

The Use of Computers in Different Age Groups and their Self-reported Neck Symptoms

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Keywords: Computers, Age, Symptoms, Neck.

Abstract: The aim of this paper was to investigate the self-reported physical symptoms in the neck and the use of computers in different age groups. The study was carried out as a cross-sectional study by posting the questionnaire to 15,000 working-age Finns. The daily use of desktop computers at work is quite popular (over 60%) in the age groups 31–40, 41–50, and 51–60. In these same age groups, a very similar percentage of the respondents reported having physical symptoms in the neck as ‘very often’.

1 INTRODUCTION

In recent years, the use of computers and other mobile internet or communication devices has increased at work and at leisure. For example, according to the Finnish Statistics Office (2008), in 2006, the percentages of computer users among people aged 18–64 years were as follows: 100% in upper-level white-collar workers and students; 97%, in lower-level white-collar workers; 89% in other entrepreneurial group, and 83% in blue-collar workers.

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).

Musculoskeletal diseases involving the neck or shoulder region are quite common. In addition, in recent years, the use of new technical equipment has increased.

The average workers’ age has increased (Shephard, 2000a). Before workers are 65, they often had chronic health problems (Huuhtanen and Piispa, 1993; Kilbom et al., 1993).

Shephard (2000b) described that aging is associated with progressive decreases in aerobic power, thermoregulation, reaction speed and acuity of the special senses. In another publication, Shephard (1997) documented and described that age-related decreases in reaction speed and the

acuity of the special senses. Shephard reported the special categories of employment in which a deterioration of vision or hearing can substantially limit employment prospects (Shephard, 1997, 1974).

Ishihara et al. (2001) studied the age-related decline in visual ability. According to them, for example, light sensitivity, susceptibility to glare, color perception, static and dynamic acuity peripheral vision and depth perception change with age (Ishihara et al., 2001; Kline and Scialfa, 1997). Roy et al. (1991) described in their publication that the best color discrimination occurred in subjects between the ages of 20 and 50.

The Tampere University of Technology (TUT) has studied the health effects of new technical equipment using a questionnaire. The study was carried out as a cross-sectional study by posting the questionnaire to 15,000 working-age Finns. Of the responses, 6,121 were received, which included multiple-choice questions on the familiarity and usage of new technical devices, prevalence of physical and mental symptoms, accidents associated with mobile phone use and an open-ended question on health and new technology (Korpinen et al., 2009).

In our earlier article “self-reported use of ICT (Information and communication technology) uptake in 2002 and discomfort amongst Finns aged 45–66” we reported that the use of new technical equipment among the group of people who are outside working life was smaller than the people’s usage in general.

Therefore, when new technical equipment is developed, it is important to take into account, that people outside working life do not use, e.g., the Internet as much as people in general. (Korpinen and Pääkkönen, 2010).

The aim of this paper was to investigate the self-reported physical symptoms in the neck and the use of computers in different age groups.

2 METHODS

2.1 Study Population

The questionnaire was sent to 15,000 Finns. The study focused on the working-age population, so the questionnaire was sent to people between the ages of 18–65.

The names and addresses of the participants were obtained as a random sample from the Finnish Population Register Centre. The study design was approved by the Ethical Committee of Pirkanmaa Health District, Finland (decision R02099).

2.2 Questionnaire

The questionnaire was divided into six sections. 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. In the third section, the focus was on physical loading and ergonomics.

The fourth section concerned psychological welfare. Accidents and close-call situations at leisure or at work were handled in the fifth section. The last part was an open-ended question ‘other observations concerning technology and health’.

The details of the questionnaire have been reported earlier (Korpinen et al, 2009).

2.1 Statistical Analysis

The statistical analysis was performed using IBM SPSS Statistics versions 20 software. Age groups were classified as: under 20, 21–30, 31–40, 41–50, 51–60, and over 60. For the analysis, we took group 2 (21–30), group 3 (31–40), group 4 (41–50), and group 5 (51–60), as the remaining groups were too small.

