

# The impact of Virtual Reality (VR) therapy and its modifications in mental health nursing services: A scoping review

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## You Have to Know!

1. Virtual Reality Therapy have an impact on mental health
2. Modifications made in Virtual Reality Therapy in the treatment of mental disorders

## Abstract

**Introduction:** The development of technology to improve effective, efficient, and comprehensive mental health care services have now been carried out, one of which is the development of Virtual Reality Therapy (VR) in mental health services to achieve optimal health by creating the illusion of living in virtual reality. This article aimed to find out the application of technology-based Virtual Reality Therapy (VR) in mental health care services and modifications that might be made by reviewing the existing limitations. **Methods:** A scoping review was written based on identifying scientific articles in three databases, namely Science Direct, Pubmed NCBI, and Proquest, using the terms Virtual Reality Therapy, Mental Health, and Nursing. The author carried out the selection and analysis process using PRISMA based on the inclusion and exclusion criteria determined by the researcher, and a total of 15 articles were analyzed. **Results:** The use of technology-based Virtual Reality Therapy in psychiatric nursing has been shown to have a positive impact on the condition of psychological health problems, including reducing anxiety, changing moods, emotions, empathy, reducing stress, loneliness. Therapy delivery system and allows for program modifications. **Conclusion:** Virtual Reality Therapy has a positive impact on improving one's mental health. It is necessary to develop modifications in VR implementation to achieve optimal physical and psychological health

**Keyword:** mental health, modification, treatment, virtual reality therapy

## How to Cite:

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## 1. INTRODUCTION

Technological development is growing rapidly at this time, where the interaction between software and humans is a separate phenomenon, one of which is Virtual Reality (VR) technology. VR is a technology where application users can interact with an environment built with computer graphics/computer-simulated environment.<sup>1</sup> The use of VR technology can provide an experience in which the

user feels like being in an artificial environment that has been developed. VR technology can be used in various fields such as health, military, education, and entertainment. In the health sector, VR technology is used to assist medical personnel in studying the anatomical system of the human body.<sup>2</sup>

VR technology will provide a new experience for users where users can interact directly with virtual objects. Through the new experiences gained by users, it is hoped that the information conveyed can

be more informative and interactive by using this technology. The application of Virtual Reality Therapy (VRT) has been widely used in health, including in mental health services. Virtual Reality Therapy is a form of therapy it's shows solutions to problems or creates the illusion of living in virtual reality.<sup>3</sup> Research conducted by Martono (2020) in the case of children with autism showed that by implementing Virtual Reality Therapy Technology through images on the fulfillment of self-care and positive results, children with autism could perform self-care independently.<sup>2</sup> In addition, in certain cases, such as mental disorders in young adults, VRT has a positive impact.<sup>3</sup>

## 2. METHODS

A comprehensive scoping review was conducted to retrieve articles discussing the impact of Virtual Reality Therapy (VR) in Mental Health Care Services, sourced from the Science Direct, Pubmed NCBI, and Proquest databases. The search for scientific articles is limited according to the following inclusion criteria: articles published online for the last five years (2015-2020), studies related to the impact of implementing Virtual Reality Therapy (VR) in Mental Health Care Services, articles in the form of full-text scientific literature reviews and original research. The data-based reputable literature search was reviewed systematically to obtain empirical evidence. The search used a combination of keywords using the BOOLEAN method, namely Virtual Reality Therapy And Mental Health And Nursing, to get related articles that fit the purpose. Critical evaluation through systematic reviews and PRISMA meta-analysis flowcharts to select scientific literature found from the database to be adapted to the objectives is shown in Figure 1. This study was written based on 15 articles from a previously identified database, shown in table 1.

## 3. RESULTS

Technological advances are currently developing so rapidly, including having a positive impact in helping the activities and work of health workers in providing health care services, especially in mental health care.

