



6th International Conference on Applied Human Factors and Ergonomics (AHFE 2015) and the
Affiliated Conferences, AHFE 2015

Ergonomic evaluation of office workplaces with Rapid Office Strain Assessment (ROSA)

M. Matos^a, Pedro M. Arezes^{b,*}

^aHealthy Generation, Rua Luciano Cordeiro, 116 – 5^o Frt, 1050-140 Lisboa, Portugal

^bCentre ALGORITMI, University of Minho, 4800-058 Guimarães, Portugal

Abstract

The regular use of the computer in the office contributed to the appearance of many risk factors related with work-related musculoskeletal disorders (WRMSD) such as maintaining static sitting postures for long time and awkward postures of the head, neck and upper limbs, leading to increased muscle activity in the cervical spine and shoulders. The objective of this study was to evaluate the presence of risk factors for WRMSD in an office using the Rapid Assessment Office Strain method (ROSA). Based on the results of this ergonomic evaluation, an occupational gym program was designed and implemented. Thirty-eight workplaces were evaluated using the observation of the tasks and pictures records in order to characterize those tasks in more detail. The ROSA tool was applied by an observer, who selected the appropriate score based on the worker's posture as well as the time spent in each posture. Scores were recorded for the sections of the method, specifically Chair, Monitor and Mouse and Keyboard and Telephone. The scores were recorded in a sheet developed for the method. The mean ROSA final score was 3.61 ± 0.64 , for Chair section was 3.45 ± 0.55 , to Monitor and Telephone section was 3.11 ± 0.61 , and to Mouse and Keyboard section was 2.11 ± 0.31 . The results led to understand that the analyzed tasks represent situations of risk of discomfort and, according to the methods guidelines, further research and modifications of the workplace may be necessary. It should be emphasized that these scores may not be related to the poor available equipment but with the need to optimize their use by the workers. It was noticed also that the interaction of workers with the tasks and the adopted sitting posture at the computer throughout the day have effects at a muscular level, essentially for the cervical area and shoulders. ROSA tool is an useful and easy method to assess several risk factors associated with WRMSD, also allowing the design of specific occupational gym programs.

© 2015 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of AHFE Conference

Keywords: Work-related musculoskeletal disorders; Rapid Assessment Office Strain method (ROSA); Occupational gym

* Corresponding author. Tel.: +351-253-510-340.

E-mail address: parezes@dps.uminho.pt

1. Introduction

The appearance of work-related musculoskeletal disorders (WRMSD) at the offices as rise over the last years, mainly because of the regular use of computers at the workstations [1–3] increased the occurrence of WRMSD reported [4] mostly on neck and upper limbs [3,5]. WRMSD are the reason for a high proportion of sickness absence from work than any other health condition, approximately a half of all work-related disorders in European Union members. In the fourth European working conditions survey, almost a quarter of European workers report muscular pain in their neck, shoulders and upper limbs [6]. This problem associated with the use of the computer in offices had been related to neck, upper limbs and back segments [3,4,7,8].

Office work represents a complex physical work environment, with interactions among the various dimensions of the workstation and equipment, speed of data entry, position and lighting of visual targets (screen and documents), and job content. This type of work have been related with some WRMSD risk factors like awkward, or critical, postures, prolonged static sitting, sustained non-neutral postures of the upper limbs, static low load or repetitive work, increased muscular activity in the upper back and shoulders, duration of the work and time pressure [8–10]. It was known that many office workers spend more than 75% of their work time seated at a computer [11,12].

The relationship between sitting posture and cervical spine and shoulder changes have been extensively studied. Although it seems that there are no studies able to attest a clear relationship between posture, muscles motor activity and WRMSD [1], some authors have shown that a sustaining static posture for long periods of time is related to persistent muscular activity on the spine and shoulder stabilizers [13], even at low loads [14]. Most of this risk explained above are related with the interaction between the office workers with components of the workstation such as the desk, chair, monitor, mouse, keyboard and telephone [15–17].

The prevention of WRMSD among office workers depends on accurate identification of exposure to occupational risks. Many studies about the association between risk factors and the resulting WRMSD have used several approaches to characterizing working posture. The goal of workplace study is to proactively identify factors associated with increased risk of musculoskeletal disorders. The three approaches that have been used to identify risk factors related to WRMSD are the worker self-report, where the worker is asked to estimate the risk factor levels associated with their own work; the observation-based methods, where a job analyst observes the work in real time or from recorded video, with a systematic approach to classifying risk factors; and the direct measurement, where instrumentation is used to measure posture directly [18]. Observation-based assessments appear to provide the levels of costs, capacity, versatility, generality and precision accorded to the needs of occupational safety and health specialists who have limited time and resources at their disposal and need a basis for establishing priorities for intervention [19]. Some examples of this type of assessment are the Rapid Upper Limbs Assessment (RULA) [20], the Rapid Entire Body Assessment (REBA) [21] and the Rapid Office Strain Assessment (ROSA) [22]. This last one is a recent office workplace assessment method and is based on other methods, such as RULA and REBA.

The ROSA method is a diagram-based checklist that was developed to quickly quantify the exposure of workers to risk factors in office workplaces and if an office workplace requires additional assessment or intervention. This method is based on the CSA standards for Office Ergonomics (CSA-Z412) and the musculoskeletal risk factors are identified through extensive research specific to office and computer work. The risk factors incorporated into the tool are organized into several subsections like chair, monitor and telephone, and mouse and keyboard. These subsections emphasize the risk factors of each component of the office workplace and weigh risk scores. The scores verified in each subsection are then combined to achieve a ROSA final score, indicative of the overall risk of musculoskeletal discomfort, as a result of the office organization [22].

To design an occupational gym program that could be effective to decrease WRMSD in office workers it is necessary to analyze properly the postures and the interactions between the worker and the components of the workplace to know which exercises would be more accurate to minimize the risk factors of the office work. Therefore, the aim of this study was to evaluate the presence of risk factors for WRMSD in an office of an insurance company using the Rapid Assessment Office Strain method (ROSA). Based on the results, an occupational gym program was designed and implemented.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات