151 - ERGONOMIC STUDY OF THE WORKSTATION OF JUDICIARY TECHNICAL SERVER OF THE REGIONAL COURT OF LABOR - 12ª REGION

ALEXANDRE CRESPO COELHO SILVA PINTO
UFSC - PPGEP - FLORIANÓPOLIS - SANTA CATARINA - BRASIL
PEDRO FERREIRA REIS
GERGILA - IFAL - IESFI – UDC – FOZ DO IGUAÇU – PARANÁ - BRASIL
ANTÔNIO RENATO PEREIRA MORO
UFSC - PPGEP - FLORIANÓPOLIS - SANTA CATARINA – BRASIL
almvpinto@gmail.com

doi:10.16887/88.a1.151

1. INTRODUCTION

The final activity of the Regional Labor Court of the 12th Region (TRT-12) comprises the resolution of conflicts that may occur between employee-employer, that is, the TRT-12ª is a Labor Justice body whose purpose is to assist people in labor matters where they may have some divergence, trying a priori, to make an agreement between the parties.

According to Pena et al. (2011), the work changes and, above all, the techniques are transformed or are used differently in the conformation of conditions unfit for health. Repetitive strain injuries (RSI) were the first occupational diseases related to repetitive movements, described in 1700 by Bernadino Ramazzini. In this context, they constitute a technical-organizational phenomenon that conditions the causality of RSI and other work-related disorders today.

According to Tirloni et al. (2008), computer use, has led to an increase in all types of problems related to the musculoskeletal extremities of the upper limbs.

Iida (2005) and Grandjean (2005) state that working conditions in a computer terminal, compared to office work, are more severe and the ergonomic inadequacies of this post can have quite uncomfortable consequences.

The Ergonomic Analysis of Work (AET) aims at the complete description of the activities of the workers' behaviors, being that their methodology addresses the real work, making the distance between the prescribed work and the actual work transparent (WISNER, 1994; MARTINS, 2005). The objective of this study was to analyze the work position of an assistant Judiciary technician at the Regional Labor Court of the 12th Region in order to identify and evaluate the typing activities inherent to his job.

2. MATERIALS AND METHODS

The case study used the Francophone methodology of the Ergonomic Analysis of Work (DANIELLOU, 2004; GUÉRIN et al., 2001), which is divided into stages that include the analysis of demand, task, activity, ergonomic diagnosis and recommendations (MOTTER and GONTIJO, 2012).

This study is characterized by a descriptive approach of exploratory nature, since it aims to generate a better knowledge about the activities developed by an individual in his work position (ENSSLIN et al., 2012). She participated in the AET a worker who was the assistant judge at the hearings, 39 years of age, higher education, and working for 15 years in court.

A questionnaire was used in order to obtain information about the worker, her job position and the nature of the work performed by her. A direct observation, a digital camera (Fuji - FinePix E510) for photos and filming and the RULA (Rapid Upper Limb Assessment) worksheet were also used for the development of AET, aiming to analyze the servant 's posture taking into account the movements and postures of the upper limbs, neck, trunk and legs.

2.1 Organization characterization

This case study was carried out in the TRT-12a of the municipality of Florianopolis-SC, being this one federal public company, composed of three sticks and a distribution sector. Each rod produces an average of two thousand processes a month and the rod where the AET was performed had nine servers.

The company operates from Monday to Friday from 12 a.m. to 7 p.m., and the hearings begin at the time of 1:30 p.m. From Monday to Wednesday there are 8 to 10 initial hearings and 4 to 5 follow-up hearings. On Thursdays there are 8 to 10 hearings called summary proceedings, which are the hearings where the judge seeks to close the cases, whether by conciliation or not, therefore, they are faster hearings. Fridays do not have audiences.

Each Court has its own form of management having a judge and a general director; however, it is the judge who makes the final decision on any type of lawsuit. The workstation is located in the 1st Court having the following characteristics: it is arranged in an area of 3.5 square meters, with illumination made by chutes with fluorescent lamps, has natural air ventilation (windows) and artificial (air conditioning).

The organization of the work allows the worker to maintain direct contact with the judge during its activities and also with the general director and other colleagues of his sector. There may be small intervals between the hearings, but it is up to the judge, in general, they happen around 4pm. The worker has the autonomy to finish part of her tasks outside her working hours, for example, the morning shift.

