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PRELIMINARY SURVEY OF ERGONOMIC AGENTS IN A REFERENCE AND SOCIAL ASSISTANCE CENTER IN THE PARAÍBA BACKLANDS

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Summary

Ergonomics is directly linked to the interaction between people and their work, promoting a safe and healthy work environment so that workers can work comfortably, preventing accidents and illnesses. The CRAS (National Care Center for the Rehabilitation of Children and Adolescents) is the gateway to several social programs. Numerous risk factors and ergonomic agents can be identified in a workplace. Based on this premise, we sought to conduct a survey of ergonomic risk agents at the CRAS. After collecting, analyzing, and identifying the risks, measures were proposed to mitigate them.

Keywords: Ergonomics, Occupational Safety, Workers' Health.

1. INTRODUCTION

Ergonomics is linked to the interactions between the employee and the work environment, minimizing discomfort and maximizing worker performance (Barsano & Barbosa, 2018, p. 173). In other words, a fundamental principle of ergonomics is to adapt the work to the worker, in order to ensure a safe, comfortable, and productive work activity (Silva et al. 2023).

Within the vast field of ergonomics, there are three domains: physical, cognitive and organizational ergonomics: physical ergonomics linked to the anthropometric characteristics of the worker; cognitive ergonomics related to mental processes and organizational ergonomics linked to systems and structures.

Regulatory Standard 17 – Ergonomics, establishes that organizations carry out ergonomic assessments and analysis of work situations through Ergonomic Work Analysis (AET) with a view to promoting and improving the quality of life of workers in the workplace.

The Social Assistance and Reference Center (CRAS) is the gateway to all social programs and services. As Rodrigues & Gabriel (2023) point out, the CRAS space should offer services according to the needs of the families being assisted. According to the authors, it is necessary to identify the vulnerabilities to be addressed in order to develop a plan, a map of the situations to be managed. It is through the CRAS that social programs such as the Bolsa Família Program are provided to thousands of families, as well as the Senior Citizens' Coexistence Service, which works to preserve the integrity of those over 60, and the Coexistence and Strengthening of Bonds Service, which, through workshops, seeks to strengthen relationships between children and adolescents (Rodrigues & Gabriel, 2023).

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The Social Assistance and Reference Center (CRAS) is a place where numerous occupational risk factors can be found, including ergonomic risk factors. Based on this proposal, we sought, through field research, to conduct a preliminary survey of ergonomic factors at a CRAS in the Paraíba backlands.

2. THEORETICAL FRAMEWORK

2.1 CONCEPT OF ERGONOMICS

To begin this discussion properly, let us seek to understand what ergonomics is. The term Ergonomics was adopted by Wojciech Jastrzębowski in 1857. According to Abrahão et al. (2009, p. 18), the term 'ergonomics' is formed by the words *ergon* (work) and *nomos* (laws and rules). In other words, ergonomics is basically the study of the interactions between humans and work.

Corrêa & Boletti (2015, p. 2) explain that the main objectives of ergonomics are the satisfaction and comfort of workers during work activities, so that the worker does not suffer work-related problems in the future.

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2.1.2 Ergonomics Domains

Within the vast field of ergonomics, there are three domains: physical, cognitive, and organizational ergonomics. Let's take a closer look below.

Physical ergonomics is linked to anthropometric, physiological, and biomechanical issues related to a given activity. This includes posture, material handling, repetitive movements, monotony, and more. (Kassada et al., 2011; Corrêa & Boletti, 2015, p. 15; Silva Filho, 2021 p. 106).

Cognitive ergonomics relates to the mental processes that can affect the interaction between humans and the work environment itself. Factors such as memory, reasoning, motor response, perception, attention, among others (Kassada et al., 2011; Corrêa & Boletti, 2015, p. 15; Silva Filho, 2021 p. 106).

Organizational ergonomics refers to the optimization of sociotechnical systems, as well as organizational, political and process structures (Kassada et al., 2011; Corrêa & Boletti, 2015, p. 15; Silva Filho, 2021 p. 106).

2.2 NR 17 – ERGONOMICS

The first regulatory standards – NR – emerged from Ordinance 3,214 of 1978. With them, NR 17 emerged, establishing the parameters to be followed to promote honest work, duly adapting its conditions to the worker.

