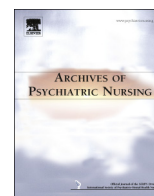




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Research Paper

Efficacy of the Virtual Reality-Based Stress Management Program on Stress-Related Variables in People With Mood Disorders: The Feasibility Study

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A B S T R A C T

This study aimed to investigate the effect of a VR-based stress management program on people with mood disorders. A quasi-experimental study was conducted in a tertiary hospital in Singapore, and a convenience sample of 22 was recruited. The program comprised three daily 1-hour sessions incorporating psychoeducation and VR-based relaxation practice. Participants who completed the program had significantly lowered subjective stress ($t = 6.91, p < 0.001$), depression ($t = 5.62, p < 0.001$), and anxiety ($t = 5.54, p < 0.001$); and increased skin temperature ($F = 17.71, p < 0.001$), perceived relaxation ($F = 26.20, p < 0.001$) and knowledge ($F = 13.77, p < 0.001$). Participants' feedback on the program was positive. Findings from this study contribute to improving clinical practice and serve as preliminary data to conduct more rigorous research in the future.

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Across the world, stress has been cited as the second most frequent health problem afflicting individuals' health and well-being (World Health Organization [WHO], 2005). Stress refers to individuals' physiological responses to any demand perceived to be threatening to the physical, emotional or psychological health (Varvogli & Darviri, 2011). At low to moderate levels, stress can be beneficial to the individuals. However, at high and persistent levels, stress becomes unhealthy, causing more harm than benefit and can contribute to poor mental health (Wilson, 2009).

Several studies show that stress can trigger mental disorders, especially mood disorders (Danese & Pariante, 2008). In Singapore, major depressive disorder (MDD) and bipolar disorder (BD) are commonly found with a lifetime prevalence of 5.8% and 1.2%, respectively (Chong et al., 2012). Individuals with mood disorders often experience illness-related stress, which further aggravates their mental health problems (Wilson, 2009). As a result, the persons may encounter relationship breakdowns, occupational disruptions and even premature deaths through suicide (Walsh, 2011).

Stress management interventions, including psychoeducation and relaxation therapy, have been developed for people with mental

disorders. Evidently, psychoeducation was efficacious in mitigating stress-related outcomes and enhancing patients' knowledge (Bernhard et al., 2006; Colom et al., 2003; Gamito et al., 2010; Oflaz, Hatipoglu, & Aydin, 2008; Pratt et al., 2005), and relaxation therapy helped reduce depression among participants (Chen et al., 2009; Jorm, Morgan, & Hetrick, 2009; Knubben et al., 2007; Watkins & Moberly, 2008). Furthermore, the combination of psychoeducation and relaxation therapy appears to reduce depression among people with dysthymic disorder (Little, Kligler, Homel, Belisle, & Merrel, 2009). Additionally, virtual reality (VR) technology has been increasingly used in the mental health domain in the past 10 years.

The VR is a set of technology (such as graphical displays with sound) that contains a convincing interface to stimulate the immersion and/or interaction between users and created environments (Brooks, 1999, November/December). The users may feel like "being there" in the VR environment after experiencing vivid visual images and accompanying audio materials. For people with mood disorders, the VR device could be used as an innovative tool to deliver psychoeducation. It may also serve as a powerful visual imagery tool to induce relaxation and enhance positive emotions (Ku et al., 2007). However, there is limited empirical evidence to support the effects of VR on people with mood disorders, suggesting enormous knowledge gaps in the literature.

The utilization of VR in stress management interventions is an emerging science with promising benefits. A randomized controlled trial tested the effectiveness of the interreality (VR-based stress management program) on teachers and nursing professionals (Pallavicini et al., 2013). In this study, participants showed significantly lower

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perceived stress in comparison to controls (Pallavicini et al., 2013). Another study tested the ESCAPE (VR stress management program) on university students and public officers (Villani & Riva, 2012). Participants had significantly lower heart rate than those in the control group (Villani & Riva, 2012). Little is known about the effects of VR stress management interventions on people with mental disorders.

The VR has been used as a tool to deliver exposure therapy, psychoeducation, and relaxation therapy in people with anxiety disorders. A quasi-experimental study tested the virtual reality-incorporated psychoeducation intervention on ten participants with posttraumatic stress disorder (PTSD) and found that the participants in the experimental group had significantly lower depression (Gamito et al., 2010). Similarly, another quasi-experimental research reported that the virtual-reality based psychoeducation helped reduce anxiety and depression among 14 individuals with social anxiety disorder (Yuen et al., 2013). Furthermore, a randomized controlled trial (RCT) was conducted to compare the VR-guided combined psychoeducation and relaxation therapy with cognitive-behavioral therapy (CBT) in 39 patients with anxiety disorders (Banos et al., 2011). Findings showed that participants in the VR group had significantly lowered depression and greater relaxation intensity than controls. However, there were no significant differences in anxiety between these two groups.

