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DIGITAL TECHNOLOGIES, STRESS AND MENTAL HEALTH: THE ROLE OF ARTIFICIAL INTELLIGENCE AND SOCIAL MEDIA IN MODERN SOCIETY

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ABSTRACT

The dynamic development of digital tools, including artificial intelligence and social media, significantly affects the functioning of modern society, also impacting mental health and stress levels. The aim of this paper was to assess the impact of using these tools on the level of stress and to analyze its health consequences, taking into account both positive and negative aspects. The study used a literature review method with elements of a systematic approach in accordance with the PRISMA guidelines. Publications from 2015 to 2025 were analyzed, mainly from the PubMed database and supplemented with other scientific sources. Ultimately, 10 articles meeting the criteria were included in the analysis. The results indicate that digital tools can significantly support healthcare by enabling real-time monitoring of health parameters, improving chronic disease management, and increasing patient engagement in the treatment process. At the same time, excessive use of social media is associated with increased levels of stress, anxiety, and depression, which is due to social comparison mechanisms and exposure to idealized content, among other things. Medical misinformation remains a significant problem, as it can lead to dangerous health decisions, including refusal of treatment. The impact of digital tools on mental health and stress levels is complex and depends primarily on the way they are used and the quality of the content available. Responsible and conscious use of technology can bring significant health benefits, while its improper use can lead to negative consequences. Therefore, further research and educational activities aimed at promoting the proper use of digital tools are necessary.

KEYWORDS

Digital Health, Social Media, Artificial Intelligence, Stress, Mental Health

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Introduction:

In today's world, the internet can be present anywhere in the world. Thanks to it, we can use social media and ubiquitous artificial intelligence, which plays an increasingly important role in society. It is becoming available not only for adults but also for teenagers and even children. Nowadays, students are increasingly taught to use artificial intelligence tools in school, which helps them access information more quickly and improves the efficiency of learning. But does it really have only positive effects? Do the advantages associated with the use of modern technologies outweigh their negative consequences? In just a few years, we have seen numerous cases in which the overly widespread access to social media, the internet, or artificial intelligence has led to chronic stress, anxiety, and even mental disorders that result in numerous mental and somatic diseases.

Methodology:

This work is a literature review in accordance with the PRISMA elements concerning the impact of using digital tools, including artificial intelligence and social media, on stress levels and their health consequences.

To collect research material, a systematic search of scientific publications was conducted in databases, particularly in PubMed, and additionally in other available scientific sources (including Google Scholar and ResearchGate). The search was conducted using English keywords such as: "digital health", "social media", "artificial intelligence", "stress", "mental health", "wearable devices", "atrial fibrillation", "diabetes monitoring". The analysis included publications published in recent years, review, observational or experimental in nature, referring to the impact of digital technology on mental or somatic health. Articles of low methodological quality and non-scientific sources were excluded. Ultimately, publications presenting both the positive aspects of using digital tools and their negative consequences were included in the work. The

analysis of the collected data was qualitative in nature and consisted of comparing the results of individual studies and identifying the main trends and relationships described in the literature. Special attention was paid to the mechanisms of the impact of digital technologies on health and the factors that modify this impact.

Literature Review on the Impact of Digital Technologies on Health:

Social media provide access to answers to a wide range of questions that individuals may have. Mainly thanks to artificial intelligence. Unfortunately, the author of the response or its source is not always known. Therefore, we are not sure how reliable this answer is. Despite this, we can be guided by the answer, which may change our worldview. Sometimes even adults struggle to recognize subtle changes in content that may alter its meaning; this difficulty is even greater in children, who lack life experience and are more susceptible due to their natural curiosity about the world. We can also find a lot of false information on the Internet, for example, about treating diseases. This can be extremely dangerous and even lead to death. Ashby J. describes cases in which 800 deaths occurred due to the theory that alcohol kills the virus. [1] During the COVID-19 pandemic, the perfect cure for COVID appeared on the internet. The main advantage was the wide availability of menthol. People, in their helplessness and ignorance, which was caused by fear and all kinds of misinformation, trusted the information read on the internet, which unfortunately had the worst possible consequences - death. Additionally, as a result of using methanol as a treatment for COVID-19 infection, another 60 people suffered blindness, and as many as 5,876 people required hospitalization. This is a perfect example of how false information on the internet can lead to serious health consequences.