We analyzed the answer percentages to the questions:

a) Have you had an ache, pain or numbness in the

neck during the last 12 months? (choices: (0) cannot say, (1) not at all, (2) sometimes, (3) fairly often, (4) often and (5) very often) and
 b) How often do you use the following equipment or services at work? (choices: (0) cannot say, (1) not at all, (2) less than monthly, (3) monthly, (4) weekly, and (5) daily).

3 RESULTS

A total of 6121 responses arrived and the response percent was 41. Figure 1 shows the answers of all participants for the question ‘how well do you know the desktop computer?’.

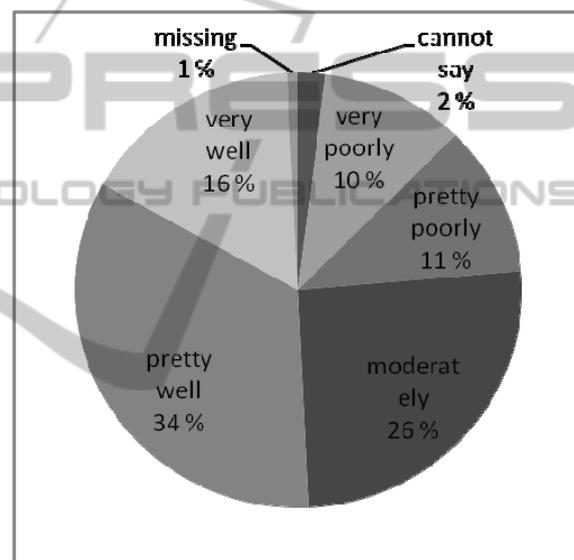


Figure 1: Answers of all participants for question ‘how well do you know the desktop computer?’.

Figure 2 shows answers for the question ‘how often do you use the desktop computer for leisure?’ (using all data) and Figure 3 shows the answers of all participants for the question ‘how often do you use the desktop computer at work?’.

In the age group 2, 34.7% of respondents used a desktop computer at work on a daily basis and 37.8% at leisure.

In group 3, the numbers were 60.5% at work and 37.3% at leisure. In group 4, 66.3% at work and 30.5% at leisure and in group 5, 63.5% at work and 30.7% at leisure.

Figure 4 shows the physical symptoms in the neck expressed in groups ‘sometimes and fairly often’.

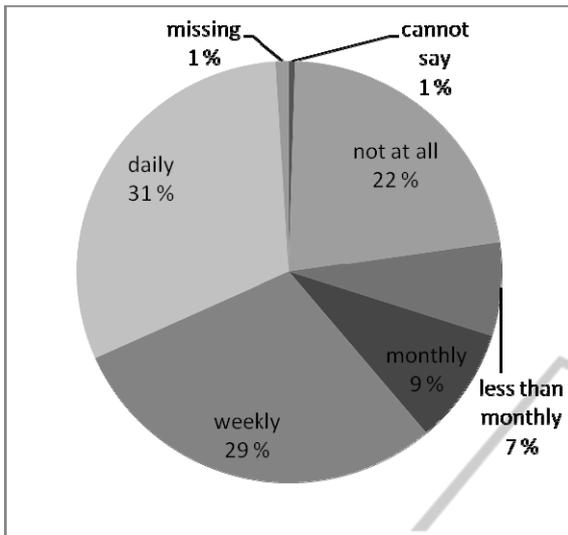


Figure 2: Answers of all participants for the question ‘how often do you use the desktop computer for leisure?’.

