Risk of Mobile Phone Addiction in Secondary School Pupils

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Abstract: Background: the urge to use mobile devices constantly and anxiety that might come in case of impossibility to use them, represent one of the forms of behavioral addictions, the so-called nomophobia. Nomophobia negatively affects all attributes of human health, seriously affects its mental, physical and social components.

Objectives: the main objective of the research was to determine the degree of nomophobia in a sample of secondary school students, the partial objective was to map potentially risky areas with the use of modern information and communication technologies.

Methods: a quantitative method was chosen to carry out the survey, and an anonymous questionnaire containing a standardized core was used as a research tool. It consisted of 20 items focused on respondents' reactions in situations where communication links are not available or cannot be used. The survey was conducted in the eighth and ninth grades of 11 randomly selected primary schools in the Hradec Králové region. Data were obtained from 373 respondents with a balanced representation of boys and girls. 3 working hypotheses were established to compare the opinions, behavior and degree of nomophobia between boys and girls. The answers were evaluated by methods of descriptive statistics, Student's t-test was used to analyze the hypotheses.

Results: 0.5% of respondents did not show symptoms of nomophobia, a very mild and moderate form was recorded in 70% of respondents, mild form in 18% of the group, moderate in 8% and severe in 2% of respondents. Almost three-fourths of the students were not directly at risk of dependence on a mobile, but a tenth of the sample showed serious problems of a behavioral addiction nature. Respondents used an average of 4 applications, mainly communication programs, social networks and music players.

Conclusions: girls in the sample showed a higher rate of nomophobia than boys. The biggest differences in responses were mainly for fears of not being able to communicate immediately with family or friends.

Key words: questionnaire, mobile phone, nomophobia, prevention, risk, school, research, health, addiction, pupil

Introduction

Since the simple transmission of voice the mobile telephone communication has undergone rapid development in recent years, associated in particular with the expansion of text and picture messages. Subsequently, the massive use of the Internet connection enabled communication via social networks, online games and other features. The mobiles offer tools for working with information on the Internet, taking photos, shooting videos, using navigation and other more or less useful applications. The approach to mobiles by the owners is diverse - some cannot live without them, the others do not pay attention to them until someone calls or sends them a message (Broža, 2000).

Recently a new type of anxiety was observed and later defined in some users. This is the so-called nomophobia – addiction to a mobile phone. It manifests itself if a person cannot use a mobile phone for any reason and it represents a major life complication for the person. In most developed countries as well as in the Czech Republic the children also use the mobile phones. Nowadays young and very young children own mobiles. Therefore it is necessary to set the rules how to use mobile phones and other electronic devices at schools and other educational institutions (Slaninová, 2017).

As the signs of nomophobia are already evident in elementary pupils, it is appropriate to map the situation at schools and use appropriate preventive strategies. This intention became the motivation for the implementation of the research survey.

Theoretical basis

Addiction and its characteristics

Addiction can be described as disorder = a repeated urge to use a substance or repeat a certain behavior. An addict cannot resist the urge despite the negative consequences that addictive behavior brings (Vacek & Vondráčková, 2014). Vágnerová (2008, p. 548) interprets addiction syndrome as follows: *"Addiction syndrome can be defined as a set of mental (emotional,*

cognitive and behavioral) and somatic changes that arise as a result of repeated use of a psychoactive substance. Addiction can be understood as a lifestyle dominated by a preferential focus on this substance. It manifests in certain symptoms that persist for 12 months."

According to the 10th revision of the International Classification of Diseases (ICD-10) of the World Health Organization (WHO) the definition of addiction is based on the occurrence of physiological, behavioral and cognitive phenomena that are associated with the use of addictive substance or substances. This use is much more important to individuals than their previously recognized and valued values and patterns of behavior. They desire (crave) to take psychoactive substances, alcohol or tobacco. Reuse of substance after a period of abstinence usually leads to a faster re-emergence of symptoms unlike use of substance in persons without addiction (Nešpor, 2011).

According to the American Psychiatric Association (APA) and the 4th revision of its Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), a diagnosis of addiction can be made if an individual has at least three of the seven symptoms for at least one year. It is: (1) a strong desire or urge to use the substance; (2) difficulty in self-control when using the substance; (3) physical withdrawal; (4) evidence of tolerance to the substance; (5) long unsuccessful efforts or attempts to control use; (6) the gradual neglect of other pleasures or interests in favor of the substance used; and (7) the persons continues using substances despite clear evidence of obviously harmful consequences (Nešpor, 2011). Factors influencing addiction can be divided into internal and external. Internal risk factors are innate and affect a person all his/her life. This group includes substance abuse in ancestors, psychiatric illness, violent tendencies, self-control disorder, susceptibility to common chronic illnesses, or tendencies to depression and self-pity. The group of external risk factors includes family, school, peers, society and the environment (Nešpor, 2001).

According to Vacek & Vondráčková (2014) it is possible to divide addiction to two basic types. The first is substance addiction associated with the action of substances of the nature of psychoactive substances to the organism, the second is behavioral addiction, where people show elements of addictive behavior in relation to certain activities. The terminology in this area is not completely uniform, in addition to the term *behavioral addiction*, synonyms of *non-substance addiction, non-chemical addiction, non-drug addiction, substance less addiction or process addiction* are used. In the following text, we will stick to the term *behavioral addiction*.

Behavioral addictions

According to Vacek & Vondráčková (2014, p. 327) behavioral addictions can be diagnosed when an individual shows *"significance (a certain activity becomes the most important activity in the person's life and dominates his/her thinking, feelings and behavior); mood swings as a result of the start of certain activity which is primarily as coping strategy; tolerance; withdrawal symptoms; interpersonal or intrapersonal conflict and relapse"*.

The criteria are almost identical to those for substance addiction. According to Vágnerová (2008, p. 527) behavioral addiction is defined differently: *"Many human activities are considered normal or even socially desirable, but only when one does them at a reasonable level. If they get out of control they can turn into pathological behavior. Then it is no longer so much about the content of the activity as about its adequacy and ability to control it in an acceptable way."*

Alter (2018) compared two types of addictive behavior' patterns; substance and behavioral. It was found out that the reaction of the brain of the pathological player during the game and the addict after taking the drug is similar. This means that both substance and non-substance behavior activate the same reward center in the brain that releases dopamine. It is a substance that then evokes an intense wave of pleasure. Addiction is the relationship between the individual and his/her experience. The individual becomes addicted against his/her will. Therefore behavioral addictions can be similarly dangerous as substance addictions. Addictions should be viewed from a broader sociological perspective and focus prevention on values which were key values to the addict before he/she became addicted (Matoušek et al., 2013).

