The Effort to Reduce a Muscle Fatigue Through Gymnastics Relaxation and Ergonomic Approach for Computer Users in Central Building State University of Medan

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Abstract. Fatigue due to long and continuous computer usage can lead to problems of dominant fatigue associated with decreased performance and work motivation. Specific targets in the first phase have been achieved in this research such as: (1) Identified complaints on workers using computers, using the Bourdon Wiersma test kit. (2) Finding the right relaxation & work posture draft for a solution to reduce muscle fatigue in computer-based workers. The type of research used in this study is research and development method which aims to produce the products or refine existing products. The final product is a prototype of back-holder, monitoring filter and arranging a relaxation exercise as well as the manual book how to do this while in front of the computer to lower the fatigue level for computer users in Unimed’s Administration Center. In the first phase, observations and interviews have been conducted and identified the level of fatigue on the employees of computer users at Unimed’s Administration Center using Bourdon Wiersma test and has obtained the following results: (1) The average velocity time of respondents in BAUK, BAAK and BAPSI after working with the value of interpretation of the speed obtained value of 8.4, WS 13 was in a good enough category, (2) The average of accuracy of respondents in BAUK, in BAAK and in BAPSI after working with interpretation value accuracy obtained Value of 5.5, WS 8 was in doubt-category. This result shows that computer users experienced a significant tiredness at the Unimed Administration Center, (3) the consistency of the average of the result in measuring tiredness level on computer users in Unimed’s Administration Center after working with values in consistency of interpretation obtained Value of 5.5 with WS 8 was put in a doubt-category, which means computer user in The Unimed Administration Center suffered an extreme fatigue. In phase II, based on the results of the first phase in this research, the researcher offers solutions such as the prototype of Back-Holder, monitoring filter, and design a proper relaxation exercise to reduce the fatigue level. Furthermore, in order to maximize the exercise itself, a manual book will be given to employees whom regularly work in front of computers at Unimed’s Administration Center.

1. Introduction

Occupational health is a specialization in health sciences that aims to improve the highest degree of health both physically and mentally with preventif and curative efforts against diseases caused by occupational factors and work environment. Act No. 13 of 2003 article 86, paragraph 2 states that the work safety and health effort is intended to provide safety assurance and improve the health status of
the workers by preventing accidents and occupational diseases, hazards in the workplace, health promotion, treatment and rehabilitation.

According to Depkes RI (2005), 40.5% of workers in Indonesia have health problems related to their work and among them are skeletal muscle members as much as 16% (Tana 2009). Based on data in Indonesia General Hospital of Lampug Tengah, a group of musculoskeletal diseases including back pain was ranked the top ten most diseases in outpatients. During the year 2006 there were 32 patients treated with muscle pain complaints, whereas in 2007 there was a surge more than triple. Most of them suffer from rheumatoid arthritis and some back pain. During January to March 2008 there were about 40 patients with the same pain complaints and most of the sufferers were workers who spent much time in office as computer operators (Sumekar, 2008).

The total ergonomic approach emphasizes the use of a systemic, holistic, interdisciplinary and participatory approach (SHIP approach) in the analysis of ergonomic issues and formulates workplans and selects interventions through the application of appropriate technology (TTG). Ergonomic interventions are conducted thoroughly resulting in best interventions with minimal impact (Manuaba, 2006). The implementation of the total ergonomic approach is recommended by some experts because the method used is able to create humane, competitive and sustainable working conditions thereby increasing the productivity and income of employees and employers (Manuaba, 2005).

Relaxation is one of self-management techniques based on the workings of the sympathetic and parasympathetic nervous system. In Indonesia, research on relaxation is also quite a lot done. Prawitasari (1988), reported that relaxation is useful for reducing physical fatigue.

Based on the initial survey conducted on the employees of computer users in the Central Administration of Medan State University obtained information that they most experienced complaints in the neck, shoulder and waist. Fatigue of these muscles also resulted in their performance decreased so that data should always be updated often experience delays and not accumulated well, and often occur data revision because some data have typing errors. The operator works from 08.00 - 16.00 WIB and is given one time break which is 12.00-13.00 WIB. At the time of obtaining tasks such as data processing KRS and KHS, charging DPNA, and even processing data payments SPP student money, then the time to rest will be shorter and the end of the work will be longer than the time specified. From the data above shows that there is an effort to decrease the level of muscle fatigue through relaxation exercises and ergonomics approach for employees of computer users in Unimed Administration Center.

2. Research Methods

The method used in this research is research development with the method "Research and Development" which aims to produce products or improve existing products that can be justified. The resulting product is a backstop design, monitor filters and relaxation gymnastics design and the provision of a pocket book design how to do relaxation exercises while in front of the computer to reduce fatigue levels for computer user employees at the Unimed Administration Center. The Borg & Gall development model includes a systematic guide of steps undertaken by a researcher in order for the product to be designed to have a feasibility standard in the field. Borg & Gall (2007: 590) states that the development research procedure basically consists of two main objectives: (1) developing the product as a function of the developer, and (2) testing the effectiveness of the product as validation in achieving the goal. Thus, the concept of development research is more properly defined as a development effort which is also accompanied by validation efforts. The population of this research is civil servant or honorary staff who use computer in building Administration Center Unimed amounted to 67 people that is computer user in Academic Administration and Students (BAAK) Bureau counted 24 Respondent, Administrative Bureau of General and Finance (BAUK) 32 Respondents and Administrative Bureau Planning and Information Systems (BAPSI) 11 Respondents who use computers over 4 hours 1 day.
3. Results
In this study of muscle relaxation techniques that have been validated by the expert and back buffer design, monitor filters to reduce fatigue rates for computer users in the Center Administration Unimed as follows:

3.1. Technique of muscle relaxation movement that has been validated by the expert

3.1.1. Relaxation of the waist muscles
1. Movement rotate waist to right and left with count 1 to 8
2. Hold both hands and do a light beating at the waist
3. Bend down and straighten up

![Waist Muscles Relaxation Movement](image)

**Figure 1.** Waist Muscles Relaxation Movement

3.1.2. Relaxation of the back muscles
1. Straighten both hands forward and pull backward with interpal hands in the fore gear while exhaling from the mouth, and both hands are pulled backward while drawing breath from the nose.
2. Rotate both hands with a straight elbow position in the pull backward from front to back and vice versa the back.
3. Align the right hand from the front in the drag sideways 1 to 8 and replaced with the left hand with the same movement.
3.1.3. Relaxing the hand muscles and fingers

1. Sticking the fingers of both hands and make movements such as the waves with the elbows bent hands in front of the chest.
2. Gluing the two fingers with the palm of the hand outward with the elbow position in straightening in alternating bend.
3. Gluing both fingers with palm position into the inside. both elbows straight. The hands alternately pull to the left and right side alternately.
3.1.5. Eye muscle relaxation

1. Closes and opens eyes with a count of one close and count 2 opens up to 8 counts
2. Pressing with both fingers at the bottom of the eyelid
3. Pressing with your finger over the eyelid.
3.2. Back-Holder design and Monitoring Filter

Figure 6. Back-Holder

Figure 7. Monitoring Filter

4. Conclusion
Based on this finished study, it can be concluded that the result of the first phase clearly shown the holistic tiredness in computer users at Unimed’s Administration Center. The general description regarding to the health issue which suffered by the employees can at least be identified as a following action. The researcher devises solutions like a prototype of Back-Holder, Monitoring Filter, dan a Manual Book of how to do the exercise which has been validated by experts in order to decline the level of fatigue when they are using computers at Unimed’s Administration Center. Moreover, this research could possibly assist the computer users to cope with their health issue.

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