

Mental practice on stroke rehabilitation health and social care essay



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\n[/toc]\n \nByron LaiKin 606The Effects of Mental Practice on Stroke Rehabilitation

Introduction

Stroke is defined as a cerebrovascular event, caused by abnormalities in cerebral blood flow that can result in death of brain tissue (" National Institute of Neurological Disorders and Stroke. Stroke: Hope Through Research," 2012). Stroke is a leading disability in the United States and can result in acute coma, syncope, chronic physiological and neurological impairments, and even death. If individuals post-stroke do not have the ability to walk independently, only 23% of them are able to recover independence through rehabilitation (Jorgensen et al., 1995). Consequently, motor skills recovery is a primary focus during early stroke rehabilitation. Mental skills training, a concept focused on improved performance through cognitive practice, has been suggested to increase motor performance in sport (Driskell, Copper, & Moran, 1994). In these studies, it is typical for a group with mental skills and physical training to outperform a group with either mental skills or physical training alone. Imagery and mental practice have recently gained attention in the rehabilitation of people post-stroke. Much focus has been given to the effects of mental practice on motor tasks, a concept known as " motor-imagery," which is a neuro-rehabilitative <https://assignbuster.com/mental-practice-on-stroke-rehabilitation-health-and-social-care-essay/>

technique to improve motor function after a stroke. Mental practice offers a form of rehabilitation that is time efficient, effective, and practical. While there are only theoretical implications towards the cognitive mechanisms of mental skills training that promote motor recovery in this population (Braun, Beurskens, Borm, Schack, & Wade, 2006), a few studies by Page and colleagues (Page, Harnish, Lamy, Eliassen, & Szaflarski, 2010; Page, Szaflarski, Eliassen, Pan, & Cramer, 2009) suggest improved motor recovery and neuro-plasticity following such training. Although literature that has found mental skills training improves motor recovery (Hewett, Ford, Levine, & Page, 2007; Page, Levine, & Leonard, 2007; Page, Levine, & Leonard, 2005) is more abundant than studies that have found improvements in motor recovery and neuro-plasticity, the absolute efficacy of mental skills training in people post-stroke still appears debatable (Braun et al., 2006; Zimmermann-Schlatter, Schuster, Puhan, Siekierka, & Steurer, 2008). However, the inconsistency with the literature may be due to the wide array of research methodologies used during mental skills training. Consequently, the purpose of this paper is to examine the knowledge surrounding the effects of mental-skills training on rehabilitative measures of people post-stroke.

Stroke

The level of physiological and neurological impairment following a stroke varies with the location, severity, and duration of cerebral damage (Bowman & Giddings, 2003). Following a stroke, many symptoms may occur simultaneously that affect locomotor, visual, visuospatial, verbal, or sensory function skills (Durstine, Moore, Painter, & Roberts, 2009). Hemiparesis is a

common physical deficit following a stroke, which causes partial or complete paralysis of one side of the body. Hemiparesis occurs from damage to the cerebellum, which can result in a reduced number of motor units to perform movement (" National Institute of Neurological Disorders and Stroke. Stroke: Hope Through Research," 2012). However, even with relatively functional motor skills, it is estimated that one-third of people post-stroke are not able to walk independently outside of their home (Lord, McPherson, McNaughton, Rochester, & Weatherall, 2004). If individuals post-stroke do not have the ability to walk independently, only 23% of them are able to recover independence through rehabilitation (Jorgensen et al., 1995). Consequently, motor recovery is a primary focus during stroke rehabilitation.

