Computers, Children & Repetitive Stress Injuries

"The Effects of Computer Workstation Design on Children's Posture"

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The use of computers in schools has grown rapidly over the past 10 years. This growth is likely to continue since it is a widely held belief that computers enhance children's ability to learn. Many school districts have spent large sums of money to purchase computers and set up labs and individual workstations in classrooms. Some districts have also purchased computer workstation furniture while others have converted desks and tables into workstations.

As adult office workers' use of computers has increased, the incidence of computer-related musculoskeletal complaints and injuries has also increased. Although the use of computers in the classroom is increasing, little attention has been paid by educators, furniture manufacturers, or researchers to the ergonomic design issues of educational furniture for computer use. A recent study by Cornell researchers looked at the ergonomic appropriateness of computer workstations in school facilities for children grades 3-5 in six New York and Michigan elementary schools. Using the Rapid Upper Limb Assessment (RULA) (McAtamney & Corlett, 1993) as a measuring tool, the study revealed that all six schools had computer-equipped classrooms in which students assumed postures associated with high risk for the development of musculoskeletal disorders (Oates, et al., in press).

Effects of workstation design on overall seated posture, task performance, engaged behavior, and user preferences were assessed in another Cornell study (Laeser et al., in press). Each subject served as his/her own control. Subjects were drawn from a pool of Middle school sixth and eighth grade students. Each student performed a keyboarding task and mousing task under two conditions: one in which the keyboard and mouse was placed on a standard desktop, and the other in which the workstation was fit to the anthropometric requirements of the student. Posture was assessed using the RULA method; typing performance and mousing accuracy were measured by the computer program used for each task; and preference data was obtained via interview.

Overall student posture scores improved, as measured by RULA, at the workstation that could be adjusted to the anthropometric needs of the student. In addition to an assessment of overall posture, postures of the arm, wrist, neck, and trunk were analyzed separately. The greatest postural improvements were found in the arm during mousing, and the wrist during keyboarding. A small but statistically significant increase was found for mousing accuracy (3%) at the adjustable workstation. Results indicate that workstation design can impact computer task performance; however, additional research is needed to understand the extent of this effect. Overall, students responded favorably to a workstation which was fit to their anthropometric needs.

Important areas of future research include workstation design for differently abled children, teacher and student training in healthy computer work posture, and the durability of adjustable workstations in educational environments.

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