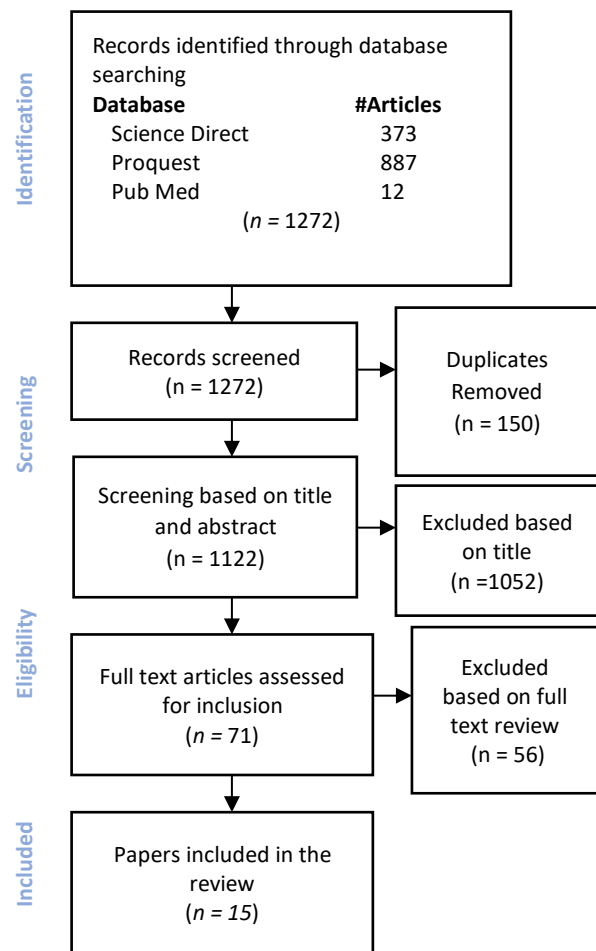


Figure 1. Reporting items for study flow diagram

The use of technology-based Virtual Reality Therapy in psychiatric nursing has been shown to have a positive impact on psychological conditions, including reducing anxiety, changing mood, emotional, empathy, reducing stress, loneliness and improving relationship quality, pathological sadness, as well as exploring negative experiences to the level required for needs.

Specific therapeutic agent to affect the pain felt by the body. Virtual Reality Therapy is inseparable from several limitations and constraints, such as the implementation system of therapy and the possibility of modifying the program in VR. Virtual reality modifications in health services have been widely carried out, including augmented virtual reality applications that help the medical team quickly provide suggestions and change the patient's mindset in a more positive direction and other modifications such as Virtual Reality Exposure (VRE).

**Table 1.** Summary of selected articles (n=15)

No	Author & Years	Results
1	Zhang C, et al. (2020)	VR therapy given to spinal cord injury rehabilitation patients has a positive impact on the patient's mood and emotions.
2	Wu Y, et al. (2020)	The application of VR therapy to caregivers of dementia patients effectively grows empathy, reduces stress, loneliness, and improves the quality of relationships. It is necessary to evaluate and develop scenarios for treatment.
3	Schlegl S, et al. (2020)	The use of game-based VR in rehabilitation can improve physical and mental health and train one's cognitive. It is hoped that this therapy can increase enthusiasm and motivation between the therapist and patient during the rehabilitation process. The therapist can detect whether the patient is doing the exercise correctly, and there is a feedback warning. The therapist will receive complete information about how the patient performs during the rehabilitation exercise.
4	Tieri G, et al. (2018)	VR is not effective in changing the medication adherence of mental disorder patients.
5	Branquinho C, et al. (2020)	Stress Management Program based on VR DE-STRESS Technology, it is necessary to evaluate the intervention's sustainability further.
6	Thompson NJ, et al. (2018)	Use VR technology to support psychological treatment programs for the treatment of PTSD, Adjustment Disorder, and pathological grief, and explore negative experiences to the extent necessary for specific therapeutic needs.
7	Cherry KE, et al. (2017)	VR can potentially change the assessment, understanding, and treatment of mental health issues. VR's ability to simulate reality can significantly improve access to psychological therapy, while treatment outcomes can be improved with technology.
8	Maples-Keller JL, et al. (2017)	VR is a viable tool to assist treatment and the most powerful for use in therapeutic exposure for patients with anxiety disorders, exposure to therapeutic cues for patients with substance use disorders.
9	Deng W, et al. (2019)	Virtual reality exposure therapy (VRET) can reduce symptoms of anxiety.
10	Liang L, et al. (2020)	There were differences between VRET and active interventions in reducing PTSD and depression symptoms.
11	Wechsler TF, et al. (2019)	Both VR and in vivo applications produce large effect sizes regarding fear/phobia reduction.
12	Rogowska AM, et al. (2020)	VR is applied to delivering cognitive rehabilitation, social skills training interventions, and assisted therapy for virtual reality psychotic disorders.
13	Saurabh K, et al. (2020)	VR has a positive impact on individuals' physiological, psychological, and rehabilitation outcomes compared to traditional treatment. Exercise can effectively relieve fatigue, reduce depression tendencies and increase Health-Related Quality of Life.
14	Rogowska AM, et al. (2020)	The potential of VR to examine paranoid ideas, anomalous experiences, self-confidence, self-comparison, physiological and behavioral activation.
15	Heydarpour S, et al. (2019)	Relaxation using VR technology and hypnotism in girls with PMS relieves physical and psychological symptoms.

