109 - ERGONOMIC ANALYSIS OF JOBS IN OFFICE IN A FINANCIAL INSTITUTION

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1. INTRODUCTION

The everyday work at the office is likely to present ergonomic risks to workers' health. Analyzing the Brazilian overview of work-related accidents, according to the Social Security Department during the year 2010, approximately 701,500 accidents were filed at INSS. Compared with 2009, the number of work-related accidents decreased by 4.3% and the total accidents filed at the Work Accident Notification ("CAT" in Portuguese) decreased by 1.7% from 2009 to 2010. Out of all the accidents filed with a Work Accident Notification, commonplace injuries accounted for 79.0%, 18.0% regarding commuting and work-related illness 3.0% (Statistical Yearbook of the Social Security Department, 2010).

The financial services companies have over 25% of their work-related accidents due to occupational illnesses. Employees of these companies spend 90% of their time working on computers. The Brazilian banking sector is characterized by a small group of institutions acting nationally. After 1964, the sector grew from the emergence of large multi-industry companies and extensive branch networks throughout the country (CERQUEIRA et al., 1998).

Brazil is known as one of pioneer in the banking technology. The early development of banking technology in Brazil occurred in a relatively short time and with great collaboration of resources. The conditions were identified with the macroeconomic situation and the monetary policy of the country that led this process (SEADE, 2001). The financial sector in recent years has undergone administrative and technological changes, but the most common problems among bank employees are RSI/WMSD and mental disorders, they remained present, as seen in the Statistical Yearbook of the Social Security Department of 2010. This can be explained by the increase of requests on activities that generated the variety of job functions (National Institute for Occupational Safety and Health, 2008).

Among the major illnesses that most affect bank employees are RSI / WMSD and mental illnesses such as depression, but no one knows their range, because there is no statistical category for banks, nor a national survey was conducted by sampling. The only data available are the ones from the Social Security Department (National Institute for Occupational Safety and Health, 2008).

Consequently this survey sampling aims to examine whether the replacement of furniture in the financial institution may be a factor in the reduction of work-related injuries. Therefore it was necessary to perform ergonomic comparatives of the workstations with the old furniture and the new standard furniture. Besides checking briefly whether the use of computers impose a direct influence on the ergonomic conditions of the job, according to the standards adopted in the financial institution under study.

2. MATERIALS AND METHODS

The study was conducted in a financial institution based in Curitiba, Brazil, which was in the process of replacing its workstation furniture. However, an ergonomic analysis was performed before and after the replacement of the furniture. Altogether 30 questionnaires were performed, 15 for each standard furniture. To check its ergonomic dependability, the following steps were performed:

· Proof of dependability to the Regulatory Standard 17;
· Conducting an employee questionnaire;
· Comparative analysis of the results to verify improvements and major causes.

3. RESULTS AND DISCUSSIONS

The old furniture of the financial institution was used for 10 years by 80% of its workforce. Seeking an improvement in the quality of these workstations, within the new renovations, a different standard is now being adopted. There is a distinction between managerial chairs and desks, however, for this study employees' chairs will be considered. The old standard furniture of the institution under study contemplates "office chairs" and desks in an "L" shape, as shown in Figure 1.



Figure 1 - Furniture used in the old standard of the institution under study.
Source: MFlex Móveis para Escritórios, 2012

To support this analysis, the dimensions of this furniture were taken on-site in one of the administrative centers of the institution as observed in Table 1. These are the dimensions of the chairs and desks.

Table 1 - Dimensions of chairs and desks of the old standard furniture

chair	measures (cm)	desk in an "L"	measures (cm)
backrest	35 x 28	width	160 x 140
seat	39 x 42	Depth to legs	80
height adjustment	45 – 55	height	80
backrest angle	95°	extremities	rounded
base diameter	56		
armrest	N/D		

It is important to emphasize that this kind of chair has only height adjustment, no armrests and no adjustable backrest. In the same way, the measurements were taken from "L" shape desks which are used according to the old standard furniture; these desks have no available height adjustment. The desks also have conduits on their upper back for the equipment cables to be used and lower space to fit the computer tower if needed.

