Original Article

Physical and mental human health in the contemporary information environment

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Abstract:
The article deals with the problem of the relationship between human health and information technologies, the violation of the somatic and mental population health, due to informational and psycho-emotional stresses. A comparative analysis of the advantages of information and communication technologies usage in Ukraine and some foreign countries has been conducted. According to the results of the research, it was determined that the greatest danger for the mental health of the population is the information influence, which is associated with the emergence of computer and Internet addiction. The main types of children, youth and adults Internet addiction are identified, its measured valid indicators are determined. It is proved that excessive spending time in the cyber environment leads to an increased level of anxiety, rigidity and extraversion of the population. Compliance with the standards of information hygiene acts as a factor in protection against the negative impact of information and communication technologies on the person, the preservation of their physical and mental health.
Key words: information technologies, information environment, Internet addiction, physical, mental health of a person.

Introduction
One of the main priorities in Ukraine is the creation of an information society in which everyone could create and accumulate information and knowledge, have free access to them by promoting social and personal development and raising the quality of life (Denysova L., Shynkaruk O., Usychenko V., Zakon Ukraíni «Pro Osnovní zasadi rozvitku ínformatsíynogo suspíl'stva v Ukraíní na 2007-2015 roki», Strategíya rozvitku ínformatsíynogo suspíl'stva v Ukraíní). Information and communication technologies (ICT) are the basis of the information society, an important part of the usage of information resources process in all spheres of society's life. At the same time, the issue of the negative impact of ICT on the somatic and mental health of the population, primarily children and young people, due to information and psycho-emotional stress remains relevant (Shinkaruk O. A., Denisova L. V., Kharchenko L. A.). Today, scientists and specialists are facing the question of adhering to the rules of information hygiene. Specialists consider it as a separate system of knowledge that studies the laws of the influence of information on the formation, functioning, state of mental, physical and social well-being of man and society, which develops measures to improvement of the information environment.

The purpose of the article is to determine the usage of peculiarities of the information and communication technologies in everyday life and to investigate their impact on the individual physical and mental health.

Material & methods: analysis and synthesis, generalization and systematization, observation, surveys, methods of mathematical statistics.

Results and their discussion
To determine the impact of information and communication technologies on human health, we first looked at the availability of research carried out by scholars on the dissemination of ICTs in the world and in

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Ukraine. The results of research carried out by Ericsson's ConsumerLab laboratory on the benefits of using information technology have been analyzed. The poll was attended by 500 respondents from Kyiv, Lviv and Kharkiv (age 15-69). The sample was representative and reflected the opinion of about 3.4 million people, including all segments of the population. It has been proved that more than half of the population (59%) in the Ukrainian cities have access to high-speed Internet, which means that its use is the same as in other developed markets in Europe (Germany - 61%, Italy - 52%) (Parakhonskiy A. P., Ericsson. Retrieved from) According to research, 68% of Internet users in the cities of Ukraine use social networks weekly (United Kingdom - 63%, USA - 62%), while 28% use Skype or similar IP-telephony services for communication at least once a week (United Kingdom - 20%, US - 19%) (Study of Ericsson Internet users in Ukraine, Ericsson. Retrieved from). Thus, Ukraine is ahead of the United States and many European countries by the intensity of using social networks and IP-telephony.

More than 2/3 of respondents in Ukraine use mobile Internet every day, and more than 90% - every week. Research by Ericsson ConsumerLab has clearly shown that the frequency of TV viewing on demand - that is, short online video clips, TV shows and films, as well as downloaded content - is increased by the influence of young people's habits in Ukraine (Study of Ericsson Internet users in Ukraine).

According to the study, the reasons for using the mobile Internet are: Internet access (45%), ease of use (26%) and mobility outside the home (26%). These same factors are fundamental for people who do not have a mobile Internet today, but are going to use it in the near future. According to Ericsson ConsumerLab, 65% of people between the ages of 15 and 24 watch short video clips on the Internet at home, and about 60% watch downloaded movies and TV shows at least once a week (Study of Ericsson Internet users in Ukraine, Ericsson. Retrieved from).

