Course work on the topic **«The influence of video games on people in the modern world in the field of medicine»**

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# Introduction

In recent years, there has been a shift in the approach to analyzing the impact of video games on human health and behavior. According to Forbes Global data for 2020, over 70% of companies are utilizing gamification in various areas, including employee training and customer engagement, indicating a growing interest in gaming technology for educational purposes.

Simultaneously, questions arise in the medical field regarding how video games can affect people's health and well-being. Research is being conducted on the potential of gaming products in treatment, rehabilitation, and improving cognitive functions such as attention and memory. According to the World Health Organization (WHO), millions of people suffer from various psychological problems and disorders, emphasizing the need for innovative methods to support mental health.

Modern studies confirm the positive effects of specialized games on the treatment and rehabilitation process of patients with psychological disorders. There is a growing interest in medical practice in developing games aimed at rehabilitation and prevention of mental illnesses, as evidenced by the results of recent research.

However, despite the positive trends, further research is needed for a deeper understanding of the impact of video games on human health and behavior. Work in this area requires expanding the sample size and conducting more precise analysis to obtain objective results.

The aim of this study is to investigate the impact of video games on individuals in the modern world, particularly in the medical field, and to identify potential areas for future research.

# Basic Concepts

In today's world, video games have become an integral part of popular culture and daily life. Their influence on human health and behavior has attracted increasing attention from both society and medical researchers. This essay will explore the main concepts related to the study of video game's impact on modern treatment and diagnosis methods for psychological diseases and cognitive function-related illnesses.

1. Video games and health: Video games are often seen as a form of entertainment and recreation. However, their impact on health can vary, and it is important to consider factors such as game content, duration of play, and individual player characteristics.

2. Psychological diseases:

- Depression: A mental illness characterized by low mood, lack of interest in activities, and reduced mental activity.- PTSD (post-traumatic stress disorder): a condition that can occur after experiencing a traumatic event and manifests itself in dreams, emotional reactions, and flashbacks.

- ASD (autism spectrum disorder): a group of conditions that include social difficulties and repetitive behaviors.

- Dementia: a condition characterized by the deterioration of cognitive functions, such as memory, orientation, and understanding, which interferes with daily life.

3. Cognitive Functions and Mental Development: Video games have the potential to improve cognitive functions and promote mental development, which can help prevent and treat diseases associated with cognitive impairment such as dementia.

4. The Role of Games and Gamification in Medicine:

- Diagnosis: Games and gamified approaches can be used to assess patients' cognitive and emotional functioning, helping to identify and understand psychological and cognitive conditions.- Treatment and Rehabilitation: Video games can be incorporated into treatment and rehabilitation programs to enhance patient motivation, develop mental skills, and reduce stress. These basic concepts highlight the fundamental aspects of the influence of video games on health and behavior, as well as the need for more research in this field to develop effective methods for treating and preventing psychological and cognitive disorders.

# Analysis of the use of video games by disease areas

Overall, video games and VR technologies have great potential for use in the medical field, but more research and consultation with experts are required before they can be widely used as an official treatment method.

The use of video games and VR technology in various areas of diagnosis and treatment of psychological disorders, memory problems, aggression, and concentration has great potential (Hyun Han, et al., 2019). Virtual reality can be used to diagnose and treat different types of phobias (He Huang, 2022). Virtual Exposure Therapy (VET) provides a controlled environment that helps patients to be in an environment of danger and fear, thus alleviating the symptoms of phobia and helping to keep the patient healthy (Shawn Green, 2019, Reddy Kandi 2020).

# Video games implementation in the treatment of mental illnesses

There has been an increase in interest in using video games as a tool to treat mental illness (Hazel et al., 2022).

Between 2019 and 2021, there have been many studies focusing on the coronavirus. This was due to the need to develop new methods of diagnosing and treating psychological illnesses that arose in involuntary isolation. In 2021, research focused on psychological illnesses such as depression, ADHD, eating disorders, etc. Articles through 2019, before the pandemic, focused on finding the dependence of aggressive behavior on video games and which identified gamification as one of the new ways to treat patients. Research from 2022-2023 delves deeper into the creation and use of “therapeutic games” to identify problems in concentration, social interaction, and other mental issues.

Video games can be used as an alternative to traditional treatments such as medication, psychotherapy or exercise. They allow patients to immerse themselves in a virtual world and distract themselves from real-life problems, and help them develop the skills needed to cope with mental illness.

One example of the successful use of video games in the treatment of mental illness is a game program called SPARX (Smart, Positive, Active, Realistic, X-factor Thoughts) (Drummond et al., 2022). This program was developed in New Zealand and is a virtual world where patients can perform various tasks related to coping with depression.

VR technology has also found applications in the field of mental disorders and elevated stress levels. VR headsets are used as an additional diagnostic tool in the study of nervous system disorders. In addition, VR games are used to rehabilitate patients with elevated stress levels caused by illness. (Mader, 2019).

The use of video games in the treatment of mental illness represents a new and promising approach that could be an important addition to traditional treatments. However, further research and development of specialized programs for different patient populations is needed.

# Memory problems and improvement of cognitive functions of the brain

There are many studies that show that games can help improve cognitive functions of the brain including memory, attention, reaction speed, and problem solving (Hatta et al., 2022).

One example of creating and using video games to diagnose and treat memory problems is NeuroRacer. This game was developed to assess cognitive abilities and find ways to improve cognitive function in older adults. In the game, the player drives a car and must quickly switch between tasks and make decisions. In a study conducted by the University of California, San Francisco, participants between the ages of 60 and 85 who played NeuroRacer showed improvements in memory, attentiveness, and the ability to quickly switch between tasks (Gazzaley et. al., 2020). Thus, video games may be useful for improving cognitive function, especially in older adults.

