities related to the actions of the internal protocol for care to the coronavirus.

The task of "COVID-19 Teleservice" was chosen for analysis, of which the worker is the "*focal point*", where the occurrence of failures in the process related to the identification, communication and late treatment of cases was identified, which compromises the quality of the service provided, generating criticism from the General Management of Health, Safety and Environment.

The frequency of performing this task is not defined, as it depends on the worker's contact. During the study period, the average number of cases treated was approximately 27 suspected cases and 34 contacts. The demand for this service can arrive through four different channels, such as telephone call, worker complaint during face-to-face service,

Communication via *WhatsApp* and via e-mail. Specifically, the task carried out from the telephone call of a suspected case will be detailed.

The worker develops the COVID-19 Telecare task in a room within the medical outpatient clinic, with approximate measurements of 3m in length and 5m in width. It has artificial and natural lighting, with an incidence of light reflection from the window on the worker's monitor screen. Ventilation is natural and artificial, with a split-model air center, which provides hot or cold air.

The workstation consists of an office desk, which has an L shape, with approximate measurements of 160 cm wide, 80 cm deep, 75 cm high and rounded edges with 2 mm. It uses a chair in the "desk" model, which has armrest, backrest and seat support in laminated foams and nylon cover. It has adjustment and adjustment for the backrest and the seat has height adjustment with gas piston.



The workstation consists of a *height-adjustable desktop* computer, independent keyboard and mouse, *headset*, landline telephone and a *scanner* machine for scanning and copying documents, which serves the entire sector. It does not have ergonomic accessories such as document holders, wrist rests and footrests.

In the room there is a printer located on a specific table, outside the workstation, which serves all nurses, and it is necessary to travel to collect printed or copied documents. The medical record file is arranged in the room and is handled several times throughout the day, for the removal and storage of medical records in 90% of the consultations. The company has a documented environmental report, but it was not made available for this study, however the activity of the Occupational Health Nurse is not classified as a risk in terms of exposure to noise, due to the environment being compliant, within the tolerance limits according to NR-17. Thus, it was decided to carry out a qualitative evaluation, related to the subjective perceptions of the worker regarding environmental aspects, and the noise was considered by the worker as bad, not because of the actual auditory discomfort, but because of the effects on attention and concentration during the development of her activities.

The room where the workstation is located contains 5 telephone extensions, considering 3 people to serve them, who were sometimes not available. It is common for a teleservice to take place while other extensions ring or the other nurses are also attending, generating attention deviation and failures in the collection of important information in relation to the case attended. In this scenario, it is worth mentioning that during the study the sector was going through a building work and the activities were being carried out under constant noise from machinery. Regarding the cognitive aspects, in order to perform the task object of this analysis, which is characterized as complex due to the high cognitive demand, the worker needs constant attention during the service, short-term memory, interpretation of information to support the reasoning in relation to the case and decision-making to solve problems, which are not constant, but they happen daily.

At the workplace, the conditions that the worker had to perform this activity are summarized in a place where it is necessary to multitask simultaneously, such as interrupting a call center to make a copy of documentation required by other team members or to request that a worker who arrives in search of face-to-face service wait for a few minutes, since there is no receptionist or administrative support on site.

There are times when the service is completely interrupted, to be resumed later in another call, when a clinical emergency or work accident occurs. The worker is sometimes



doing the teleservice and receives other calls at the same time through the extensions of the room, virtual calls via *webex application* and *whatsapp*. Attention, at this moment, is extremely impaired, leading to errors that compromise the conduct of cases, generating delays in the pertinent treatments, which implies inferring that the cognitive conditions for carrying out the task of "COVID Teleservice" are inadequate.

The detailing of the activities that make up the "COVID Teleservice" task, chosen for analysis in the study, according to Table 3, was carried out to identify all the activities that make up the task and thus allow understanding the work process, to identify ergonomic requirements and consequently the measures to prevent or reduce the associated risk factors.

