



Self-reported ache, pain, or numbness in hip and lower back and use of computers and cell phones amongst Finns aged 18–65



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ABSTRACT

The aim of our work is to study persons who self-reported aches, pain, or numbness in the hip and lower back very often and their use of computers and cell phones via a questionnaire. The study was carried out as a cross-sectional study by posting a questionnaire to 15,000 working-age persons, and among all respondents (6121), 8.2% of them reported that they very often experienced pain, numbness, and aches in the hip/lower back. Thirty-eight percent of them used a desktop computer at work daily, and 79.0% used cell phones at leisure. As a group, they had more physical and mental symptoms than others. We found also significant differences in the use of different computers at work. In the future, it is important to take into account that persons' physical symptoms in the hip and lower back very often can be associated with other physical or mental symptoms and computer usage.

Relevance to industry: Hip and lower back symptoms are quite common discomforts that affect the productivity and well-being of industrial workers. A large-scale questionnaire offers a good reference for evaluating the prevalence of the hip and lower back symptoms associated with other symptoms and usage of computers and cell phones.

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1. Introduction

In recent years, the use of different computers and cell phones has greatly increased both at work and at leisure all around the world and now, especially in some countries, involves the large majority of the population. In Finland, according to the [Finnish Statistics Office \(2015\)](#), in 2012, 88% of Finnish households have a computer and 72% own a laptop. In the same country, almost all young – middle aged persons use the Internet: 90% of people aged 18–64 years according to the report of the [Finnish Statistics Office \(2015\)](#), and the use of Internet is increasingly involving also aged people (66–74 years): 61%. In the Fourth European Working Condition Survey Report, around 26% of employees worked with a computer either all or almost all of the time ([Parent-Thirion et al., 2007](#)).

These relevant changes are likely to have an influence also symptoms prevalence in computers and cell phone users, especially

considering that the physical demands for computer work are different than those required during typical manufacturing and industrial tasks even though computer tasks quite often require lower levels of physical force than industrial work. According to [Jonsson \(1988\)](#) and [Hoyle et al. \(2011\)](#), an important aspect of computer work is that the muscles are rarely (if ever) able to relax completely; therefore, the duration of sustained contraction is thought to be a critical component for musculoskeletal disorder risk.

In effect, pain symptoms are the most common health problems among the working population ([Mehlum et al., 2006](#)). [Hsu and Wang \(2003\)](#) and [Ming et al. \(2004\)](#) have reported musculoskeletal disorder prevalence rates of 20% to over 75% among computer workers or similar workers. Specifically considering low back pain (LBP), 12 months prevalence ranging e.g. from 26% to 75% were reported in different working population ([Porter and Gyi, 2002](#); [Trinkoff et al., 2002](#); [Ijzelenberg and Burdorf, 2005](#); [Alexopoulos et al., 2006](#)); but in office workers prevalences up to 51% and higher have been recently reported ([Akrouf et al., 2010](#)).

[Cho et al. \(2012\)](#) investigated the prevalence of musculoskeletal symptoms for office workers with a high computer workload in

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Taiwan. They sent two questionnaires to three companies and one university; they received answers from 254 subjects, 203 of which met the inclusion criteria. They found that high psychological distress was significantly associated with upper back and shoulder pain. Additionally, the high workload was associated with LBP.

The influence of psychosocial factors on persons with acute LBP has been studied. For example, Fritz and George (2002) have examined baseline psychosocial variables and their ability to predict prolonged work restrictions. They suggested that fear avoidance beliefs are the most important psychosocial variable for patients with acute, work-related LBP (Fritz and George, 2002).

A reduction of LBP in computer users can be obtained by adequate ergonomic interventions. E.g., Pillastrini et al. (2010) assessed the effectiveness of a workstation ergonomic intervention for work-related posture and LBP in Video Display Terminal (VDT) workers (100 VDT workers and control group). Their results contribute to the evidence that individualized ergonomic interventions may be able to improve work-related posture and reduce LBP for VDT workers.

As the use of technical equipment, e.g. personal computers, portable computers, notebooks, cell phones, and more recently, also tablets, e-readers, and smartphones, has increased, it is important to recognize the possible health effects that can be linked to new technologies. Therefore, we conducted a study in 2002 on possible influences of new technical equipment on the health of the working-age population via a questionnaire divided into six sections and sent to about 15,000 Finns. The first section dealt with background information, such as age, gender, marital status, education, occupation, and home county. In Section Two, the familiarity and use of given technical devices at leisure and at work were mapped. The third section focused on physical loading and ergonomics, and the fourth section was concerned with psychological welfare. Accidents and close-call situations at leisure or at work were handled in the fifth section, and the last part was an open-ended question: "other observations concerning technology and health". The details of the questionnaire and the results of the ergonomic health aspects and mental symptoms in all data have been reported earlier (Korpinen et al., 2009; Korpinen and Pääkkönen, 2009). Furthermore, we reported in our earlier article that persons who very often had symptoms in the neck also had other symptoms very often (e.g., exhaustion at work). Moreover, their use of information and communication technology (e.g., computers) is associated with their symptoms (Korpinen et al., 2013).

