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The use of virtual reality in the treatment of mental disorders such as phobias and post-traumatic stress disorder

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ABSTRACT

Mental disorders, such as phobias and post-traumatic stress disorder (PTSD), are a serious health problem that significantly impacts people's quality of life. These disorders can significantly impair the quality of life of patients, so studying ways to treat them using modern methods is important and relevant. The purpose of this study is to evaluate the effectiveness and potential of using virtual reality (VR) technology in the treatment of phobias and PTSD. The methods used in the study include analytical, comparative, and systematization methods. The study has shown that cognitive behavioural therapy and exposure therapy are the main treatments for these disorders. The use of VR in the treatment of mental disorders, including phobias and PTSD, opens up new opportunities for safe and effective exposure to stressful stimuli. It was found that the benefits of using VR in the treatment of mental disorders include safe exposure, an individualized approach to treatment, and the ability to create realistic simulations of stressful situations. The study confirmed that the use of VR in the treatment of phobias allows patients to gradually get used to phobic stimuli and change their negative perceptions and reactions to them. The use of VR in the treatment of PTSD has significant potential, allowing the application of various techniques, including exposure, gradual desensitization, cognitive behavioural therapy, therapeutic recovery, meditation, and relaxation, to alleviate the symptoms of the disorder and improve the quality of life of patients. The findings of the study can serve as a basis for improving clinical practice in psychotherapy and psychiatry, allowing for more effective and individualized care for patients with disorders.

1. Introduction

Many people could go through at least one potentially traumatic event in their lifetime. However, only 3.9% of them will develop a post-traumatic stress disorder (PTSD). 40% of the people who suffer from PTSD recover within one year (World Health Organization, 2024). Traditional treatments for mental disorders can have their limitations and drawbacks. For example, exposure therapy, which is one of the main treatments for phobias and PTSD, can be difficult for patients due to the difficulty in fully immersing themselves in traumatic scenes. Thus, innovative methods are needed that can complement or enhance traditional approaches. The use of virtual reality (VR) is such an innovative method. VR provides the ability to simulate real-life scenarios and environments, allowing patients to gradually experience stress and learn to effectively cope with their symptoms. In addition, VR can create a controlled environment where therapists can tailor sessions to the needs of each patient. Thus, research into the use of VR in the treatment of mental disorders is important for the development of effective and innovative treatment approaches. Although VR technologies are developing rapidly, they are still limited in their availability and complexity of use, which affects the representativeness of studies (Trifkovic et al., 2017; Latka et al., 2018).

VR is an innovative technology that creates artificial environments in digital form where the user can experience real-life-like sensations through special means such as helmets, glasses, projectors, and gloves with sensors, as noted by Horoshko (2023). This technology, according to the scientist, allows not only perceiving visual, sound and tactile stimuli, but also manipulating a virtual image of one's body and interacting with an immersive environment through an "avatar" or computer VR. The scientist's research has shown that VR is an effective method of rehabilitation for patients with various phobias, anxiety disorders, Parkinson's disease, Alzheimer's disease, multiple sclerosis, depression, insomnia, and PTSD. This technique is also successfully used for neurorehabilitation after a stroke.

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The integration of VR into psychotherapy is particularly valuable in treating PTSD. Tsokota and Platonov (2021) emphasis on that in their study. The researchers consider the virtual environment as a means of "extracting" a patient from the real world and loading him or her into the synthetic one by providing synthetic sensory information that simulates real life stimuli. VR, for its part, recreates real time, allowing the patient to interact with the virtual environment. As part of an alternative form of psychotherapy, according to the scientists, patients have the opportunity to interact with a safe virtual reproduction of traumatic stimuli in order to reduce the fear response. Ukraine, which is currently at war, also starting to implement VR technologies in treatment of PTSD. Psychologist and director of the University of Southern California's (USC) Institute for Creative Technologies, Dr. Skip Rizzo develops VR treatments for various conditions. To develop a VR system specifically for the Ukrainian market, the researcher is collaborating with a group of partners in the US, Europe, and Ukraine (Ubiquity, 2023). Both soldiers and citizens with PTSD will be able to receive trauma-focused treatment thanks to this Virtual Ukraine project. There is only one private institution in Ukraine that specialises in war trauma and possesses tools to provide a VR-based therapy, which is War to Health rehabilitation centre in Dnipro (Guz, 2024).