Michael A. Gisondi et al. describes preventable deaths resulting from the use of protective vaccinations. [2] The authors indicate that the reluctance and refusal to vaccinate is caused by the spread of false information about COVID-19 on social media. They also emphasize the development of a disrespectful attitude towards the pandemic threat, which was also caused by false information on the Internet.

What has realistically increased the number of deaths during the COVID-19 pandemic.

Lazard et al. conducted a survey of 603 oncology patients and their caregivers in the United States. [3] The study aimed to assess the exposure to disinformation about cancer treatment and the reaction to it in the adult population. Among the studied patients, as many as 55.9% encountered disinformation about cancer treatment on social media. However, among oncology patients, this percentage reached as high as 70.6%. Among the sources of spreading disinformation, the largest percentage was Facebook (as much as 39.8%). However, YouTube was in second place (27%). Among the cancer treatment methods, the focus was on diet and alternative therapies such as natural methods of treatment. Unfortunately, as many as 59.2% of people declared their willingness to share such content and make it available.

Johnson et al. emphasizes that the analysis of the 200 most popular social media articles on each of the 4 most common cancers contained as much as 32.5% of misinformation and 30.5% were potentially harmful information. [4] Most importantly, the incorrect content had a larger reach than the verified and reliable content. This also highlights the importance of the problem.

It is important not to overlook the positive aspects of the internet. In today's world, thanks to the "ubiquity" of internet access, it can be used in various ways. It is not only used for entertainment, but also in work, education, and communication. The biggest breakthrough was having access to the internet from anywhere. Whether we are on the beach, in the mountains or on the bus, all we need to do is pull out our phone. It allows for quick access to information, enabling users to expand their knowledge and satisfy their curiosity. Although traveling is expensive and not everyone can afford it, the internet allows you to explore the world and other cultures without leaving your home. Thanks to its widespread availability, low cost and accessibility, it has also become a part of everyday life for children. Unfortunately, this has various consequences. It enables faster access to information needed not only for school but also for using social media, which, although officially available from the age of 13, are often used by younger users. Nowadays world, people strive for an idealized life, which is why the posts and reels they share are often highly curated and do not reflect reality. In this way, we create patterns in our minds that are actually impossible to achieve. Unfortunately, not everyone has enough resources to filter this information and verify how true it is. This problem also affects adults. It often leads to comparing ourselves to others, which is associated with a decrease in self-esteem. As a result, it may lead to sleep disturbances and negatively affect mental health. Ahmed et al. organized the results of previous studies, assessing the benefits of using social media in relation to mental health and sleep. Among 6,108 studies, 182 were included in the review, and 92 in the meta-analysis (which included 120 of these individuals). [5] A strong correlation between social media use and increased rates of depression, anxiety, and

reduced psychological well-being has been confirmed. A quality of sleep also worsened. The authors of the study “The Impact of Body-Positive Social Media Content on Body Image and Mental Health” confirmed that contact with „ideal photos” available on social media worsens one’s body image and increases dissatisfaction with it. [6] It affects the occurrence of depression, anxiety and eating disorders among these people. Eating disorders can lead to somatic diseases. One of the most important conclusions was that it is not the internet itself that is the problem, but the type of content consumed.