Table 3. Description of the activities.

Task Activities	Operative Mode	Average time to perform
1. Receives the demand through telephone service and performs anamnesis om Nursing.	Anamnesis consists of filling out a questionnaire to collect personal information and information about the occurrence, such as complaints, symptom onset and contacts. In this activity, orientation is also carried out for external medical care, care and distancing measures.	20 minutes
2. Accesses the system to seek additional information from the communicating worker.	Complementary information such as management, sector and area are commonly searched in the system, because most workers have difficulty informing. This data must be included in report managerial so Need be correctly informed.	2 minutes
3. Identifies who are the employees included as direct contacts of the case and Proceeds to communication of the removal.	In the occurrence of direct contacts who are also from the company, it is necessary to contact them by phone and dismiss them immediately to start home isolation, in addition to making the necessary guidelines. If it is impossible to locate the worker, the area must be activated through the secretaries or supervisors.	15 minutes
4. Formalize the exemptions of workers involved in the case (suspect and contacts).	Send e-mail to supervisors and managers of dismissed workers. In this activity, it also formalizes the request for cleaning of the place of work, in addition to the Information for bus line waiver chartered, if it uses.	10 minutes



5. Record the information collected in the anamnesis in a specific spreadsheet.	The data must be entered into three spreadsheets, two of which are related to the suspected case and one to the contacts. It cannot contain errors, as the spreadsheets are used by management to generate indicators that are presented to the board in a weekly meeting. The study worker is responsible for keeping the spreadsheet with data up to date and reporting to management, however all nurses have access to and sometimes impute wrong data.	5 minutes (per case)
6. Pack anamnesis form in a specific folder and monitor communication channels to identify the sending of documentation of the suspected worker that will support the case (certificates, PCR request, medical report).	Monitoring should happen throughout the shift, through the visualization of internal and external e-mail and <i>whatsapp</i> .	2 minutes each view
7. Targeting To company medical when After case classification by the external doctor.	Print documentation sent through the communication. Separation of the Chart of the worker. Organization of documentation in the medical record and referral to one of the doctors at enterprise. When the case is classified as suspected and the PCR test is not requested in the external care, the nurse needs to articulate with the intern to request this test and call the social service for scheduling.	15 minutes

Through the detailing of the task, it is possible to identify that activities 1, 2 and 3, in which the demand is received, are characterized as of great importance considering the need to collect the information that will serve as a basis for the treatment of the case in the later stages.

In a survey on procedural failures, it was evidenced that most of them occur in these stages, since it is necessary to identify the worker correctly, as well as his contacts, in addition to making the negotiations directed to the correct people involved in the case. The main flaws in the process are as follows:

- Contacts who are not away in time, because in the midst of the task, a new demand arises that disperses the attention of the occupational nurse, needing to pause the actions indefinitely and return to the activities previously started;
- E-mails communicating dismissal of cases containing errors such as the worker's name and registration or probable return date lower than necessary, according to the protocol and guidelines of the guiding bodies;



- Removal of contacts or bus lines improperly;
- Improper release of the return of contacts and bus lines removed;
- Late release of the return of contacts and bus lines;
- Incomplete or erroneous data in the management monitoring spreadsheet, from which the reports presented to the board of directors in the weekly COVID committee originate.

The "COVID-19 Teleservice" task implies cognitive overload, mainly related to the need for systematic execution and continuous attention to the task, in order to minimize the occurrence of failures in the process. The requirements present in the task were categorized for better understanding into physical, mental, environmental and organizational, and were identified in the activities of the task in question, according to Table 4.

Table 4. Ergonomic requirements identified.