Another work that confirms this statement is a study conducted by Panchenko (2023), where the scholar notes the effectiveness of using VR in psychotherapy for the treatment of phobias, anxiety disorders, and PTSD. The scientist emphasizes that these technologies allow for the creation of a controlled environment where patients can safely experiment with their emotions and put themselves in various situations, which can be beneficial for their mental health. The author notes that VR can be useful because it allows patients to gradually get used to stressful situations recreated in a virtual environment and respond to them in a safe and controlled format, which can help reduce anxiety and strengthen psychological resilience. Also, the importance of using VR for the treatment of PTSD is reflected in its effectiveness and the possibility of deploying it to numerous people. This is highlighted in the study by Li Pira et al. (2023). However, the researchers emphasize the need to improve the quality of existing software and the use of VR therapy in line with modern standards of positive mental health. Scientists point to the need to continuously improve treatment methods and tools, including through VR technologies, to ensure optimal results in the treatment of PTSD.

Krzystanek et al. (2021) note that the high prevalence of phobias and limited access to psychotherapeutic services prompts the search for alternative treatments to improve the availability of effective therapy. According to the researchers, the use of VR technology is a possible way to overcome these barriers to effective treatment. Scientists note that VR therapy is effective in the treatment of agoraphobia and social phobia in the form of 8–12 sessions conducted on average once a week for at least 15 min each. Also, the treatment of specific phobias can be effective in the form of one long session lasting from 45 to 180 min. At the same time, researchers note that increasing the frequency of sessions and adding medication therapy can help reduce the overall treatment duration.

The significance of this study lies in its exploration of VR as a modern and innovative tool for treating mental disorders. VR offers a way around some of the limitations of traditional therapy. It provides more individualized and effective exposure by mimicking real-life experiences in a safe and controlled environment. This helps patients eventually face and manage their concerns. This technology is very useful in psychotherapy since it can replicate realistic stimuli, opening up new treatment options for mental illnesses. The study's context, framed within the growing demand for more accessible and tailored therapeutic approaches, highlights VR's utility as a complementary method to enhance patient outcomes and improve the quality of mental health care.

Therefore, this predetermine the purpose of this study which is to investigate the effectiveness and potential of VR in the treatment of phobias and PTSD. To achieve this, the author needs to analyse the psychological mechanisms behind these disorders and how effectively VR can be used in their treatment. This, in turn, means also the identification of the advantages and disadvantages of using VR and compare it with traditional therapeutic approaches.

2. Materials and methods

The analytical method of research in the context of studying mental disorders, in particular phobias and PTSD, has proven to be useful in understanding the effectiveness and mechanisms of action of treatment methods. One of the aspects that was investigated using the analytical method was the effectiveness of these therapeutic approaches in reducing anxiety and stress in patients. In this context, the analytical research method proves to be a tool for understanding the effectiveness and mechanisms of action of this innovative approach to the treatment of mental disorders using VR. By applying the analytical method, it was possible to find out how successfully patients manage to reduce their anxiety symptoms and improve their quality of life after undergoing treatment with VR. In addition, the analytical method of the study allowed identifying factors that may affect the effectiveness of VR therapy. By applying the analytical method in this research study, it was possible to determine which specific factors can make therapy more or less effective for different individuals. In addition, using the analytical method to study the mechanisms of action of VR in the treatment of mental disorders, it was found out how interactive sessions in virtual environments affect the processing of negative thoughts and beliefs in patients with PTSD, as well as which aspects of these sessions contribute to reducing their anxiety and stress.

The study also used a comparative method to carefully compare the advantages and disadvantages of using VR in the treatment of mental disorders. This method allowed comparing different aspects of the impact of VR on the treatment of phobias and PTSD to better understand how these technologies can contribute to the improvement of patients' condition. The comparison method helped to identify the main advantages of using VR in shaping exposure to stressful situations. Using the comparison method, it was possible to compare this advantage with other therapeutic approaches in detail and determine its effectiveness compared to traditional methods of treatment. However, it should be noted that the comparison method also allowed determining potential disadvantages of using VR. The comparison method also allowed for a comparison of different techniques and strategies used with VR in the treatment of phobias and PTSD. As a result, an in-depth study of the advantages and disadvantages of using VR in psychotherapy was conducted using the comparison method, which contributed to a better understanding of this approach and the development of strategies to optimize the treatment process.