This office furniture is suitable in accordance with the RS 17 concerning ergonomics given the requirements for seats and desks. Following this classification, some items were considered to meet the ergonomic situation of the chair: footrest, keyboard, monitor, and CPU tower, computers, interaction and layout of the site, working system and room lighting.

Despite the basis of analysis, questionnaires were given to a population of 15 workers to be compared with another 15 that are 100% of the population that is already working for over a year with the new standard furniture to be applied to all workers of the financial institution in the years to come.

From the entire survey sampling, with an average height of 1.71m and no anthropometric deviation that might present discrepancies in the sampling, we have that 60% of the sampling consists of the female workers and the rest corresponds to male workers. The total survey sampling indicates having work breaks, but 47% of people feel ill or very tired during the work period and 40% feel their muscles tense for hours as shown in Figure 2.

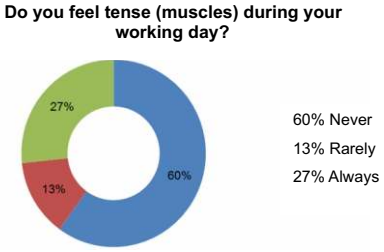


Figure 2 - Stress related problems in the interviewed employees.

Approximately 70% of workers experience body pain during work hours, which is a fairly significant amount. The classification where employees feel these body pains can be seen in Figure 3.

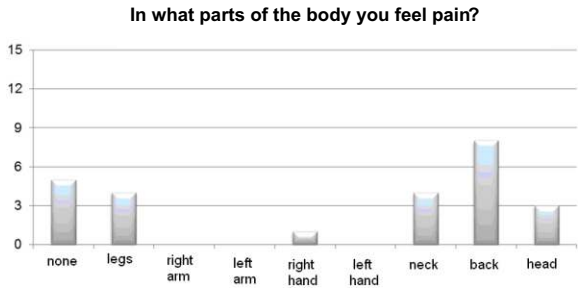


Figure 3 - Parts of the body that workers complain of pain

The parts of the body with the most incidence of pain were the back and the neck and there was no presence of arm pain. 80% of workers requested in the questionnaire to some how improve the chairs used at their workplace (Figure 4).

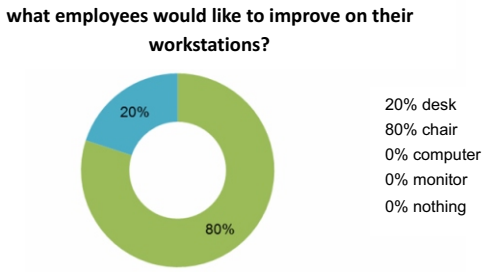


Figure 4 - Employees would like to improve on their workstations

Another issue addressed in the questionnaire attested that 100% of workers do not have proper instruction on how to adjust their chair and work equipment so it would be ergonomically correct, 60% had this kind of instruction but do not recall and 40% had no instruction as to the proper use of their equipment in relation to ergonomics.

The new standard furniture being adopted in new constructions and renovations of the institution under study contemplates chairs called "NET ON" by having their back covered by a fabric similar to a net, and by “bench style” straight desks as observed in Figure 5. The main purpose of this change according to the engineering department of the institution was to bring more ergonomic comfort for workers.



Figure 5 -New standard furniture used at the institution under study
Source: MFlex Móveis para Escritórios, 2012

To initiate the analysis, the dimensions of desks and chairs were measured on-site, as observed in Table 2.