Ergonomic Requirements	Task Activities	Conditions
Physics	1, 2, 3, 4, 5, 6 and 7	Sitting posture in activities 1 to 5. Handling of the file cabinet to locate medical records in activity 7, which requires extension movement and elbow flexion to open and close drawers, trunk flexion to close the heaviest ones by pushing them, squat for handling in the lower drawers. Considering that physical medical records are used in almost all consultations, even those that are not Related to the study task, physical demand is relevant.
Mental	1, 2, 3, 4 and 5	Attention is needed to collect and interpret the information received, as well as to correctly identify those involved who will be dismissed to initiate isolation and communication of cases; short-term memory to resume the negotiations that were pending during frequent interruptions; reasoning and decision-making in cases where it is necessary to direct the worker to external medical care and the ability to solve problems, when they occur deviations in the process.



Environmental	1 and 3	There is an environmental requirement related to noise, related to telephone contacts, which are fundamental in the task. As exemplified in the characterization of the workplace, it is perceived that especially when simultaneous care occurs, with all nurses talking on the phone or especially when the telephone channels ring together, the occupational nurse is not able to hear the worker who reports the case, which can cause misunderstandings in the information Collected.
Organizational	1, 2, 3, 4 and 5	Distinct tasks and activities, sometimes divergent in level of demand (operational x intellectual) are performed simultaneously. Lack of an established flow for communications and service. Administrative tasks conflict with care and care tasks. private nurses.

In the "COVID Teleservice" task, psychophysiological efforts are related to the physical, mental, environmental and organizational requirements identified above.

Regarding the physical demands evidenced in this study, the physical load can trigger musculoskeletal complaints, injuries related to the handling of the file cabinet and trigger health problems due to sitting work, such as low metabolism and cardiovascular diseases. Silva (2011) states that physical load is associated with physical effort and the wear and tear of body structures to perform a certain work, being related to the gestures, postures and movements of the worker necessary to perform the task, being expressed by the quantity and quality of the physical effort expended by each worker in the performance of their tasks.

Mental load can trigger stress, emotional changes, dissatisfaction with work, exhaustion, concentration and attention deficits, among others. For Frutuoso & Cruz (2005), workload plays a prominent role in the discussion on health and

job satisfaction, if we consider that the perception of well-being or even the condition of illness are generally associated with variations in the workload resulting from changes in physical and organizational conditions. For the authors, an imbalance in the process, whether overload or underload, can generate consequences for the worker's health, being manifested through fatigue, absenteeism at work, incidence of musculoskeletal disorders, and more recurrent behavioral and mental disorders.

In the study, the psychophysiological demands related to environmental aspects are characterized by the presence of noise, which impairs concentration, causes fatigue, stress, and disturbances in communication. For Ganime et. al. (2010), "noise is understood as a



contaminating agent of a physical type; It is an undesirable sound and, therefore, annoying. It is defined as the sound or group of sounds of such amplitude that it can cause illness or interference in the communication process".

Workers exposed to noise can respond to this stimulus with different auditory and extra-auditory responses depending on the characteristics of the risk, the exposure and the exposed individual himself. Extra-auditory effects are considered to be: disorders in the brain and in the nervous, circulatory, digestive, endocrine, immunological, vestibular, muscular systems, sexual and reproductive functions, psyche, sleep, communication and performance of physical and mental tasks, which can cause damage to health such as stress, irritability, hypertension and can be associated with other risk situations (GANIME et. al., 2010). According to Puro et al. (2010), occupational stress refers to stimuli in the work environment that require a response and its characterization depends on the individual's perception of evaluating events as stressors, with cognitive stress playing an important role in the process that occurs between potentially stressful stimuli and the individual's responses to them. For the author, stressors are characterized as stimuli generated at work and have negative physical or psychological consequences for a greater number of individuals exposed to them, which can be extra-organizational and organizational factors, individual and group,

Organizational ergonomics, also known as macroergonomics, is related to socio-technical systems and their optimization, including the organizational structure, its policies and processes. It is possible to exemplify through shift work, work scheduling, supervision, teamwork, among others (CORREIA & SILVEIRA, 2009). For Couto (2002) the "organization of work is the whole set of actions taken by the manager and the facilitators so that the prescription of work, objectives, plans and goals, dictated by the organization's management are fulfilled". Thus, it is emphasized that the development of multitasking and multifunctioning, characterized as a psychophysiological effort of an organizational aspect, can offer stress to the worker, in addition to professional demotivation due to the feeling of mischaracterization of his work.