According to Internet World Stats (Internet World Stats. World Internet Users and 2018 Population Stats), as of December 31, 2017, 4.15 billion people in the world are connected to the Internet and actively use ICT (Table 1).

Table 1 The number of Internet users in different parts of the world and the world population as of 2018

World regions	World population (as of 2018)	World population, %	Internet users, (as of December 31, 2017)	Internet users %
Africa	1,287,914,329	16.9 %	453,329,534	10.9
Asia	4,207,588,157	55.1 %	2,023,630,194	48.7
Europe	827,650,849	10.8 %	704,833,752	17.0
Latin America	652,047,996	8.5 %	437,001,277	10.5
Middle east	254,438,981	3.3 %	164,037,259	3.9
North America	363,844,662	4.8 %	345,660,847	8.3
Australia /Oceania	41,273,454	0.6 %	28,439,277	0.7
Total in the world	7,634,758,428	100.0 %	4,156,932,140	100.0

Every day, this number increases. The information world captures all segments of the population. Internet technologies have become a natural component of children and modern youth lives. Computer is not only an entertainment but also a means of communication, self-expression and personality development (Fig. 1)
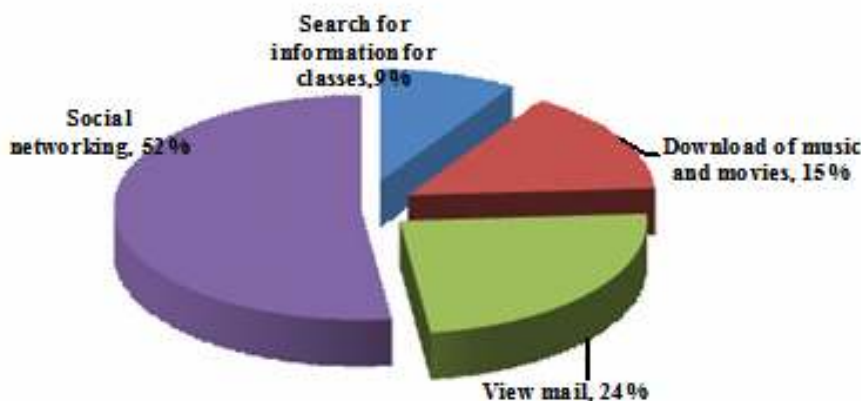

Fig. 1. Distribution of children and adolescents 10-17 years in the Internet by activity, %

Self-discovery of the informational world allows to expand the range of interests of the children and promotes their additional education, as well as the improvement of memory, attention, thinking, logic,

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observation, training of reaction speed, etc. There are many games that, at the same time, have an upbringing and educational basis and can cause the interest of school-age children to the economy, sociology, history, and literature.

The Internet attracts modern children and youth by diverse communication, the search for new forms of expression, anonymity and virtual freedom; they learn to freely navigate in the information space. (Voyskunskiy A.Ye., Martynova O. S.).

It should be noted that children cannot really assess the level of reliability and security of information containing the Internet. The availability of Internet resources for minors dictates increased requirements for the quality, reliability and security of information contained in the network (Study of Ericsson Internet users in Ukraine).

The researches of the Institute of Sociology of the National Academy of Sciences of Ukraine have identified serious threats that await Ukrainian children online. At the same time, 79% of children are convinced that they are sufficiently aware of the risks on the Internet and 67% reported and told about the rules of work on the network. The main informants, according to children, are parents (59%), friends (37%), and the last place teachers (33%). Analyzing the results of this study, we can state the insufficient level of informing the Ukrainian population about the rules of safe work on the Internet. Scientists note that for children and young people at the present stage of information technologies development, the most common threats are: computer dependence, the difference between real "I" and its Internet image, access to unwanted content (adult content), Internet fraud, infecting a computer with malicious software, online violence, etc. (Voyskunskiy A.Ye., Parakhonskiy A. P., Tserkovniy A.).

