



ORIGINAL ARTICLE

# Simple and Task-oriented Mirror Therapy for Upper Extremity Function in Stroke Patients: A Pilot Study



Young-Rim Paik <sup>a,\*</sup>, Su-Kyoung Kim <sup>a,b</sup>, Jae-Shin Lee <sup>a,b</sup>,  
Byoung-Jin Jeon <sup>c</sup>

<sup>a</sup> Department of Occupational Therapy, The Graduate School of Public Health and Welfare, Konyang University, Daejeon, Republic of Korea

<sup>b</sup> Department of Occupational Therapy, The Konyang University, Daejeon, Republic of Korea

<sup>c</sup> Department of Occupational Therapy, Kangwon National University, Kangwon, Republic of Korea

Received 30 May 2013; received in revised form 20 November 2013; accepted 10 January 2014  
Available online 31 March 2014

## KEYWORDS

mirror neuron;  
mirror therapy;  
stroke;  
task-oriented  
approach

**Summary** *Objective/Background:* To compare the effects of simple and task-oriented mirror therapies on upper extremity function in stroke patients with hemiplegia.

*Methods:* A single-subject, reversal (applied behaviour analysis) research design was used, and the study included four patients and two treatments. Treatment 1 involved simple mirror therapy that was performed using simple upper limb movements. Treatment 2 involved task-oriented mirror therapy that required each patient to perform functional movements associated with the tasks of daily living. Changes in upper extremity function were assessed during 23 sessions using box and block test, cube carry, and card turning tests. The Fugl-Meyer Assessment of upper extremity function was also performed.

*Results:* The upper extremity function of all patients increased after mirror therapy. However, the improved upper extremity function of the patients undergoing simple mirror therapy was not maintained after the conclusion of the therapy. By contrast, the improved upper extremity function of the patients receiving task-oriented mirror therapy continued to improve, even after therapy cessation.

*Conclusion:* Task-oriented mirror therapy in stroke patients provided more effective improvement in the upper extremity function of the hemiplegic stroke victims.  
Copyright © 2014, Elsevier (Singapore) Pte. Ltd. All rights reserved.

Conflicts of interest: All contributing authors declare no conflicts of interest.

\* Corresponding author. Department of Occupational Therapy, The Graduate School of Public Health and Welfare, Konyang University, Gasuwon-dong, Seo-gu, Daejeon 302-718, Republic of Korea.

E-mail address: [ot2001@netsgo.com](mailto:ot2001@netsgo.com) (Y.-R. Paik).

<http://dx.doi.org/10.1016/j.hkjot.2014.01.002>

1569-1861/Copyright © 2014, Elsevier (Singapore) Pte. Ltd. All rights reserved.

## Introduction

Recovery of upper extremity function proceeds most rapidly during the initial 3 months after the stroke, but typically slows after 6 months and reaches a neurological recovery plateau by the end of the 1st year. Even among stroke victims whose neurocognitive function was improved, 55–80% of the victims continued to exhibit upper extremity disorders (Nakayama, Jørgensen, Raaschou, & Olsen, 1994). Upper extremity disorders after stroke can result from weakened or stiff muscles, imbalance, hypertonia, and sensory disturbances (Gracies et al., 2000). Because upper extremity tasks, such as reaching, grasping, manipulating, and carrying, require coordination of multiple joints and muscles, recovery of each joint function is necessary before full function is restored. The recovery of proximal joint (shoulder and elbow) function often proceeds at a faster rate than that of the distal joints (wrist and hands; Cauraugh, Light, Kim, Thigpen, & Behrmann, 2000). Accordingly, even when patients have regained strength and coordination in their shoulder and elbow joints, the functions of their fingers and hands often have not recovered, which continue to limit the activities of daily living (ADLs; e.g., eating, dressing oneself, and self-management; Cooper, Glendinning, & Vierck, 1993). Therefore, recovery of finger and hand dexterity is a critical component of rehabilitation in chronic hemiplegia patients (Cauraugh et al., 2000).