The positive aspects of using the Internet and digital tools should also be taken into account. They are increasingly being used in medicine to monitor the condition of patients. One of the currently used digital tools is smartwatches used in diabetology among patients with type 1 or type 2 diabetes. Diabetes is a metabolic disease with various causes and courses. It is estimated that about 10% of the world's population suffers from diabetes. The WHO's etiological classification of diabetes divides it into type 1 and type 2 diabetes. Type 1 diabetes: an autoimmune disease in which the immune system destroys the beta cells of the pancreas, leading to absolute insulin deficiency. Type 2 diabetes, on the other hand, is the most common form of diabetes. Affects as many as 80% of people with diabetes. It is caused by progressive impairment of insulin secretion. Environmental factors such as obesity, lack of exercise and an unhealthy diet play a decisive role. Diabetes is a chronic disease that, if poorly controlled, can lead to many serious complications. The most serious complications include cardiovascular problems such as heart attack, stroke, and atherosclerosis. It can also lead to blindness, kidney failure, diabetic foot and sensory disturbances. This is one of the reasons why it is so important to educate patients with diabetes on how to maintain proper blood glucose levels. Maintaining the correct level of glucose in the blood allows for delaying or limiting the development of diabetes complications. Currently, glycemic control is becoming more accurate and increasingly available thanks to the presence of digital tools. Alvarez et al.’s study included 322 participants with type 1, type 2, or gestational diabetes. [7] The results showed that smartwatches support self-monitoring of the disease by monitoring glycemia and tracking physical activity during the day. They also remind you to take your medication and encourage you to be physically active, which is another advantage. Asamoah, on the other hand, analyzed 100 health apps aimed at supporting monitoring and treatment processes, as well as monitoring cardiovascular diseases. [8] The app's help in controlling blood pressure, cholesterol, sugar levels, and body weight has been confirmed. Additionally, increased patient engagement in following recommendations had a positive impact on treatment outcomes. The apps also supported patients in maintaining a healthy diet, quitting smoking, and stress control by providing key recommendations. The prognosis of patients improved thanks to the implementation of healthy daily habits and control of the most important risk factors for cardiovascular diseases.

In a randomized study by Ghose, 1,070 patients with diabetes were examined. [9] For several months, their glucose levels, sleep, physical activity, and diet were analyzed. Comparing the group using the app to the control group, it was concluded that patients using the app had lower glucose levels and lower HbA1c levels. (HbA1c reflects glycemic control over several months). Another field in medicine where digital devices are widely used is cardiology. Smartwatches are used among patients with atrial fibrillation. Atrial fibrillation is the most common heart arrhythmia in adults. It affects about 1% of the entire population. Among people over 80 years of age, it affects even >10%. It is characterized by activation of the atria, which leads to loss of hemodynamic efficiency of their contraction, accompanied by an irregular ventricular rhythm. It is manifested by palpitations, shortness of breath, fatigue, or dizziness, but it can also be asymptomatic. The symptoms of AF are not pathognomonic, which is why early diagnosis of AF is so important. Atrial fibrillation can be divided into paroxysmal lasting < 7 days, persistent lasting > 7 days, long-lasting persistent, and permanent, in which the arrhythmia is present constantly. The causes of AF can be both cardiac and non-cardiac. Untreated atrial fibrillation can lead to serious complications. The most dangerous complication of AF is ischemic stroke. Among patients with AF, the risk of stroke is 5 times higher. AF can also lead to heart failure. Due to the often-episodic course of the disease and the asymptomatic nature, many episodes may go undetected. Therefore, the role of digital tools is becoming increasingly important among patients with AF.

Stache et al. conducted an analysis of the impact of devices on the course of atrial fibrillation patients. [10] The article describes three main technologies: PPG (photoplethysmography) which analyzes heart rate, single-lead ECG recording, and an AI algorithm that interprets data and aims to detect arrhythmias. Smartwatches were shown to be superior to a one-time ECG test because they detect more AF episodes. They enable continuous monitoring through 24-hour measurement and provide the possibility of long-term observation. Patients using smartwatches have better prognosis due to quick reaction to heart rhythm disorders, which enables faster diagnosis, and thus the risk of complications is lower. Among the limitations of these devices, the possibility of false alarms was mentioned.