With the advent of new technologies, there are new types of addictions. Thus, the American scientist Kimberly Young at this moment identifies five main types of Internet addiction (Yang K. S.):
1) computer addiction: obsessive passion for work on a computer (programming, games or other activities) ;
2) net compulsions: compulsive search for information in remote databases;
3) information overload: a pathological inclination to Internet-mediated gambling, online auctions, e-shopping;
4) cybersexual addiction: Depending on the "cybersex", that is, visiting the pornographic sites, discussing sexual topics in chat rooms or closed groups "for adults";
5) cyber-relational addiction: Dependence on communication in social networks, forums, chats, group games and teleconferencing, which can lead to the replacement of real family members and friends by virtual ones.

Today, researchers (Varlamova S., Goncharova Ye., Sokolova I.) highlight the following valid and measurable indicators of the Internet addiction: the amount of time spent on the Internet; ways to spend free time; quantity/quality of sleep, its violation through the use of the network; manifestation of aggressiveness, irritability when it's impossible to use the internet; worsening of working/educational indicators in connection with the use of the network.

Table 2. Internet **addiction typology**

No.	Indicator	Criterion	Type of Internet addiction
1	The amount of time that is spent daily on the network with non-working / non-learning goals	more than 10 hours per day	absolute
		from 6 to 10 hours	strong
		less than 3 hours a day	weak
			absence
2	Motives of spending time on the Internet	way to fight boredom, rest, online games	absolute
			strong
		mainly for the purpose of self-education, the search for work, study information and news	weak
			absence
3	Maximum period of time during which the user comfortably copes without going to the Internet	less than a few hours	absolute
		from several hours to one day	strong
		from week to month	weak
		from a few months to an indefinitely long	absence
4	The basic type of information that is obtained from the Internet	entertaining, communicative nature	absolute
			strong
		work, educational information and news	weak
			absence
5	The amount of time each day spent by the user with friends outside the Internet	less than an hour per week	absolute
			strong
		from 4 to 7 hours a week	weak
		from 7 hours a week or more	absence
6	The main ways to spend free time	exclusively on the Internet	absolute
			strong
		various kinds of leisure activities, not related to the Internet	weak
			absence

The world community pays particular attention to the children's safety, which belong to the most vulnerable category of Internet users. Protecting children and young people from negative informational

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influences is one of the priorities of the Ukrainian state policy in education. The content of the state policy in the field of the protection of public morality is the creation of the necessary conditions that promote the implementation of the right to information space, free from materials that threaten physical and intellectual development or the moral and psychological state of children and young people (Parakhonskiy A. P.).

According to Balakireva O.M. 9.9% of respondents found a strong Internet addiction, and 81% moderate Internet addiction, based on indicators such as the amount of time spent on the Internet, motives for spending time on the Internet, the attitude to social networks, computer games, internet surfing. Today every third young man spends more than four hours on the Internet on a working day. Note that for girls all rates are higher than for boys.

The cyber-communicative addiction is widespread in Ukraine. Thus, according to researches, social networks are the first place to visit - 27% in general among young people. The higher rate is for girls - 29.8%, the lower for boys - 23.9% (Parakhonskiy A. P.).

