Effects of elbow and forearm support on upper trapezius muscle fatigue while typing

Mohamad Hosein Ghasemi[1], Abed Salimi[1], Mehrdad Anbarian[2*], Ma'some Fadaee[1], Sara Moghadasi[1], Hamed Esmaeeli[3]

Received: 18/11/2014 Accepted: 18/05/2015

Abstract

Introduction: Today, computers are widely used in many homes and workplaces. The relationship between computer use and musculoskeletal disorders in the neck and upper extremities has been well documented. Muscle fatigue in the shoulder and arm regions is one of the most frequently reported problems in computer users. Supporting the upper extremities has been suggested as a way to reduce the static load on upper body muscles while using a keyboard. The purpose of this study was to determine the effect of elbow and forearm support on upper trapezius muscle fatigue while typing.

Materials and Methods: Eight students of Bu-Ali Sina University (Hamadan, Iran) participated in this quasi-experimental study. The surface electromyography activity of the upper trapezius muscle of the dominant side was recorded in three positions, namely without elbow support, elbow support with the table, and elbow support with a pad while typing. The muscle fatigue index for the three typing positions was calculated based on the median frequency slope of the raw electromyography signals. Repeated measures analysis of variance (ANOVA) was employed for statistical analyses.

Results: Median frequency slope decreased significantly in elbow support with the table in comparison with non-support position ($p = 0.04$). There were no significant differences between elbow support with a pad and other two positions.

Conclusion: These results suggested elbow support as a mechanism to delay trapezius muscle fatigue and thus increase task efficiency. More research is required to determine the advantages or disadvantages of using different pads.

Keywords: Typing, Elbow support, Fatigue, Trapezius muscle.

1. M.Sc., Student in Sports Biomechanics, Faculty of Physical Education, Bu-Ali Sina University, Hamadan, Iran.
2. * **(Corresponding Author)** Associate Professor, Faculty of Physical Education, Bu-Ali Sina University, Hamadan, Iran. Email: anbarian@basu.ac.ir
3. PhD Student in Sports Biomechanics, Faculty of Physical Education, Bu-Ali Sina University, Hamadan, Iran.