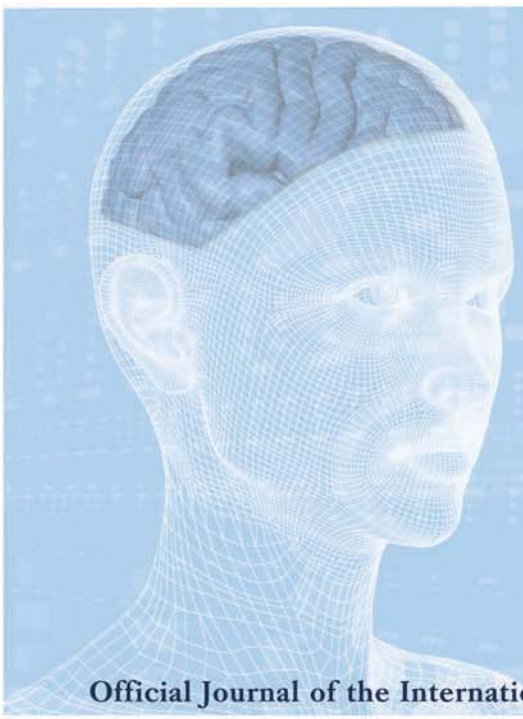
Volume 1, Issue 3, Fall 2008



JCR

Journal of CyberTherapy &Rehabilitation

Official Journal of the International Association of CyberTherapy & Rehabilitation

www.vrphobia.eu

In This Issue

THE VIRTUAL REALITY MEDICAL INSTITUTE

JCR
Journal of CyberTherapy &Rehabilitation

Journal of CyberTherapy & Rehabilitation

Fall 2008
Volume 1, Issue 3

Journal of CyberTherapy & Rehabilitation
Fall 2008, Volume 1, Issue 3

EDITORIAL

Welcome to the third issue of the Journal of CyberTherapy & Rehabilitation (JCR). This peer-reviewed academic journal continues to explore the uses of advanced technologies for therapy, training, education, prevention, and rehabilitation. JCR is a quarterly published academic journal, which focuses on the rapidly expanding worldwide trend of moving toward technological applications in healthcare. Scientific research has broadened its fields to encompass new technologies such as virtual reality, human computer interfaces, robotics, telehealth and non-manual controls. These emerging fields are helping to expand and improve the accessibility and quality of healthcare across the globe.

I would like to take this opportunity to introduce our four new Associate Editors of JCR, Professor Cristina Botella, Professor Stéphane Bouchard, Professor Luciano Gamberini, and Professor Giuseppe Riva. Professor Botella is the Chair Professor of Psychological Treatments and the Director of the Psychological Assistance Services at the Department of Basic and Clinical Psychology at Jaume I University in Castelló de la Plana, Spain. Professor Stéphane Bouchard is the Chairholder of the Canada Research Chair in clinical cyberpsychology and a professor at the Department of Psychoeducation and Psychology at the Université du Québec en Outaouais. Professor Luciano Gamberini is an Associate Professor in the Department of General Psychology at the University of Padova, Italy; and Head of the Human Technology Laboratories. Finally, Professor Giuseppe Riva is an Associate Professor at the Catholic University of Milan and the Head Researcher of the Applied Technology for Neuro-Psychology Laboratory-Istituto Auxologico Italiano in Milan, Italy.

Recently, the JCR was chosen as the official journal of the CyberTherapy Conference series. This year, CyberTherapy 14 (June 2009) will be held in Lago Maggiore, Verbania, Italy. This year's conference will continue the tradition of offering a truly unparalleled scientific event. The JCR has also gained interest from International high-level conferences on healthcare along with healthcare officials around the globe.

This issue of JCR features comprehensive articles by preeminent scholars in the field. This issue's reviews and studies include some of the most promising applications for technology in the fields of cybertherapy and rehabilitation, surveying the concepts and studies that laid the groundwork for the field up to this point. In the previous issue, the focus of the articles involved the many new and innovative expansions on cybertherapy and healthcare in more focused fields. This issue has articles covering new applications for virtual reality in the expanding fields of cybertherapy and healthcare in more focused fields. It is exciting to see the JCR progress into new aspects, applying new technology and scientific findings in our publications, to reflect the transforming field of cybertherapy.