The research paper used the systematization method to study the different approaches and techniques used in the treatment of PTSD with VR. This method allowed identifying the possibilities of using VR in the treatment of PTSD, as well as to systematically classify these possibilities. The study used the systematization method to highlight the different ways VR can be used to treat PTSD, including the use of virtual scenarios, interactive applications, simulations, and other virtual technologies. This diversity of approaches was systematized based on their focus on alleviating PTSD symptoms and improving patients' quality of life. The systematization method also allowed identifying the main challenges and obstacles that may arise when using VR in the treatment of PTSD, such as technical limitations, patient discomfort, or limited availability of equipment.

3. Results

3.1. The use of VR in the treatment of phobias

Treatment of mental disorders plays an important role in preserving people's quality of life, as it allows them to reduce suffering and improve

functioning in everyday life (Kamkhen et al., 2022). It is worth noting that phobias and PTSD are serious mental disorders that significantly limit a person's life and health.

According to the DSM-5 (American Psychiatric Association, 2023), the first therapeutic methods of choice for phobias are cognitive behavioural therapy (Wright et al., 2023) and exposure therapy (Odgers et al., 2022). Cognitive behavioural therapy (CBT) is used to identify and reassess negative thoughts and beliefs related to phobic situations, as well as to develop effective coping strategies (Sadvakassova et al., 2021). Exposure therapy involves gradual and systematic exposure of the patient to objects or situations that cause phobic fears in order to reduce fear and habituation to them. CBT is also used in the treatment of PTSD (Loskot et al., 2023), which aims to identify and reassess negative thoughts and beliefs related to traumatic experiences. Another effective method for treating PTSD is exposure therapy (McLean et al., 2022), which involves gradual and safe exposure to traumatic memories and situations in order to reduce fear and anxiety.

In the 21st century, virtual tools are becoming increasingly important in the treatment of mental disorders in psychiatry and psychotherapy. VR offers the possibility of creating controlled environments where patients can safely face phobic stimuli or traumatic memories. The use of VR in the treatment of phobias and PTSD allows patients to gradually get used to scary objects or situations, as well as change their negative perceptions and reactions to them. The main advantages of using VR in the treatment of mental disorders are safe and controlled exposure to stressful stimuli, an individualized and flexible approach to treatment, and the ability to create realistic simulations of traumatic situations. However, it should be borne in mind that the use of VR can cause certain disadvantages, such as the possibility of disorientation, undesirable effects or discomfort in some patients. Also, the availability and cost of VR equipment may be limited for some clinical settings (Table 1).

Approaches to the use of VR in the treatment of mental disorders can vary, but the main goal is to create conditions for safe and controlled exposure of the patient to the stimuli that cause their symptoms. The use of VR in the treatment of phobias is a promising area of psychotherapy that can provide safe and effective exposure to stimuli that cause phobic reactions (Albakri et al., 2022). A phobia is an excessive, uncontrollable fear of certain objects or situations that can significantly limit a person's life and affect their psychological and social state (Merrill and Ashton, 2024). The main idea of using VR in the treatment of phobias is to create a controlled virtual environment where the patient can gradually get used to scary objects or situations.

Table 1
Advantages and disadvantages of using VR.

Advantages	Disadvantages
Safe Exposure: VR allows patients to be exposed to phobic stimuli or traumatic memories in a controlled and safe environment, without the risks associated with real-world exposure.	**Discomfort and Side Effects:** Some patients may experience disorientation, nausea, or increased anxiety when using VR, which can limit its effectiveness or lead to discontinued treatment.
Individualized Approach: VR can be tailored to the specific needs and experiences of each patient, allowing for a more personalized and effective treatment plan.	**Limited Availability and Cost:** The specialized hardware and software required for VR-based therapy may be expensive and not easily accessible for all healthcare providers and patients.
Realistic Simulations: VR technology can create highly realistic simulations of stressful situations, enhancing the immersive experience and the effectiveness of exposure therapy.	**Sense of Disconnection:** Some patients may feel a sense of disconnection from the virtual environment, which could reduce the emotional impact and the effectiveness of the treatment.
Gradual Exposure: VR allows for a gradual and controlled exposure to phobic stimuli or traumatic memories, helping patients to gradually adapt and develop coping strategies.	**Technical Limitations:** Current VR technology may have limitations in terms of visual quality, interactivity, and the ability to replicate all sensory experiences, which could affect the realism and effectiveness of the treatment.
Improved Accessibility: VR-based therapy can potentially be more accessible than traditional in-person treatment, especially for patients who live in remote areas or have mobility limitations.	**Ethical Concerns:** The use of VR in the treatment of mental disorders raises some ethical concerns, such as data privacy, informed consent, and the potential for misuse or overreliance on the technology.