Table 2 - Dimensions of chairs and desks of the new standard furniture

chair	**measures (cm)**	**desk in an "L"**	**measures (cm)**
backrest	52 x 45	width	160 x 80
seats	45 x 45	Depth to legs	80
height adjustment	44 x 54	height	80
backrest angle	90° - 110°	extremities	rounded
base diameter	70		
armrest	18 - 25		

The new standard chairs come with adjustable seats, synchronized tilt, armrests and backrest height adjustment and the backrest with a curvature to follow the lumbar shape of the employee as observed in Figure 6.



Figure 6 - More detailed demonstration of the differences of the seat
Source: MFlex Móveis para Escritórios, 2012

From the entire survey sampling, with an average height of 1.75m and without anthropometric deviation that might present discrepancies in the sampling, we have that 80% of the sampling consisted of males and 20% females. The total survey sampling indicates having work breaks, and 60% of people do not feel tired during the work day, 40% feel somewhat tired and this proportion can be applied to the sensation of muscle tension during work, thus 60% do not feel tense at work and 40% rarely feel in this situation as shown in Figure 7.

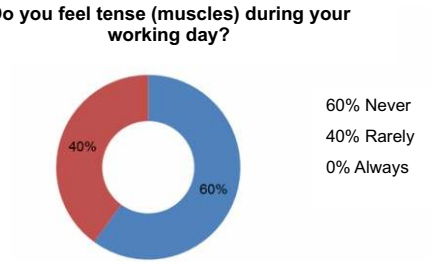


Figure 7 - Stress related problems in the interviewed employees

In relation to the previous standard the number of employees that complained of body pain during work significantly reduced from 70% to 27%, the classification of the place where employees experience these pains can be observed in Figure 8.

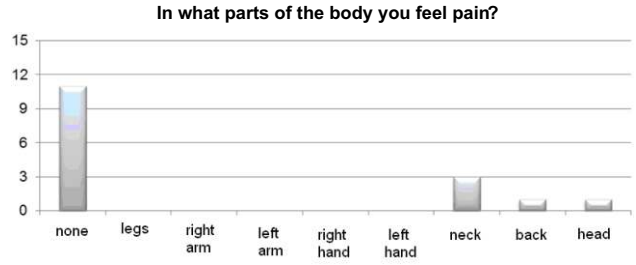


Figure 8 -Body regions where workers complain of pain

The part of the body with the most incidence of pain among the workers remained the back, neck and head and there was no presence of pain in the arms and there was a significant reduction in the amount of complaints in the leg area. Workers indicated in the questionnaire that there is no need to change their workstation and only 20% informed the need for some changes on the desks or chairs as shown in Figure 9.

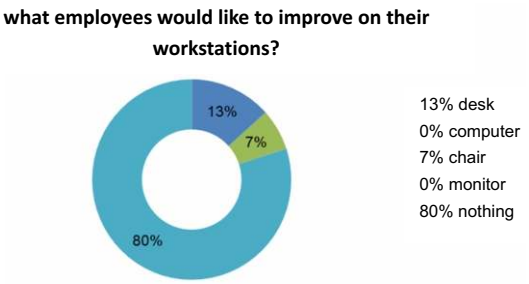


Figure 9 - What improvements employees would like to see at their workstations

Another issue is that 100% of the workers who had their furniture replaced also received orientation of how to regulate the components of their workstation in the right way to their height, but only one remembers how to do it and the other 93% do not remember how to make these adjustments nor the good ergonomic practices.

4. CONCLUSIONS

With the analysis of the questionnaires' results, it was possible to confirm the existence of ergonomic problems in the old standard furniture due to the presence of several complaints of pain, especially in the back and neck, which are present even in some workers who are using the new standard furniture. Another important finding was that 60% of workers who answered the questionnaire and are using the old standard furniture did not receive further instructions on how to adjust their seats and which good ergonomic practices help improve the ergonomic conditions in their jobs. With no doubt this can be an aggravating factor to increase the number of pain-related complaints from these workers.

