

VRability-technologies: innovative rehabilitation of military personnel with post-traumatic stress disorder

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Abstract

The article examines the impact and necessity of introducing the latest innovative virtual reality technologies to the process of psychological recovery and getting rid of the consequences of military personnel "combat syndrome".

Keywords: VR technology, virtual reality, military personnel

1 Introduction

The active development of computer technologies makes it possible to use the latest technical tools in the framework of medical and diagnostic processes, to study the impact of technical innovations on the human psyche, his or her daily life and behaviour.

The problem of post-traumatic stress disorder (PTSD) is becoming particularly relevant for Ukraine and the international community as a result of psych traumatic circumstances of military nature, due to the aggravation of the geopolitical situation in the world and a large number of local military conflicts (hereinafter – LMC) and terrorist acts.

Participants of military operations in the course of professional activity are exposed to stress, which causes the appearance of various psychological states of a destructive nature, among which post-traumatic stress disorders, mental injuries, neuropsychiatric tension, military fatigue, combat exhaustion, military neurosis, which have their own symptoms, forms of manifestation and consequences. A particularly difficult type is combat stress caused by a long-term threat to life in a combat situation.

Today, it is impossible to pass the facts of indifference to veterans of the ATO (OOS) by the leadership of Ukraine, where more than 400,000 people have already become "veterans", and the state system cannot organize even elementary psychological rehabilitation for thousands of wounded and maimed soldiers [1, 2].

Therefore, PTSD is a consequence of leaving a soldier in combat conditions and it significantly affects the course of person's mental activity, and it is not only an individual problem, but also a social one.

Virtual reality immersion technologies can come to the rescue in this case, and reconstructing traumatic events

and re-experiencing them to respond to negative emotional experiences will move from the category of "painful treatment" to the category of "addictive game".

The use of medical, psychological and social rehabilitation methods as a complex allows us to solve such psychotherapeutic problems.

In our opinion, the introduction of innovative virtual reality technologies into the rehabilitation program can solve this problem to a certain extent in the comprehensive rehabilitation of ATO participants. It is obvious that the introduction and use of VR technologies in the rehabilitation process of patients with post-traumatic stress disorder is very relevant.

The main task is to pay attention to the need of introducing the latest information technologies when determining possible directions for creating appropriate psychological measures.

2 The main part

Recently, there have been many publications devoted to the problem of using VR information technologies of reality in the rehabilitation of military personnel, which is new and is now being carefully studied.

Such researchers as S. Aksenov, S. Bondarenko, N. Hnedko, A. Hoshchynskyi, A. Zasekin, Yu. Lemeshko, S. Lytvynova, A. Petrenko-Lysak, A. Petritsa, R. Pavliuk and others were engaged in the issue of using and functioning of virtual reality in various spheres of human life.

Virtual reality technologies have long ceased to serve exclusively for entertainment. For example, VR glasses with simulated social interactions are used to treat paranoia, depression, and even fear of death. Scientists led by Iris Brunner from the University of Bergen (Norway) tested the effectiveness of VR in restoring motor functions.

A huge step to the development of virtual rehabilitation was the development by Microsoft of the Kinect sensor for the xbox 360 game console in 2012. The Kinect sensor has two cameras, which allow you to register movements in three-dimensional space and create game tasks, taking into account the three-dimensionality of human movements. In addition to the release of the game console and sensor, Microsoft Kinect has provided unlimited free access to the software for everyone. Thus, the sensor and software can be used to create individual game scenarios that relieve the negative effects of stress, post-traumatic stress disorder.

Diagnosis and treatment of PTSD using computerized tools in Telemental health is one of the most common areas. According to the World Health Organization, 3.6% of the world's population suffers from PTSD [3]. At the same time, the concept of PTSD was transformed from "military fatigue", "combat exhaustion", "military neurosis", "post-traumatic neurosis" [4] to the DSM-V System [5], introduced in 2013 by the American Psychiatric Association, which provides a refined system of its constituent features. PTSD is considered as a system of symptoms that are expressed in memory of trauma (flashback), evading memories of it, and can be accompanied by emotional numbness or hyper excitation [6]. The consequences of PTSD are a decrease in the quality of life in all its areas: social, work and family.

In order to improve rehabilitation activities, we have developed the program "Psychology of Virtual Space VRability – a set of technologies" for military personnel participating in military operations. The program is aimed at developing self-regulation skills to relieve the negative effects of stress, post-traumatic stress disorder and normalize the mental state. The main techniques used during VRability technologies: psychological information; breathing training; biofeedback systems; relapse prevention.

VR technology or virtual reality technology is a human – machine interaction technology that allows the user to immerse themselves in a three-dimensional interactive information environment. Virtual reality is primarily a game. However, despite all the seemingly frivolous use of games in the rehabilitation of military personnel, this method helps to diagnose diseases and treat them. Doctors and rehabilitation specialists can learn how to diagnose diseases and perform operations using virtual reality.

The video that a person watches with VR glasses can calm him down and set him up in the right way, and helps

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Kukhtyk T, Sihova A, Khoroshailo O

them fight stress. With the help of virtual reality and a specially designed program, a person enters a state of harmony with himself. In the video, 360 people see a beautiful landscape around them. Then there is thick smoke, which can only be dispersed by shouting. Shouting improves your mental state and maintains your emotional balance. Virtual reality, on the contrary, distracts the patient from difficult thoughts. Moreover, in order to enhance the effect of reality, the image on the screen can be accompanied by various sound effects and smells.

Projection of the image on liquid crystal displays mounted in a special helmet or glasses and connected to a computer also provides almost complete immersion in the virtual environment. In this case, both eyes see different images, and when combined together, they create a sense of a three-dimensional world.

With the help of virtual reality, you can "visit" the place, "get" into the circumstances that caused PTSD, and relive it all anew. The difference is that a person experiences it in comfortable environment, knowing that this is virtual reality and that he can always stop the session. Together with a psychotherapist or psychologist, a person goes through the event that traumatized him, works out his own reaction and pronounces the experience experienced.

3 Conclusions

The introduction of the latest innovative VRability technologies of virtual reality to the rehabilitation process of military personnel with post-traumatic stress disorder occupies an important place and organically complements traditional methods of treatment. Virtual reality rehabilitation makes training more effective by combining motivational, gaming, and competitive mechanics. Creating a virtual scenario in which the patient performs certain actions simplifies the course of rehabilitation itself and does not make it emotionally exhausting for the person.

Virtual reality, with its ability to model almost any space, to provide almost unlimited feedback with highly motivated game tasks, is able to fill in the missing components of a successful rehabilitation program.

Prospects for further research may include exploring less technologically advanced Telemental health techniques, from virtual reality systems to augmented reality systems and mobile apps to smartphones, as part of PTSD treatment.

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Kukhtyk T, Sihova A, Khoroshailo O
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