Excessive stay in the virtual world separates a person from the real world, leads to a constantly high level of anxiety, emotional alienation, and difficulties with attention concentration (Fig. 2).
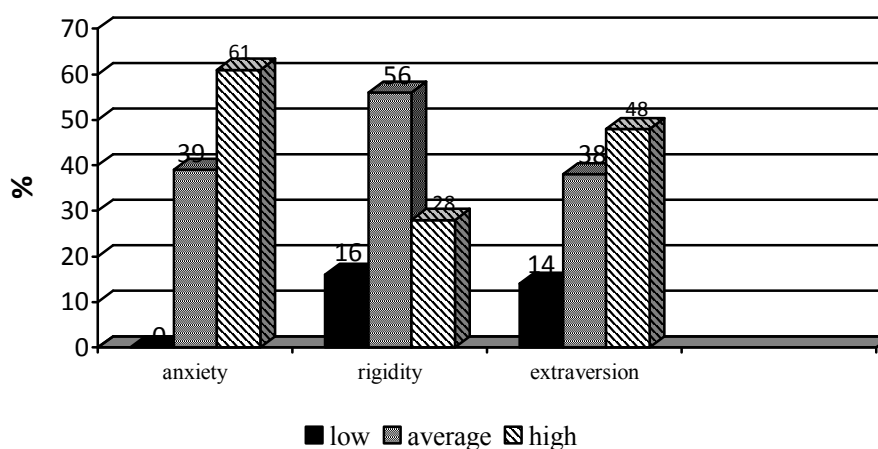

Fig. 2. Level of anxiety, rigidity and extraversion of Internet users

Sleep and nutrition routine can be interrupted by immersion in the network. An American psychiatrist, Ivan Goldberg, who was convicted that overuse of the Internet causes depression, stress, and aggression (Voyskunskiy A.Ye.), was the first to sound an alarm in 1995. The lifestyle of modern youth can be called "sedentary", which becomes habitual, necessary, and comfortable, even in spite of the negative impact on health. Schoolchildren and students spend on average 9.5 hours a day sitting (in educational institutions, preparing for classes, talking on the Internet or playing on a computer, etc.), which causes the emergence of dependence on hypokinesia (Voyskunskiy A.Ye., Martynova O. S.).

Today it is known that for children and adolescents the dependence on the virtual space causes a delay in social and emotional development. As a result of such influence, we can get the society of individuals who are not able to interact, think collectively, and view the world with the eyes of other people.

In order to predict further trends in the development of this dependence, it is enough to take advantage of the experience of countries that are significantly ahead of Ukraine in the information and technical sphere. For example, Poligayeva D. notes that in Japan technological progress arose such a social problem as "hikikomori" (meaning "finding in isolation", "acute social self-isolation") (Polygayeva D.). This Japanese term refers to people who renounce social life and often seek to an extreme degree of social isolation and solitude as a result of various personal and social factors. Mostly it is about 15-year-old boys from well-to-do families who drop out of school and for months, and sometimes for years sit in their rooms one-on-one with a computer, avoiding contact with the outside world. At the beginning of his work, the Japanese psychiatrist Tamaki Saito was impressed by the number of young Japanese who lead this way of life. Currently, in the 127 million people Japan there are at least one million of such people (Polygayeva D.).

There are no data on internet psychosis in Ukraine. Most of them are hidden cases of addiction. For example, in small, successful Holland there are 10,000 drug addicts and 40,000 online addicts. This means that for each drug addict patient there are four Internet addicts. And if such a ratio is projected into Ukraine, then dangerous numbers would appear (Study of Ericsson Internet users in Ukraine).

In modern conditions, it is important for the individual to master and observe the rules of informational hygiene, save their time, the ability to analyze, filter and extract the information received from the stream, necessary for solving specific problems.

Conclusions and perspectives of further research

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Thus, any dependence is only a symptom of the fact that the social life and the society itself become technogenic and informational. For mental health, the greatest danger is from the informational influence that lies in the emergence of addiction - computer and online dependencies.

According to the results of the conducted studies, it is proved that information and communication technologies are widely used in Ukraine, including various Internet services. The problem with Internet addiction is becoming more and more relevant in our country, as in many countries around the world. The number of Internet addicted people is growing only over time, due to the existing objective conditions for the dissemination of information and communication technologies and the development of the Internet.

The experts identified that the Internet dangers for the population, especially for children and young people, emphasize the need to adhere to the standards of information hygiene, which serves as a factor in protecting against the negative impact of information and communication technologies on the personality, a guarantee of the preservation of its physical and mental health.

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