Behavioral addictions can be divided into currently defined and accepted diagnoses and new, yet unclassified types of disorders. ICD-10 lists only the following types of behavioral addictions: F63 – addictive and impulsive disorders (gambling – disease gambling, kleptomania – disease theft, pyromania - disease firing, and trichotillomania - hair pulling disease). Furthermore the signs of addictive behavior show classified disorders F52.7 – hyper sexuality, disorder F50.2 – eating disorder and disorder F50.4 – food addiction (Vacek & Vondráčková, 2014). Recently new types of behavioral addictions have emerged, including the use of the Internet and computer game addiction, loan addiction, shopping addiction, work holism, addiction to another person and extensive care of the others, co-dependency (Krejčí, 2016).

Technological addictions and their influence on youth

Technological dependencies represent a subset of behavioral dependencies. According to Vacek (2017a) modern information technologies include television, computer, mobile phone, Internet and other technologies which are becoming an essential part of the individual and the society. The same opinion shares Hubinková et al. (2008).

Sieberg (2011) sees the attractiveness of the Internet primarily in freedom and anonymity. He considers the negative effects of communication absence, loss of barriers and time spent with technologies that prevent individuals from natural development and thus separate it from the real world. Černá et al. (2013) states that the most vulnerable group on the Internet are adolescents who need to experiment with their identity. The Internet offers them anonymity and the loss of barriers to communicate. This way they feel that in "online world" they are better understood than in ordinary "offline" life.

Dočekal et al. (2019) compares the Internet to a huge playground where a child can promote will and desire to learn and create. He also says that this playground might have a possible effect on children as future "addicts". Spitzer (2014; 2016) recalls that the use of the Internet is changing our brains, which have been evolving for many years and adapting to the conditions of individual stages of human development without digital technology. He points to the so-called digital dementia, i.e. a disorder of cognitive abilities and mental functions which is caused by a long-term use of digital media which gradually loses patterns of behavior and inability to remember important details from everyday life. He further points out that digital media relieve individuals of the need to perform intellectual work as this basic human activity is taken over by modern technologies. The expansion of digital media results in a lower intensity of brain use and a decline in brain performance over time. In young people the brain development is delayed, so their mental performance remains below its potential.

Zimbardo & Coulombová (2017) view the use of the Internet as a serious problem in establishing a healthy relationship and sexual life of young people. Another author dealing with this issue is Alter (2018) who states that modern technologies should primarily make our lives easier, so it is important to find the right balance. If we learn to use the modern technologies properly and find a balance between, the people do not necessarily become addictive to them.

Last three generations in the Czech society can be referred to as Generation X, Y and Z. Generation X represents people born between 1968 and 1983. In the Czech Republic this group is called the Husák's children (Husák was a president under socialism era) and practically did not encounter digital technologies during their childhood. Generation Y is often referred to as the so-called millennial generation. These are people born between 1984 and 2005 who experienced a rapid development of information technology during childhood and their youth. Generation Z is a generation of people born between 2005 and 2015 who grew up and are growing up surrounded by ubiquitous modern information and communication technologies (ICT), they cannot imagine life without the Internet. In this group the differences between the real and online world are practically zero (Müllerová, 2019).

The effects of ICT on the young people can be divided into positive and negative. The positives ones include easy search for information, possibility of self-education, personal development in the form of fun games or competitions, the creation of social groups, the development of logical thinking, memory or perseverance or spatial imagination. It is also important to acquire skills and knowledge in the field of computer literacy, which is a very desirable feature of employers and will probably be highly required in the future (Vacek, 2017b).

Negative influences include uncritical receipt of unverified information, spending a large amount of time on ICT and possible problems in personal, verbal and social communication. Decreased levels of social intelligence lead to an inability to empathize, to discharge aggression in connection with playing computer games. In terms of negative impacts on the health of an individual it is necessary to mention the tendency to obesity, the risk of vision damage, back pain, frequent headaches. ICT abuse is a separate issue of behavior' risk patterns associated with cyberbullying, stalking, hoaxing and other negative phenomena (Vacek, 2017b).

More common types of technology addictions

Addiction to mobile phones

In the Czech Republic the mobile networks were launched in 1992, the devices at that time were very expensive, bulky and heavy, allowing only long-distance calls. In 1995 SIM cards came to the market that allowed the use of a single phone number with different types of mobile phones. The price of the devices was dropped, the weight and dimensions were greatly reduced. In addition to phone calls it was also possible to send short text messages (SMS). Three main mobile operators gradually divided the Czech market. At the turn of the millennium telephones with integrated cameras and color graphics displays became available (Tomek, 2006).

Another milestone in the development of mobile communication are the smartphones using an advanced operating system and application interface that allows the installation or modification of programs. Mobile applications can be divided into: games, web browsers, antivirus programs, e-mail programs, programs for playing and editing multimedia, applications using GPS, shopping applications, social networks and more. This represents a very interesting business subjects with high potential (Clement, 2020c).

Opinions on the use of mobile devices by the school management vary. In most cases the school management leans towards strict forms of restrictions or prohibitions imposed by the school rules, as there is a number of problems associated with excessive use of mobile phones at schools (Fišer, 2018). The main risks in children include reading disorders, anxiety and depression, tendencies to obesity, as well as reduced ability to concentrate, which can lead to reduced emotion control and insufficient empathy in adulthood (Brdečka, 2019; Drahoš, 2016). Other risks include financial problems (high fees for telephone services), sleeping disorders or effects associated with the electromagnetic radiation on the human brain, which has not been much researched yet (Kopecký, 2015a). Better concentration, lower level of stress might go hand in hand with the reduction of mobile phones - but it depends on the school's priorities - whether it is important for students to protect students from external influences or prepare them for the existence in a global environment with global competition (Brdečka, 2019).

An important argument for reducing the use of mobile phones at school is also the effort to reduce cyberbullying. The more students use the mobile phones, logically the greater risk of

their misuse for risky forms of behavior (Brdečka, 2019). Restrictive measures at school concerning mobile phones are also associated with a significant improvement in pupils' social competencies and a higher degree of their social interaction with classmates (Fišer, 2018). It turns out that a ban on the use of mobile phones only at school does not solve the risk of addiction to them. It is more advantageous to introduce ethical rules and zones without a mobile phone, possibly without a signal. Strict adherence to those rules of mobile phone use, basic rules of decency and consideration might be used as a practical compromise for most schools (Brdečka, 2019).