Rehabilitation

Repetitive task-specific practice (RTP) is a newer rehabilitative method that focuses on rehabilitation of the affected limb. These approaches may require inventive technology and generally high volumes of therapy sessions (Wolf et al., 2008) to promote optimal functional outcomes. These methods may be expensive, time consuming, and often impractical to both the client and therapist. RTP procedures may also be invasive for the client. Costly rehabilitative methods pose a problem for people post-stroke because many of these techniques are not covered by medical insurance. There is a need for cheap and effective forms of therapy in this population. Mental practice is a technique that is cost effective and non-invasive. Mental practice involves the use of imagery and visualization to cognitively rehearse physical skills and scenarios. Mental practice in stroke rehabilitation has generally emphasized motor recovery of the affected arm and leg. The most successful

studies appear to elicit training two to three times per week for 30 minutes. The most accepted and successful methods of mental practice used appear to be imagery and the use of mirrors or video-feedback to provide a visual component in therapy. Originally, the physiological aim of mental practice was to cognitively activate the same musculature and neural structures during the actual physical performance of the replicated task. Mental practice has been shown to stimulate cerebellar and cerebellar sensory motor networks similar to those activated during physical practice (Lacourse, Turner, Randolph-Orr, Schandler, & Cohen, 2004). It appears that most literature associated with significant functional improvement of an affected limb have combined mental practice with other forms of therapy. Mental practice combined with therapy, has been suggested to improve motor recovery and increase affected arm use when performing activities of daily living compared to a placebo group with therapy in people with stroke (Page et al., 2007). Mental practice combined with physical practice has also demonstrated improvements in cortical plasticity in some studies (Butler & Page, 2006; Page et al., 2009). It appears that repetitive physical movements in the form of therapy are able to achieve greater motor recovery when combined with mental practice. Mental practice alone may not be effective in stimulating motor recovery/function in people with chronic stroke. A recent randomized controlled trial (Ietswaart et al., 2011) examined the efficacy of mental practice with motor imagery in stroke recovery. From a pool of 125 participants, their results suggest that mental practice was not effective in sub-acute (early) people post-stroke. This study was one of the largest and most statistically holistic (statistical power satisfied, randomized, double-controlled, and starting sample of 1129 people post-stroke)

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performed in the area of mental practice. No evidence was found suggesting that mental practice alone was effective in stroke recovery. Letswaart and colleagues do note that their study consisted of people with sub-acute stroke and much significant literature involves people with chronic stroke. The authors also acknowledge that mental practice may be more beneficial for people with chronic stroke. However, it is assumed people early after a stroke are more susceptible to neurological/cognitive improvement. Since it appears mental practice alone is not effective in people early post-stroke, the mechanism for motor recovery following mental practice may not be brain plasticity. According to Letswaart and colleagues (Letswaart et al., 2011), since people with chronic stroke have found significant improvement following mental practice, the possible mechanisms of mental practice may be: motivational, organized cognitive models of performed movements, or the reactivation of previously or recently used motor response pathways that result in an increased practice effect (an indirect effect of neuroplasticity). This may be why the most regarded evidence for the significant response of motor-recovery following mental practice is in people with chronic stroke. People with chronic stroke have most likely lost their repertoire of motor function over an extended period of time. Mental rehearsal following practice may be particularly significant in a population where people have lost a significant part of their motor repertoire over time. This knowledge reduces the clinical significance of mental practice in people post-stroke. Mental practice is regarded as a cost-effective method of therapy which was primarily and originally targeted towards people early post-stroke. Since mental practice is not effective in the early post-stroke population, it loses much of its clinical significance and application. However, this does not

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dissuade the importance of this therapy. Regardless of the mechanism responsible, mental practice combined with therapy appears effective in people with chronic stroke, which is supported by the most recent review study published regarding mental practice in stroke (Zimmermann-Schlatter et al., 2008). This knowledge is clinically significant for moderate to long-term rehabilitation or exercise programs, such as the Center of Achievement located at California State University, Northridge. While mirrors are used to stimulate a possible neurological or motivational component during exercise at the Center of Achievement, there is currently no repetitive imagery technique used following exercise. It may be beneficial for supervisors and staff at the Center of Achievement to recommend people with chronic stroke, whom are attempting to recover motor function of an affected limb, to perform mental practice on specific tasks they performed during their exercise session in the lobby once their exercise session is over. Mental practice offers a cost-effective method of aiding previous forms of therapy/training to promote physical function in people with chronic stroke. The exact mechanism for this occurrence is still under investigation. Regardless of the mechanism, the positive benefits cannot be ignored and may be recommended by rehabilitators/trainers to compliment a physical rehabilitative training program.