Journal of CyberTherapy & Rehabilitation
Fall 2008, Volume 1, Issue 3

DESIGNING GAME-BASED LEARNING ACTIVITIES FOR VIRTUAL PATIENTS IN SECOND LIFE

Maria Toro-Troconis[1,2], Ulf Mellström [2], Martyn Partridge[3], Karim Meeran[3], Michael Barrett[1,4], Jenny Higham[1]

Opportunities for building learning activities around real patients have decreased and various representative simulations have become an increasingly common alternative. The use of virtual patients is one such simulation developed to support the delivery of clinical teaching. Game-based learning has been considered a new way of delivering clinical teaching that is more suited to the new generation of 'digital natives'. Online multi-user virtual environments offer rich interactive 3D collaborative spaces where users can meet and interact. This paper discusses different learning types and the virtual patients developed in Second Life that follow game-based learning approaches based on a four-dimensional framework, as well as other design considerations that look at emergent narratives and modes of representation. Attitude towards game-based learning was assessed by measuring four components, including 21 statements, each scored on a 5-point Likert scale. General recommendations on delivery of game-based learning for virtual patients in Second Life are presented.

Introduction

Medical education faces difficult challenges in the 21st century. Increasing pressure upon doctors to deliver service targets, the European Working Time Directive and changes in the way in which we deliver healthcare, coupled with higher numbers of students entering medical education, have increased the demands on academics, resulting in less time for teaching (Olson LG et al. 2005). Opportunities for building learning activities around real patients have decreased, and various forms of representative simulation, many of which use digital technology, have become an increasingly common alternative in healthcare education (Begg et al. 2005b).

The convergence of information and communication technologies has led to a rapid expansion of digital applications that support all aspects of teaching and learning in medicine (Youngblood and Dev 2005).

Many high-quality e-learning materials are being produced by medical schools and healthcare organizations (Ruiz et al. 2006). 'Virtual patients' is one of the models developed to support the delivery of clinical teaching. Healthcare students are familiar with the concept of virtual patients, as they are frequently exposed to actors performing the role of patients in clin-

Corresponding Author
Maria Toro-Troconis BSc, Dip O&H, MSc, MPhil, School of Medicine, Sir Alexander Fleming Building, Imperial College London, South Kensington campus, London SW7 2AZ, United Kingdom
+44 7594 9815
m.toro@imperial.ac.uk

1 School of Medicine, Imperial College London
2 Department of Human Work Sciences, Section of Gender, Technology and Organisation, Luleå University of Technology, Sweden
3 Department of Respiratory Medicine, NHLI Division, Imperial College London
4 Department of Investigative Medicine, Division of Investigative Science, Imperial College London
5 Department of Histopathology, Division of Investigative Science, Imperial College London

Journal of CyberTherapy & Rehabilitation
Fall 2008, Volume 1, Issue 3

COMBAT SCENARIOS AND RELAXATION TRAINING TO HARDEN MEDICS AGAINST STRESS

Melba C. Stetz[1], Chris P. Long [1], Brenda K. Wiederhold [2] and David D. Turner[1]

Virtual Reality-Stress Inoculation Training (VR-SIT) is a technique designed to mitigate the negative effects of psychological stressors. This study was designed to examine the usefulness of VR-SIT to increase levels of stress in medical military personnel. We examined the psychological stress levels in 63 participants that were either in a group to practice combat medical skills with virtual scenarios only, or practicing relaxation techniques only, both, or neither. We observed higher levels of hostility in the VR group than in the rest. Also, those practicing relaxation techniques while exposed to the VR games showed higher levels of sensation-seeking. Interestingly, further analyses showed higher levels of both anxiety and dysphoria in those previously deployed that participated either in the VR or the relaxation group. Our results suggest that exposure to VR scenarios where to practice medical skills is a promising way to prepare warfighters for combat stress.