In 2018 the Czech School Inspectorate issued an opinion which, on the one hand, allows the restriction of mobile phones at schools, but on the other hand does not recommend a total ban, because mobile phones are the students' personal property and a tool for education, obtaining and working with information in modern society. However, an effort to designate environment and time to use them may not be easy. The management of most schools prohibits students from using mobile phones during classes and specific rules are set out in the school rules (Andrys, 2018). The inconsistency in the interpretation of this opinion has the consequence that at some schools the use of mobile phones is strictly forbidden, at others is limited to breaks (Kopecký, 2019).

Addiction to the mobile phones is referred to as *nomophobia*. The term was first developed and applied in the UK in 2008 as part of a survey focused on the possibility of anxiety disorders' cases due to excessive use of the mobile phones. It is composed of the words *NO MObile PHOne phoBIA* and is used to describe a mental state where people are afraid of being disconnected from mobile phones or losing the mobile network signal. As a result of these unfounded concerns, negative effects on the physical and mental condition of users might be observed. The term is constructed from the definitions described in DSM-IV and has been described as *phobia of certain - specific things* (Bashar et al., 2019; Güzel, 2018).

Yildirim & Correia (2015) describe nomophobia as a modern phenomenon characterized by the so-called smart mobile phones, with fast and comfortable access to the Internet allowing the users to use many applications, including social networks. In this way they increase the fears of users of the loss of communication not only for voice transmissions via the mobile network, but also for the use of the wide possibilities of the Internet, including the social networks.

Social networks are the most used applications on the mobile platform, then followed by games, communication, and shopping applications (Riley, 2018). In developed European countries (France, Germany), the average user spends about two hours a day using his/her mobile phone, in developed Asian countries (South Korea, China) and some countries in South America (Brazil) it is twice as long (AppAnnie, 2019).

Svobodová (2016) mentions the following symptoms of nomophobia: nervousness and even panic if a person does not have a mobile phone or the device on them, if it is discharged or without a signal, constant check the display, immediate response to incoming messages. Blinka et al. (2015) added to those symptoms: strong desire, euphoria, tolerance, withdrawal syndrome, conflict, and relapse.

Nomophobia is associated with a number of health problems, such as sleep disorders, headaches or eye pain from constant monitoring the display. In the social sphere a direct face-to-face personal communication is limited. Due to the desire to control the mobile phones constantly, nomophobic people cannot concentrate, and more often they are also at risk of losing personal data and passwords due to fraudulent software (Güzel, 2018). One of the most common symptoms of nomophobia is so-called multitasking (performing multiple activities at the same time on a mobile). Krejčí (2019) reminds that in the organism there is a leaching of stress hormones that excessively stimulate the brain, affecting thinking and the ability to concentrate. The brain is constantly flooded with a lot of information, which weakens our concentration.

According to expert advice if person experiences symptoms of nomophobia, he/she needs to start developing new habits and try to be without a mobile phone for several hours a day. It is not desirable to fully stop using the phone immediately, but to use it only if someone calls or the user needs to call. It is important to set a daily limit to use a mobile. Another tip is to turn off the phone when a person is expecting a social meeting (family celebration, dinner with friends) (Svobodová, 2016). According to Krejčí (2019) for people who want to reduce the use of mobile phones the most important is a change of their thinking, making their own decisions, setting and adhering to priorities related to the use of the mobile phone, organizing time, scheduling tasks.

Internet addiction

The Internet is a worldwide computer network connecting millions of computers and servers all over the world. Internet addiction is technically called *netolism or net mania*. Internet users can be divided into two groups. Some users use the Internet as a working tool for information search, the others as a hobby (Pokorný et al., 2002).

Some users overuse the Internet. Blinka et al. (2015) distinguish excessive Internet use from the Internet addiction. Internet addiction is when the following characteristics are met: strong desire, mood swings, tolerance, withdrawal syndrome, conflict, and relapse. This is the so-called Griffits operational definition of addiction. Thus the Internet addicts are the most affected group of people who use the Internet excessively.

According to Pokorný et al. (2001) the emergence of netolism is related to the way the user perceives himself/herself and his/her surroundings, how he/she is open to the outside world. Other contributing factors are low self-esteem or self-doubt. The Internet offers to an addict a seemingly increase his/her personal prestige in the virtual world.

Internet addiction is a broader range of different types of behavior. Young (2010) states the following: addiction to cybersex and Internet pornography, addiction to social networks, addiction to online gambling, shopping or stock trading, addiction to information search and download and addiction to computer games. Internet addiction is associated with the use of some of the digital devices that can use the Internet connection effectively. The most used digital device is a mobile phone (based on the customs of a certain country), followed by personal computers and tablets (GSS, 2019).

The negative consequences of excessive Internet use include physical, mental and social health. Physical problems include, in particular, posture defects and back pain, visual impairment, impaired blood circulation, obesity due to lack of exercise and poor eating habits. In case of mental problems the user has difficulties to concentrate due to information overload, is irritated, distracted or unfocused. Moreover, the children are at risk of leaching from the excitatory amino acids due to excessive and prolonged tension when watching the Internet, damaging the cerebral cortex, which can reduce intellectual abilities. In the social sphere the computer is becoming a substitute for mutual interpersonal communication in the real world and endangers especially children and adolescents. Netolism is also often reflected in partner and sexual life, where sexual life is reduced to browsing porn sites (Pokorný et al., 2002).

It is recommended to solve the very beginning of Internet addiction under professional guidance. First, it's a good idea to share it with your family, colleagues, or your friends to see if they also see someone addicted to the Internet. If so, it is advisable to seek the help of a professional psychologist (Pírko, 2005).

Addiction to social networks

The term *social network* is currently most often associated with a service on the Internet, providing a certain group of people with different opportunities for communication and data sharing (Kabele, 2018). "*We define social networking sites as web services that allow individuals to: (1) compile a public or semi-public profile within a restricted system; (2) formulate a list of other users with whom they share a connection; and (3) view and browse their list of connections and connections created by others in the system "* (Boyd & Ellison, 2007, p. 211). The foundations of the modern concept of social networks were laid at the end of the second millennium (Boyd & Ellison, 2007).

Relatively recent data shows that there are 4.54 billion active Internet users in the world, of which 4.18 billion use a mobile phone for connection. Approximately 3.8 billion Internet users actively use social networks and the vast majority of them connect via mobile phone. The number of Internet users is constantly growing, the number of mobile Internet users is growing slightly faster, and the number of social network users available mainly through the mobile Internet is growing the fastest (Clement, 2020a). Losekoot & Vyhnánková (2019) see the reasons for the constant growth of social network users in the natural human need to fit into the pack, to behave in conformity.