2.2 Demand

The demand of the analysis of the activity of the judicial technician arose from an initial conversation with the general director of the 1st Court. This evidenced that the post in question was where it was most typed, thus offering a considerable workload, in particular, a postural overload. The worker also reported, in an initial conversation, that the task of typing generated muscle tension, mainly due to the layout of her desk that left her back to the Judge and, therefore, had difficulty maintaining a good posture when typing (Figure 1). His complaints regarding his work position were related to muscular tension in the cervical spine, shoulders, wrists and hands, and complaints about furniture were mainly related to the arrangement of the table, chair and the dimensions of the footrest.

2.3 Task

The worker served as a Judge's assistant in the hearings, with 39 years of age, superior level of education and worked for 15 years in TRT-12a. A part of the task depended on the cooperation of his superior, in this case the Judge of the Rod. Tasks were performed on a computer terminal. The gestures that the worker frequently performed during her tasks were predominantly upper limbs and trunk, such as: arm and forearm flexion, wrist extension, extension, flexion, and trunk rotation. It adopted the sitting position and static posture during the audiences and its displacements were sporadic, between an audience and another

and in small distances. For the accomplishment of its tasks, the following tools were used: computer (17-inch LCD monitor, standard keyboard, and standard mouse), printer, and microphone, punch and office supplies. The worker used typing shortcuts called "MACROS", ordered the documents referring to each hearing, used drill and office supplies in the assembly and organization of the processes and prepared the minutes through the program called Procedure Monitoring System 1a. Instance (SAP1).

Figure 1: Workstation before AET

2.4 Regulatory Standard-17 (NR-17)

This standard aims to establish parameters that allow the adaptation of the working conditions to the psychophysiological characteristics of the workers, so as to provide maximum comfort, safety and efficient performance. Work conditions include aspects related to the lifting, transportation and unloading of materials, furniture, equipment and environmental conditions of the workplace and to the organization of work itself (BRAZIL, 2013).

The standard always suggests that the work can be performed in the seated position; the workstation must be planned or adapted to this position. For manual seated or standing work, benches, desks, desks and panels should provide the worker with good posture, viewing and operation conditions and must meet the following minimum requirements:

> have height and work surface characteristics compatible with the type of activity,
> the required distance from the eyes to the working field and the height of the seat;
> have a work area that is easy to reach and visible by the worker;
> have dimensional characteristics that allow adequate positioning and movement of the body segments.

With regard to the seats used in the workstations, these, according to the norm, must meet the following minimum comfort requirements, such as:

> height adjustable to the height of the worker and the nature of the position exercised;
> characteristics of little or no conformation at the base of the seat;
> Ar rounded front edge;
> back with a shape slightly adapted to the body to protect the lumbar region.

3. RESULTS AND DISCUSSION

3.1 Activities

The observations of the activities carried out by the servant were during her working day, accompanying the development of her tasks in five summons rite hearings and eight initial hearings.

3.2 Developed activities

The worker upon reaching the courtroom becomes aware of the list of hearings and opens SAP1. It then organizes the proceedings in the order in which the hearings will take place, and then talk to the Judge to make sure he can call the parties. To do this, he makes use of the microphone to request the entrance of the persons involved in the hearing with their respective lawyers. The worker then performs the typing of the testimony of the witnesses (when necessary) and the speech of the Judge. After the Judge completes the hearing, with or without conciliation, the worker completes the minutes and prints the document in three copies, delivering it to the Judge and passing it on to the other members to collect the signatures.

3.3 Typing activities

At the beginning of the hearing, while the Judge makes the first considerations and attempts a conciliation between the parties, the worker together with SAP1 prepares the minutes using auto text (macros) to enter data for the parties (names, values , costs, agreements, bank details, etc.). After this step, she enters the Judge's speech and the statements, when they occur, and, at the end of the hearing, checks the data entered and makes corrections using the mouse, especially at that moment and after doing so, print the minutes.

3.4 Timing of activities

In relation to the time spent to carry out its activities, the following was verified:

a) Actual average time of the hearings was 55 minutes;
b) Average real time of its work cycle duration was 20 minutes and 37 seconds;
c) Total typing time in the audience was 2 hours and 20 minutes.

