



ANALYSIS OF THE ACTIVITY AND ITS CONTRIBUTION IN IDENTIFYING THE WORK REQUIREMENTS OF AN OCCUPATIONAL NURSE

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SUMMARY: The ergonomics of activity is centered on human activity, and more specifically, on the activity situated in action. Ergonomists appropriated the concept developed by Activity Analysis Theory, and placed it in action, which enabled a new look at work activity. The study aimed to analyze the activity of an Occupational Nurse, identify the requirements in the work process and propose ergonomic recommendations to improve working conditions. It is a study of a qualitative nature, of a case study type, of a descriptive and analytical nature and is guided by the fact that it was developed based on the experience of the postgraduate student in Ergonomics, with the application of self-analysis of the 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 workstation and collection of organizational information. Based on the worker's perception of the stress experienced while carrying out the internal coronavirus care protocol, the task of "COVID-19 Teleservice" was chosen for analysis. Physical, mental, environmental and organizational demands and cognitive overload were identified, related to the need for systematic execution and continuous attention to the task. The stress signaled by the worker is related to the risk factors observed and their causes and 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; Nursing work.

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INTRODUCTION

Ergonomics allows us to take a systemic approach to aspects of human activity, and in order to understand this dimension, ergonomists must analyze work considering physical, cognitive, social, organizational aspects, the work environment, 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).

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 Norm No. 17 (NR), which aims to establish parameters that allow the adaptation of working conditions to the characteristics psychophysiological characteristics of workers, aiming to ensure that work is carried out safely, 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 “Activity Ergonomics” to help tackle problems related to working conditions, given the large number of accidents of this nature (FILHO & LIMA, 2015).

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

The knowledge generated is obtained through ergonomic work analysis (AET), which 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 specific to people and the context of use. Through this, it is possible to identify work organization factors that directly impact the physical and mental health of workers (STICCA, 2017).

According to Vilela et. al. (2015), AET is a method that makes it possible to learn about the functioning of human beings in a real work situation, making it possible to understand their 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 Nurses in Brazil perform activities related to occupational hygiene, safety and medicine, and are part of study groups to protect worker health and safety. Their responsibilities include varied tasks related to the prevention of illnesses and accidents at work and the promotion of health at work.

In practice, this professional sometimes takes on multitasking involving managerial, assistance, investigative, educational actions and currently, during 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 surveillance actions. epidemiological, guidance, case identification, monitoring the evolution of cases, among others.

The primary demand of this study originated from work developed in a postgraduate course in Ergonomics, which proposed the self-analysis of the work activity, in the case in

question, of an Occupational Nurse. Subsequently, complaints of stress from other nurses at the institution, as well as the identification of flaws in processes relating to the COVID protocol adopted by the company, characterized the secondary demand, directing the study towards the need to understand in a more comprehensive way, the relationship between the problem highlighted and its relationship with work.

The study aimed to analyze the activity of an Occupational Nurse, identify ergonomic requirements (risk factors) in the work process and propose recommendations for improving working conditions.

WORK METHOD

The study is qualitative in nature, of the case study type, descriptive and analytical in nature and is guided by the fact that it was developed based on the experience of the postgraduate student in Ergonomics, with the application of self-analysis of her work activity. According to Piana (2009), research cannot be developed without methodological techniques and instruments being applied appropriately, in order to allow an approach 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 collection of organizational information.

RESULTS AND DISCUSSION

The worker in question was admitted as a Junior Occupational Nurse through a selection process based on a technical interview, behavioral and specific knowledge tests, having been hired with a CLT and has a working day of 44 hours per week, carried out from Monday to Friday at the scheduled time. from 06h - 15h:43, 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 study worker.

Gender	Feminine
Age	34 years
marital status	Married
Children	01
Training	Bachelor and Degree in Nursing.
Education level	Postgraduate level lato sensu in Occupational Nursing and in Cardiology and Hemodynamics Nursing. Currently studying Ergonomics.
Training time	10 years and 11 months
Professional performance time	10 years and 2 months
Current role	Junior Occupational Nurse
Company time	08 months
Time in role	08 months

The team at the study site is made up of nurses and doctors, 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 carried out by nurses, whether administrative, serving the general public, low complexity or private to the category.

In relation to the tasks carried out throughout the day, it is clear that the worker alternates postures, where part of the activities are carried out standing, however the sitting position predominates throughout the shift. In short, it currently has the task of starting the medical outpatient clinic's activities 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 that way until 7:30 am, when two nurses who work administrative hours and the coordinating doctor arrive.