The world's most widespread social network is Facebook with about 2.5 billion users, followed by You Tube, followed by WhatsApp and Facebook Messenger (Clement, 2020b). Social networks represent a powerful marketing tool (Smith, 2019).

Blinka et al. (2015, p. 181) say that *"excessive use of social networks can have a form of addiction, as all its features are present, including withdrawal symptoms, conflicts with the environment and relapse."* Extroverts with their distrust of their social competence in real life have social networks addiction, the introverts have increased tendency to some forms of addiction (Blinka et al., 2015).

Social network addicts subconsciously know that they spend a disproportionate amount of time in the online world, but they do not want to admit this fact. They feel guilty and at a more advanced stage of addiction changes similar to those on the Internet begin to show. They neglect hobbies, duties, loved ones and themselves. They excuse for their behavior, they run away from problems. In case of abstinence they suffer from nausea, anxiety or depression, often also insomnia due to check of social network several times a night (Dočekal & Eckertová, 2013).

Fieldingová (2018) describes Facebook as an invaluable resource for meeting human needs such as communication and belonging. However, she reminds that in case of overuse, this tool has completely opposite effects. There may be a loss of well-being and depressive states known as *Facebook depression*. Another risk is the *compare and do spair syndrome*, which is related to the perception of photos of friends showing happy moments in their lives. The person feels that when compared to them he/she does not live such a happy life as presented on their Facebook, they can gradually fall into depression with the risk of resulting in suicidal behavior.

According to Blinka et al. (2015) a possible solution is to listen to the reactions from their surroundings. If a person is repeatedly told that he/she spends too much time on social networks, he/she should seek professional help. The victim himself is not aware of his/her dependence on social networks. It is important to make a decision to see a psychologist or a psychiatrist, and then start treatment according to the usual procedure, which is very similar to other types of behavioral addictions.

Objectives

The main objective of the research survey was to determine the degree of addiction to mobile phones in a sample of 8th and 9th grades of the elementary school pupils (age range 13 to 16 years) of selected in the Hradec Králové region in the Czech Republic. We assumed that the rate of nomophobia would be higher in girls than in boys. Related to this fact are three working hypotheses that compare the behavior of boys and girls and were statistically tested. The secondary objective was to find out which mobile applications are most used by this sample.

Methods

The research survey was designed as a quantitative one, an anonymous questionnaire consisting of a standardized core was the tool for data collection. The survey took place in 11 randomly selected elementary schools in the northeastern Bohemia in the Hradec Králové region in the school year 2019/2020, in 15 classes of the last and penultimate years (in two eighth and thirteen ninth classes). The locations of schools were marked numbers 1 to 8 in order to comply with data protection regulations.

- Location 1 is the largest in the selected group with more than 11,000 inhabitants. There are several primary schools with 1,614 pupils. The survey was conducted at three primary schools in their final years.
- Location 2 is the second largest city with approximately 7,000 inhabitants, it includes several surrounding municipalities and local parts. There is one primary school with a total of 770 pupils.
- Location 3 is a town with more than 6,000 inhabitants and a fully organized primary school with a total of 723 pupils. There is also an orphanage with a school in the town. It is a modern facility that implements the European principles of education of children with behavioral disorders. 40 pupils were contacted in this facility.
- Location 4 includes a town with more than 4,500 inhabitants. The local primary school attends total of 475 pupils, questionnaire survey was conducted there, including preliminary research.
- Location 5 is located in the foothills of the Eagle Mountains with approximately 2,100 inhabitants. There is a primary school with a total of 380 pupils.
- Location 6 includes approximately 1,900 inhabitants and a primary school with 300 pupils.
- Location 7 is located in the vicinity of the Eagle Mountains has almost 1,700 inhabitants and a primary school with a total of 330 pupils.
- Location 8 is a mountain village with the smallest population in the group 1,050 people living in it. The primary school attends 140 pupils, half of whom commute from the surrounding mountain villages.

The research sample included a total of 373 pupils, of which 184 were girls (49.3%) and 189 boys (50.1%). From the point of view of gender representation, it was very balanced. In terms of age, most respondents reached the age of 14 and 15, 115 pupils were 14 years old

(30.8%), 222 pupils were 15 years old (59.5%). When classifying the group by sex, 14-year-old boys were 26.5%, 14-year-old girls 35.3%, 15-year-old boys 62.4% and 15-year-old girls 56.5%. The relative frequency of younger and older pupils outside the most represented group ranged from 0.5% to 6%. The average age of all respondents was 14.7 years, for boys 14.7 years, for girls 14.6 years.

An anonymous questionnaire consisting of two parts served as a research tool. The basis of the first part was a standardized core, the second part was originally assembled and connected within the research survey. The first part of the questionnaire consisted of a standardized model, which was created at the University of Iowa in 2014 (Yildirim & Correia, 2015). It spread rapidly and became a recognized standard for quantitative surveys of the nomophobia' degree. It was popularized in the journal Huffpost in the Science section (Gregoire, 2015) and its Czech translation was available in August 2015 on the E-safety portal (Kopecký, 2015b).

It contains a total of 20 items evaluating common situations, not extremes. The introductory 9 questions examine the behavior of respondents if they *have a mobile phone on them, but for some reason they cannot use it.* The first 4 items are focused on the situation when the respondent is not able to use a mobile phone to *obtain information*, the next 5 maps the feelings of respondents in situations where they have a mobile phone, but *for technical reasons cannot use it*. The following 11 questions examine the behavior and feelings of respondents when *they do not have a mobile phone on them at all*. The items 10 to 15 focus on situations where respondents *do not have access to communication* via mobile phone (e.g. with friends or family), items 16 to 20 ask about situations where respondents *lose connection*.

Scaling was used to answer the questions. Six categories were offered as part of the percentage agreement with the question that best describes the respondent's behavior. Thus, the respondent could express the degree of his agreement with the relevant item from 0% to 100% in steps of 20%. The lower part of the scale (0% agreement rate) means that the respondent would never feel or behave this way, the upper part (100% agreement rate), that the respondent always agrees with the question asked, 20% agreement means that the respondent agrees with the question in one out of five cases, etc.

