Control Software Designation of Postural and Ergonomic Variables during Working with Computer Users

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Abstract

Objectives: Widespread usage of computer in Third Millennium lead to prevalence of postural and ergonomic injuries and eye and other organs fatigue. Hence we are to design software for maintenance of corrected and normal body posture.

Methods: This is a semi-empirical and case study that was done in sport biomechanics laboratory. First some specific points of body was marked then sited on specific seat of computer with normal posture. Some images were prepared from anterior and lateral views by motion analyzer. After analyze, images were transferred to software and was saved to personal computer. Once user sat in front of PC, front and tween lateral PC camera controlled maintenance of body posture. If some incorrect posture was observed, the n computer had warned him to have correct position.

Results: Data showed that repeatedly usage of the software led to postural correction of user and prevention of wrong habits. It was confirmed by multiple usages.

Conclusions: During the research, most of users were satisfied by the software and no pain, fatigue and skeletomuscular disorder were not reported.

Keywords: Software; Skeletomuscular disorder; Ergonomic variables; Computer users

Introduction

Today, it is so common to observe people many hours on a fixed posture and inappropriate to activities such as computer work, and this issue has a high incidence [1,2]. The pervasiveness of computer use in the third century is the common causes of injuries and postural abnormalities and ergonomic and fatigue eyes and other organs of the body as people were in exposure from 1997 to 2003 hours of 9/5 hours to an average of 6/14 which has several side effects, including muscle disorders, headaches and neck pain associated with [3]. Musculoskeletal disorders caused by working with computers are undertaken a large group of diseases that can be harmful, causing fatigue, pain and inability to users organs are functioning. The discomfort of tendons, ligaments, joints, nerves, muscles and blood vessels is the result [4]. Several studies have shown that the structural economic problems have a large impact on the users, their organizations and communities [5]. So that in many countries, the prevention of disease among computer users, is a national priority [6] such as research of Harcombe et al. [7]. Institutions and companies that have used these tools to the table and chairs and room lighting, the arrangement person behind the computer, adjust the screen and so ignored and more of our users want and the lack of attention this standard provides a lot of damage [3]. In recent years, scientists focus on the field of pathology and Information Technology to the principle that the analysis conditions of postural patients using sophisticated equipment such as computers. They seek Simple and practical strategies in the field of software features to improve the conditions of people in the workplace ergonomics maximally. Hence we are to study in this field.

Methods

This research was designed in condition case study and was conducted in the laboratory of Sports Biomechanics. First, certain parts of the user's body marked by the marker, then held in the correct position and normal posture sitting on computer chair. From the anterior and lateral motion devices Diagnostic images analyzer were taken by the user. Images were transferred to a personal computer user and were stored. After the records of points coordinates were analyzed in system and after a series of statistical operations via specific software. as soon as the user set in front of his computer screen camera, a side camera in terms of maintaining the correct body posture and disturbances in the body's control was adjusted and if the computer user adapted wrong posture, the correct the situation with warned him/her. This application software in C #, the design and functionality of the application in accordance with object-oriented functions, defined and implemented.

Results

The application of the standard dimensions of a person when working with computers was set according to individual demographic characteristics. The other features of the software, the ability to create audio alarm and schematic depending on the users' manual. Figure A shows the location of specific markers in the main areas (acrimiom process, sternoclavicular articulation, hip, collarbone, sternum, the breastbone dagger process, prominence of the elbow, bone growth lance anticubital, lateral condyle of the knee, ankle left foot, plantar joint fifth finger, trochanteric hip, ears, the center of the brow bone and sometimes confusing) is under the control and all main statistical data extracted from the coordinate measurement and evaluation software was used (Figure 1).

The results of this study showed that the use of this software constantly modify user posture and prevention of wrong habits he repeated on several other user and proved the validity of this claim. The database can be embedded in the software, hey help to record different

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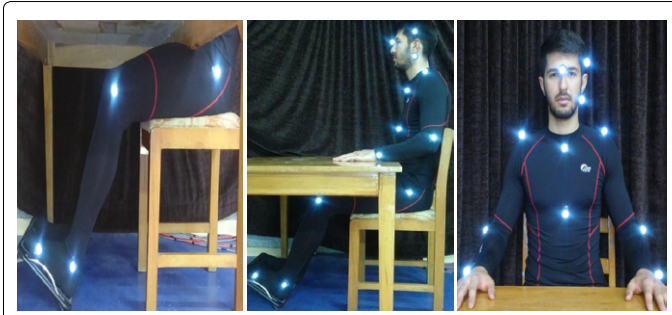
Figure 1: The coordinates of the area connecting markers processing software.

people to mean of similar habits and bad postural status of people.

Discussion

The results showed that the use of this software is constantly correcting posture and preventing user habits, he is wrong. Given that the highest prevalence of musculoskeletal disorders among computer users in the neck, back, waist and shoulder. In some studies, between eccentric head and body of work including rotating body or sit down with the neck bent and complaints of neck and shoulder pain, there was a significant relationship [8], also states that hold neck bent forward position for a long time and is repeated and prolonged work in the same situation, both significantly associated with neck pain [8]. Compare internal studies and abroad show that the prevalence of musculoskeletal disorders in the neck and the back of the computer users in Iran have been less than other communities, but there is little difference in other areas of the body [9]. According to research conducted prolonged use of a computer can cause skeletal problems - muscle areas of the upper body, especially the neck, shoulder, arm, wrist and fingers lead [10-14].

Musculoskeletal disorders due to continuous work and had a lot of computers. In Germany, Sudan, Denmark and Lebanon, computer users compared to men, women, neck and shoulder pain reported higher that the reported gender differences in pain, it could be because women on average tend to do repetitive, while men do not want to sit for a long period of time; in addition, more women for housework and caring for children, are exposed to additional stress [15,16].

Conclusion

During the study, the majority of computer users expressed satisfaction with this application and any pain, fatigue and musculoskeletal disorders and eye were reported. Thus, according to the results of this study, it is suggested to reduce musculoskeletal injuries among computer users in different professions, along with other effective ergonomic interventions, the exercise movements are used on an ongoing basis. Based on the results obtained, to reduce the incidence of musculoskeletal injuries in the study population basic measures such as work stations designed according to ergonomic principles, educate users about the principles of ergonomic computer work, - create a variety of user tasks Computers and reduced working hours at the computer, performing exercise movements at regular intervals (based on work-rest cycle for 75 minutes, 10 minutes of exercise and rest), is done. It seems to learn by doing, we can reduce the risk of damage to the health workforce and helping students.

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