The standard goes on to say that:

> Working conditions include aspects related to lifting, transporting and unloading materials, workplace furniture, working with machines, equipment and hand tools, comfort conditions in the work environment and the organization of work itself (Brasil, 2022).

NR 17 establishes that organizations must conduct ergonomic assessments to promote and improve workers' quality of life in the workplace. Since its last update in 2022, by Ordinance 4,219 of December 20, 2022, the standard, which mentions the mandatory performance of an Ergonomic Work Analysis (EWA), now mentions the possibility of conducting a preliminary ergonomic assessment, which may follow the parameters established by NR 1 through the stages of hazard identification and risk assessment (Brasil, 2022).

3. METHODOLOGY

The research was conducted at a Social Assistance and Reference Center (CRAS) in a city in the Paraíba backlands. The CRAS is a 337m² building located in the city center. It currently has 11 departments, where 24 employees work in the following roles: secretary, social worker, psychologist, social educator, coordinator, general services assistant, receptionist, registration officer, interviewer, visitor, and workshop facilitator.

The CRAS hierarchy is organized as follows: The constitutional mayor passes the actions to the secretary of social action, who in turn passes them on to the coordination team, thus distributing them to the other sectors. Let's understand this better as shown in Figure 1 below:

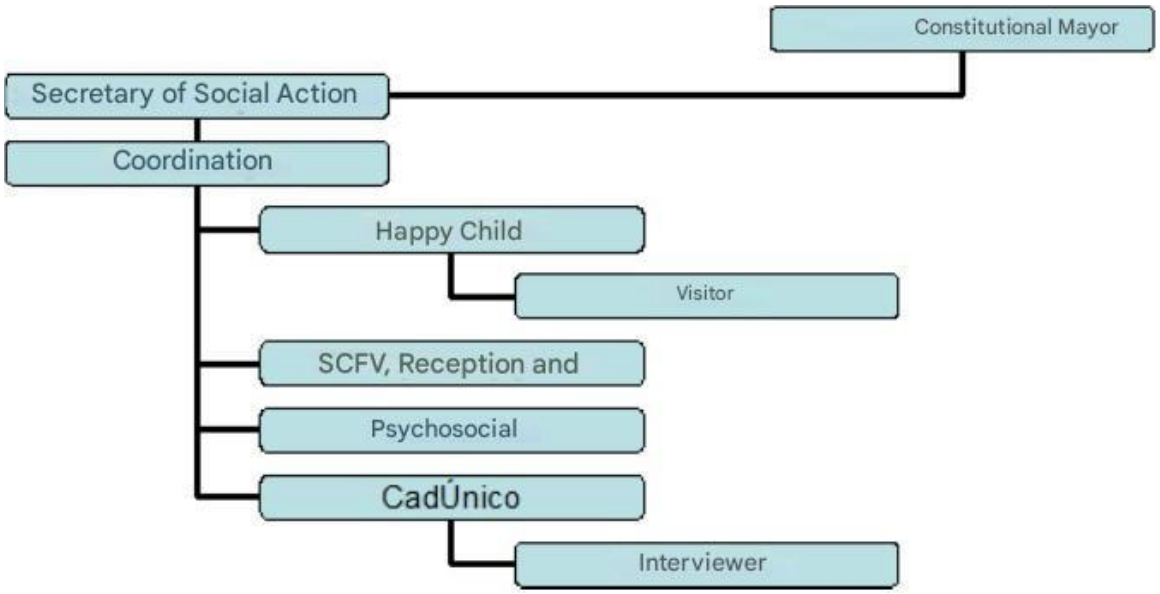

Figure 1 – CRAS management hierarchy

Source: Author's own elaboration (2024)

The methodology used consisted of exploratory field research. According to Marconi & Lakatos (2017, p. 204), this form of research is used to obtain information about a given problem while simultaneously seeking answers to questions about the subject. Exploratory studies:

> These are empirical research investigations whose objective is to formulate questions or a problem, with a threefold purpose: to develop hypotheses, to increase the researcher's familiarity with an environment, fact, or phenomenon, to conduct more precise future research, or to modify and clarify concepts. Systematic procedures are generally employed either to obtain empirical observations or for data analysis (or both simultaneously). Both quantitative and qualitative descriptions of the object of study are often obtained, and the researcher must conceptualize the interrelationships between the properties of the phenomenon, fact, or environment observed. A variety of data collection procedures can be used, such as interviews, participant observation, content analysis, etc., for the relatively intensive study of a small number of units, but generally without the use of probabilistic sampling techniques. Often, an independent variable is manipulated to discover its potential effects (Marconi & Lakatos, 2017, p. 204).

