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ANALYSIS OF THE NEGATIVE EFFECTS OF WORK WITH A COMPUTER FOR THE ATTENTION OF A MAN AND ITS WORKING CAPACITY

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The work presents a study of the influence of working with a computer on human attention and working capacity. To conduct the study there was created a program that made it possible to assess the attention and speed of analysis of the visual information of the respondents. Attention was assessed before and after working on a computer; 103 respondents at the age of 20-22 and 54 at the age of 8-10 took part in the experiment. Studies have shown that at a certain hour of work there is a significant drop in attention and concentration, which can be regarded as overstrain of the cerebral cortex, visual analyzer and general fatigue of the subject. It will be advisable to make rest during prolonged work at the computer.

Key words: computer; working capacity; attention; visual information.

The problem of the impact of computer technique on human health is more pressing than ever. Because the number of professions and employees related to the use of computers is growing every year. More and more computers are involved in production. Multimedia technologies are used

in the learning process: independent work of the student, various tests, programs for home study (for schoolchildren and students) are implemented with the use of computer technology. This problem is especially relevant for students, because testing, as a form of control of the learned material, independent work of the student, a large amount of literature in electronic form and today's pandemic conditions require the use of a computer [1, c. 237].

The negative impact of computers on human health is an undeniable fact. On the first there is a violation of the CNS, on the second the work is accompanied by hypodynamics, on the third vision deteriorates and finally due to the long sitting in one position the condition of the musculoskeletal system deteriorates, too [2, c. 619].

A clear understanding of the mechanisms of this effect will, firstly, increase the productivity of the computer work, and secondly, minimize the negative impact of this work on the body. In addition, the computer is used in everyday life for entertainment and getting information outside the educational process.

The purpose of the study: To assess and analyze the impact of working with a computer on human attention and working capacity. To determine the maximum time for safe and most efficient work separately for adults and children.

Materials and methods of research. The experiment used a specially created program for assessing the attention and speed of analysis of visual information. 103 respondents aged 20-22 years were assessed for the condition of their attention before starting work at the computer and after each subsequent hour of work. For the younger group of respondents (54 children aged 8-10 years) the interval was 30 minutes. To assess, each respondent was tested three times. Nominal points from 0 to 10 were awarded for the attempt. Next, the average of these attempts was calculated, and that was considered as a conditional estimate of attention and speed of analysis of visual information. The following measurements were performed in a similar manner. Then the analysis of the obtained results was performed.

Research results: As a result of the work it was found that in the adult group of subjects after an hour the test score decreased by an average of 3,3%, after the second by 6,5%, after the third – 12,7%, after the fourth – 21,5%, after the fifth – 22,1% in comparison with the estimation received before the beginning of work (fig.1).

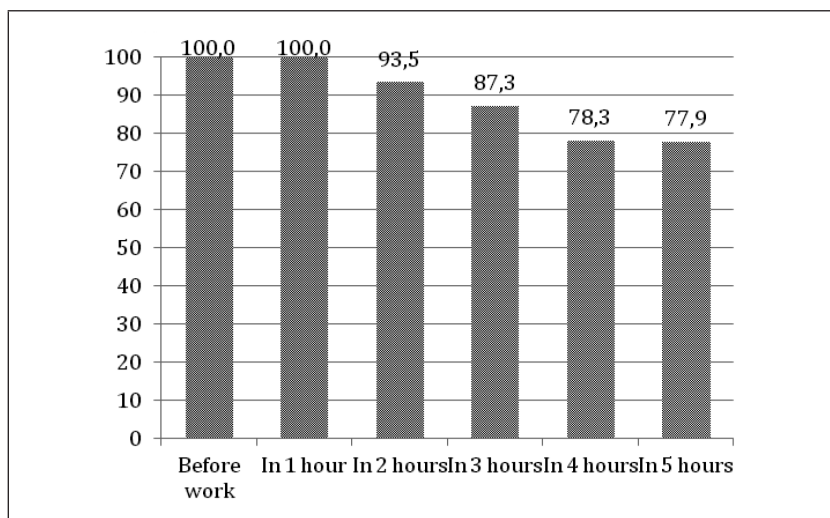


Figure 1 – Decreasing attention (%) in the explored group aged 20-22 years, (n = 103)

If we compare the results among respondents in the adult group depending on the article, the results don't differ significantly. It's noted only that in women this score is slightly lower, but taking into account the error, the difference isn't significant.

The following results were noted in the younger group: after 30 minutes of work the assessment decreased by 5%, after an hour - 16.7%, after an hour and a half - 25.8%, after two hours - 28.3% compared to the initial assessment (Fig. 2).