A relatively simple and cost-effective approach for improving upper extremity function, known as mirror therapy, has shown promise in the treatment of patients with hemiplegia (Stevens & Stoykov, 2003). This type of therapy is based on the principle that visual stimuli, conveyed to the brain through observation of the unaffected body part movements, can improve the function of the affected limb. In other words, mirror therapy is a comparative treatment method aimed at improving the function of the affected side by having the patient focus on the movements of the unaffected side (Stevens & Stoykov, 2003). Mirror therapy is an attractive treatment option for clinical practice because it is simple to implement, relatively inexpensive, less intimidating for patients, and often equally or more effective than many alternative treatments (Sütbeyaz, Yavuzer, Sezer, & Koseoglu, 2007).

Many recent studies have reported improved limb functional improvements after mirror therapy (Toh & Fong, 2013). Yavuzer et al. (2008) found that motor skills related to hand function were improved more by mirror therapy than by sham therapy in a random crossover study of 36 acute stroke patients. In another study, Stevens and Stoykov (2003), using the Fugl-Meyer Assessment (FMA), reported that the active range of motion, speed of movement, and hand dexterity increased for two stroke patients, 3–4 weeks after the implementation of mirror therapy. Similarly, Altschuler et al. (1999) observed that upper extremity function (range of motion, speed of movement, and accuracy) was improved in chronic stroke patients who received mirror therapy. Sathian, Greenspan, and Wolf (2000) also concluded that mirror therapy effectively increased upper extremity movement and hand strength on the affected side of chronic stroke patients.

However, not all mirror therapy studies involving stroke victims have yielded such encouraging results. Baek (2009) observed that the positive effects of mirror therapy decreased over time, and that mirror therapy involving the repetition of simple movements produced improvements during the first 4 weeks of treatment, but were followed by a gradual decrease in function as the patients became bored with the movements and began resisting therapy. Based on this observation, mirror therapy programmes that incorporate a variety of functional tasks were proposed to be more effective than those involving only simple movements designed to mimic tasks. Yoo (2010) also suggested the use of more functional and task-oriented programmes because simple movements restrict the functional recovery of more complicated movements performed using the upper extremity. This suggestion was also supported by Wu, Trombly, Lin, and Tickle-Degnen (2000) in a task-oriented exercise programme that involved picking up a coin. These authors observed that treatment was more effective when an actual coin was used rather than when the same motion was performed without a coin.

Although mirror therapy has been shown to improve motor function in stroke patients, differences in study designs and tasks have yielded discrepancies in the observed results. Furthermore, studies investigating the use of mirror therapy have compared the results with a control group (individuals not receiving mirror therapy; Baek, 2009), but studies comparing simple and task-oriented mirror therapies are lacking. Therefore, this study aimed to compare the effects of simple mirror therapy, involving both simple and task-oriented movements, on the recovery of upper extremity function in hemiplegic stroke patients.

## Methods

### Patients

The purpose and methods of this study were explained to the four patients, and their written consent was obtained before beginning the study. The study adhered to the principles outlined in the Declaration of Helsinki.

The characteristics of the study patients are shown in Table 1. The level of ADL function of all the patients indicated that they required mild assistance. With regard to bowel and bladder control, mobility, and getting in and out of bed or chairs, they met the criteria for independent functioning. The patients also met five additional criteria, including the following: (a) they had suffered a stroke more than 6 months before the study; (b) they suffered from chronic hemiplegia, with a slow rate of recovery extending over a period >6 months; (c) their cognition was not compromised and they scored more than 24 on the Mini-Mental State Examination-Korea; and (d) they had no previous exposure to mirror therapy and had normal visual perception.

### Intervention

The study patients performed either simple or task-oriented mirror therapy. The mirrors used for therapy

Download English Version:

<https://daneshyari.com/en/article/2694725>

Download Persian Version:

<https://daneshyari.com/article/2694725>

[Daneshyari.com](https://daneshyari.com)