And he continues explaining that the three phases for this type of study are: Bibliographic survey with a view to gathering the largest number of references about the subject studied, characterizing it as the theoretical framework of the research; determination of the techniques that will be administered for data collection; and determination of analysis techniques after collection (Markoni & Lakatos, 2017, p. 205).

Data collection was conducted through the application of a checklist and observations made by the researcher. For data tabulation and analysis, existing literature on the subject was used, aided by *Microsoft Excel 2016 software*. It should be emphasized that this was an observational study; therefore, no tools other than the aforementioned checklist were used for data collection.

The research was conducted with the institution's authorization; data were then collected through observation and a checklist developed specifically for this research. Because the

research does not involve human subjects or any confidential information, it is exempt from Ethics Committee approval under Resolution No. 510 of April 7, 2016.

4. RESULTS AND DISCUSSION

After collecting and tabulating the data, we arrived at the data shown in table 1 below.

Table 1 – Ergonomic agents identified from the research

Sector	Ergonomic agent
Front desk	Monotony and repetitiveness; stress
Workshop 1	Monotony; stress
Workshop 2	Monotony; stress
Coordination	Manual heavy lifting; long working hours; stress; repetitiveness
Psychosocial	Monotony and repetitiveness; stress
CadÚnico	Monotony and repetitiveness; stress
Interview room	Monotony and repetitiveness; stress; limited space for movement
Happy child	Monotony and repetitiveness; stress.
Kitchen	Physical effort; manual lifting of weights; poor posture; long working hours; monotony and repetitiveness; stress.
Warehouse	Physical exertion; manual lifting of weights; poor posture.
Bathrooms	Inadequate posture

Source: Author's own elaboration (2024)

Next, we will discuss the ergonomic agents identified according to the domains of ergonomics.

4.1 PHYSICAL ERGONOMICS

Within the physical ergonomics department, some risk situations were identified. Monotonous and repetitive situations were identified in eight departments: Reception, Workshops 1 and 2, Coordination, Psychosocial, CadÚnico, Interview Room, and Happy Child.

In the following departments: reception, coordination, CadÚnico, psychosocial, interview room, and *Criança Feliz*, some activities are similar, depending on the specifics of each role. These departments constantly require data entry (manually or digitally).

At reception, we provide a data entry service, such as registration for the Coexistence and Strengthening of Bonds Service (SCFV), among other programs. The employee fills out registration forms and minutes daily, as well as using the reception computer to type and digitize these forms, as well as send emails and perform other tasks specific to the role. Also in this area, it was identified that the employee needs to constantly go to the next room to retrieve printed documents, as there is no printer installed in the reception area.

The Coexistence and Strengthening of Bonds Service Information System (SISC) is constantly completed and updated within the coordination department. The Social Assistance Secretary, along with the CRAS Coordinator and the Social Educator, spends several hours in front of the computer performing this task, without significant breaks. Similarly, CadÚnico,

Psychosocial, the interview room, and *Criança Feliz* perform data entry and system input activities, constantly drafting documents manually and digitally.

Workshops 1 and 2 host the SCFV activities, which, at this CRAS, take the form of playful, theatrical, musical, dance, and martial arts workshops. The monotony in these sectors occurs in the classes taught by the facilitators themselves. At the CRAS in question, there are two types of SCFV user demand: priority demand and spontaneous demand. Priority demand refers to people living in situations of social risk, while spontaneous demand refers to anyone and everyone who wishes to participate in the workshops. Because of this spontaneous demand, which occurs occasionally, facilitators must repeat everything already taught to other users to avoid losing new participants.