Source: compiled by the author.

One example of VR in the treatment of phobias is exposure therapy (Freitas et al., 2021). In this case, the patient uses VR to be exposed to the stimuli that trigger their phobia. For example, a person with arachnophobia can be exposed to a virtual simulation of contact with cobwebs or spiders. During this exposure, the patient can gradually get used to the object of their fear and develop coping strategies (Kamkhen et al., 2024). The benefit of using VR in the treatment of phobias lies in its controllability and the ability to be tailored to the individual needs of each patient. Virtual simulations can be adapted for different types of phobias and levels of symptoms. In addition, the use of VR allows patients to be exposed in a safe environment, which allows them to feel more in control and secure during treatment. However, there are some drawbacks to using VR in the treatment of phobias. Firstly, not all virtual simulations may be realistic enough to elicit an adequate response from the patient. Some people may feel that they cannot fully confirm the reality of the virtual environment, which can reduce the effectiveness of the exposure. In addition, the individual characteristics of each patient should be taken into account, as in some cases, exposure to stimuli can lead to an increase in anxiety and stress instead of reducing them (Hudon et al., 2023).

Thus, the use of VR in the treatment of phobias can be an effective tool, but it requires an individual approach and careful consideration of the characteristics of each patient. The protocol for treating phobias using VR includes various techniques aimed at gradually accustoming (desensitizing) the patient to objects or situations that cause phobic reactions. The techniques listed in Table 2 allow patients to gradually get used to phobic stimuli and reduce the level of anxiety and stress associated with them, which helps improve their quality of life and functioning.

Table 2
Main techniques used in the treatment of phobic reactions using VR.

No.	Techniques	Description
1	Exposure	The patient is exposed to virtual scenarios that reproduce situations or objects that cause phobic fear. For example, if a patient has a phobia of public speaking, they can be exposed to a simulation of speaking in front of a large audience in a virtual environment.
2	Gradual desensitization	Exposure to phobic stimuli is carried out gradually, starting with less intense scenarios and gradually moving to more intense ones. This allows the patient to adapt and get used to stressful situations gradually and without overload.
3	Appropriate support	During exposure sessions in VR, the patient receives the support of a therapist who provides psychological support and helps manage stress and anxiety.
4	Positive reinforcement	After successful exposure to the phobic stimuli, the patient receives positive reinforcement or praise, which reinforces positive associations with those stimuli.
5	Coping skills practice	The patient learns to effectively cope with the stress and anxiety associated with phobic situations by using various relaxation techniques, such as breathing exercises or meditation.

Source: compiled by the author.

3.2. *The use of VR in the treatment of PTSD*

The use of VR in the treatment of PTSD is a promising and innovative approach that can help patients overcome the effects of traumatic events

and improve their quality of life (van Loenen et al., 2022). PTSD is a serious mental disorder that occurs as a result of a person's exposure to severe or stressful events, such as war, disasters, or violence. One of the main ways VR is used in the treatment of PTSD is through the use of virtual scenarios that recreate the situations that caused the trauma. For example, veterans or individuals suffering from PTSD can be exposed to simulated military operations or other stressful events in a virtual environment. This allows them to re-experience and gradually adapt to dangerous situations in a safe environment, under the supervision of a therapist (Smashna, 2023).

