



A Mini Review on Effect of Virtual Reality on Psychological Wellbeing.

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Abstract:

Virtual Reality is a computer generated environment in which is experienced by the individual using displays, head mounted devices, additions virtual inputs are delivered using speakers headphone, and force feedback devices. Virtual reality is used in rehabilitation and psychological wellbeing. various psychological disorders such as depression, anxiety, attention deficit hyperactive disorder (ADHD), post traumatic stress disorder (PTSD), job induced stress such psychological conditions many times remain undiagnosed which in long run have adverse effect on individuals mental and physical well being many times such conditions lead to myogenic pain which is hard to treat such conditions such as phantom limb pain, bruxism, cognitive disorder, co-ordination and balance impairment in individuals suffering from parkinsonism and certain life threatening conditions like cancer which are challenging for an medical professionals to treatment. Affection of Temporomandibular joint is a serious condition as this joint is involved in various daily activities like chewing, swallowing, breathing and communication, etc, and almost 15-20% of individuals in the age 20-40 suffer from Temporomandibular joint pain. so aim of the review is to check the effectiveness of various conditions having direct influence of individual psychological wellbeing. Results various evidences are available on the for conditions like post stroke cognitive impairment, balance and gait training in parkinsonism patient, and lacking higher level incidences is lacking in chronic cancer patient and individuals with phantom limb pain. We have fund no literature associated for rehabilitation of Temporomandibular joint using virtual reality. We conclude that more researched should be done on the effect of virtual reality in chronic cancer patient and temporomandibular joint pain.

Keywords: Virtual Reality, Psychological Disorders, Rehabilitation, Temporomandibular joint, Review Article.



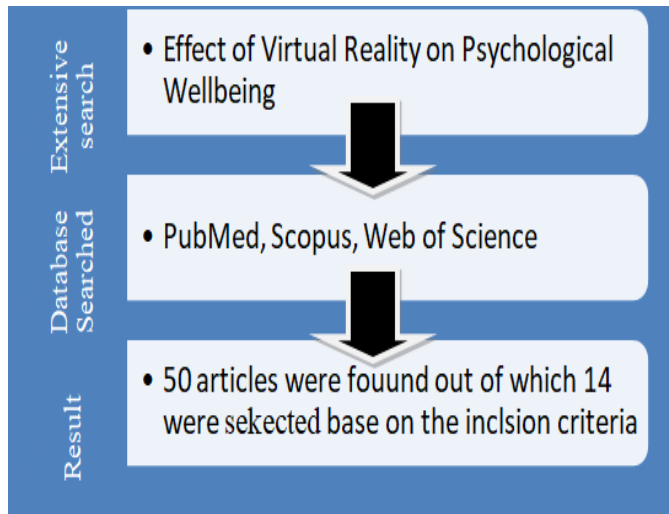
Introduction

Virtual reality is a computer generated 3D reality using visual auditory, and tactile feedback virtual reality has proven to be effective in treatment in various conditions like stroke, parkinsonism, cognitive rehabilitation and psychological wellbeing in various life threatening medical condition[1]. Virtual Reality is a user ready training tool for clinical application in various medical conditions along with physical therapy and medical therapy for reducing pain, re educating patient and restoring normal functioning. The increasing availability and affordability of the VR based treatment have showed improvement in overall response of the individuals[2].

Temporomandibular joint is a synovial joint between the temporal bone and mandible, for proper mouth opening and closing both left and right Temporomandibular joint must work together for proper harmony, the causes Temporomandibular joint dysfunction(TMJ) are due to excessive mechanical stress on the TMJ which are due to certain stress induced disorders of TMJ which include Bruxism which means excessive clenching of the teeth and oral parafunctional habits in daily life such as smoking, tobacco chewing which leads to irreversible damage in the joint tissue[3]. A study conducted in year 2019 assessed the relation between the work induced stress and Temporomandibular joint dysfunction led to an assumption stating excessive mental stress at work place is related to TMJ dysfunction[4]. a study conducted in 2021 which reveled 50% positive association between stress and TMD across various job categories and TMJ clicking was significant in musicians, other review asses the relation between the sleep quality and Temporomandibular joint dysfunction which reveled positive relation between poor sleep quality and Temporomandibular joint dysfunction [5,6]. Further study revealed that a good portion of individual suffering from TMD were depressed and experienced moderate to severe somatization[8]. The aim of the review is to assess the role of virtual reality in temporomandibular joint dysfunction.

