

Dynamic Chiropractic – January 1, 2010, Vol. 28, Issue 01

Computer Use and Adolescent Neck Pain

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The Study

Title: "Prevalence of Neck Pain and Headaches: Impact of Computer Use and Other Associative Factors."

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Publication: *Cephalalgia*, 2009;29:250-57.

Background

Chiropractors commonly see patients with neck pain and headaches that can, at least in part, be blamed on the countless hours people spend sitting at computer work stations. As the work world has evolved (or devolved?) into primarily sedentary tasks, so has the educational environment for many adolescents, who are now also spending far too much time on computers (not to mention video games etc.). This age group was the focus of this study.

To date, the literature suggests that a high percentage of adolescents experience neck pain, and that adolescent neck pain and headache is a primary predictor of chronic neck pain in adulthood. In fact, the point prevalence of neck pain in adolescents in developed countries is anywhere between 20 percent and 60 percent. Experts also suggest that sedentary lifestyles and prolonged computer use may result in neck pain in this age group.¹ Other significant risk factors for adolescent musculoskeletal pain (based on a variety of studies) include female gender, increasing age, family history of back pain, smoking, involvement in competitive sports, and psychosocial factors.

As the use of computers in schools increases, it is logical that the prevalence of neck pain in students could increase as well. The majority of manual medicine disciplines are involved in community campaigns to raise

awareness of common musculoskeletal conditions. The results of this study could certainly be incorporated into these important initiatives.

Study Methods

Subject data for this study was gathered from students in grades 10-12 from schools in the Western Cape metropolitan area of South Africa. One hundred twenty-four possible schools were identified - some incorporated computer use, while others did not, providing a wide range of computer exposure values for this study. These 124 schools were divided into four regions, and two schools were randomly selected from each region for study participation.

Computer use data was collected using a previously validated instrument called the Computer Usage Questionnaire (CUQ). Computer use was determined by assessing the total number of hours per week spent using school computers and computers elsewhere. The CUQ includes questions asking how many times per week and for how long students use school or other computers; answers to these questions were multiplied to arrive at a total usage value.

Information on neck pain and headache was gathered in simple but effective fashion. Neck pain occurring in the past month was identified by students on a body chart. For analysis purposes, students were classified as having neck pain or no neck pain, headache or no headache, or a combination of both neck pain and headache. Where neck pain or headache was indicated, students reported a severity score in the form of "slight discomfort" or "a lot of discomfort." Psychosocial factors were also assessed, in addition to amount of sports participation.

Age values were divided into two categories: 14-16 and 17-18; this was based on previous research suggesting that adolescents > 16 can be considered adults due to their roles in the work force.

Pertinent Results

This study included data from 1,073 students, 64.9 percent of whom were female (average age 16.3) and 35.1 percent of whom were male (average age 16.4). There was no statistical difference between female and male subjects.

Symptoms: Overall, 26 percent of students reported suffering headaches; twice as many females reported headaches as males (30.3 percent vs. 16.1 percent). Of headache sufferers, 33.4 percent reported their

headache as "severe." Roughly 20 percent of students suffered neck pain, with 12.3 percent reporting their pain as "severe" (equal among male and female subjects). A much smaller group of subjects reported both neck pain and headache - 7.1 percent overall (roughly equal in males and females).

Computer Exposure: The median amount of computer exposure was 8.5 hours/week (range was 0-28 hours). More than 50 percent (52.3) of subjects did not attend a school that used computers - of these students, only 8.5 percent used a computer elsewhere for > 8.5 hours/week. In subjects who did attend a school that used computers, 43 percent used a computer for > 8.5 hours/week.

Additional Factors: Girls tended to score higher for psychosocial factors than boys, as did older students compared to younger students. On average, students spent 3.3 hours/week in sports participation (range was < 30 minutes to > 8 hours). Regarding sports participation, girls participated significantly less than boys.

Predictors and Associations With Neck Pain and Headache

- High hours of computer use were not associated with headache, but was the only factor associated positively with neck pain (> 8.5 hours/week had an odds ratio of 1.7).
- As previously mentioned, females suffered headaches twice as often as males, and younger students with higher psychosocial scores (that is, more issues) also had more headaches.
- Overall, gender seemed to be more influential on headaches than computer use.
- No significant factors were identified that were related to students having both neck pain and headache.

Conclusions and Practical Application

This study reports a concerning association between neck pain and the number of hours spent on a computer for a sample of adolescent students. The authors suggest that poor ergonomic setup, poor posture, and soft-tissue creep during lengthy work sessions can all contribute to neck pain when using a computer. These factors are all logical and likely, but require further study to fully determine their individual contributions to the development of neck pain.

This study also revealed that adolescents can suffer considerably from headaches with or without neck pain. A higher prevalence of headaches was noted in female adolescents, and those who reported being under more stress, but this study was not statistically capable of establishing a cause-and-effect relationship.

In addition to manual medicine interventions, important components of a prudent treatment approach for mechanical neck pain in patients of any age include education about proper posture, ergonomics (despite the lack of definitive guidelines for computer station setup), hydration, and tissue-sparing techniques. Further, patients should also be questioned regarding recent optometric examination to determine if corrective eyewear is current or required.

Overall, there is not a lot of literature on this topic. The results of this study strengthen the argument for limiting computer time for adolescents. Further research is required.

Study Critique

This study included data from a large number of students with a wide range of computer exposure values. Although the findings are suggestive of an association between computer usage and neck pain in adolescents, the following limitations should be considered: This study recorded data at only one time point; neck pain and headache reporting was subjective, and could have been strengthened by utilizing a reliable and valid outcome measure like the NDI; and this study was cross-sectional in nature - a cohort study would be a stronger model that would allow a more in-depth analysis.

Additional Reference

1. Auvinen J, et al. Neck and shoulder pains in relation to physical activity and sedentary activities in adolescence. *Spine*, 2007;32:1038-1044.
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Dr. Shawn Thistle is founder and president of the Research Review Service (www.researchreviewservice.com), from which all content for this and other articles by Dr. Thistle is derived. Research Review Service posts approximately 60 reviews like this each year and currently has a database of more than 250 reviews. Dr. Thistle graduated from the Canadian Memorial Chiropractic College, where he has been a faculty member since 2004. He holds an honours degree in kinesiology (McMaster) and a certificate in contemporary medical acupuncture. He is also fully ART-certified and is a certified strength and conditioning specialist. Dr. Thistle practices full time at Shape Health and Wellness Centre in Toronto.



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