VR therapy is particularly promising in treating PTSD since it exceeds the constraints of conventional talk therapy. VR-based therapies have the potential to provide patients with a profoundly embodied experience, in contrast to traditional methods that mostly focus on verbal processing of trauma-related memories. VR treatment can elicit a more visceral and profound reaction by immersing patients in simulated environments that mirror the emotional and sensory aspects of their trauma. Instead of only addressing their terrible recollections intellectually, patients can simultaneously feel the physical and psychological effects of them. This embodied aspect of VR-based PTSD treatment may play a significant role in assisting patients in processing and overcoming their trauma in a way that improves their quality of life overall and their symptoms more significantly (Nazar, 2024).

The benefit of using VR in the treatment of PTSD is that this approach allows patients to effectively process their traumatic experiences and reduces the risk of renewed anxiety and stress in real-life situations (Eshuis et al., 2021). In addition, virtual scenarios can be customized and personalized to meet the specific needs and experiences of each patient. However, there are some drawbacks to using VR in the treatment of PTSD. Firstly, the specialized hardware and software required can be expensive and require specialized skills to use. In addition, not all patients may be ready or feel uncomfortable using VR, especially if they have problems with vision or motor skills (Latka et al., 2019). It is also important to keep in mind that virtual environments may not fully replicate reality, which can limit the effectiveness of therapy. Some patients may feel alienated or distant from VR, which may affect their response to the therapeutic process. So, while the use of VR in the treatment of PTSD has its advantages, including the possibility of effective recovery and processing of traumatic events, it is important to consider the disadvantages of this approach and carefully evaluate it according to the needs and capabilities of each individual patient.

Some studies showed a statistically significant reduction in PTSD symptoms in patients treated with VR compared to other therapies (Pellicano, 2023). For example, Folke et al. (2023) conducted a study to examine the feasibility of the BraveMind VR exposure therapy for non-U. S. military veterans. There were ten sessions in the treatment, after which significant increases in quality of life were observed, along with a significant decrease in self-reported PTSD. One of the well-known software products used to treat PTSD is Virtual Iraq. In this programme, veterans and military personnel suffering from PTSD can drive military vehicles in a virtually recreated environment that reflects the reality of combat situations in Iraq, Afghanistan, and the United States. Using a joystick and other control devices, patients can interact with this environment and observe changes on the display (Gonçalves et al., 2012).

Brian Peach, a professor at the University of Central Florida's College of Nursing, has developed an innovative VR program designed to help patients overcome PTSD caused by stressful hospital stays (Binette, 2023). This VR program meticulously recreates the intensive care units (ICUs) environment, including the sights, sounds, and even the smells of the hospital. Patients use a VR headset to recount traumatic events in a simulated hospital room, with the room customized to mimic the patient's experiences. This takes place under control of their therapist. The goal is to help patients desensitise to the triggers associated with their hospital stay, ultimately reducing anxiety and fear that may linger long after discharge. Another example is XRHealth which has developed an innovative VR platform specifically designed to address mental health challenges (XRHealth, 2024). Their VR technology is used to create immersive, therapeutic environments that can help manage and treat a wide range of mental health conditions, including anxiety, depression, phobias, and trauma. The platform offers over 140 different VR environments, providing personalized and engaging experiences tailored to each patient's needs.

Table 3
Main techniques used in the treatment of PTSD using VR.

No.	Techniques	Description
1	Exposition	The patient is introduced to a virtual environment that reproduces scenes or situations that cause stress or traumatic memories. It can be a simulation of combat operations, military operations, accidents or other events related to the traumatic experience.
2	Gradual desensitization	Exposure to traumatic stimuli is carried out gradually, starting with less intense scenarios, and gradually moving to more intense ones. This helps the patient gradually adapt and get used to stressful situations.
3	CBT	VR can be combined with CBT, allowing the patient to reevaluate and reformulate their thoughts and beliefs about the traumatic experience.
4	Therapeutic recovery	The use of VR can help the patient create new, positive memories and experiences that contribute to the therapeutic recovery process.
5	Meditation and relaxation	Special meditation and relaxation programs can be used in the virtual environment to help patients reduce stress and anxiety.

Source: compiled by the author.

VR treatment for PTSD includes a variety of techniques aimed at reducing symptoms and facilitating adaptation to traumatic experiences (Table 3). These techniques aim to help patients focus on their emotions, reduce anxiety and stress, and develop strategies to cope with their traumatic experience.

These techniques can be used separately or in combination with other therapies to provide a more effective and individualized approach to the treatment of PTSD using VR.