It was possible to confirm furthermore that even changing the desks that had previously an "L" shape, which have a better ergonomic arrangement, the seat with armrest could satisfy the workers' needs, and there was no injury on the ergonomic condition of the workstation. Finally, it is concluded that changing the old standard to the new standard furniture adopted by the company has brought benefits to workers who are already using it. It also proved that if the incidence of pain and complaints of workers remain low, as demonstrated in this study, can bring long-term cost savings to the institution.

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ERGONOMIC ANALYSIS OF JOBS IN OFFICE IN A FINANCIAL INSTITUTION

ABSTRACT

This study presents an ergonomic analysis performed on a financial institution based in the city of Curitiba, which was in the process of exchanging your furniture jobs. However, the objective was to analyze whether the exchange of securities of the financial institution may be a factor in disease reduction work. Therefore it was necessary to perform comparative ergonomic workstations with antique furniture and furnishings of the new standard. In addition to checking whether a simplified way to use notebooks exerts direct influence on the ergonomic conditions of work according to the standards adopted in the financial institution. Altogether 30 questionnaires were conducted with workers, 15 for the old standard and 15 for the new standard. To verify the adequacy ergonomic was used the norm NR-17, was also performed comparative analysis of the results to verify improvements and major causes. We conclude that with the modification of the securities could change the condition of

ergonomic computer workstation from good to great, which can later be proven with the results of the questionnaires, which showed a reduction of 67% to 27% of complaints back pain, neck, head, arms or legs by workers who are already using the new standard. It was also concluded that the main factor of the improvement occurred by changing the ergonomic seat, and thus further studies can be conducted to verify the reduction of business costs with diseases of work and labor as justification for the exchange of securities of posts computerized work by more sophisticated components that bring better ergonomic conditions for workers.

KEY WORDS: Ergonomic Analysis, Safety, Financial Institutions, Diseases of work.

ANALYSE ERGONOMIQUE DES EMPLOIS DANS LE BUREAU DANS UNE INSTITUTION FINANCIÈRE

RÉSUMÉ

Cette étude présente une analyse ergonomique effectuée sur une institution financière basée dans la ville de Curitiba, qui était en train d'échanger vos meubles emplois. Cependant, l'objectif était d'analyser si l'échange de titres de l'institution financière peut être un facteur dans le travail de réduction de la maladie. Par conséquent, il était nécessaire d'effectuer de comparaison postes de travail ergonomiques avec des meubles anciens et des meubles de la nouvelle norme. En plus de vérifier si une méthode simplifiée pour utiliser les ordinateurs portables exerce une influence directe sur les conditions ergonomiques de travail selon les normes adoptées dans l'institution financière. Au total, 30 questionnaires ont été menées auprès des travailleurs, 15 pour l'ancienne norme et 15 de la nouvelle norme. Pour vérifier l'adéquation ergonomique a été utilisé NR-17, a également effectué une analyse comparative des résultats pour vérifier les améliorations et les causes majeures. Nous concluons que la modification des valeurs mobilières pourrait changer la condition de poste de travail ergonomique de bon à excellent, qui peuvent ensuite être prouvée par les résultats des questionnaires, qui ont montré une réduction de 67% à 27% des plaintes maux de dos, le cou, la tête, les bras ou les jambes par des travailleurs qui utilisent déjà la nouvelle norme. Il a également conclu que le principal facteur de l'amélioration survenue en changeant le siège ergonomique, et donc d'autres études peuvent être menées pour vérifier la réduction des coûts des entreprises de maladies du travail et du travail pour justifier l'échange de titres de messages de travail informatisé par des composants plus sophistiqués qui apportent de meilleures conditions ergonomiques pour les travailleurs.

MOTS-CLÉS: Analyse Ergonomique; La sécurité ; Les Institutions Financières ; Les Maladies du Travail.