A summary was chosen to evaluate the entire questionnaire. To do this, the individual scales of answers to the questions were scored from 1 point (0% agreement with the question) to

6 points (100% agreement with the question) in steps of 1 point. The results of the questionnaire survey for 20 items can take values of 20–120 points. We based on the evaluation of the questionnaire according to Kopecký (2015b), but its slight adjustment was made due to the large range reported for mild and moderate rates of nomophobia (Havranová, 2020). A total gain of 20 points means that the person does not suffer from symptoms of nomophobia, a range of 21–40 points indicates very mild nomophobia, 41–60 points mild nomophobia, 61-80 points mild degree of nomophobia, 81–100 points moderate degree of nomophobia and 101-120 points severe nomophobia.

The second part of the questionnaire contained a single item and was focused on the applications that respondents prefer to use. Respondents were instructed that they could select a maximum of the five most frequently used applications with priority sorting, so position 1 is the most popular, 5 the least popular. The list of applications was compiled on the basis of Richter's research (2017) and findings from preliminary research (Havranová, 2020).

In order to assess the respondents' behavior when using a mobile phone, the applications were in categories that better characterized the respondents' behavior for a similar type of application. Some categories of applications partially overlapped, their predominant focus was taken into account. The following categories were chosen: social networks, text, voice or video communication, listening or downloading music files, playing games, pornographic applications, sports applications, advertising and shopping applications, news sites and applications, internet search engines, applications for playing and downloading movie and series files.

The survey was conducted in June 2019 on a voluntary basis. Randomly selected primary schools were personally visited and asked for cooperation. The questionnaires were prepared in printed form and their completion took place anonymously during Civics. According to the teachers' feedback the study appealed to the students, and no one refused to fill in the form, which is a signal that this is a current issue affecting the Czech school system. If the school management showed interest to see the results, they were provided. Data obtained from completed printed forms were converted into electronic form using a spreadsheet processor MS-Excel and are subjected to statistics. Some surveys (Arslan et al., 2017) show that girls are more prone to mobile phone addiction. Therefore, the working hypotheses related to this fact were formulated in a null and alternative version to the following research assumptions:

Working hypothesis H1: The value of the averages of the scored answers to the individual survey questions is /is not the same for girls and boys.

Working hypothesis H2: The value of the averages of the total score of nomophobia is/is not the same for girls and boys.

Working hypothesis H3: The value of the averages of the point evaluation of the answers to the first twenty questions of the survey is/is not the same for girls and boys.

Testing of the mean value using a t-test (Student's test) with the selected confidence level α=0.05 (Bednářová, 2020) was used for statistical processing. In the case of the first hypothesis, the items in the questionnaire were divided into 4 groups of questions related to the same situations as follows:

- group 1: items 1 to 4, the user has a mobile phone, loses access to information;
- group 2: items 5 to 10, the user has a mobile phone, for technical reasons cannot use it;
- group 3: items 11 to 15, the user does not have a mobile phone, loses the possibility of communication;
- group 4: items 16 to 20, user does not have a mobile phone, loses connection.

This is an unpaired distribution (the number of boys and girls was different and the responses of both groups were independent), the F-test was used first to determine the identity of the variances of both groups. Based on its results, an unpaired two-sample two-tailed t-test was selected and applied. The procedure was similar for the second hypothesis, where the total sum of points obtained from all 20 items in girls and boys was tested. The third hypothesis was evaluated using a paired two-tailed t-test (Bednářová, 2020). Excel version 2016 spreadsheet was used for calculations.

Results

We present a brief evaluation of the first part of the questionnaire for each of the twenty items, followed by the outputs from its second part and an analysis of working hypotheses.

Data obtained from the first part of the questionnaire

Item 1: *I would feel uncomfortable without constant access to information via my mobile phone.* Most of the respondents were relatively moderate in answering this question, which

applies both in the whole group and in the classification of answers by gender. One third of the group responded with a 20% agreement rate, a quarter with a 40% rate, and 16% with a 60% rate. The relative frequencies of the remaining options are around 10% without major differences between boys and girls. Most respondents would therefore be able to cope with this situation relatively well.

Item 2*: I would be upset if I couldn't look at the information on my mobile phone when I needed*. The answers to this question were relatively evenly distributed throughout the sample, even with a gender breakdown of between 20% and 100% agreement by approximately one-fifth. Only 6% of respondents were completely dissenting. Compared to item 1, more respondents reacted angrily if they could not use their phone when they needed it.

Item 3: *It would make me nervous if I could not receive messages (events, weather, etc.) on my mobile phone.* Respondents did not see a big problem in this situation, the average frequency of the 0% to 40% agreement rate was 20%, and with a higher agreement rate it decreased. The answers sorted by gender were relatively balanced, with differences of up to 6%.

Item 4: *I would be upset if I couldn't use my mobile phone and its capabilities when I needed*. A higher level of agreement was recorded for this question (with a frequency of almost 60% in the whole sample at 60% and a higher level of agreement). Most respondents would be angry that they would not be able to use their mobile phone if they needed one for some reason. There was a certain difference (6% to 8%) between the reactions of boys and girls, which was observed in the 20% to 40% agreement rate and further in the range of 80%–100% agreement rate.

Item 5: *It would scare me if the battery runs out in my phone.* Respondents assessed this situation with the highest frequency (29% to 39% in the whole sample) at a 0% to 20% agreement rate, towards a higher agreement rate the frequency decreases to 6% to 8%. Girls had a significantly higher level of concern, with 40% and a higher level of agreement being reported by 42% compared to boys with a frequency of 27%.

Item 6: *I would panic if I used up my monthly data limit or ran out of credit.* This situation would not worry respondents too much. More than half of the respondents strongly disagreed with the statement (0% agreement), a fifth expressed a 20% agreement. Categories with

a higher level of agreement were represented in the sample with a frequency from 4% to 9%. No significant differences were found between the responses of boys and girls.

Item 7: *If I did not have an operator signal or Wi-Fi, then I would constantly check if I am already connected.* Most respondents expressed a low level of agreement with this item; a clear disagreement was evident in 27% of the sample, a 20% agreement rate in a quarter of the sample. In total, a third of respondents chose a 60% to 100% consent rate. No significant differences were found between the responses of boys and girls.

Item 8: *If I could not use my mobile phone, I would be afraid that I would get lost, get stuck, etc.* Respondents' fears that they would get lost or stuck somewhere if the mobile phone did not work were assessed in a rather disagreeable way - almost half of the respondents clearly disagreed, 20% agreed, 20% tenth, 40% tenth, the remaining categories were represented with frequency from 4% to 6%. The frequency of major disagreements was higher for boys (54%) compared to girls (39%). The lower level of concern was probably due to the fact that respondents would rely on loved ones in the event of difficulties.