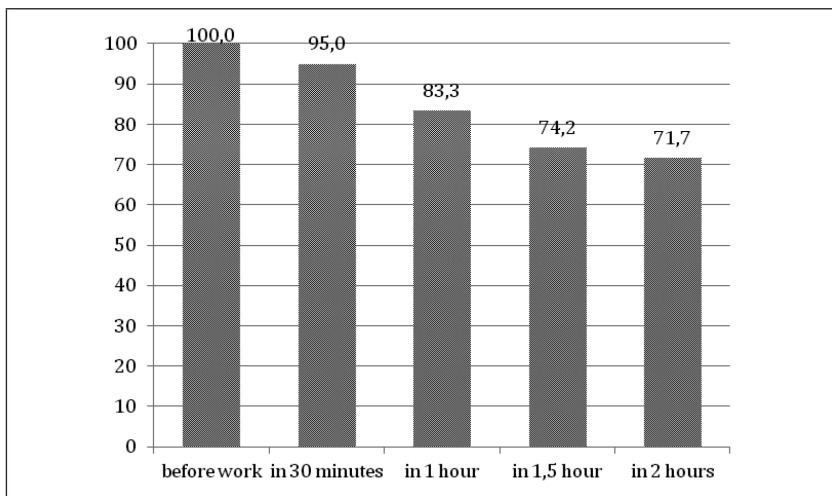


Figure 2 – Decreased attention (%) in the observed group aged 8-10 years, (n = 54)

In the adult group, there was the greatest decline in attention and the ability to quickly analyze visual information in the period of work on the computer from 3 to 4 hours. In the younger group, this decline was observed between 30 minutes and 1 hour.

If we compare the results of the adult and younger groups, it is clear that in an hour there is a significant decrease in children, at the same time when the working capacity of adults is still virtually unchanged.

For two hours, when in the adult group the first noticeable decrease in indicators was noted, in the younger group the working capacity was significantly reduced (Fig. 3).

Periodic change of activity is recommended to reduce the load on the body. It is effective to perform gymnastics for the eyes during breaks, to detect physical activity – at least to walk around the room this time. Don't use any gadgets or means of communication during recreation. Maybe listen to nice music.

It will allow you to comprehensively remove the load from the CNS, musculoskeletal system and visual analyzer. These preventive measures were proposed to the observed group aged 20-22 years.

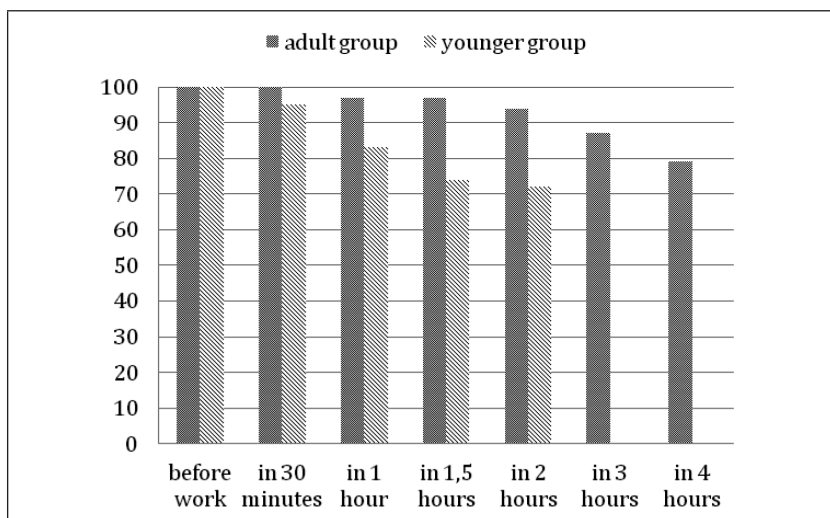


Figure 3 – Decreases in attention (%) in the observed groups

After analyzing the results, we found that respondents who took the recommended preventive measures and breaks showed more stable indicators of concentration compared to those who did not use preventive measures when working on a computer (Fig. 4).

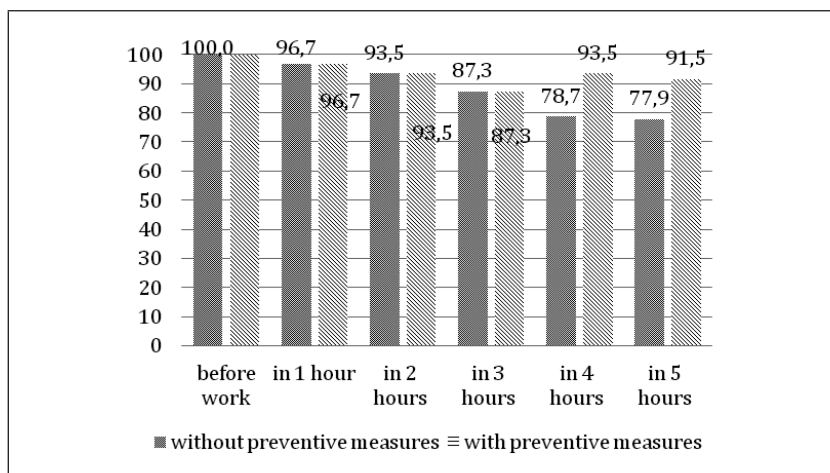


Figure 4 - Comparison of attention and working capacity deficit (%) in the older group.

Conclusions.

1. Our research has shown that at a certain hour of work there is a significant decrease in attention and concentration, which can be regarded as an overstrain of the cerebral cortex, visual analyzer and general fatigue of the subject. It is noted that in the younger group this time is much less.

2. It will be expedient to make rest for adults no later than three hours of work at the computer, and for children this time makes 45 minutes. This will increase the effectiveness of work or study and reduce the risk of diseases of the nervous system, depletion of the visual analyzer and deterioration of general well-being.

3. It is established that the implementation of preventive measures while working on a computer significantly prolongs the high level of concentration and working capacity of the subjects.

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