According to Souza et al. (2018), monotony in the workplace contributes to increased worker fatigue. Repetitive activities that do not explore creativity or offer challenges to employees directly contribute to feelings of tiredness, fatigue, or dissatisfaction, as this type of routine does not stimulate workers and, consequently, users.

It is interesting to note that, even when linked to physical ergonomics, monotony and repetitiveness also interfere with the cognitive sphere, as Pereira (2020) explains, highlighting monotony and repetitiveness as psychological risks. As seen previously, monotonous/repetitive activities do not contribute to the work process because they do not tap into the worker's creativity.

Two sectors presented situations of physical effort, manual lifting, long working hours and inadequate posture: coordination and kitchen.

In coordination, heavy lifting occurs when materials are delivered. Due to a lack of organization and communication, some materials are deposited in the coordination room, requiring workers to move them to the correct location. As expected, this lifting is not done ergonomically, thus damaging joints and spines. Similarly, in the kitchen, service assistants perform heavy lifting when carrying fruit and other food items that arrive at the CRAS (Rehabilitation Center). As in coordination, lifting this weight is done in a completely anti-ergonomic manner, contributing to the onset of pain and future injuries. According to Luz et al. (2024), heavy lifting constitutes an aggravating factor for Musculoskeletal Disorders (MSDs), as lifting loads incorrectly can strain the lumbar discs, potentially culminating in problems such as a herniated disc. Gouveia & Fernandes (2020) corroborate this by linking lifting loads exceeding 23 kg with lower back problems.

Long working hours are directly linked to coordination. On several occasions, the CRAS coordinator extends her duties beyond her usual working hours, even staying late into the night. Barros Júnior & Montenegro (2022) present a unique but comparative example. In their study, the authors demonstrate the reality of drivers who work night shifts and extended working hours, which are permitted by law. However, the authors explain that this type of workday can trigger a high level of fatigue, so that if the worker exceeds their limits, their body will respond in the opposite way. This information directly corroborates the reality of CRAS.

To reduce these situations, some measures can be taken. NR 17 itself states that preventive measures must be implemented (Brazil, 2022) so that workers who may perform repetitive activities avoid:

a) Extreme postures;

b) Sudden movements;

c) Excessive use of force;

d) Frequency of movements in the lower and upper limbs.

When dealing with monotony and repetitiveness, breaks can be established during the workday. In cases of heavy lifting, physical exertion, and similar activities, awareness-raising efforts with the help of ergonomics training—with professionals in the field—can be implemented during the workday, raising employees' awareness and teaching them the correct way to perform their tasks. Finally, long workdays can be managed through planning, where tasks can be redistributed and organized into an action plan that will facilitate the execution of these tasks without exceeding working hours.

4.2 COGNITIVE ERGONOMICS

Within the field of cognitive ergonomics, risk factors were also identified. The main factor identified in the following sectors: reception, workshops 1 and 2, coordination, psychosocial, CadÚnico, interview room, *Criança Feliz*, and kitchen was stress.

Stress is a natural response of the human body when faced with threat. Under the control of the thalamus, the adrenal glands release cortisol into the bloodstream, stimulating the body to face a given threat, generating what is called *eustress* (good stress). However, the greater the risk, the higher the level of cortisol released, triggering *distress* (bad stress), which can lead to health problems such as high blood pressure and mental health issues (Garcia, 2018; Rocha, 2018; Crema, 2019).

Within work activity, stress is characterized as occupational stress. According to Resende (2017), occupational stress is a negative reaction between the employee and their work environment. These disturbances can lead to problems such as hypertension, ulcers, and other illnesses associated with workplace stress (Fernandes et al., 2009). Lima Neto, Leite, and Bakke (2022) correlate workplace stress with the onset/worsening of symptoms and illnesses such as insomnia, irritability, fatigue, hypertension, headache, and shortness of breath. Based on this, they found that stress is directly linked to all of these symptoms. Occupational stress can also trigger Burnout Syndrome—a syndrome in which the worker completely loses motivation to work—which greatly affects professionals who work directly with the public, such as healthcare professionals, police officers, and teachers. (Codo & Vasques-Menezes, 1999, p. 258).