Item 9: *If I couldn't use my mobile phone for a while, I would feel compelled to check it.* One third of respondents disagreed with this statement in principle, a quarter expressed a 20% agreement with it, a fifth with a 40% agreement. The frequencies of the remaining categories ranged from 4% to 12%. 4% of boys and 9% of girls would feel the urge to check their mobile device constantly.

Item 10: *I would feel nervous because I can't communicate with my family or friends immediately.* The highest frequency - 20% of agreement (one third of respondents) was represented in the sample, followed by 40% of consent (one fifth of respondents), 60% and 0% of 15% each. Categories with a higher level of agreement were represented with a frequency of about 10%. One third of boys and 41% of girls stated an agreement with 60% and higher.

Item 11: *I would be afraid because my family or friends would not be able to contact me.* As with the previous item, a higher level of agreement (80% and 100%) with this situation was significantly higher for girls (27%) compared to boys (14%). The most frequent rates of agreement in the whole group were 20% (acknowledged by a quarter of respondents) and 40% (chosen by a fifth of respondents).

Item 12: *I would feel nervous because I would not be able to receive SMS messages and calls.* Absolute disagreement with the situation was expressed by boys (23%) compared to girls (16%), while a high degree of agreement with the question (80% and 100%) was expressed by girls (22% in total) compared to boys (12% in total). The 20% consent rate was represented with the highest frequency (one third) in the whole group.

Item 13: *I would be nervous because I would not be in contact with my family and friends.* Boys again expressed stronger disagreement in this situation (18%) compared to girls (11%). In the case of a high level of agreement (80% and 100%), the situation was just the opposite (girls a total of 25%, boys a total of 16%). In the whole group, the highest frequency of consent was represented by 20% (28%) and 40% consent (one fifth of respondents).

Item 14: *I would be nervous because I wouldn't know if anyone wanted to contact me.* A quarter of the sample expressed a fundamental disagreement with this item, almost a third of the respondents expressed a 20% agreement and almost a quarter of the respondents a 40% agreement. A high level of concern was recorded in 13% of respondents, which may be due to the fact that respondents do not yet solve important term tasks to ensure the running of the household or the performance of work duties. Mainly friends and parents call them, pupils have a relatively fixed weekly program.

Item 15: *I would be nervous because my constant contact with family and friends would be disconnected.* The frequencies of occurrence of the categories 0%, 20% and 40% of the agreement rate in the whole group were relatively balanced, ranging between 22% and 26%. Girls showed a slightly higher degree of nervousness in the 60% categories and a higher level of agreement (34% in total) compared to boys (28% in total).

Item 16: *I would be nervous because I would be disconnected from my online identity.* Three quarters of the sample (total of 0% and 20% of the agreement rate) fundamentally or almost disagreed with this statement. The frequencies of the remaining categories ranged from 3% to 9%. There were no significant differences in responses by gender. Respondents do not consider their online identity to be very important.

Item 17: *I would feel uncomfortable because I would not be able to update information from my social networks and online media.* The situation was similar to the previous item. More than half of the respondents strongly disagreed with the statement, which was also true when classifying reactions by gender. A quarter of the sample expressed a 20% agreement rate. The

remaining categories were represented with low frequencies from 3% to 12%. Respondents would not feel uncomfortable if they could not update information about themselves on social networks and websites via mobile phones. They usually do not have the urge to post on social networks as soon as possible after an experience.

Item 18: *I would feel uncomfortable because I would not be able to receive update notifications from my online contacts.* Approximately 70% of respondents would not feel uncomfortable in this situation (0% and 20% agreement) with the question. The frequencies of the remaining categories were lower, ranging from 3% to 13%. There were no major differences between the reactions of boys and girls.

Item 19: *I would be nervous because I couldn't check my emails*. In this situation the lowest level of agreement was recorded out of all 20 monitored items. Three-quarters of respondents felt no nervousness if it were not possible. One-fifth of the group expressed a 20% agreement rate. The frequencies of the remaining categories varied from 0% to 6%. A probable explanation may be the fact that respondents prefer other means of communication (synchronous, e.g. chat, than asynchronous e-mails).

Item 20: *I would feel weird because I wouldn't know what to do.* The majority of respondents reacted strongly negatively or rather dissentingly, with 0% and 20% agreeing with the situation, with more than 60% of them expressing no major differences between boys and girls. The frequencies of the remaining categories ranged from 5% to 17%. Most respondents do not feel that they do not know what to expect without a mobile phone.

Comparisons of responses to situations were made using arithmetic mean and standard deviation. The results are summarized in Table 1.

Table 1

Evaluation of survey questions using statistical indicators of position and variability

Questionnaire item	Entire set (n = 373)				Boys (n = 189)				Girls (n = 184)			
	Item scoring	Standard deviation	Average agree (%)	Average deviation (%)	Item scoring	Standard deviation	Average agree (%)	Average deviation (%)	Item scoring	Standard deviation	Average agree (%)	Average deviation (%)
1	3.05	1.11	41.0	22.2	3.08	1.20	41.6	24.1	3.02	1.01	40.4	20.2
2	3.80	1.30	56.0	26.0	3.85	1.32	57.0	26.5	3.74	1.27	54.8	25.4
3	2.92	1.31	38.4	26.2	2.94	1.26	38.8	25.2	2.90	1.35	37.9	27.1
4	3.81	1.28	56.2	25.6	3.89	1.25	57.8	25.1	3.72	1.31	54.5	26.3
5	2.45	1.32	29.0	26.4	2.25	1.20	25.1	23.9	2.65	1.37	33.0	27.4
6	2.00	1.12	20.0	22.4	1.92	1.06	18.4	21.2	2.08	1.18	21.5	23.6
7	2.78	1.39	35.6	27.8	2.78	1.36	35.7	27.2	2.78	1.40	35.5	28.0
8	2.13	1.13	22.6	22.6	1.96	1.03	19.2	20.7	2.30	1.16	26.1	23.2
9	2.51	1.26	30.2	25.2	2.52	1.21	30.4	24.2	2.51	1.27	30.1	25.3
10	3.06	1.27	41.2	25.4	2.86	1.20	37.1	24.1	3.28	1.31	45.5	26.1
11	3.11	1.26	42.2	25.2	2.93	1.16	38.6	23.2	3.30	1.32	46.0	26.4
12	2.88	1.28	37.6	25.6	2.69	1.19	33.9	23.8	3.07	1.33	41.4	26.5
13	3.10	1.30	42.0	26.0	2.91	1.22	38.2	24.4	3.29	1.33	45.8	26.5
14	2.65	1.26	33.0	25.2	2.60	1.18	32.0	23.7	2.71	1.27	34.1	25.4
15	2.90	1.32	38.0	26.4	2.83	1.27	36.6	25.3	2.97	1.31	39.5	26.3
16	1.91	1.04	18.2	20.8	1.90	1.00	18.0	20.0	1.93	1.00	18.6	20.0
17	1.98	1.06	19.6	21.2	2.03	1.07	20.6	21.4	1.92	0.97	18.4	19.4
18	2.05	1.08	21.0	21.6	2.13	1.05	22.6	21.1	1.97	1.00	19.4	20.0
19	1.38	0.63	7.6	12.6	1.44	0.63	8.8	12.6	1.33	0.49	6.5	9.8
20	2.40	1.31	28.0	26.2	2.33	1.21	26.6	24.2	2.48	1.30	29.7	26.0
1–20	**2.64**	**1.20**	**32.9**	**24.0**	**2.59**	**1.15**	**31.8**	**23.1**	**2.70**	**1.20**	**33.9**	**23.9**

