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BENEFITS AND HARMS OF MOBILE DEVICES FOR HIGH SCHOOL STUDENTS

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ABSTRACT — It is well known that electromagnetic radiation from modern mobile devices has a negative effect on the central nervous system, especially for children. We studied the opinion of high school students about the impact of mobile devices on their bodies by questioning. It was revealed that students using mobile devices up to 7 hours a day note irritability, tearfulness, dissatisfaction with themselves and their academic performance is much lower than that of peers. It turned out that *Internet addiction* is observed more often in girls than in boys.

KEYWORDS — educational migration, youth health, mobile devices, radiation, Internet addiction, visual impairment, depression.

Modern society is focused on building a new model of the school, and as the main result involves the development of students' *gene* of independence in cognitive activity. Today, the established forms and methods of teaching schoolchildren require correction and new pedagogical decisions, taking into account the information society as a whole [4]. However, with the active introduction of all forms of electronic technology in the educational process, one should not forget about the information security of children. Today, a huge amount of information, both about the benefits and the dangers of mobile devices for children. Each parent has his own opinion on the use of tablets by children, or a categorical restriction, or time limits or complete freedom. Under the influence of EMR, absolutely all organs, and systems of the child's body fall. In children, often using cell phones, the processes of memorization and reproduction of information, sleep is disrupted [5]. According to statistics, from 2015 in the UK every 3rd child has his own tablet. Under the age of 15, 60% of children used a tablet computer at home.

However, the Parliamentary Assembly of the Council of Europe (PACE) recommends that all reasonable measures be taken to reduce the effects of electromagnetic radiation, especially radio frequencies from mobile phones, on children and young people who are most at risk of brain tumors [1]. Scientists from different countries asked the UN to formulate international standards for the safety of electromagnetic radiation.

On the recommendation of the Canadian Society of Pediatricians, there should be a restriction on the use of mobile devices to 2 hours a day for children 6 to 18 years old. In Russia, electronic textbooks have been actively introduced since 2015. The Ministry of Education and Science requires the content of electronic and paper textbooks to be consistent. However, according to the Russian sanitary standards, it is not recommended for children to use phones, smartphones, tablets. However, to ensure the information security of children, along with the prohibition of information products, it is necessary to promote the creation of conditions that ensure positive socialization and individualization of the child, his psychological well-being and positive worldview [2]. Researchers from the Russian center for electromagnetic safety argue that electromagnetic radiation from modern mobile devices has a negative effect on the central nervous system, especially children. In adolescence, gadgets carry the danger of the emergence of *Internet addiction*.

Internet addiction is a mental disorder in which a person is very obsessively willing to enter the global network and is not able to get out of it on time. [3]

Schoolchildren who regularly used tablets and smartphones differ from their peers in diffused attention, increased impulsivity. Their ability to self-regulation decreases. The regular use of smartphones and tablets takes a lot of time, reducing the time for physical activity. Naturally, such a way of life leads to a delay in the physical development of the child, and therefore his successes in school are quite low.

With prolonged use of electronic sensor devices in children, abnormal formation of muscle tissue is observed, and spinal curvature occurs. Most smartphones harm the eyes, as they contribute to the development of myopia. With the frequent use of mobile devices, children become closed or spend a lot of time alone, avoid contacts, both with their peers and their loved ones, including parents. Children begin to lie and skip classes at school. Turning to them with ordinary questions and requests causes an inadequate, sometimes

aggressive reaction. The purpose of the study: to identify the presence of *Internet addiction* in the 8th-grade students.

MATERIAL AND METHODS

We studied the opinion of high school students on the impact of mobile devices on the body of the younger generation. The study involved only children of the same class. There are 20 children in total, 10 of them boys and 10 girls. The average age was 13.5–14 years. Students filled out forms at school anonymously and independently, without the influence of adults. The questionnaire included 18 questions: age, gender, from what age has access to mobile devices, what does it use for, Internet addiction, study, health, well-being, and other points.

DISCUSSION

According to the age of access to a mobile device, two groups were identified. The first group — they had access to technology from 7 years old — 6 children, of which girls — 2, boys — 4. The second group — children had access from 10 years old — 14 schoolchildren, among them — 8 girls and 6 boys. In the first group, children use smartphones first for playing and watching video films, and then for learning. 3 out of 6 reported impaired vision, poor sleep, and fatigue (2 schoolchildren boys, 1 girl). Two are studying *satisfactorily*, and 4 students (3 boys and 1 girl) — *good*. The presence of *Internet addiction* was noted by 3 children, and mood swings, if they selected a mobile phone, were noted by all respondent children. Students in this group are ready to use a mobile device for an unlimited time. In the second group, 8 schoolchildren use mobile devices, first for playing, then for learning (5 girls and 3 boys). All of them noted the presence of *Internet addiction*, deterioration in visual acuity and rapid fatigue. 4 schoolchildren complain of headaches and poor sleep. They rated their studies *satisfactory*. It was revealed that students who use (6 children) mobile devices for learning, watching instructional videos are learning *good* and *excellent*. Deny *Internet addiction* in their own right. They can turn off mobile devices themselves.

It was revealed that *Internet addiction* is observed more often in girls than in boys. Headaches, fatigue and poor sleep are more often noted by girls, which is shown in Fig. 1. While visual impairment was detected in 11 schoolchildren, there are more girls among them.

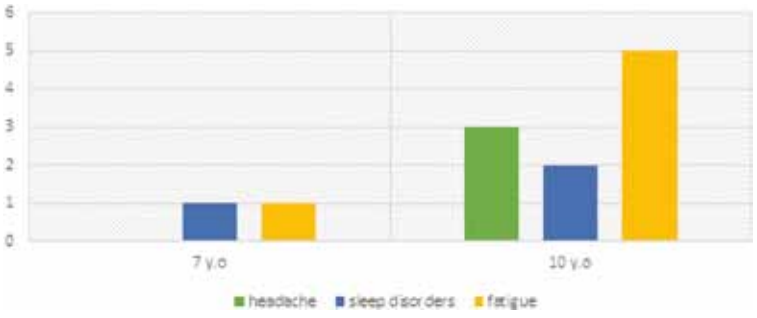

Fig. 1.

It was revealed that 12 students have access to mobile devices from 1 hour to 4 hours a day. While 8 students have access — 7 hours or more per day. The performance analysis showed that students who have limited access to mobile devices up to 4 hours a day study better, and their *Internet addiction* is less pronounced emotionally and brighter.

Studies have shown that students using mobile devices up to 7 hours a day report irritability, tearfulness, dissatisfaction with themselves and their academic performance is lower than that of their peers.

CONCLUSIONS

1. Students are ready to use the mobile device for an unlimited time.
2. Early access to mobile devices (from the age of 7) contributes to the development of *Internet addiction*. The performance of this group is low.
3. The use of mobile devices for self-training does not particularly improve academic performance since, without the control of elders, children are distracted by other sites.
4. The long-term use of mobile devices worsens students' well-being.

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