Overall, the use of video games in treating memory problems and improving cognitive brain function is a new and promising approach that may be an important addition to traditional treatments.

# Video games in the field of aggression control

Video games can be used to treat aggression. Generally, games appropriate for treating these disorders require the player to focus and make quick decisions. Currently, there are several approaches to using video games to treat aggressive behavior:

1. Game Scenario Therapy: the therapist may use specially designed computer games to help patients develop strategic thinking and emotional regulation (Bavelier, 2019; Jones, 2022). Games can include simulations of real-life situations in which the patient can learn to express emotions and respond to conflict.
2. Stress relief games: there are games that do not teach but help to relieve stress and tension (Reem Alnanih, 2020). Their main objective is to create a positive psychological effect and reduce the level of aggression in the player.
3. Biofeedback games: these games use equipment that provides feedback of the patient's electrophysiological parameters such as breathing rate and heart rate. The player can learn to control his or her excitement and stress levels in real time.

Using video games to treat aggression can be an effective method, but should be used in conjunction with other psychological techniques and under the supervision of trained professionals (Mona Choi et al., 2022). One example of games used in this area is biofeedback games. Biofeedback games allow users to monitor their physiological indicators, such as heart rate and breathing, and use this data to control gameplay (Kerin Carey et al., 2022). Players learn how to manage their physiology and respond to stressors, which helps them control their aggression and increase their self-control.

In addition, there are games that utilize elements of meditation and relaxation exercises to reduce users' stress and aggression levels. These games can provide special tools such as nature sounds, hidden objects, or coloring pages for coloring that help users relax and take away tension.

The use of games in the area of aggression control may be an important addition to traditional treatments. However, further research and the creation of specific programs are needed to make the most effective use of games in this area.

# Video games and VR technologies in the field of patient rehabilitation

Video games and VR technology can be useful in rehabilitation after injuries, stroke and other conditions that result in impaired motor and cognitive function. They can help restore a full life, strengthen muscles, and increase confidence in everyday tasks. VR technology allows immersion in a virtual world where patients can perform a variety of tasks, including balance training and motor skills and coordination training.

Video games can improve cognitive function and train memory after a stroke or through rehabilitation programs. They test and improve brain functions such as information storage, spatial orientation, and analyzing complex maps.

An example of the successful use of video games and VR technology in rehabilitation medicine is the game “Reaqua”, which helps to restore the nervous system and treat back and neck injuries. In this game, patients perform various tasks related to strength, balance and coordination training.

# Video games and VR technologies in the field of medicine

There are several trends in the use of video games and VR technology in the medical field, including:

1. VR technology is being used to train surgeons and help them make better decisions during surgeries. Surgical training programs using VR goggles and specialized controllers allow them to practice various surgeries in realistic conditions without risk to patients. Medical Realities has developed a VR course on laparoscopic surgery. VR technology is also useful in teaching diagnosis and treatment of various diseases.
2. Rehabilitation using video games and VR technology helps patients regain function after an injury or illness. One example is the VirtualKnee project for patients after knee replacement. The VR application shows how to move properly after surgery. Another example is the game “DEEP” for rehabilitation of people after a stroke. In the game, you need to recognize objects and situations and perform tasks with the help of body movements. This improves coordination, concentration, visual perception, and motor skills.
3. Diagnosis: VR technology is used in medicine to create models of the human body to help diagnose diseases more accurately. Studies have shown that people with Alzheimer's disease often have trouble orienting themselves in three-dimensional space. Researchers developed a VR game that tests this ability. The results indicate that participants with initial symptoms of Alzheimer's showed worse performance in this game than people without these symptoms. This makes it much easier to diagnose the disease at an early stage.
4. Optimizing doctor-patient communication: VR technology helps doctors better explain diseases and the treatment process to patients. The Medical Realities project allows medical professionals to undergo virtual training using VR technology. This helps them better understand surgical procedures and avoid mistakes. VR technology can also be used to educate patients before procedures so that they are better prepared and more confident in their knowledge.
5. Pain reduction: Games and VR technology are used to reduce pain in patients during procedures such as injections and manipulations. One example of the use of VR technology in pain reduction is the game “SnowWorld”. It was developed to treat burns and severe pain. The game takes the patient to a virtual winter world: they can look at snowflakes, listen to the sounds of nature and even throw snowballs at penguins. This helps to distract attention from the pain and reduce its level.
6. The use of VR technology allows doctors and researchers to conduct medical research in a controlled environment. This helps in prototyping new devices and tools for medical procedures. For example, a study on the effects of anti-stress techniques on people, conducted using virtual reality simulating a stressful situation, showed their effectiveness in reducing stress and related physical symptoms. The use of controlled environments and VR technology allows precise parameters to be established and tests to be modified to produce more accurate results. This can help in developing new treatments and deciding on the most effective strategies.

# Conclusion

The main findings of the study show that video games have both positive and negative effects on human health and psychological well-being in today's medical world. Players who play video games regularly may experience benefits such as improved movement coordination skills and faster reactions to visual and auditory cues. In addition, some video games can improve cognitive abilities and complex problem solving.

It has also been found that video games have potential clinical applications in the medical field. They can be used to treat patients with fears and phobias, as well as for training surgeons and rehabilitation after brain contusions and other head injuries.

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