It is obvious that the respondents mostly agreed with the statements for items 2 and 4, i.e., that they would be angry if they could not use a mobile phone when needed. Boys expressed a slightly higher degree of agreement than girls did. On the contrary, a very low level of agreement was recorded for item 19 on nervousness in case respondents could not check

e-mails. The overall evaluation showed that the average level of agreement in the first part of the questionnaire reached 32.9% in the whole set. It represented 31.8% for boys and 33.9% for girls. The higher consent rate for girls' concerned items 5, 10, and 11 to 13.

A comprehensive evaluation of the rate of nomophobia according to the described methodology showed that 1.9% of respondents suffer from severe nomophobia, 7.8% from moderate nomophobia. In contrast, 0.5% of the sample showed virtually no signs of nomophobia. A slight degree of nomophobia was observed in 18.8% of respondents. The most numerous group of respondents (42.4%) falls into the zone of mild nomophobia and very mild nomophobia (28.7%). The majority of respondents, i.e. 71.6%, are not yet at risk of nomophobia, the opposite is the situation in about one tenth of the sample. When classifying the results of the overall rate of nomophobia by gender, it was found that girls are slightly more at risk in the categories of mild, moderate and severe forms of nomophobia. Only 1% of girls, no boys, was completely asymptomatic.

Analysis of data obtained from the second part of the questionnaire

It was a probe into the behavior of respondents using the Internet. Respondents had the task of choosing a maximum of 5 applications out of 12 in the basic menu, which they use most often. On average, 4.1 applications were selected without major differences between boys and girls. Each of the respondents uses an average of 3 social networks and one program to communicate, almost every third uses an application to listen to music.

Respondents also had the opportunity to add their favorite application directly, with an average of 0.28 applications per person. If we consider the whole set, then 373 respondents marked a total of 1,634 applications in the basic offer or newly added them, 4.4 applications per respondent. Approximately every fourth girl and almost every third boy entered one additional application. Girls more often mentioned applications designed for chatting, recording and playing multimedia files, photo processing, boys more often expanded the list to include applications focused on sports matches and results, games, journalism and erotic content. Online viewing of films and series has become a common area of interest. In almost 70% of the applications used, social networks (Messenger, YouTube, Instagram, and Facebook) formed the most numerous categories. 20% followed communication programs for internet calling and chatting, 10% music applications and games. Girls preferred Instagram, Pinterest, TikTok and Twitter, while boys preferred Facebook, music apps and Reddit.

Testing of working hypotheses

In the first working hypothesis, sets of scores of boys and girls for individual items were statistically tested. The results are summarized in Table 2. For none of the items 1 to 4 of the first block of situations aimed at the loss of access to information, the null hypothesis cannot be rejected, the difference between the reactions of boys and girls is not statistically significant.

For items 5 to 9 of the second group of situations focused on the loss of mobile phone' capabilities use, the rejection of the null hypothesis prevails for three items (6, 7 and 9), its rejection in two (5 and 8), there is a statistically significant difference in responses to the submitted situation between the observed groups. In girls, a greater degree of susceptibility to nomophobia is evident in these situations.

For items 10 to 15 of the third block of situations related to loss of communication, the rejection of the null hypothesis prevails for four items (10 to 13), there is a statistically significant difference in reactions between the observed groups. Girls show a higher degree of nomophobia. For items 14 and 15, the null hypothesis cannot be rejected.

In the case of items 16 to 20 of the fourth block of situations mapping reactions to loss of connection, the null hypothesis cannot be rejected for any of the items, so no statistically significant difference between the reactions of boys and girls was demonstrated. Although 6 cases of rejection of the null hypothesis were recorded in 4 groups of items, it can be concluded that in the whole block of 20 items it cannot be rejected as a whole.

In the case of the second working hypothesis (see Table 2), a two-tailed unpaired two-sample t-test was used. The variances of both sets turned out to be identical. The level of significance of the t-test was greater than 0.05, we do not reject the null hypothesis for the agreement of the mean values of the sets of answers of girls and boys (overall evaluation of nomophobia). The values of the averages of the overall score of nomophobia do not differ significantly between boys and girls.

Table 2

Statistical testing of the first two working hypotheses

Questionnaire item	Significance level differences of the F-test	Variances of non-paired two-sampled double-sided t-test	Significance level of the t- test	Verdict on the null hypothesis	Group of items
1	p<0.05	mismatching	p>0.05	do not reject	1
2	p>0.05	matching	p>0.05	do not reject	
3	p>0.05	matching	p>0.05	do not reject	
4	p>0.05	matching	p>0.05	do not reject	
5	p>0.05	matching	p<0.05	reject	2
6	p>0.05	matching	p>0.05	do not reject	
7	p>0.05	matching	p>0.05	do not reject	
8	p>0.05	matching	p<0.05	reject	
9	p>0.05	matching	p>0.05	do not reject	
10	p>0.05	matching	p<0.05	reject	3
11	p>0.05	matching	p<0.05	reject	
12	p>0.05	matching	p<0.05	reject	
13	p>0.05	matching	p<0.05	reject	
14	p>0.05	matching	p>0.05	do not reject	
15	p>0.05	matching	p>0.05	do not reject	
16	p>0.05	matching	p>0.05	do not reject	4
17	p>0.05	matching	p>0.05	do not reject	
18	p>0.05	matching	p>0.05	do not reject	
19	p<0.05	mismatching	p>0.05	do not reject	
20	p>0.05	matching	p>0.05	do not reject	
1-20	p>0.05	matching	p>0.05	do not reject	-

The third working hypothesis verified the difference in the values of the responses' means for individual 20 items when classifying responses by gender. A two-tailed paired two-tailed t-test was used. The agreement of the variances of both sets' values was found. We reject the null hypothesis for the concordance of the averages of the boys' and girls' responses to individual items at the significance level of 0.05. The difference between the reactions of boys and girls is statistically significant, girls show a higher rate of nomophobia.