ANÁLISIS ERGONÓMICA DE PUESTO DE TRABAJO EN OFICINA DE UNA INSTITUCIÓN FINANCIERA

RESUMEN

Este estudio presenta una análisis ergonómica realizada en una institución financiera con sede en la ciudad de Curitiba, que se encontraba en el proceso de intercambio de los muebles de sus puestos de trabajo. Sin embargo, el objetivo ha sido analizar si el cambio de los muebles de la institución financiera puede ser un factor de reducción de enfermedades de trabajo. Por lo tanto, fue necesario realizar comparativos ergonómicos de los puestos de trabajo con muebles antiguos y el mobiliario de lo nuevo estándar. Además de verificar si una forma simplificada de utilizar ordenador portátil ejerce una influencia directa en las condiciones ergonómicas de trabajo de acuerdo con los estándares establecidos de la institución financiera. En total se realizaron 30 cuestionarios con los trabajadores, 15 para el antiguo estándar y 15 para el nuevo estándar. Para verificar la adecuación ergonómica se utilizó NR-17, también se realizó un análisis comparativa de los resultados para verificar las mejoras y las principales causas. Concluye de que con la modificación de los muebles fue posible cambiar la condición de ergonómica del puesto de trabajo de bueno para excelente, lo que más tarde se puede comprobar con los resultados de los cuestionarios, que mostró una reducción de 67% a 27% de las quejas de dolor de espalda, el cuello, la cabeza, los brazos o las piernas de los trabajadores que ya están utilizando lo nuevo estándar. También se concluyó que el principal factor de la mejora ergonómica ocurrió al cambiar el asiento, de esta manera se pueden realizarse estudios posteriores para verificar la reducción de costes de las empresas con enfermedades de trabajo y acciones de trabajo como justificación para el cambio de muebles del puesto de trabajo computerizado por componentes más sofisticados que contribuyen para mejores condiciones ergonómicas de los trabajadores.

PALABRAS CLAVE: Análisis ergonómica; Seguridad en el Trabajo; Instituciones Financieras; Enfermedades de Trabajo.

ANÁLISE ERGONÔMICA DE POSTOS DE TRABALHO EM ESCRITÓRIOS EM UMA INSTITUIÇÃO FINANCEIRA

RESUMO

Este estudo apresenta uma análise ergonômica realizada em uma instituição financeira com sede na cidade de Curitiba, a qual estava em processo de troca de mobília de seus postos de trabalho. No entanto, o objetivo foi analisar se a troca dos mobiliários da instituição financeira pode ser um fator de redução de doenças de trabalho. Para tanto foi necessário realizar comparativos ergonômicos de postos de trabalho com o mobiliário antigo e o mobiliário do novo padrão. Além de verificar de maneira simplificada se a utilização de notebooks exerce influencia direta sobre as condições ergonômicas de trabalho segundo os padrões adotados na instituição financeira. Ao todo foram realizados 30 questionários com os trabalhadores, 15 para o padrão antigo e 15 para o novo padrão. Para verificar a adequação ergonômica foi utilizada a NR-17, também foi realizada análise comparativa entre os resultados para verificar melhorias e principais causas. Conclui-se que com a modificação dos mobiliários foi possível alterar a condição ergonômica do posto de trabalho informatizado de boa para excelente, o que pode ser posteriormente comprovado com o resultado dos questionários, que demonstrou uma redução de 67% para 27% de queixa de dores nas costas, pescoço, cabeça, membros superiores ou inferiores pelos trabalhadores que estão já utilizando o novo padrão. Concluiu-se ainda que o fator principal da melhora ergonômica ocorreu pela mudança do assento, e desta maneira podem ser realizados estudos posteriores para verificar a redução de custos das empresas com doenças de trabalho e ações trabalhistas como justificativa para a troca de mobiliários de postos de trabalho informatizados por componentes mais sofisticados que tragam melhores condições ergonômicas aos trabalhadores.

PALAVRAS CHAVE: Análise Ergonômica; Segurança do Trabalho; Instituições Financeiras; Doenças de trabalho.