1.1. Aim of the study

The aim of this study was to determine the possible relation between self-reported hip and lower back symptoms (aches, pain, or numbness) and computers/cell phone usage, and to analyze how the symptoms are specifically associated with the use of desktop computers, portable computers or minicomputers, and cell phones. As the use of computer and laptop, but also mini-computers, and cell phones frequently enhance sedentary behavior, and prolonged sit long times, and it can have an influence on the hip and lower back of users. Is it possible to find associations between the use of these technical equipment, and users' hip and lower back symptoms? We evaluated the frequency of self-reported symptoms and the frequency of the use of PCs, laptops, minicomputers, and cell phones. The hypothesis is that these new devices may increase the risk of developing hip and LBP related to, e.g., poor postures or to other factors. We have also considered the relation between self-reported mental symptoms, other physical symptoms, and background information.

2. Methods

2.1. Study population and questionnaire

In October 2002, a questionnaire was sent to 15,000 Finns. As the study focused on the working age population, only people aged 18–65 were included. Names and addresses were obtained as a random sample from the Finnish Population Register Centre. The study design was approved by the local Ethical Committee (Pirkanmaa Health District, Finland, decision R02099).

2.2. Statistical analysis

The questionnaire included three questions regarding symptoms in the hip and lower back. In the first the responders have to refer the presence of symptoms in the last 12 months, ("13) Have you had any ache, pain, or numbness in the following body part during the last twelve months?" the anatomic localization ("a) in wrists and fingers, b) in elbows and forearms, c) in neck, d) in shoulders, e) in hip and lower back, f) in feet") and the frequency ("cannot say," "not at all," "sometimes," "quite often," "often," and "very often"). In the second items the responders have to subjectively refer the possible association of symptoms to the use of computer ("14) Have you had an ache, pain or numbness, which you associate with desktop computer use, in the following body parts during the last 12 months? a) in wrists and fingers, b) in elbows and forearms, c) in neck, d) in shoulders, e) in hip and lower back, f) in feet"; again, the possible answers were: "cannot say," "not at all," "sometimes," "quite often," "often," and "very often," and in the third to portable computers, including laptops, mini-computers, and cell phones ("15) Have you had an ache, pain or numbness, which you associate with portable computer use, in the following body parts during the last 12 months? a) in wrists and fingers, b) in elbows and forearms, c) in neck, d) in shoulders, e) in hip and lower back, f) in feet"). The first item (Question 13) was more general, where Questions 14 and 15 are leading questions in this study. We only report the amount of the answers to these questions.

Only persons who had aches, pain, or numbness in the hip and lower back were chosen. Subjects were classified in groups according to the frequency of symptoms: Group 1 persons who reported aches, pain, or numbness in the hip and lower back very often, Group 2 persons who reported the same symptoms often, Group 3: persons who reported symptoms quite often, and Group 4: persons referring aches, pain, or numbness in the hip and lower back sometimes. The options to Question 13) "Have you had any ache, pain, or numbness in the following body part during the last twelve months? a) in wrists and fingers, b) in elbows and forearms, c) in neck, d) in shoulders, e) in hip and lower back, f) in feet" were "cannot say," "not at all," "sometimes," "quite often," "often," and "very often". We coded the answers such that "cannot say," "not at all," and "sometimes" corresponded to 0 (no symptoms), 1 (quite often), 2 (often), and 3 (very often), respectively. Likewise, the answers to question "16) Have you suffered from a) sleeping disorders/disturbances, b) depression, c) exhaustion at work, d) substance addiction, e) anxiety, or f) fear situations during the last 12 months?" were codified in the same manner. The options to Question "11) How often do you use the following equipment or services at work? a) mobile phone, b) desktop computer, c) Internet, d) electronic commerce, e) portable computer or minicomputer, f) teletext and g) digital television etc.," were "cannot say," "not at all," "less than monthly," "monthly," "weekly," and "daily". In the analyses, we used persons who answered daily. The statistical analyses were performed using IBM SPSS Statistics versions 19 and 20.

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