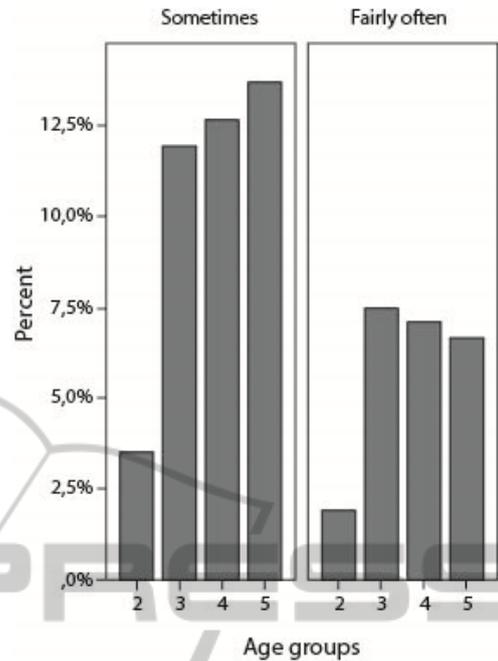


Figure 4: The physical symptoms in the neck between response groups ‘sometimes and fairly often’, and with different age groups.

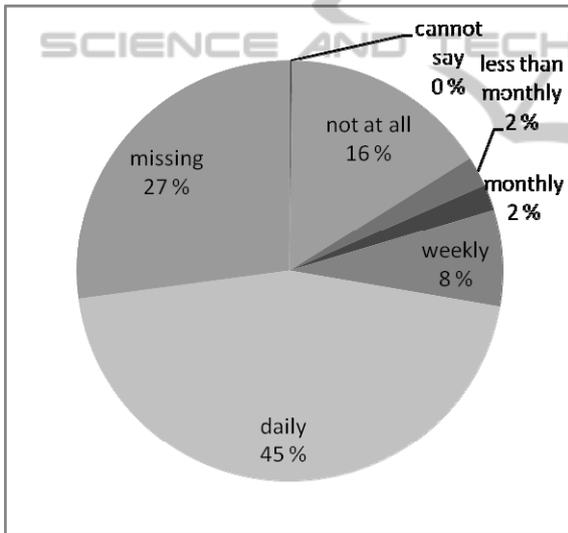


Figure 3: Answers of all participants for the question ‘how often do you use the desktop computer at work?’.

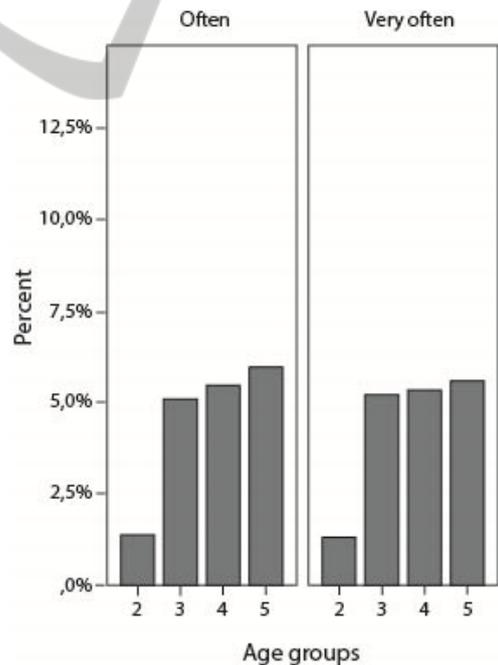


Figure 5: The physical symptoms in the neck ‘often and very often’.

Figure 5 shows the physical symptoms in the neck classified in groups ‘sometimes, fairly often’, often and very often’. In age groups 3 (31–40), 4 (41–50), and 5 (51–69), the percentages are quite similar, when respondents reported experiencing their symptoms ‘very often’.

3 DISCUSSION

3.1 Evaluation of Methods

In this study, the population was 15,000 working-age Finns. The amount of responses was 6,121, which was quite large. Therefore, it was possible to make analyses on the subgroup of people, such as based on age groups. However, the results of our data are not highly reliable, because the nonresponse rate was over 50%.

In the questionnaire, the new technical units included desktop computers, portable computers, hand-held computers, communicators, Internet, mobile phones, electronic marketplaces/commerce, teletext, digital television and associated services. In some of age groups, people might not use all these services or equipment.