THE CURRENT STUDY

Despite the encouraging findings, it is not known if the VR technology is beneficial for individuals with mood disorders. Furthermore, there is a dearth of studies exploring the effects of stress management interventions on stress-related variables in individuals with mood disorders, especially in Asian populations, reflecting gaps in the literature. Guided by existing empirical evidence, we developed the three-session VR-based stress management (VR DE-STRESS) program for people with mood disorders. This study then aimed to test the feasibility and initial

effects of the program in a hospital setting. Research questions were: a) would the VR DE-STRESS Program mitigate objective stress, subjective stress, depression, and anxiety among people with mood disorder? and b) would the program enhance participants' relaxation levels and patient knowledge?

THEORETICAL FRAMEWORK

The Neuman System Model (Neuman & Fawcett, 2002) provided a theoretical framework to guide this study. The model focuses on stressors; and the interaction between people and their environment, which is an integral aspect of mental wellbeing. The Neuman System Model comprises four major domains; person, environment, health and nursing (Fig. 1). In this study, person refers to individuals with mood disorders, who constantly interact with environments to achieve a state of health and wellbeing. Environment could be the source of stressors for the person. In this study, stressors refer to undesirable stimuli encountered by people with mood disorders (such as hospitalization and relationship breakdowns). Without proper management, stressors may disrupt the person's equilibrium, contributing to poor health or delayed recovery. Health in this study was represented by levels of subjective and objective stress, depression, anxiety, perceived relaxation and knowledge. Stress refers to the person's biophysiological and psychological changes in response to stressors from the environments. Within the Neuman System model (Neuman & Fawcett, 2002), nursing is a profession that assists persons to achieve and/or resume their state of equilibrium. In this study, the VR DE-STRESS Program represented a nursing tertiary prevention intervention, which aimed to maintain optimal wellness by restoring balance to the client through reconstitution. Reconstitution is the process whereby the client utilizes resources to prevent further stress. Through the VR DE-STRESS Program, people with mood disorder learned skills to manage with their stress.

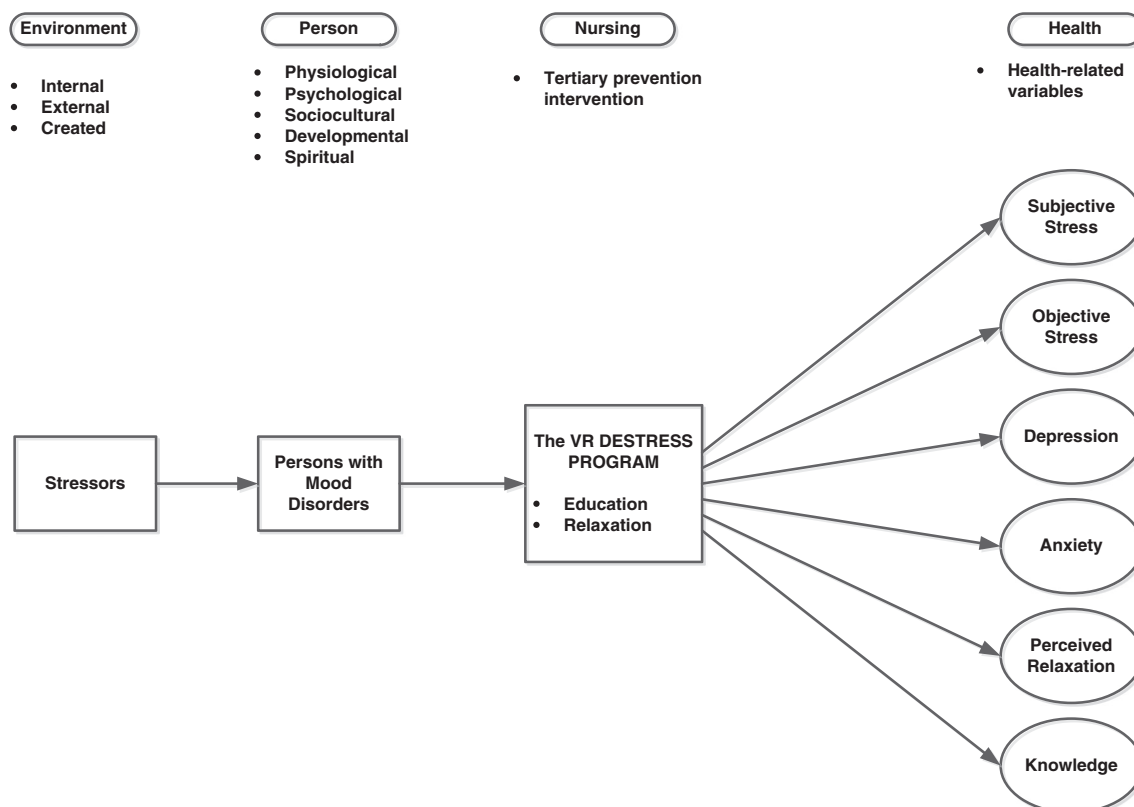


Fig. 1. Research framework guided by the Neuman System Model (Neuman & Fawcett, 2002).

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