Brazilian legislation is still moving slowly toward managing psychosocial factors in the workplace. NR 17 suggests reducing conflicts and role ambiguities to reduce workplace stress. However, this measure is not sufficient. Recently, NR 1 was updated, recommending that companies include psychosocial risks in their risk management processes to improve mental health and promote decent work, through Ordinance No. 1,419 of August 27, 2024 (Brazil, 2024). According to the ordinance:

> 1.5.3.1.4 Occupational risk management must cover risks arising from physical, chemical, and biological agents, accident risks, and risks related to ergonomic factors, **including work-related psychosocial risk factors (Our emphasis)** (Brazil, 2024)

This new wording, already approved, has been extended until 2026; however, companies can now adapt to the new text through the measures proposed in the new wording.

Some measures can be taken to reduce stress at work. Established breaks in cases of repetitive work can also be adopted in this case. This way, the worker will have time to "breathe" and return to work. In addition to breaks, psychological support for the work team (Miranda and Afonso, 2021) is always welcome, as psychology professionals can positively contribute to a team's success, whether through consultations or through lectures and discussion groups where relevant topics can be addressed.

4.3 ORGANIZATIONAL ERGONOMICS

Moving on to the field of organizational ergonomics, only one risk factor was detected in one sector of the CRAS (National Registry of Social Responsibility). The interview room is where document inspections and verifications are carried out for people wishing to register with CadÚnico and other government programs. The location in question is a makeshift room that previously served as a warehouse and, due to demand, became an interview room.

Because it's a small room, the computer desk, used for in-house services, takes up a large portion of the room's space, forcing the interviewer to turn to leave the room, making it impossible for anyone else to enter her area if necessary. One positive aspect is that the desk's corners are protected, thus reducing the chance of an accident.

In this specific case, the only way to eliminate this situation is to renovate the building, expanding this sector for better movement and, consequently, better work.

5. CONCLUSION

The main objective of the study was to carry out a preliminary survey of ergonomic agents in a CRAS in the Paraíba backlands.

After collecting and analyzing the data, ergonomic agents were identified in various CRAS departments. Based on this finding, some measures can be implemented to mitigate the impact of these agents on workers.

Furthermore, a Preliminary Ergonomic Assessment, in accordance with NR 17, is recommended to deepen understanding of ergonomic risk factors present in the workplace and implement mitigation/control measures when necessary. Subsequently, if necessary, meeting the requirements set forth in NR 17—i.e., if more in-depth assessments are required, for example, an Ergonomic Work Analysis is recommended to promote a healthy and worker-friendly work environment.

REFERENCES

Abrahão, J., Sznelwar, L. I., Silvino, A., & Sarmet, M., Pinho, D. (2009). Introdução à ergonomia: da prática à teoria. Editora Blucher.

Barsano, P. R., & Barbosa, R. P. (2018). Segurança do Trabalho: guia prático e didático. v. 2, São Paulo, Érica,

Barros Junior, H. E., & Montenegro, G. (2022) Jornada de trabalho dos motoristas de caminhão, Rede de Ensino Doctum, Carangola-MG.

Brasil. (2022). Norma Regulamentadora 17 – Ergonomia. Recuperado de: https://www.gov.br/trabalho-e-emprego/pt-br/acesso-a-informacao/participacao-social/conselhos-e-orgaos-colegiados/comissao-tripartite-partitaria-permanente/arquivos/normas-regulamentadoras/nr-17-atualizada-2022.pdf Acesso em 21 de set. 2024.

Brasil. (2024). Portaria nº 1.419, de 27 de agosto de 2024. Recuperado de: https://www.gov.br/trabalho-e-emprego/pt-br/assuntos/inspecao-do-trabalho/seguranca-e-saude-no-trabalho/sst-portarias/2024/portaria-mte-no-1-419-nr-01-gro-nova-redacao.pdf/view Acesso em 18 de jun. 2025.

Codo, W., & Vasques-Menezes, I. (1999). O que é Burnout? In: CODO, W. Educação: Carinho E Trabalho. v. 2. [s.l], 1999, p. 277

Correa, V. M., & Boletti, R. R. (2015). Ergonomia: fundamentos e aplicações. Bookman editora.