Introduction

Warfighters face stressors such as uncertainty, long work hours, sleep deprivation, information overload, risk of death or disease, etc. (Campbell, Ritzer, Valentine, & Gifford 1998; Lukey, Stetz, & Romano, 2005). Stetz et al. (2005) found that in 2003 (n = 5,671), stress and depression were the main reasons why 7% of warfighters during Operation Enduring Freedom (OEF) and 6% during Operation Iraqi Freedom (OIF) were medically evacuated from theater. Hoge, Castro, Messer, McGurk, Cotting, and Koffman (2004) reported that approximately 18 percent of warfighters returning from Iraq and 11 percent returning from Afghanistan screened positive on stress-related measures. Hoge, Auchterloni, and Milliken (2006) also suggested that 1 in 10 U.S. Iraq veterans suffer from some type of stress disorder. This increased stress to soldiers has led to a increased rate of suicide among the soldiers. According to the Army Suicide Event Report that was published in 2007, the rate of suicides in 2006 (16.91 per 100,000) was the highest since 1991, while the historical average for suicides has been around 12 per 100,000 soldiers (Yosick 2008). The Soldier suicide rates have varied since the operations in Iraq initiated in 2003, the suicide rates per 100,000 in 2003 (18.8), 2005 (19.9), and 2006 (17.3, $p<.05$) were higher than the 10-year average of the U.S. Army (11.6 per 100,000), while in 2004 (9.6) the rate was lower than the average (Castro 2008).

While Stetz (main author) was deployed to Iraq in 2008, she observed that the military continues to face significant challenges in its efforts to prevent and heal combat stress casualties. Some potential reasons being: warfighters and their organizations ("units") either fail to recognize or deny combat stress as a readiness problem; lack of enough deployed resources to help prevent and treat combat stress; lack of rapid access to combat stress help; etc.

Corresponding Author:
MAJ Melba Stetz, Ph.D., Research Director, Psychology Department, Tripler Army Medical Center, Hawaii
Tel: +1/ 808-433-1651
Melba.Stetz@us.army.mil

[1]United States Army Aeromedical Research Laboratory, Fort Rucker, Alabama
[2]Virtual Reality Medical Center, San Diego, California

The views expressed in this article are those of the authors and do not necessarily represent the official policy or position of the Department of Defense. This project was funded through the Army Medical Department Advanced Medical Technology Initiative, Telemedicine and Advanced Technology Research Center (TATRC), US Army Medical Research and Materiel Command, Fort Detrick, MD. TATRC has been involved in many partnerships with universities and federal agencies supporting well over 500 research projects.

Journal of CyberTherapy & Rehabilitation
Fall 2008, Volume 1, Issue 3

THERAPEUTIC PROCESSES IN VIRTUAL REALITY EXPOSURE THERAPY: THE ROLE OF COGNITIONS AND THE THERAPEUTIC ALLIANCE

Katharina Meyerbröker[1] and Paul M.G.Emmelkamp[1]

Little is known about the processes involved in Virtual Reality Exposure Therapy (VRET), including the role of the therapeutic alliance and the patients' cognitions. This study was designed to investigate VRET processes in patients with specific phobias. We analyzed the influence of VRET on self-efficacy and negative self-statements without addressing these cognitions directly through treatment. In addition, we examined whether the quality of the therapeutic alliance as assessed with the Working Alliance Inventory (WAI) predicted successful outcome in VRET in terms of anxiety reduction. As expected, results showed that anxiety was reduced through treatment and an increase in self-efficacy, and a decrease in negative self-statements was observed. The quality of the therapeutic alliance was only positively related to outcome in fear of flying patients, but not in patients with acrophobia.

Introduction

The essential feature of a specific phobia is the intense fear that the stimulus provokes in the individuals that suffers from phobias (DSM-IV-TR, APA, 1994). People with specific phobias tend to avoid the feared stimulus and this avoidance will reinforce anxiety because leaving the feared object or situation will reduce the experienced fear.

The 'golden standard' for the treatment of specific phobias is exposure in vivo (Emmelkamp, 2004). Over the last decade, technical innovations made it possible to simulate anxiety-provoking situations in the therapist's office via computer generated virtual environments. The effectiveness of Virtual Reality Exposure Therapy (VRET) for the treatment of specific phobias has been demonstrated in several studies (for an overview see Wiederhold & Wiederhold, 2005). Today, computer generated virtual environments simulate anxiety provoking situations in even more complex anxiety disorders such as panic disorder (e.g. Botella et al., 2007; Peñate et al., 2008). However, not all studies meet high methodological criteria and validity (Cote & Bouchard, 2008). Recent meta-analyses have shown that exposure therapy given in virtual reality is at least as effective in anxiety reduction as the state-of-the-art exposure in vivo (e.g. Powers & Emmelkamp, 2008; Parsons & Rizzo, 2008).

