Future Research:

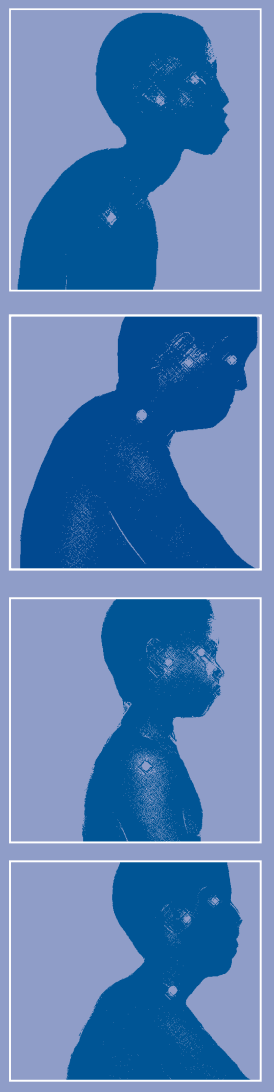
Project 1: Develop, test and implement educational programmes (exercises, stretches and advice) that aim to teach educators, students and parents on assuming good posture while working on computers and avoiding bad habits in order to prevent neck and back pain

Project 2: Assess how the computer workstation set-up at schools influences the development of neck and back pain among high school students and adjust the furniture and computer environment accordingly

Project 3: The anthropometric measures (height, weight etc.) and dimensions of the computer room furniture of a sample of high school students will be obtained. These measurements will be used to match the students with their computer room furniture.

Project 4: A new portable instrument will be designed to measure the three-dimensional sitting postures of students while they work on computers at school

Project 5: The three-dimensional measurement tool will be used in schools to measure the posture of pain free computing high school students. These students will be followed for 1 year to determine whether a certain sitting posture leads to the development of neck, shoulder and arm pain.



Summary

To date there have been four studies conducted between Stellenbosch University and Cape Town schools. This has led to clear evidence of the link between computer use and the development of poor spinal health for our adolescents during their formative years. Like all good research it has generated even more questions and we are appreciative of the ongoing collaboration between Stellenbosch University and schools so that together we can improve the health and educational experience of our young people.

For further information please contact Prof Quinette Louw at 021 9389301.

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Research conducted for the past three years in the field of

Adolescent Spinal Health

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Introduction

There has been an increased awareness of the relationship between computer use and high levels of body aches and pains among adolescents. Computer use is becoming more common in South African schools due to the government's initiative to increase tuition via computers as a means to increase the educator capacity in schools and to boost careers in science and technology. However if prolonged sitting, due to computer use, occurs during a critical period of skeletal growth in the vertebral column then damage to the spinal structures can occur. Our series of school spinal health projects aim to investigate and prevent the development of spinal muscular and skeletal dysfunction among students using computers.

The pathway of conducting research

Prior to engaging in research, a hypothesis must be formulated. This hypothesis must then be tested through conducting various studies. The hypothesis for this project was: Computer exposure increases the risk of musculoskeletal pain among adolescents / high school students. It is as yet unknown whether this statement is true or false. The conclusions drawn from medical research involve mechanisms to either prevent or manage certain diseases. Before preventative or management strategies for computer-related neck and back pain can be implemented there has to be sound evidence as to which factors lead to or contribute to the development of computer-related musculoskeletal pain. These factors are referred to as "risk factors" and when students are more exposed to these factors, their chance of developing computer-related musculoskeletal pain increases. It is therefore the purpose of conducting research to be able to identify these risk factors. This project has identified components associated with computer exposure to be systematically researched. These components included:

The time spent sitting per computer session;
·total hours of computer use per week;
·height and weight of students;
·sitting postures in front of computers;
the ways students use computers;
·the design of the school furniture in school computer rooms;
Psychosocial factors e.g. anxiety and depression;
Gender and age

Once the impact of these factors on musculoskeletal pain has been established, then guidelines for computer use can be formulated and implemented in schools.

What has been developed:

- A Computer Usage Questionnaire has been designed to describe the musculoskeletal health status of South African high school students. This questionnaire considers the impact of computer use on the musculoskeletal health of high school students. This questionnaire can be used for computing and non-computing high school students as the questionnaire relates to computer use at school and elsewhere. The questionnaire is available in English, Afrikaans and Xhosa.
- An instrument has been designed to measure the two-dimensional sitting posture of high school students while they work on desk top computers in the school computer room. This instrument measures the angles of the head, neck and upper back at any given time.

What has been discovered / found:

- 20% and 26% of high school students suffer from neck pain and headaches respectively
- 7.1% of high school students suffer from both neck pain and headache
- The average time spent using the computer per week is 8.5 hours for computing and non-computing students
- The use of a computer for more than 8.5 hours per week is strongly associated with neck pain among high school students
- 5.5% of non-computing students use the computer for more than 8.5 hours per week
- 43% of computing students use the computer for more than 8.5 hours per week
- Grade 10 boys use the computer on average 8.8 hours per week
- Grade 10 girls use the computer on average 6.2 hours per week
- 16.1% of students who use the computer for less than 5 hours per week suffer from neck pain
- 47.6% of students who use the computer for more than 25 hours per week suffer form neck pain
- 29% of pain free grade ten students who commence with computer studies could develop neck, shoulder and arm pain that is associated with computer use after 6 months
- Students with extreme neck angles are at risk of developing neck, shoulder and arm pain
- Students with a combination of extreme neck and upper back angles are also at risk of developing neck, shoulder and arm pain

What is recommended:

- Limit the use of computers to less than 8.5 hours per week either at school or elsewhere
- Pay special attention to the amount of time that boys spend using the computer
- Pay attention to grade 10 students who commence with computer studies or compu-typing
- Pay special attention to the sitting posture of students while they work with computers