3.5 Postures and gestures

During the analysis of the activities, it was possible to verify that the worker performed her activities in the seated position. Maintaining this position requires a static posture of segments of the upper limbs (shoulders, arms, forearms and hands), neck (cervical joints, upper trapezius muscles and scapula lift) and trunk (lumbosacral joint). This position was adopted by her throughout her working day, and she also performed constant and repetitive movements with the joints of the hands, especially when typing. It was observed that the worker performed the following positions during the typing process: trunk extension, shoulder elevation, semiflexion of the head, semiextension of wrists, semiflexion of the metacarpophalangeans and knee flexion.

3.6 Rapid Upper Limb Assessment - RULA

This method was used to analyze the servant's posture taking into account the movements and postures of the upper limbs, neck, trunk and legs. It is based on the direct observation of the postures during the execution of a given task (Figure 2).

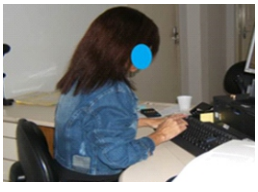

Figure 2: Posture selected for RULA

As an aid to a global pre-diagnosis was used to the RULA worksheet, which assesses the risk of exposure to external load factors, concluding for the need or not for research and modification of the job. According to the application of the spreadsheet, the following results were obtained (Table 1):

Table 1: Application of the RULA method for posture analysis.

Postures	Score partial	Score final
A (arm, forearm and wrist)	5	5
B (neck, trunk)	2	↓ (make changes soon)

The post analyzed, located at risk level 3 of the RULA method, resulted in score 5, which means that there is a need to investigate further and also to make changes soon. In this step, the aspects observed in the analysis of the activity are confronted with the aspects seen in the analysis of the task. The results were presented as follows: a) Regarding the environmental conditions; b) Physical and gestural conditions.

3.7 As for the environmental conditions

The layout of the furniture is apparently good, and there are no obstacles that make it difficult to carry out the activities. Regarding the keyboard, it was observed that the server adjusts the same several times during the journey according to his posture at the time of typing. When the keyboard is far away from the edge of the table, the server leans forward overloading her spine. The mouse is positioned in a way that forces it to perform lateral movements and external rotation of the right shoulder.

These biomechanical factors lead to musculoskeletal static overload. The chair, despite adjustments in the seat, backrest and armrest, causes inappropriate postures (the servant does not know how to make adjustments). These postures, if not modified, will cause problems in the spine, especially the lower back. The support of the feet does not have any type of regulation that allows the movement of the same. This causes a constant modification in the positioning of the legs and the angle of the knees. The observed knee angulation (> 30º <90º) can result in circulatory and muscular problems.

3.8 As for physical and gestural conditions

The worked works most of the time in the seated posture, performing rotations and inclinations with the trunk and neck, in addition to the flexion and extension movements performed with the upper limbs. These factors imply the maintenance of inadequate postures that may constitute in the causal aspects of complaints of pain and discomfort, mainly in the upper limbs and cervical spine. The biomechanical factors are associated with the muscle activity of the neck region and upper limbs according to the data obtained in the RULA worksheet (risk level 3 due to overload). Verified muscle tension is also associated with muscle activity and increased cervical discomfort. Static postures are an important risk factor for musculoskeletal disorders of the cervical spine and upper limbs.

These disorders have been reported as the most frequent musculoskeletal problem among office workers, both for prolonged use of the keyboard and the mouse. Use of the mouse has contributed to increase the muscular activity in the neck by the greater visual demand during its use (end of the cycle) and a consequent discomfort in the cervical region (upper trapezius). The shoulder-raised posture with the upper limbs not resting on the table and the flexed neck for visualization increases the level of muscle tension resulting in a tension-free cervical pain. The external rotation of the shoulder associated with a slight trunk rotation is responsible for causing postural deviations and myofibrositis in the dorsal musculature (scapula adductors). The lack of palm rests causes a gap in the wrists and isometric contraction of the carpal extensor muscles, the main causes of carpal tunnel syndromes, tendinitis and nerve compression.

3.9 Layout of post-AET workstation

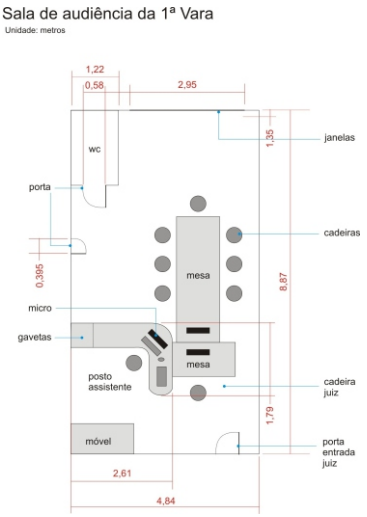

Figure 03: Ergonomics of correction at the workstation.