In general, it should be noted that the treatment of phobias and PTSD using cognitive behavioural therapy and exposure therapy has been proven to be effective, leading to an improvement in the quality of life of patients. The use of VR in these therapies opens the door to new possibilities, providing safe exposure to stressful situations and an individualized approach to each patient. The benefits of using VR include safe exposure and the ability to create realistic simulations of stressful scenarios. However, possible disadvantages, such as the possibility of discomfort and limited availability of the necessary equipment, should be taken into account. In the treatment of PTSD, VR also allows the use of various techniques, helping to alleviate symptoms and improve the quality of life of patients.

4. Discussion

The treatment of phobias and PTSD using cognitive behavioural therapy and exposure therapy is an effective method that can improve the quality of life of patients. The use of VR for treatment purposes opens up new opportunities for safe exposure to stressful stimuli and facilitates an individualized approach. The advantages of using VR include safe exposure and the ability to create realistic simulations of stressful situations, but possible disadvantages such as discomfort and limited availability of equipment should be taken into account. In the treatment of PTSD, VR also allows for the application of various techniques, helping to alleviate symptoms and improve the quality of life of patients. Studying the positions of scientists who have researched this issue and comparing their findings with the results obtained in this paper can add significant context and broaden understanding of the problem. Comparing and analysing different approaches and research results will help to identify consensus points, discrepancies and possible limitations

of previous studies. Such an approach will help to identify the strengths and weaknesses of different methodologies and establish which aspects of the problem have already been studied and which still require attention and further research.

In their own study, Mayer et al. (2022) examined the effectiveness of using VR to treat claustrophobia. They note that for successful treatment, it is important to consider changing the intensity of stimuli, adding complex signals to trigger anxiety, and creating a realistic sense of intimacy with the help of virtual characters. Researchers also point out that some fears can be linked to symptoms of social phobia or agoraphobia, which should be taken into account when developing a VR programme. Some patients may benefit from the physical presence of a therapist, although opinions differ on this. To provide effective help with specific anxiety symptoms, researchers recommend using a higher level of difficulty in a VR programme. This is especially important when engaging patients with claustrophobia. Compared to the results of this study, there are similarities in the approaches to using VR to treat phobias. Both studies point to the need for an individual approach to patients and consideration of their specific needs and anxiety symptoms.

The study conducted by Jin et al. (2023) focused on investigating people's interest in using VR technology in psychological interventions. This study revealed a significant interest among individuals in using VR as a tool for treating psychological problems. Advanced technologies in the field of VR provide new opportunities for the development of psychotherapeutic approaches, the researchers note. Scientists point to the potential for VR to be used as an effective tool for treating various psychological problems, such as anxiety, phobias, and depression, which indicates a potential market for VR in psychiatric and psychotherapeutic practice. However, it is also important to consider the possible side effects of using VR in the treatment of psychological problems, as some patients may experience discomfort or even worsening of symptoms due to immersive virtual environments. It is also important to consider the cost and accessibility of the technology, as it may be limited for some patient groups.

PTSD is the result of direct experience, observation, or repeated exposure to negative events such as violence, trauma, or death, according to Kothgassner et al. (2019). The researchers emphasize that although many people show resilience after traumatic events, up to a third may develop PTSD with clinically significant symptoms such as replaying traumatic experiences, avoidance, hyperarousal, and changes in mood and cognitive function. Research conducted by scientists confirms that VR can be as effective as traditional methods in the treatment of PTSD. According to the researchers, VR provides the ability to emulate real-life situations, which can be especially useful for PTSD patients who may find themselves in stressful situations caused by even the smallest triggers, allowing them to gradually get used to stressful stimuli, processing negative associations and reducing anxiety. One of the key benefits of using VR, according to the researchers, is that it can create a controlled environment where patients can gradually experience stress and learn to effectively cope with their symptoms, which creates the possibility of individualized treatment where therapists can tailor VR sessions to the needs of each patient. Scientists emphasize that VR can also reduce the limitations associated with conventional treatments, such as limited access to real-life situations or high costs of simulations. Thus, according to the researchers, VR can become a more accessible and effective means of treating PTSD. In comparison to the results of this study, it should be noted that the use of VR may have its advantages and limitations, in particular, the feeling of discomfort or unpleasantness when using VR technology may be a problem for some patients. It is also important to consider the need to establish the technical infrastructure and skills to conduct VR sessions. However, given the potential benefits, the use of VR in the treatment of PTSD is a promising area of research and could bring significant benefits to patients suffering from this disorder.