As of yet, little is known about the processes involved in VRET, such as the role of the therapeutic relationship and of cognitions during the therapy. Hardly any information about cognitive restructuring or coping as a result of VRET is available. In the context of therapy, self-efficacy can be described as someone's assumptions about his or her own capacities to finish certain tasks and actions successfully and his belief in his own skills or abilities (Bandura, 1980). To date, only one study has investigated the effects of VRET on self-efficacy (Krijn et al., 2007b) on individuals with a fear of flying. VRET has led to a linear increase in self-efficacy.

Corresponding Author:
Katharina Meyerbröker, University of Amsterdam, Department of Clinical Psychology,
Roetersstraat 15, 1018 WB Amsterdam, Tel: +31(0)525 7084.
K.Meyerbroker@uva.nl

[1] University of Amsterdam

Journal of CyberTherapy & Rehabilitation
Fall 2008, Volume 1, Issue 3

Physiological Assessment During VR PTSD Treatment of a Motor Vehicle Accident Patient

Pedro Gamito[1], Tomaz Saraiva[1], Jorge Oliveira[1], Diogo Morais[1], Pedro Rosa[1], Miguel Pombal[1], Luiz Gamito[2] and Alberto Leal[2]

Besides physical injuries, motor vehicle accidents (MVAs) are responsible for serious mental disorders, up to 40% of the victims of MVAs can develop posttraumatic stress disorder (PTSD). A 42-year old patient was exposed to a virtual highway with an increasing anxiety triggering events (traffic intensity; horns; proximity of the surrounding buildings; tunnels; crossovers). The results indicate that the patient had a decrease in PTSD symptoms, namely in the IES (Intrusion and Avoidance dimensions) and in the HADS (Anxiety and Depression dimensions). As far as the psychophysiological activation concerns, the distribution GSR and ECG values during the 12 sessions followed the expected pattern, being reduced during the final session with statistically significant differences between sessions for ECG ($F(11) = 2.842$; $p < .05$). However, the most relevant fact is that this decrease led to the patient being able to drive again.

Study

Motor vehicle accidents (MVA), besides death and physical injuries, are also responsible for anxiety disorders such as acute stress disorder or Posttraumatic Stress Disorder (PTSD). Albuquerque et al. (2003), found that 5.6% of the individuals exposed to serious MVA presented symptoms of PTSD. A higher figure was found by Blanchard & Hickling (1997). They estimated that 8 to 40% of MVA victims suffered from PTSD; furthermore, Pires & Maia (2006) presented results in which they suggest that in the first evaluation after the accident (3/4 days), 55% of the 42 subjects presented PTSD symptoms. Four months after the accident, the percentage was reduced to 31%, even though 7.1% of the subjects presented more symptoms then on first evaluation. A follow-up longitudinal study also showed a prevalence of 11% 3 years after the MVA (Mayou, Ehlers & Bryant, 2002)

The most common therapy for the treatment of PTSD is exposure therapy, as suggested by the International Society for Traumatic Stress Studies (Foa et al., 2000). Traditionally, imagination exposure, in the impossibility of in vivo exposure such as in the MVA cases, is usually psychotherapists' first choice. However, more often than not, patients with severe anxiety disorders are not willing to cooperate with the therapist when asked to imagine the situation that induced the trauma., The avoidance of recalling the traumatic experience is a PTSD symptom itself. On the other hand, some of them are not able or not willing to engage emotionally, which may reduce therapy success (Jaycox, Foa & Morral, 1998).

This brings about a new challenge to psychotherapists, as traditional techniques may not deliver the expected results. An alternative to in vivo and to imagination exposure may be Virtual Reality Exposure (VRE). The use VRE, despite being a

Corresponding Author:
Pedro Gamito, PhD, Associate Professor, Department of Psychology, University Lusofona de Humanidades e Tecnologias, Campo Grande, 376, 1749-024 Lisboa, Portugal, Pedro.gamito@gmail.com

[1] University Lusófona of Humanities and Technologies
[2] Hospital Júlio de Matos