Crema, M. C. M; Carvalho, N., Curta, G. C., & Ferreira, F. (2019). Avaliação do estresse e sua relação com os níveis plasmáticos de cortisol em profissionais do setor industrial do município de Ponta Grossa – Paraná. XI Encontro Internacional de Produção Científica.

Fernandes, S. M. B. De A., Medeiros, S. M. De., & Ribeiro, L. M. (2009). Estresse ocupacional e o mundo do trabalho atual: repercussões na vida cotidiana das enfermeiras. Revista Eletrônica de Enfermagem, Goiânia, v. 10, n. 2, p. 414–427.

Garcia, A. H. C. (2018). Estresse e níveis de cortisol em mães de indivíduos com transtorno do espectro autista. Tese (Doutorado), São Paulo, p. 1–90.

Golveia, D. C., & Fernandes, P. G. (2020). Saúde e ergonomia do militar combatente florestal quanto ao uso de bombas costais. Trabalho de Conclusão de Curso (Curso de Formação de Oficiais) - Corpo de Bombeiros Militar do Distrito Federal, Brasília.

Kassada, D. S., Lopes, F. L. P., & Kassada, D. A. (2011). Ergonomia: Atividades Que Comprometem a Saúde Do Trabalhador. VII EPCC – Encontro Internacional de Produção Científica. Cesumar, Maringá, p. 5.

Luz, E. M. F. D., Munhoz, O. L., Greco, P. B. T., Santos, J. L. G. D., Camponogara, S., & Magnago, T. S. B. D. S. (2024). Riscos ergonômicos e dor musculoesquelética em trabalhadores de limpeza hospitalar: Pesquisa Convergente Assistencial com métodos mistos. Revista Latino-Americana de Enfermagem, 32, e4176. DOI: 10.1590/1518-8345.7048.4177

Marconi. M. A; Lakatos. E. M. (2017). Fundamentos de Metodologia Científica. São Paulo, Atlas.

Miranda, A. R. D. O; Afonso, M. L. M. (2021). Estresse ocupacional de enfermeiros: uma visão crítica em tempos de pandemia. Brazilian Journal of Development, Curitiba, *7*(4), 34979-35000. DOI:10.34117/bjdv7n4-114

Pereira, M. P. B. (2020)/ Território, ambiente e saúde: pesquisas realizadas pelo PRÓ-SAÚDE GEO entre 2010 e 2020 em Campina Grande–PB. In Congresso nacional de Pesquisa e Ensino em Ciências (V CONAPESC), Campina Grande.

Resende, A. M. (2017). Estresse Ocupacional: Um Estudo com Gestores de uma Empresa Mineira de Logística de Transportes. Revista Administração em Diálogo - RAD, São Paulo, v. 19, n. 1, p. 112.

Rocha, T. P. D. O; Silva, C. O; Matos, M. S; Correa, F. B; & Burla, R. D. S. (2018). Anatomofisiologia do estresse e o processo de adoecimento. Revista Científica da Faculdade de Medicina de Campos, Campos dos Goytacazes, v. 13, n. 2, p. 31–37.

Rodrigues, M. S. B; Gabriel, M. C. (2023). SERVIÇO SOCIAL: A ATUAÇÃO DO ASSISTENTE SOCIAL NOS CRAS I E II NO MUNICÍPIO DE COELHO NETO–MA. Diversitá, v. 9, n. 1.

Silva, J. F., Melo, P. G. G. B., Santos Alves, V. M., Oliveira Almeida, G. R. (2023). ANÁLISE ERGONÔMICA DO TRABALHO: ESTUDO DE CASO EM UM POSTO DE TRABALHO ADMINISTRATIVO. In V. 5, N. 5: V Simpósio Nacional de Engenharia de Produção.

Silva Filho. J. A. (2021). Segurança do trabalho: gerenciamento de riscos ocupacionais - GRO/PGR. 1. ed. LTr, São Paulo.

Souza, S. O.; Lima Dalpim, V. A. S.; Herculani, R. (2018). Ergonomia aplicada ao setor de pcts em uma usina de cana de açúcar e álcool localizada no interior do estado de São Paulo. Revista Produção em Destaque, Bebedouro, v. 3, n. 1, p. 103–111.

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