3.10 Recommendations

After analyzing the factors described in the ergonomic diagnosis, the following recommendations were elaborated based on NR-17 (BRAZIL, 2013) and NBR 13962 (BRASIL, 2004):

ü Keyboard surfaces should be at elbow height (Item NR, 17.4.3-d);

ü It is recommended that the table be between 70 and 76 centimeters in height (Item NR, 17.3.2-a);

ü The keyboard must be independent and have mobility, allowing the worker to adjust it according to the tasks to be performed (Item NR, 17.4.3-b);

ü Palmar rests to reduce mechanical compression in soft tissues, keeping the wrist in a neutral position and partial discharge of trunk weight for better support of the spine (NR item 17.3.2-c);

ü The arm of the chair should be on the same line as the keyboard to avoid exertion of the wrist extensors, pressure in the hypotenous region, and not interfere with the movements of the user (NR item 17.3.2-a);

ü Keep your shoulders relaxed and supported on the arms of the chair, since high shoulders due to the use of keyboards on table surfaces can generate tensions and muscular pain in the cervical region (NBR 13962);

ü Armrests with arm rests relax the shoulders more, maintaining a better posture to the micro (NBR 13962);

ü The height of the seat should be adjusted so that the user can stand with his legs supported without forcing the posterior region of the thighs. The knees should be positioned around 100 degrees (Item NR, 17.3.3-a);

ü The backrest of the chair should have a suitable place to support the lower back and depth adjustment, which should be adjusted in such a way as to support the user's back without bending forward and not leaning too far back (Item of NR: 17.3.3-d);

ü When working seated, the angle formed between the trunk and the thighs should be between 100 and 120 degrees (Item NR, 17.3.2-c);

ü The footrests should be used to relieve pressures in the thighs (popliteal region) and facilitate the venous return of the legs, thus preventing circulatory problems (NR item 17.3.4).

4. CONCLUSION

The lack of democracy in the judiciary and the evidence that judicial servants are falling ill at work are some aspects that deserve further reflection. In the occupational environment, several studies have correlated muscle pain with workplace characteristics, stating that musculoskeletal constraints in the neck region are particularly common in certain occupations, such as office workers.

The Ergonomic Analysis of Labor showed a complex professional activity and a capacity of regulation of the worker as a way to better organize their work and facilitate it to reach productivity to the increasing judicial demand that is observed in the current scenario. The change in the work table arrangement was a factor that contributed significantly to the worker obtaining a better body posture when typing and with less tensional overload in the vertebral column, especially in the cervical musculature.

REFERENCES

BRASIL. Ministério do Trabalho e Emprego. Normas Brasileiras Regulamentadoras da Associação Brasileira de Normas Técnicas. ABNT: NBR/13962, 2004.

BRASIL. Ministério do Trabalho e Emprego. Normas Reguladoras de Segurança e Saúde no Trabalho. NR-17 Ergonomia (117.000-7). Disponível em: <http://www.mte.gov.br/> Acesso em janeiro de 2017.

DANIELLOU, F. A Ergonomia em Busca de Seus Princípios – Debates Epistemológicos. São Paulo: Edgard Blücher, 2004.

ENSSLIN, L. et al. Um estudo sobre segurança em estádios de futebol baseado na análise bibliométrica da literatura internacional. Perspectivas em Ciência da Informação, v. 17, p. 71-91, 2012.

GRANDJEAN, E. Manual de Ergonomia: Adaptando o Trabalho ao Homem. 5a Edição, Porto Alegre: Artes Médicas, 2005.

GUÉRIN, F.; LAVILLE, A.; DANIELLOU, F.; DURAFFOURG, J.; KERGUELEN, A. Compreender o Trabalho para Transformá-lo: A Prática da Ergonomia. 1a Edição, São Paulo: Edgard Blücher, 2001.

IIDA, I. Ergonomia: Projeto e Produção. 3ª Edição, São Paulo: Edgard Blücher, 2016.

MARTINS, C. O. Repercussão de um programa de ginástica laboral na qualidade de vida de trabalhadores de escritório. Programa de Pós-Graduação em Engenharia de Produção da Universidade Federal de Santa Catarina (Tese), 2005.