As an ergonomic diagnosis, it was possible to determine that the stress signaled by the worker in the "COVID Teleservice" task is related to the risk factors observed and their causes with the organizational issues of the work process, as evidenced in Table 5. It is important to emphasize that other diagnoses related to mental issues have been identified and reflect the need for targeted attention.

Table 5. Ergonomic Diagnosis.



Job Requirements	Psychophysiological Efforts	Causes
Physics	1) Musculoskeletal complaints; 2) Work-Related Musculoskeletal Disorder;	<ul style="list-style-type: none"> • Work done most of the time in a sitting position. • File cabinet is composed
	3) Slow metabolism and cardiovascular diseases;	by heavy drawers and part of them are below hip level of the worker.
Mental	4) Stress; 5) Emotional change; 6) Dissatisfaction with work; 7) Exhaustion; 8) Concentration and attention deficit;	<ul style="list-style-type: none"> • Miscellaneous interruptions while performing the task. • Lack of a defined process for receiving the demand.
Environmental	9) Stress; 10) Concentration and attention deficit; 11) Extra auditory complaints related to noise;	<ul style="list-style-type: none"> • Inappropriate environment for teleservice activities (varied demands that generate sound discomfort and take away concentration). • The telephone equipment, intended to meet various demands, is located in the same room and by this motive play simultaneously, increasing the noise level in the place.
Organizational	12) Stress; 13) Dissatisfaction with work; 14) Professional demotivation ; 15) Interpersonal conflicts among the team.	<ul style="list-style-type: none"> • Multitasking performed simultaneously; • Multifunction; • Inefficient division of tasks.

4. FINAL CONSIDERATIONS

At the end of the analysis, it was identified that even in the mental and environmental work demands, the causes raised were also related to organizational issues related to the work process. Thus, the main recommendations were mostly characterized as being short-term and related to adjustments in the flow of tasks and the work team.

From this perspective, the proposed recommendations were: 1) Designate a professional to deal exclusively with the task of "COVID Teleservice"; 2) Establish specific communication channels for the receipt of cases, with no more than two being advisable, in order to optimize the flow of necessary negotiations and minimize failures in the process; 3) To allocate an adequate and specific place to carry out the task; 4) Adapt the work team, through the hiring of an administrative professional and/or technical level, so that the activities are carried out



according to the competence and requirement of each professional category, were some of the recommendations proposed.

As for the physical requirements, it is recommended to provide ergonomic devices to improve the comfort conditions at the workplace, to take micro breaks for stretching and relaxation during the workday, and to replace the filing cabinet with a sliding model.

Finally, through this study it is possible to demonstrate that the application of activity analysis is a scientific, didactic and efficient method for understanding work, and allows us to identify its requirements and thus propose ergonomic improvements in the physical, cognitive and organizational fields, reflecting in greater health and safety for workers, regardless of their area of activity.