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

Sometimes the worker arrives at the 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 them to the doctor, sanitize the materials used and separate the medical records. , doing all this care alone. This routine occurs daily and is carried out until the end of the administrative shift, ending at approximately 8:30 am, when activities begin at the workstation.

At this station activities are carried out: reading and processing emails, reproducing documents through scans and photocopies for team members (bearing in mind that there is only one machine and this is located on their desk), access to management systems in occupational health for requesting and releasing test results, registering medical certificates, issuing occupational health certificates, preparing technical documentation and reports, nursing teleservices in the COVID protocol, telephone assistance to areas, among others.

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

Table 2 – Tasks carried out by the study worker.

N°	Tasks	Frequency	Workload
COVID Protocol Tasks			
1	Initial COVID screening service (away for 5 days or more)	Daily	2 hours
2	<i>COVID teleservice, identifying cases, providing guidance and conducting them</i>	Daily on demand	40 minutes / service*
3	Telephone assistance to customers (requests and queries from workers, managers and areas)	Daily on demand	10 minutes / service**
4	Feeding statistical data into spreadsheets for management submission	Weekly	1 hour

5	Inspection in the area (temperature measurement and guidelines)	2 times a week	1 hour
Operational Tasks			
6	Checking and handling internal and external emails	Daily	2 hours
7	Document management	Daily	1 hour
8	Scheduling medical appointments	Daily	30 minutes
9	Exam routine (issuing guides, printing, results)	Weekly	5 hours
10	Attestation routine	Weekly	2 hours
11	Occupational pre-examination screening	Daily	1 hour
Assistance Tasks			
13	Clinical assistance care	Monthly	1 hour
14	Urgent and emergency clinical care	Not scheduled	1 hour
Management and Planning Tasks			
15	Participation in strategic meetings of projects under your responsibility	2 times per week	4 hours
16	Health Service Waste Management	Mensual	30 minutes
17	Management meeting	Weekly	1 hour
18	Quality Management in Health Services	Weekly	2 hours

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

** Telephone calls occur simultaneously with other activities. An average of 35 telephone calls per day were mapped by the worker.

For this study, the criterion for defining the activities analyzed was adopted as the demand arising from the complaint of the Occupational Nurse, in relation to the stress reported during the performance of activities linked to the actions of the internal coronavirus care protocol.

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 quality of the service provided, generating criticism from the General Management of Health, Safety and Environment.

The frequency of carrying out 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 suspects and 34 contacts. The demand for this service can arrive through four different channels, including telephone calls, worker complaints during face-to-face assistance, communication via WhatsApp and via email. Specifically, the task carried out following the telephone call of a suspected case will be detailed.

The worker carries out the COVID-19 Telecare task in a room within the medical outpatient clinic, measuring approximately 3m long and 5m wide. It has artificial and natural lighting, with light reflecting from the window on the worker's monitor screen. Ventilation is natural and artificial, with a split model air central, which provides hot or cold air.

The workstation consists of an office table, which is L-shaped, with approximate measurements of 160 cm wide, 80 cm deep, 75 cm high and 2 mm rounded edges. It uses a “desk” model chair, which has support for arms, back and seat in laminated foam and nylon cover. It has adjustment and adjustment for the backrest and the seat has height adjustment with a gas piston.

The workstation consists of a desktop computer with adjustable height, 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, requiring travel to collect printed or copied documents. The medical records file is arranged in the room and is handled several times throughout the day, for the collection and storage of medical records in 90% of consultations.

The company has a documented environmental report, but it was not made available for this study, however the activity of the Occupational Nurse is not classified as risky in terms of exposure to noise, due to the environment being in compliance, within the tolerance limits according to NR-17 . In this way, it was decided to carry out a qualitative assessment, related to the worker's subjective perceptions regarding environmental aspects, with the noise being considered by the worker as bad, not because of the actual hearing discomfort, but because of the effects on attention and concentration during the development of its activities.

The room where the workstation is located contains 5 telephone extensions, considering 3 people to answer them, who were sometimes not available. It is common for a call center to take place while other extensions are ringing or other nurses are also attending, causing a diversion of attention and failures in the collection of important information in relation to the case being handled. In this scenario, it is worth highlighting that during the study the sector was undergoing building work and the activities were being carried out under constant noise from machinery.

Regarding cognitive aspects, to carry out 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 reasoning in relation to the case and decision making, to solve problems, which are not constant, but happen daily.

At the workplace, the conditions that the worker had to carry out this activity are summarized in a place where it is necessary to multitask simultaneously, for example, interrupting a call center to make a copy of documentation required by other team members or to request that a worker If you arrive looking for in-person assistance, please wait a few minutes, as there is no receptionist or administrative support on site.