In the fight against PTSD, various methods, both pharmacological and psychological, are used to alleviate the symptoms associated with this disorder, as noted in the study by Deng et al. (2019). However, according to scientists, traditional methods of treating PTSD have their drawbacks, including the difficulty of fully immersing oneself in a traumatic scene and performing exposure therapy. The researchers note that VR can significantly reduce the symptoms of PTSD, confirming the success of this approach in the treatment of PTSD. Compared to the results of this study, it can be noted that the use of VR does have potential in the treatment of PTSD. Studies conducted in the field of VR in the treatment of phobias and PTSD show the significant potential of this technology to improve the effectiveness and accessibility of psychotherapeutic approaches. Scientists are exploring the possibilities of using VR to create controlled environments where patients can experience stress and learn to effectively cope with their symptoms. This allows individualizing therapy sessions and adapting them to the needs of each patient.

One of the key benefits of using VR is the ability to emulate real-life situations, which helps patients gradually get used to stressful stimuli and reduce anxiety. Virtual technologies can also reduce the limitations associated with conventional therapies, providing more accessible and effective treatment for patients. However, it is important to consider the possible side effects of VR, such as discomfort or worsening of symptoms in some patients. In addition, the successful application of this technology requires the establishment of a technical infrastructure and consideration of individual patient characteristics. It is worth noting that the use of VR in psychotherapy can have significant potential to improve the treatment outcomes of patients with phobias and PTSD. VR technologies open up new possibilities for individualized and effective treatment, but further research and development of this field is important in order to optimize outcomes and maximize the potential of this innovative psychotherapeutic strategy.

The study of the impact of VR in the treatment of phobias and PTSD requires an analysis of the psychological mechanisms behind these disorders. This opens up prospects for innovative approaches to psychotherapy that require more research to understand their potential benefits and limitations. Particular attention should be paid to considering the impact of VR on the treatment of PTSD, in order to identify its effectiveness and possible limitations. In general, further research on the impact of VR in the treatment of phobias and PTSD is important for improving clinical methods and increasing the effectiveness of treatment.

5. Conclusions

Treating mental disorders such as phobias and PTSD plays an important role in improving people's quality of life. Cognitive behavioural therapy and exposure therapy are the main treatments for these disorders, which aim to identify and reassess negative thoughts and beliefs, and to systematically confront phobic situations or traumatic memories in order to reduce fear and anxiety. These techniques can help patients improve functioning in daily life and reduce suffering, contributing to overall health and well-being.

The use of VR in the treatment of mental disorders, such as phobias and PTSD, opens up new opportunities for safe and effective exposure to stressful stimuli. The approaches to using VR for treatment purposes can vary, but their main goal is to create conditions for controlled and individualized exposure of patients to phobic objects or traumatic memories. The benefits of using VR in the treatment of mental disorders include safe exposure, an individualized approach to treatment, and the ability to create realistic simulations of stressful situations. However, potential disadvantages such as discomfort for some patients and the limited availability and cost of VR equipment should be taken into account. The use of VR in the treatment of phobias allows patients to

gradually get used to phobic stimuli and change their negative perceptions and reactions to them. Techniques such as exposure, gradual desensitization, appropriate support, positive reinforcement, and coping skills practice can be effective in treating phobias using VR. Despite its potential drawbacks, the use of VR in psychotherapy opens up new perspectives for improving the outcomes of mental disorders, contributing to the improvement of patients' quality of life and their functioning in everyday life.

The use of VR in the treatment of PTSD has significant potential. It allows for a variety of techniques, such as exposure, gradual desensitization, cognitive behavioural therapy, therapeutic restoration, meditation, and relaxation. These approaches are aimed at alleviating PTSD symptoms and improving patients' quality of life by creating a safe environment for them to work through their trauma and stress. In the future, researchers should pay attention to studying the safety and ethical aspects of using VR in the treatment of PTSD, including data privacy and possible side effects.

CRediT authorship contribution statement

Liana Spytska: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The author declares that she has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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