#### 4. DISCUSSION

Various efforts to develop technology in the implementation of health care have been carried out. The use of Virtual Reality Therapy in mental health care has encountered several obstacles, including implementing activities and the sustainability of therapy. Ideally, VR is carried out in 3 sessions with 20 minutes of each session for three consecutive days.<sup>4</sup>

Several modifications have been made in the implementation of Virtual Reality Therapy, including;

- a. Head-Mounted Display (HMD), a device consisting of two small screens and following the movement of the head as transmitted via audio. The latest modified HMD has been equipped with external sensors that can track incoming hands and a good level of interaction.<sup>4</sup> This device uses a high-resolution Powerwall display, 3D glass, and visual effects in combination with an ultrasonic system. Four infrared capture cameras can display high-resolution 3D images according to the patient's viewing angle and interaction process.<sup>4</sup>
- b. The cavernous Automatic Virtual Environment (CAVE) is in a rectangular or hexagonal room with a 3D glass screen. This environment allows images to enter directly into the patient's perspective. Audio in the room uses speakers.<sup>4</sup>
- c. Augmented Reality (AR) is the latest development in computer technology which is almost the same as VR. AR allows the user to see the real world, because of composed of a display HMD equipped with a sensing device and a camera. The virtual image display that appears is equipped with the addition of objects, specific location information and the natural environment according to user needs. Augmented virtual reality applications are beneficial for the medical team quickly in providing suggestions and changing the patient's mindset in a more positive direction.<sup>5</sup>
- d. Another program of VR that can be implemented is the individual-based VR DE-STRESS for individuals with mood disorders. This program is carried out for 1 hour and 3 times a day. Each session in this program consists of psychoeducation and livelihood practices. The psychoeducation provided consists of stress management, mood disorders, positive thinking, and relaxation techniques. After being given education, participants practice abdominal breathing, progressive muscle

relaxation, and imagination as shown in the video. In the case of anxiety, Virtual reality shows a clinically significant improvement compared to patients who do not use virtual reality, where the emphasis on the virtual world towards the patient must be as relaxed as possible to relieve existing anxiety. This virtual tool is very applicable to make patients relax from all kinds of anxiety.<sup>6</sup>

- e. Virtual Reality Exposure (VRE) programs allow the manipulation of exposures in ways that may not be possible in vivo. VRE also controls the implementation of actions taken such as dose and exposure to the environment according to the stressor the patient feels. It is visualized virtually in patients with symptoms of depression or PTSD. There was a decrease in PTSD symptoms after treatment with exposure therapy. VRE can also be delivered because it is a safe and promising treatment for PTSD with sexual trauma.<sup>3</sup> Such trauma has also been associated with adverse mental health effects, including an increased risk of depression, PTSD substance abuse, and PTSD symptoms.<sup>7,8</sup> Based on the results of a study conducted on 150 phobic patients showed that VR exposure was 3% lower than in vivo as much as 27%. A total of 17 patients evaluated if VR-based therapy was better.<sup>9</sup> In addition, there was a VR program with hypnotherapy.<sup>9,10</sup>

Prolonged and habitual exposure therapy is very effective in treating PTSD, and several studies have also shown a positive impact on victims of sexual assault, showing a reduction in symptoms. VRE has also shown an impact in some anxiety disorders and PTSD in various types of trauma. Several respondents received VRE treatment and reported high satisfaction with this approach.<sup>11</sup> The advantage of virtual reality exposure therapy (VRET) is that it reduces drug use for patients with anxiety who experience fear of cyberspace. The negative impact may be that future treatment is not recommended.<sup>12</sup>

The emotional theory explains that the effects of exposure therapy are beneficial for patients who experience fear and lack of information. The emotional theory explains that exposure therapy is beneficial for patients who experience fear and lack of information. Lang (1979 in Gropalis et al 2018) defines the structure of fear related to information, namely: information about the feared situation, information from the stimulus, and response.<sup>13</sup> In patients with anxiety, the stimulus that is usually

feared is related to differences in the information received such as cancer, medical examinations, and symptoms that appear, physiological responses, autonomic nervous reactions. Interpretive information comes from the emergence of fear or concern about disease. The behavioral response that appears is avoidance behavior, this response appears when the patient's memory recalls information about the situation that was feared.<sup>5</sup>

## 5. CONCLUSION

VR has a positive impact on improving one's mental health. It is necessary to develop modifications in VR implementation in the provision of care by health workers, especially mental nurses, to achieve more optimal health by combining several modifications of pre-existing therapies.

## 6. CONFLICT OF INTEREST

All authors declared there is no conflict of interest

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