There are times when service is interrupted completely, only to be resumed later on another call, when a clinical emergency or work accident occurs. The worker is sometimes providing teleservice and receives other calls at the same time through the room's extensions, virtual calls via the Webex and WhatsApp applications. At this moment, attention is extremely impaired, leading to errors that compromise the handling of cases, generating delays in the relevant treatments, which implies inferring that the cognitive conditions for carrying out the task of “COVID Teleservice” are inadequate.

The details of the activities that make up the “COVID Teleservice” task, chosen for analysis in the study, according to Tab. 3, were 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 measures to prevent or reduce associated risk factors.

Table 3. Description of activities.

Task activities	Operative Mode	Average completion time
1. Receives the demand via telephone and takes a nursing history.	Anamnesis consists of filling out a questionnaire to collect personal information and information about the occurrence, such as complaints, onset of symptoms and contacts. This activity also provides guidance on external medical care, preventive care and distancing measures.	20 minutes
2. Access the system to seek additional information from the communicating worker.	Additional information such as management, sector and area are commonly searched in the system, as most workers have difficulty providing information. This data must be included in a management report, therefore it must be reported correctly.	2 minutes
3. Identify who the employees are as direct contacts of the case and communicate the absence.	In the event of direct contacts who are also from the company, it is necessary to contact them by telephone and immediately release them to begin home isolation, in addition to providing the appropriate instructions. If it is impossible to locate the worker, the area must be contacted through secretaries or supervisors.	15 minutes
4. Formalize the dismissals of workers involved in the case (suspect and contacts).	Email supervisors and managers of laid-off workers. This activity also formalizes the request for cleaning the suspect's workplace, in addition to information for exemption from the chartered bus line, if the suspect uses it.	10 Minutes
5. Record the information collected in the anamnesis in a specific spreadsheet.	The data needs to be entered into three spreadsheets, two related to the suspected case and one to the contacts. It cannot contain errors, as spreadsheets are used by management to generate indicators that are presented to the board at 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 and sometimes input incorrect data.	5 minutes (per case)
6. Store anamnesis form in a specific folder and monitor communication channels to identify the sending of documentation from the suspected worker that will support the case (certificates, PCR request, medical report).	Monitoring must take place throughout the shift, by viewing internal and external emails and WhatsApp.	2 minutes for each viewing
7. Referral to the company doctor after classifying the case by an external doctor.	Print documentation sent via communication channels. Separation of the worker's records. Organization of documentation in the medical record and directing it to one of the company's doctors. When the case is classified as suspicious and the PCR test is not requested in external care,	15 minutes

	the nurse needs to coordinate with the internal doctor the request for this test and contact social services to schedule it.	
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By detailing the task, it is possible to identify that activities 1, 2 and 3, in which the demand is received, are characterized as being of great importance considering the need to collect information that will serve as a basis for handling the case in the subsequent stages. .

In a survey of procedural failures, it was shown that most of them occur in these stages, since it is necessary to correctly identify the worker, as well as their contacts, in addition to carrying out negotiations directed to the correct people involved in the case. The main flaws in the process are listed below:

- Contactors not away in time, as in the middle of the task, a new demand arises that scatters the nurse's attention from work, requiring them to pause actions for an indefinite period of time and return to previously initiated activities;
- Emails communicating dismissal of cases containing errors such as the worker's name and registration number or probable date of return that is lower than necessary, in accordance with the protocol and guidelines of the guiding bodies;
- Improperly removing contacts or bus lines;
- Improper release of return contacts and distant bus lines;
- Late release of return contacts and bus lines;
- Incomplete or incorrect data in the management monitoring spreadsheet, from which the reports presented to the board in the weekly COVID committee originate.

The task of “COVID-19 Teleservice” involves 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 demands present in the task were categorized for better understanding into physical, mental, environmental and organizational, being identified in the activities of the task in question, as shown in Table 4.

Table 4. Ergonomic requirements identified.

Ergonomic Requirements	Activities of Task	Conditioning
Physical	1, 2, 3, 4, 5, 6 e 7	Sitting posture in activities 1 to 5. Handling the filing cabinet to locate medical records in activity 7, which requires extension and flexion of the elbows to open and close drawers, trunk flexion to close heavier ones by pushing them, squatting for handling in the lower drawers. Considering that physical records are used in almost all consultations, even those not related to the study task, the physical demand is relevant.
Mental	1, 2, 3, 4 e 5	Attention is needed to collect and interpret the information received, as well as to correctly identify those involved who will be exempted to initiate isolation and communication of cases; short-term memory to resume negotiations that remained 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 deviations occur in the process.