When comparing the total of 20 items, no statistically significant difference was found between boys and girls between the total number of points. However, if the average values of the responses for the individual items were examined, a significant difference was already found in the pairwise testing. In summary, girls from the observed population sample show

a higher rate of nomophobia than boys based on hypothesis testing. The biggest differences in respondents' reactions were related to fears that they would not be able to communicate with family or friends via mobile phone immediately.

Discussion and pedagogical recommendations

Discussion

Yildirim (2014) conducted a research survey in the USA in a sample of 301 respondents. They were university students of agriculture, economics, technology, humanities and the arts; 135 respondents were male, 166 female. The basis of the questionnaire and the methodology of its evaluation were practically identical to the survey described by us, but the age of the respondents was higher. A comparison of the two surveys' results showed that there was a statistically significant difference between them at the 5% level.

The mean value of the scored answers of primary school pupils' sample is significantly lower compared to the sample of university students, which can be explained by several facts. The sample addressed by us is significantly younger, it is the so-called generation Z (the year of respondents' birth mostly falls in the range of 2003–2004), and the survey in the USA concerned respondents of generation Y (their year of birth was in the range of 1990–1997). The second possible reason is that the respondents in our survey underestimated their behavior and reacted subconsciously with a lower level of agreement than would actually correspond to their behavior.

The implemented research investigation has its limits. Its results cannot be generalized, but they are valid in the monitored region and the addressed population segment. A multicenter study with the help of randomly selected primary schools with similar characteristics would contribute to a deeper mapping of the nomophobia' degree. A standardized questionnaire is advantageous, with which the degree of nomophobia can be determined and expressed using a tried and tested standardized methodology.

The observations and findings made by teachers at the senior primary school show that many pupils who do not have a mobile phone with them show a higher degree of nervousness and are more conflicting.

Social changes, including the rise of new ICT, place high demands on a person's ability to adapt to them. They bring not only benefits to humanity, but also negatives. The biological

and genetic nature of the organism lags behind the rapid development of modern technologies in the speed of adaptation. The ever-increasing pressure forcing these people to manage, receive, sort and store information leads to stressful situations that can result in serious health problems. Members of the Z generation cannot imagine their lives without the Internet, social networks and mobile devices, which, however, can, in the event of inappropriate or above-limit manipulation, condition risky patterns of behavior, including behavioral addictions.

Pedagogical recommendations

At present, our company views the use of modern ICT from various angles. The Ministry of Education, Youth and Sports of the Czech Republic has not yet defined clear rules for the use of mobile phones at schools, and experts dealing with this issue have not reached agreement. Also, the management of individual schools does not share the same views on these issues, it takes its own positions essential to creating a healthy school climate. Specific methodological recommendations for the use of mobile phones are therefore not currently set.

According to Hronová (2018), it is very important to include in school rules the rules for the use of ICT, the Internet and mobile phones on the school premises, during classes and during breaks. Zajíček (2018) in the recommendation of the Ministry of Education, Youth and Sports in *Annex 15 Netolism* proposes the prevention of ICT addiction in primary school pupils. Above all, it is a professional approach of pedagogical staff, who can detect the risky behavior of pupils in time by their observation. Furthermore, there is essential cooperation between the school management, prevention methodology, educational counselor, but above all the unity of other teachers involved in the educational process of students, and last but not least, the approach and cooperation of their legal representatives. Behavioral addictions of the public are not considered very dangerous, so they are often underestimated. Interventions to address ICT dependence and the use of mobile phones in schools do not fall within the remit of the educator himself, but his professional approach can detect undesirable pupil behavior in a timely manner. Based on his experience and empathetic approach, the teacher is able to establish contact with the student, gain his/her trust and offer him/her professional help.

Discussions with teachers and with the management of a number of primary schools have shown that although they do not strictly prohibit the introduction of pupils' mobile phones into schools, their use during teaching is prohibited. During breaks students are usually allowed to use their phones. There is a need for a clear set of rules with clearly defined sanctions for their

violation. The rules for using a mobile phone should be written in the school regulations (Havranová, 2020).

It is necessary to include the rules of good behavior in the rules, such as not using a mobile phone during personal communication or at the school canteen. Sanctions should be increased in the event of repeated infringements. An extreme sanction may be a ban on the use (not introduction, which restricts pupils' property rights) of mobile phones at school in the event of a particularly serious or repeated offense. It is very important to observe equal access to all pupils when applying restrictions (Havranová, 2020).

Conclusion

The use of mobile phones has undergone a very rapid development over the past three decades. At the same time there was a massive expansion of fixed Internet and then the transmission of data via mobile networks, which is constantly accelerating and growing in volume. Also applications for mobile phones have undergone rapid development, especially social networks have changed a lot in the field of communication and have a large number of users who spend a lot of time on them.

An anonymous questionnaire survey conducted using a standardized tool in a sample of 373 pupils in the eighth and ninth grades of selected primary schools in the Hradec Králové region showed that less than 2% of respondents show a high degree of addiction on a mobile phone. Approximately 8% of respondents are directly at risk of addiction on a mobile phone, they feel more anxious if they cannot use a mobile phone. It can be considered a positive finding that 72% of respondents are not directly endangered by mobile phone addiction, although they actively use a mobile phone, but if they do not have access to it, they do not feel anxious, but rather a certain degree of nervousness. Girls are more prone to nomophobia than boys.

Respondents most often use applications from the group of synchronous communicators (chatting), social networks and access to audio media on their mobile phones. The most common are Messenger, YouTube, Instagram, Facebook and Spotify. If it comes to level of popularity social networks clearly lead, other boys prefer gaming, sports and erotic applications, while girls prefer various types of applications that allow you to work with multimedia, especially photos and videos.

Measures aimed at controlling the use of mobile devices at schools are not uniform. The Ministry of Education, Youth and Sports of the Czech Republic has issued a set of recommendations that school management can adapt to its discretion and specific situation and implement together with possible sanctions into school regulations.

Pupils and teachers were actively interested in the questionnaire survey, as well as the results. The survey can be the basis for subsequent more detailed and multicenter studies.

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