REFERENCES

- ABRAHAAO, J. et al. **Introdução à Ergonomia: da prática à teoria**. São Paulo: Blucher, 2009.
- ANENT – **Associação Nacional de Enfermagem do Trabalho**. (2021). Disponível em: <www.anent.org.br>. Acesso em 14 jun. 21.
- BRASIL. MTPS - Ministério do Trabalho e da Previdência Social. **Portaria n.º 3.751, DE 23 de novembro de 1990** (DOU de 26/11/90 – Seção 1 – 22.576 e 22.577) Art. 1º Fica alterada a Norma Regulamentadora n.º 17 - ERGONOMIA, nos termos do ANEXO constante desta Portaria. Disponível em: <<http://trabalho.gov.br/busca?searchword=Portaria%203751/1990&searchphrase=all>>. Acesso em: 18 jun. 21
- BRASIL. MTE - Ministério do Trabalho e Emprego. SIT - Secretaria de Inspeção do Trabalho. **Manual de Aplicação da Norma Regulamentadora nº 17**. 2a ed. Brasília: MTE, SIT, 2002. 101 p.
- CORREIA SMS., SILVEIRA CS. **A ergonomia cognitiva, operacional e organizacional e suas interferências na produtividade e satisfação dos colaboradores. xxix encontro nacional de engenharia de produção**. Salvador, 2009. Disponível em: <http://www.abepro.org.br/biblioteca/enegep2009_tn_sto_105_701_12634.pdf> Acesso em: 15 de agosto de 2021.
- COUTO, Hudson de Araújo. **Como Implantar a Ergonomia na Empresa - A Prática dos Comitês de Ergonomia**. Belo Horizonte: ERGO Editora, 2002.
- FILHO, JMJ. LIMA, FPA. **Análise Ergonômica do Trabalho no Brasil: transferência tecnológica bem-sucedida?** Rev. bras. Saúde ocup., São Paulo, 40 (131): 12- 17, 2015. Disponível em: <<https://www.scielo.br/j/rbso/a/vyWrrfBH6y6YnrJFty5K37h/?format=pdf&lang=pt>> Acesso em: 15 jun. 21
- FRUTUOSO J.T., CRUZ R.M. **Work load evaluation and its relation with workers' health conditions**. Rev Bras Med Trab.2005;3(1):29 -36. Disponível: <<https://www.scielo.br/j/csc/a/hnVDnztXTS3PmfphFX3DQt/?lang=pt>> Acesso em: 26 jun 21



- GANIME, et. al. **O ruído como um dos riscos ocupacionais: uma revisão de literatura.** Rev. Enfermeria Global. Nº 19. Jun 2010. Disponível em: <https://scielo.isciii.es/pdf/eg/n19/pt_revision1.pdf> Acesso em: 25 jun 21 GENUINO S.L.V., GOMES M.S., MORAES E.M. **O estresse ocupacional e a Síndrome de Burnout no ambiente de trabalho: suas influências no comportamento dos professores da rede privada do ensino médio de João Pessoa.** Rev Anagrama. 2010;2:1 -9. Disponível em: <<https://www.revistas.usp.br/anagrama/article/view/35426>> Acesso em: 25 jun. 21.
- PIANA, MC. **A construção do perfil do assistente social no cenário educacional** [online]. São Paulo: Editora UNESP; São Paulo: Cultura Acadêmica, 2009. 233 p. ISBN 978-85-7983-038-9. Disponível em: < <http://books.scielo.org/id/vwc8g/pdf/piana-9788579830389-06.pdf>>. Acesso em: 16 jun. 21.
- SILVA, 2011. **Fatores determinantes da carga de trabalho em uma unidade básica de saúde.** Ciênc. saúde coletiva 16 (8). Ago 2011. Disponível em: <<https://www.scielo.br/j/csc/a/hnVDnztXTS3PmfphFX3DQt/?lang=pt>> Acesso em: 26 jun. 21
- STICCA, M. G. **As contribuições da Ergonomia da Atividade para a realização de diagnósticos na perspectiva da saúde do trabalhador.** Associação Brasileira de Psicologia Organizacional e do Trabalho. 2017. Disponível em: <<https://www.sbpot.org.br/publicacoes/artigos/as-contribuicoes-da-ergonomia-da-atividade-para-a-realizacao-de-diagnosticos-na-perspectiva-da-saude-do-trabalhador/>>. Acesso em: 15 jun. 2021.
- VILELA et. al. **Pressão por produção e produção de riscos: a “maratona” perigosa do corte manual da cana-de-açúcar.** Rev. bras. Saúde ocup., São Paulo, 40 (131): 30-48, 2015. Disponível em: <<http://dx.doi.org/10.1590/0303-7657000075413>>. Acesso em: 17 jun. 2021.