This data is about 10 years old, which is a long time in consumer technology. For example, the digi-TV and digibox were new when we sent the questionnaire, but nowadays the devices are well known, so the situation has changed. However, the desktop computers used in 2002 were quite similar to those used nowadays. The usage of the Internet has increased, so perhaps the amount of usage of the Internet is nowadays higher than in 2002.

3.2 Use of Computers and Reported Symptoms

In all data, 45% of all participants used a computer at work on a daily basis and 31% at leisure. The daily use of desktop computers at work is quite popular (over 60%) in the age groups 31–40, 41–50, and 51–60. In these same age groups, a similar percentage of the respondents (less than a 7.5% difference) reported physical symptoms in the neck as ‘very often’.

4 CONCLUSIONS

The daily use of desktop computers of all participants was about 45% at work and about 30% at leisure in all the data. In addition, about 5% reported physical symptoms in the neck very often in the age groups 31–40, 41–50, and 51–60. In the future, it is important to take into account ergonomic issues and the ergonomic differences of mobile devices, e.g., computers can stress a person’s neck.

ACKNOWLEDGEMENTS

The assistance of the staff (Noomi Suuronen, Jari Latva-Teikari and Riitta Lehtelä) of Environmental Health group, Tampere University of Technology was gratefully acknowledged.

REFERENCES

- Finnish Statistics office, 2008. 2. *Still more adult use computers.*(in Finnish) http://www.stat.fi/til/aku/2006/03/aku_2006_03_2008-06-03_kat_002.fi.html (Last updated 3 June 2008)
- Huhtanen, P., Piispa, M., 1993. Attitudes on work and retirement by occupation. In: Ilmarinen, J. (Ed.), *Aging and Work*. Institute for Occupational Medicine, Helsinki, pp. 152–156.
- Ishihara, K., Ishihara, S., Nagamachia, M., Hiramatsub, S., Osakic, H., 2001. Age-related decline in color perception and difficulties with daily activities - measurement, questionnaire, optical and computer-graphics simulation studies. *International Journal of Industrial Ergonomics* 28, 153–163.
- Kilbom, As., Blatzari, L., Ilmarinen, J., Nygaard, C.H., Nørregaard, C., Solem, P. E., Westerholm, P., 1993. Aging and retirement: an international comparison. In: Ilmarinen, J. (Ed.), *Aging and Work*. Institute for Occupational Health, Helsinki, pp. 54–62.
- Kline, D. W., Scialfa, C. T., 1997. Sensory and perceptual functioning: basic research and human factors implications. In: Fisk, A. D., Rogers, W. A. (Eds.), *Handbook of Human Factors and the Older Adult*. Academic Press, San Diego, pp. 27–54.
- Korpinen, L., Suuronen, N., Latva-Teikari, J., Pääkkönen, R., 2009. Questionnaire on the health effects of new technical equipment. *International Journal of Industrial, Ergonomics* 39, 105–114.
- Korpinen, L., Pääkkönen, R., 2010. Self-reported use of ICT (Information and communication technology) uptake in 2002 and discomfort amongst Finns aged 45–66. *Applied Ergonomics* 42, 85–90.
- Parent-Thirion, A., Macías, E., Hurley, J., Greet Vermeylen, G., 2007. *Fourth European Working Conditions Survey. European Foundation for the Improvement of Living and Working Conditions*, Dublin. 1–109.
- Roy, M. S., Podgor, M. J., Collier, B., Gunkel, R. D., 1991. Color vision and age in a normal North American population. *Graefe’s Archive for Clinical and Experimental Ophthalmology* 229, 139–144.
- Shephard, R. J., 1997. *Aging, Physical Activity and Health*. Human Kinetics, Champaign, IL.
- Shephard, R. J., 2000a. Worksite health promotion and the older worker. *International Journal of Industrial Ergonomics* 25, 465–475.
- Shephard, R. J., 2000b. Aging and productivity: some physiological issues. *International Journal of Industrial Ergonomics* 25, 535–545.