Discussion:

The results of the analyzed research indicate that the use of digital tools, including artificial intelligence and social media, has a complex and multidimensional impact on stress levels and human health. In particular, the dual nature of this influence is visible – these technologies can both reduce and intensify stress.

On the one hand, digital tools play a significant role in monitoring and treating chronic diseases, which can lead to a reduction in stress levels among patients. An example is wearable devices, such as smartwatches, which enable early detection of heart rhythm disorders, including atrial fibrillation, and mobile applications that support glycemic control in people with diabetes. Research indicates that the use of wearable technology enables continuous monitoring of heart rhythm and increases the detection of asymptomatic episodes of arrhythmia [10]. Continuous access to health data and the possibility of real-time analysis increase the sense of control over the disease and safety, which can significantly reduce anxiety related to health status. Furthermore, digital technologies promote greater patient involvement in the treatment process and improve adherence to therapeutic recommendations [10].

On the other hand, numerous studies indicate that excessive use of the Internet and social media can lead to increased stress levels and deterioration of mental health. Meta-analyses show a significant correlation between social media use and increased risk of depression and anxiety [5]. One of the key mechanisms is comparing oneself to the idealized images presented on the web, which can result in lower self-esteem, anxiety, and depression. Additionally, easy access to medical information, not always verified, contributes to the phenomenon of cyberchondria, or excessive worrying about one's own health.

Information overload and the constant availability of digital stimuli are also significant problems that make it difficult to recover mentally and can lead to chronic stress. Constant notifications, pressure to stay up to date, and the lack of a clear boundary between private and digital life contribute to sleep disorders and a decline in mental well-being.

It is also worth paying attention to the problem of medical disinformation, which can lead to making dangerous health decisions, including abandoning treatment, which has been observed in the case of oncological therapy, among others [8]. This phenomenon highlights the importance of the reliability of information sources available on the Internet.

At the same time, it should be emphasized that the impact of digital technology is not unequivocally negative. In many cases, the Internet is a source of social support, enabling contact with other people in a similar health situation and access to support groups, which can contribute to reducing stress and improving the quality of life.

In summary, available data indicate that the impact of digital tools on stress levels and health is determined by the way they are used and the quality of the content consumed. Responsible and conscious use of technology can bring significant health benefits, while its improper use can lead to serious mental and somatic consequences. Therefore, it seems crucial to promote health education and develop digital tools in a way that supports the well-being of users

Conclusions:

Based on the analysis of available literature, it can be stated that the use of digital tools, including artificial intelligence and social media, has a significant but complex impact on stress levels and human health.

Firstly, digital technologies show significant potential in improving healthcare, especially in the context of chronic diseases. Using wearable devices and mobile applications enables real-time monitoring of health parameters, which facilitates earlier detection of diseases, better treatment control, and increased patient engagement. As a result, it can lead to a reduction in stress related to health uncertainty and improve the quality of life.

At the same time, it should be emphasized that excessive and uncontrolled use of the Internet and social media can lead to negative health consequences. It affects mental health by increasing stress, anxiety, or depression. Social comparison mechanisms and exposure to idealized content, which can lower self-esteem and worsen mental well-being, are particularly important. Additionally, access to unverified medical information carries the risk of making incorrect health decisions.

The results of the analysis indicate that the key factor determining the impact of digital technologies on health is the way they are used and the quality of the content consumed, not the use of them per se. Responsible and conscious use of digital tools can bring tangible health benefits, while their improper use can lead to a deterioration of mental and physical health.

Therefore, it seems important to develop health and digital education, as well as create tools and content that support the well-being of users. Further studies, especially prospective and interventional ones, are also necessary to better determine the long-term impact of digital technologies on health.

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