MOTTER, A. A. & GONTIJO, L. A. Análise ergonômica de uma ferramenta de trabalho no controle de tráfego aéreo: percepção dos operadores e contribuições para a carga de trabalho. Revista Produção Online, v. 12, p. 856-75, 2012.

PENA, P. G. L.; CARDIM, A.; & ARAÚJO, M. P. N. Taylorismo cibernético e lesões por esforços repetitivos em operadores de telemarketing em Salvador-Bahia. Cad. CRH, v. 24, p. 133-53, 2011.

TIRLONI, A. S. et al. Análise cinemática da digitação em teclado tradicional de microcomputador com diferentes inclinações. Fitness & Performance Journal, v. 1, p. 30-34, 2008.

WISNER, A. A Inteligência no Trabalho: Textos selecionados de ergonomia. São Paulo: Editora da UNESP, 1994.

ABSTRACT

The objective of this study was to analyze the work position of an assistant judicial technician of Judge in the hearings of the Regional Labor Court of the 12th Region in order to identify and analyze their work activities with the purpose of generating improvements to their work position. For this, the method was applied Ergonomic Analysis of Work (AET), which showed a complex activity contrary to what was perceived and a capacity of regulation of the worker in dealing with their activities to achieve productivity. Understanding the ergonomic analysis and its importance, some recommendations were reached, however, the good use of the analysis is not only limited to the proposals, but to give subsidies to the company to understand its complex organization and to be able to generate changes.

Keywords: Ergonomic analysis work, work regional court, work conditions, typing.

SOMMAIRE

L'objectif de cette étude était d'analyser le poste de technicien judiciaire adjoint dans les audiences du Tribunal régional du travail de la 12ème Région afin d'identifier et d'analyser leurs activités de travail dans le but de générer des améliorations à leur poste de travail. Pour cela, la méthode a été appliquée à l'analyse ergonomique du travail (AET), qui a montré une activité complexe contraire à ce qui était perçu et une capacité de régulation du travailleur dans le traitement de ses activités pour atteindre la productivité. Comprenant l'analyse ergonomique et son importance, quelques recommandations ont été atteintes, cependant, le bon usage de l'analyse ne se limite pas aux propositions, mais à donner des subventions à l'entreprise pour comprendre son organisation complexe et pouvoir générer des changements.

Mots clés: Travail d'analyse ergonomique, travail du tribunal régional, conditions de travail, dactylographie.

RESUMEN

El objetivo de este estudio fue analizar el puesto de trabajo de un asistente técnico judicial de Juez en las audiencias del Tribunal Regional de Trabajo de la XII Región a fin de identificar y analizar sus actividades laborales con el fin de generar mejoras en su puesto de trabajo. Para esto, se aplicó el método de Análisis Ergonómico del Trabajo (AET), que mostró una actividad compleja contraria a lo percibido y una capacidad de regulación del trabajador al abordar sus actividades para lograr la productividad. Entender el análisis ergonómico y su importancia, se llegaron a algunas recomendaciones, sin embargo, el buen uso del análisis no se limita a las propuestas, sino que otorga subsidios a la empresa para comprender su compleja organización y poder generar cambios.

Palabras claves: Trabajo de análisis ergonómico, corte regional de trabajo, condiciones de trabajo, mecanografía.

RESUMO

O estudo objetivou analisar o posto de trabalho de um técnico judiciário assistente de Juiz nas audiências do Tribunal Regional do Trabalho da 12ª Região visando identificar e analisar as suas atividades laborais com o intuito de gerar melhorias para o seu posto de trabalho. Para isso, aplicou-se o método Análise Ergonômica do Trabalho (AET), que evidenciou uma atividade complexa ao contrário do que era percebido e uma capacidade de regulação do trabalhador em lidar com suas atividades para atingir a produtividade. Compreendendo a análise ergonômica e sua importância, chegou-se a algumas recomendações, contudo, o bom aproveitamento da análise não se limita apenas às propostas, mas sim a dar subsídios à empresa para entender sua organização complexa e poder com isso gerar mudanças.

Palavras-chave: Análise ergonômica do trabalho, tribunal regional do trabalho, condições de trabalho, digitação.

Alexandre Crespo C. S. Pinto
Rua: Ilha das Galés, 204/apto 215.
CEP: 88058-581
Cidade: Florianópolis
Fone: (48) 996274325
Email: almvpinto@gmail.com