Methodology:

A extensive search was carried out in from the database like Pubmed, Scopus, Cochrane and Web of Science. Using the keywords “Virtual Reality”, “Rehabilitation”, “Physical Therapy”, the articles from year 2017 to 2022 related to physical therapy and rehabilitation were included and analyzed. The inclusion criteria was based on Virtual Reality, psychological wellbeing, Higher functions, Clinical Trials, after the year 2017.



Virtual Reality

Virtual Reality is a computer generated interactive environment using which the individuals can repeatedly experience certain situation and teach the individual to how to react or train for certain sports. Which enables the user to navigate through the virtual world? The virtually created world is displayed using stereoscopic displays and other sensory inputs are obtained using headphones and speakers and various advanced technique use haptic inputs to provide tactile experience known as force feedback[9]. There are wide variety of devices which can be used such as oculus, kinect, leap motion sensor, haptic gloves etc. which are helpful in rehabilitation post surgery kinect is useful in wrist rehabilitation post distal radius fracture, oculus is useful in preventing work related burnout which in turn may lead to work place violence, theft, poor productivity[10,11]

Virtual Reality and Mental Disorder:

Mental health problems are inseparable from the environment, using VR the individual can be made to experience the same situation using computer generated reality and the individual can be trained for further exposure, virtual reality can be used for various psychological therapies which reduce the stress in turn reducing the mental stress[10]. Immersive virtual reality is identified as a revolutionary tool for treating mental disorders such as depression, anxiety, PTSD, de-addiction from gambling, smoking and various other injurious habits[12–15]. Exposure therapy in anxiety disorders and post traumatic stress disorder, addiction, eating disorder and ADHD[16].



One study published in year 2017 on the management of pain and anxiety in children during vaccination or any medical procedure the application of virtual reality to involve children in games and distracting them from the procedure has shown reduced pain in the children[17]. A Review was conducted in year 2017 to assess the impact of VR on phobia and post traumatic stress the authors stated that the virtual reality has been used for the psychiatric treatment for anxiety disorders, phobia and post traumatic stress by virtually creating the environment as training the individual to tackle the situations[18] .

Virtual Reality in Parkinson’s Disease:

A single blinded randomized control trial was conducted on the effect of VR on balance and gait parameters in the individuals with parkinson’s disease. 28 samples were divided into two groups one group received VR training and the control group received conventional physical therapy the outcomes used in the study were Berg balance scale, Timed Up and Go Test, the duration of the intervention was 12 weeks the result at the end of the 12 week suggest that VR rehabilitation group has showed more positive result as compared to conventional physical therapy in individuals with parkinsonis Disease[19]

Virtual Reality in Cognitive Functions in Stroke:

A review conducted in the year 2019 by maria grazia maggio et al. the aim of the review was to assess the efficiency c of virtual reality based tools for cognitive rehabilitation in individuals suffering from stroke. The review included studies conducted from year 2010 to 2017 and the database used were OPubmed, Scopus, Cochrane and Web of Science and keywords used by the author were “VR”, “Rehabilitation” and “stroke” the authors concluded that the virtual reality is effected in improving cognitive functions such as visual-spatial abilities speech and attention and memory skills, post rehabilitation in individuals with stroke[20].

Virtual Reality in Cancer patient:

A meta analysis was done in year 2019 assessed health related outcomes in the patients with cancer the articles were included from year 2013 to 2019 which revealed virtual reality is effective tools for rehabilitation in cancer in the acute stages when the individual is suffering from stress anxiety depression and pain while in the chronic stages the effect of VR is yet to be proved[21].

Virtual Reality and Phantom Limb Pain:



Phantom limb pain is a commonest complaints in individuals who has undergone amputation various available treatment strategies include mirror therapy, proprioceptive training. A review was conducted by Dunn et, al. to see the effect of VR in phantom limb pain they result depicted various case studies and case serie are published showing the effect of the VR in Phantom limb pain but no higher evidence studies are present to show the effectiveness[22].

Discussion and Conclusion:

Virtual reality is useful tool in reducing anxiety, depression, PTSD and various psychological condition which sometimes lead to myogenic pain and cannot be diagnosed easily, so virtual reality along with medical therapy and physical therapy such multidisciplinary approach will show significant positive results in reducing pain and improving overall condition of the individual. Virtual reality also plays a crucial role in improving the psychological wellbeing of the individuals. Whereas higher level of evidence is missing in the individuals with cancer and no literature is available of impact of VR on Temporomandibular joint pain and dysfunction.

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