Environmental	1 e 3	There are environmental requirements related to noise, related to telephone contacts, which are fundamental to the task. As exemplified in the characterization of the workstation, it is clear that especially when simultaneous care occurs, with all nurses talking on the phone or especially when the telephone channels ring together, the work nurse cannot hear the worker reporting the case, which may cause errors in the information collected.
Organizational	1, 2, 3, 4 e 5	Different tasks and activities, sometimes differing in level of demand (operational x intellectual) are carried out simultaneously. Lack of an established flow for communications and service. Administrative tasks conflict with the Nurse's care and private tasks.

In the “COVID Telecare” task, psychophysiological efforts are related to the physical, mental, environmental and organizational demands identified previously.

With regard to the physical demands highlighted in this study, the physical load can trigger musculoskeletal complaints, injuries related to handling the filing 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 wear and tear on body structures to perform a certain job, being related to the worker's gestures, postures and movements necessary to perform the task, being expressed by the quantity and the quality of physical effort spent by each worker in carrying out their tasks.

The mental load can trigger stress, emotional changes, dissatisfaction with work, exhaustion, deficits in concentration and attention, among others. For Frutuoso & Cruz (2005), workload plays a prominent role in the discussion about 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 workload. resulting from changes in physical and organizational conditions. For the authors, an imbalance in the process, whether overload or underload, can have consequences for the worker's health, 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 communication disorders. For Ganime et. al. (2010), “noise is understood as a physical contaminating agent; It is an undesirable and, therefore, uncomfortable sound. It is defined as a 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 individual exposed. Extra-auditory effects are considered: disorders in the brain and 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, high blood pressure and may be associated with other risk situations (GANIME et. al., 2010).

According to Genuíno 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 the cognitive playing an important role in the process that occurs between potentially stressful stimuli and the individual 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, individual and group factors,

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 this through shift work, work scheduling, supervision, teamwork, among others (CORREIA & SILVEIRA, 2009). For Couto (2002), “work organization is the entire set of actions carried out by the manager and facilitators so that the work prescription, objectives, plans and goals, dictated by the organization's management, are fulfilled”. Therefore, it is noteworthy that the development of multitasking and multifunctions, characterized as a psychophysiological effort with an organizational aspect, can cause stress to the worker, in addition to professional demotivation due to the feeling of lack of character in their 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 observed risk factors and their causes with the organizational issues of the work process, as evidenced in Tab.5. It is important to highlight that other diagnoses linked to mental issues have been identified and reflect the need for targeted attention.

Job Requirements	Psychophysiological Efforts	Causes
Physical	1) Musculoskeletal complaints; 2) Work-Related Musculoskeletal Disorder; 3) Slow metabolism and cardiovascular diseases;	<ul style="list-style-type: none"> • Work performed most of the time in a sitting position. • The filing cabinet is made up of heavy drawers and some of them are below the worker's hip level.
Mental	4) Stress ; 5) Emotional change; 6) Dissatisfaction with work; 7) Exhaustion; 8) Deficit in concentration and attention;	<ul style="list-style-type: none"> • Various interruptions during the performance of the task. • Lack of a defined process for receiving demand.
Environmental	9) Stress ; 10) Deficit in concentration and attention; 11) Extra auditory complaints related to noise;	<ul style="list-style-type: none"> • Inappropriate environment for teleservice activities (varied demands that generate noise discomfort and take away concentration). • Telephone equipment, designed to meet varied demands, is located in the same room and for this reason, rings simultaneously, increasing the noise level in the location.

Organizational	1) Stress; 2) Dissatisfaction with work; 3) Professional demotivation; 4) Interpersonal conflicts between the team.	<ul style="list-style-type: none"> • Multitasking performed simultaneously; • Multifunction; • Inefficient division of tasks.
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FINAL CONSIDERATIONS

At the end of the analysis, it was identified that even in the demands of mental and environmental work, the causes raised were also related to organizational issues linked to the work process. Therefore, the main recommendations were mostly short-term and related to adjustments to 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 receiving cases, with no more than two being advisable, in order to optimize the flow of necessary negotiations and minimize failures in the process; 3) Designate an appropriate and specific place to carry out the task; 4) Adapting the work team, by hiring an administrative and/or technical professional, so that the activities are carried out in accordance with the competence and requirements of each professional category, were some of the proposed recommendations.

Regarding physical demands, it is recommended to provide ergonomic devices to improve comfort conditions at the workplace, taking micro breaks for stretching and relaxation during the workday and replacing 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 on greater health and safety for workers, regardless of their area of activity.

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