

Morphometric Features in Adolescents with Computer Addiction

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Abstract We have studied the morphometric features of teenagers with "computer addiction", which determines a person's pathological addiction to work or spending time at the computer. This new disease affects the young part of the population, mainly teenagers. Although this disease has nothing to do with infection, it is spreading around the world at the speed of an epidemic.

Keywords Computer addiction, Teenager, Morphometric and psychological features

1. Introduction

We currently live in the era of modern technologies. It should be noted that the implementation of the state program and the system of measures to reform health care and the implementation of a strong social policy to protect the population is of great importance in ensuring the interests of a person, who is the highest value for us [1,4].

A person is now not just a physical body with his own ideas, feelings, desires and passions, he is a real participant in an intensive communication process [5,7].

Over the past two decades, the importance of the Internet as an information, semantic and gaming space has been growing, which leads to the widespread introduction of Internet resources in almost all areas of human activity. At the same time, along with the positive impact due to the ease of use of Internet resources, the problem of Internet-dependent behavior is becoming more and more pronounced [3].

Computers have become an indispensable part of everyday life, while creating new problems associated with raising a healthy child.

The Internet has become a powerful environmental factor, under the influence of which the personality of modern children and adolescents is being formed. According to sociological surveys conducted by the Public Opinion Foundation, it is teenagers and young adults who are the most active Internet users [2,5].

From this point of view, a new disease has emerged, "computer addiction", which has nothing to do with infection, but is spreading around the world at the speed of an epidemic. The term "computer addiction" defines a person's pathological addiction to work or spending time at the

computer. American scientists first started talking about computer addiction in the early 80s. Day after day, the phenomenon of the formation of a pathological connection between a person and a computer becomes obvious.

2. Research Aim

To study magnetic resonance imaging data in children and adolescents suffering from computer addiction and compare the obtained data with the data of healthy children.

3. Materials and Methods

To solve the set tasks, the following methods were used: questionnaire survey of students and analysis of the survey results.

4. Results and Discussion

We have found out the reasons for computer addiction in teenagers with varying degrees of addiction and determined the state of the spinal column posture in children and teenagers with varying degrees of computer addiction and compared them with the data of healthy children. Based on the conducted research, the characteristics of physical development and body parts of children and teenagers were studied taking into account the somatopsychological disease [computer addiction] and compared with the parameters of healthy children and teenagers. The degree of lag in physical and functional parameters of body parts development is established (Table 1).

Table 1. Morphological changes in adolescents with computer addiction in computed tomography

Brain area	Morphological changes consequences	Consequences
Frontal lobe	Decreased gray matter volume	Impaired self-control, impulsive behavior
Hippocampus	Atrophy	Decrease in cognitive abilities, memory impairment
Prefrontal cortex	Volume reduction	Impaired emotional regulation, problems with decision making
Reward centers (striatum and nucleus accumbens)	Change in functioning	Increased need for stimuli associated with addiction, decreased pleasure from other activities

Table 2. Data on the stages of computer addiction among teenagers

Stages	Quantity	Description	Characteristic signs
Mild infatuation	10 children	The initial stage, manifested by a slight interest in games and the Internet after the first experience of using a computer.	- Interest in graphics, sounds and colors. - Absence of pronounced negative emotions when there is no access.
Passion	9 children	Interest in the computer increases, the teenager spends more than 3 hours a day at the computer, reducing motivation for studying.	- A drop in academic performance. - Increased emotional upsurge during games. - Short-term negative reactions when there is no access.
Addiction	5 children	The teenager does not control the time spent on the computer, which causes problems with studies, nutrition, personal hygiene and sleep.	- Irregular meals. - Neglect of personal hygiene. - Aggression, anxiety, depression in the absence of access.

In order to determine how much children are accustomed to social networks with computer addiction, we conducted a questionnaire among 50 teenagers, among whom there were often children sitting at computer games. Based on this questionnaire, the following main psychological signs of disorder were identified in 24 children: the emergence of a feeling of euphoria during the use of a computer in 11 children, a gradual increase in the amount of time spent on a smartphone in 6, aggression in 3 children if a favorite toy was forbidden and refusal to do homework in 4 cases. Teenagers, due to their age immaturity and instability of personality structures, are especially susceptible to negative influences. Excessive passion for the Internet has a destructive effect on all aspects of their lives. This leads to difficulties in learning, problems in communicating with peers, an increase in conflicts in the family and general infantilization of the personality. This condition arose as a result of a lack of communication with important adults and peers. The main reasons for which include problems in relationships with parents. If a teenager feels unnecessary, he goes into the virtual world, where smartphones and computers become a substitute for real communication. Smartphones, due to their portability, most often accompany teenagers in their everyday life. Irresponsible performance of parents' duties. Many adults give children electronic devices, starting from a very early age, to distract them during whims. However, the consequences of such actions can lead to dependence on gadgets, which subsequently becomes a difficult problem to overcome. The results of our study are described in Table 2.

Based on the conducted research among teenagers, the stages and their main characteristics were divided to make it

easier to track the dynamics of computer addiction. We noticed the following physical signs of computer addiction: eye disorders (deterioration of vision in 16 children, display syndrome in 7 children, dry eye syndrome in 11 children), musculoskeletal system (curvature of the spine in 4 children, posture disorders in 3, back pain in 5 children. Among the questionnaires studied, children also complained of frequent headaches, insomnia, changes in sleep patterns, daytime fatigue, neglect of personal hygiene), digestive system (eating disorders, chronic constipation, hemorrhoids) movements, such as excessive use of the keyboard, which also coincides with literary data. Computer addiction not only affects the functional systems of a person, but also leads to a lag in the physical development of a young organism. Due to irregular meals and skipping meals, they show signs of delayed physical development.

5. Conclusions

Thus, it became clear that computer-addicted teenagers have asymmetry of the torso due to a forced pose in front of the computer with subsequent transition to scoliosis.

In computer-addicted teenagers, morphometric changes in the upper limb were observed, especially the right hand due to control of the computer mouse (due to prolonged overstrain, the hand muscles acquired a forced shape) and on the right side, a "dome-shaped" hand with the little finger abducted to the side was noted.

Since with computer addiction there is not only a psychological disorder or the formation of addictive behavior, but also pathophysiological processes that lead to pathology.

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