Original Article

Use of Augmented reality and virtual reality in cardiac rehabilitation

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Abstract

Virtual reality (VR) and augmented reality (AR) applications benefit both health care providers and patients in cardiovascular teaching by supplementing traditional techniques.VR/AR has already been utilized to treat patients in rehabilitation programmers and in intensive care patients who are immobilized. In the catheterization laboratory, there are a slew of other possibilities.The ultimate goal of AR and VR display development is to provide reality-like, crystal-clear visuals that can imitate, integrate into, or rebuild the surrounding environment while avoiding discomfort.Virtual reality has become a novel approach to improving the efficacy of medical treatment intervention as a result of improvements in computer technology. Cardiopulmonary rehabilitation has long been considered a necessary treatment for people who have survived heart attacks or strokes. The goal of this review is to outline the existing and future role of virtual reality and augmented reality in many sectors of cardiology, as well as their problems and perspectives.

Keywords: Augmented reality, virtual reality, cardiovascular care, imaging, virtual reality exercise, anxiety and stress, cardiac rehabilitation, depression, executive function, quality of life, ischemic heart disease, physical exercise, video consoles, video games, psychosomatic disorders, sympathetic nervous system, virtual reality exposure therapy, coronary heart disease.

INTRODUCTION

Virtual reality (VR) and augmented reality (AR) applications benefit both health care providers and patients in cardiovascular teaching by supplementing traditional techniques.VR/AR has already been utilized to treat patients in rehabilitation programmers and in intensive care patients who are immobilized.1The ultimate goal of AR and VR display development is to provide reality-like, crystal-clear visuals that can imitate, integrate into, or rebuild the surrounding environment while avoiding discomfort.2Virtual reality (VR) displays, which effectively extend the field of view (FOV), block the entire ambient, and provide an immersive virtual environment independent of the user's real surroundings, are at one end of the range.The augmented reality (AR) display, on the other hand, not only aims for high-quality see-through performance but also enriches the real world by overlaying digital content.Virtual reality has become a novel approach to improving the efficacy of medical treatment intervention as a result of improvements in computer technology.3AR and VR displays have the potential to initiate useful applications, such as health care, education, engineering design, manufacturing, retail, and entertainment.Cardiovascular disease (CVD) is the major cause of death, disability, and disease burden in the developed world, including all heart and vascular diseases. According to several research,Depression and anxiety symptoms are among the psychological components linked to the development of CVDs.4The efficiency of cardiac rehabilitation can be affected by depression and anxiety (CR). Cardiopulmonary rehabilitation has long been considered a necessary treatment for people who have survived heart attacks or strokes. Several research have looked into the efficacy of virtual reality (VR)-based therapy for anxiety and depression symptoms. VR therapy stimulates the visual, auditory, and kinesthetic senses intensely.5In the Virtual Therapeutic Garden, based on the Ericksonian treatment technique, there is a broad range of symbolsand metaphors.The metaphor of the garden, which begins fragile and drab but grows more bright and lively with each session, represents the process of restoring energy and endurance.6In CAD patients undergoing outpatient CR, VR therapy dramatically reduced the intensity of depressive symptoms, anxiety, and stress levels.Individuals with anxiety depression symptoms benefit from immersive VR therapy in terms of CR.7Total immersion in a Virtual Therapeutic Garden is beneficialto cardiac patients.However, due of the tedious

nature of endurance training, participantscommitment to and optimal efficacy of cardiac rehabilitation are frequently hampered.The goal of this review is to outline the existing and future role of virtual reality and augmented reality in many sectors of cardiology, as well as their problems and perspectives.8-18

Review

1)Immersive Virtual Reality Therapy as a Support for Cardiac Rehabilitation: A Pilot Randomized-Controlled Trial august 2021studied the efficiency of cardiac rehabilitation can be affected by depression and anxiety (CR).The goal of this study was to see how VR therapy affected patients with coronary artery disease's emotional state (CAD).Thirty-four CAD patients with chronic anxiety or depression were recruited for the study.17 participants were assigned to the intervention group and 17 to the control group after randomization.Eight VR therapy sessions were used in the intervention group.In CAD patients who received CR, VR therapy significantly reduced the intensity of depressive symptoms, anxiety, and stress levels. Individuals with anxiety-depressive symptoms benefit from immersive VR therapy in terms of CR.19-28

2)Virtual reality and video games in cardiac rehabilitation programs. Feb 2019 studies to see how a six-month home-based phase III cardiac rehabilitation (CR) specific exercise plan, done in a virtual reality (Kinect) or traditional (booklet) environment, affected executive function, quality of life, depression, anxiety, and stress in patients with coronary artery disease.The virtual reality format improved selective attention and conflict resolution ability, demonstrating the impact of CR on executive function, particularly when combined with virtual reality training.In cardiac rehabilitation, it is important to develop and to present alternative strategies, as virtual reality using the Kinect in a home context.Considering the link between physical activity and improved mental function,it's important to find out how a cardiac rehabilitation programmed affects executive function.29-37

Conclusion

The use of virtual reality and videogames could be considered as complementary tools of physical training in patients with cardiovascular diseases in the different phases of cardiac rehabilitation.Immersive VR therapy effectively supports the CR of individuals with anxiety depressive symptoms. Cardiac patients gain benefits from total immersion in a Virtual Therapeutic Garden.

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