

The Effects of Hand Reflexology on Functional Fine Motor Skills in Adults With Brain Injury

Conducted at Brooks Clubhouse, Jacksonville, Florida, USA (February – April, 2014)

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Research: This study was organized to assess the functional therapeutic value of hand reflexology as a means to improve functional fine motor skills in persons who have suffered Traumatic Brain Injury (TBI).

Literature review of *Reflexology and Rehabilitation Research* uncovered no studies directly looking at hand reflexology and effects on functional upper extremity skills with this population. Studies were found on the traditional use of occupational therapy interventions (example Neistadt, 1994), however, no studies were found with the pairing of reflexology and occupational therapy. Traditional occupational therapy usually involves a therapist choosing tabletop or functional activities for coordination retraining by using activity analyses that identifies fine motor coordination as a skill component of a given task (Neistadt, 1994). Other researchers have suggested that motor learning is also relatively specific in adults with brain injury, unless training is conducted with a variety of tasks and in a variety of settings (Duncan, 1991; Poole, 1991; Sabari, 1991). Is it possible that reflexology without additional more traditional therapies has the ability to increase functional fine motor skills or is the greatest functional gain seen in the pairing of reflexology with occupational therapy?

Selection process: The study was conducted at Brooks Clubhouse in Jacksonville, Florida. Brooks Clubhouse is a full-time day program that provides for the long-term recovery needs of individuals who have suffered from an acquired neurological injury. For more information about the facility visit <http://www.brookshealth.org/why-brooks/communityservice/clubhouse/>

A team consisting of Certified Reflexologists Ken Cook of Gainesville, Florida and John Guinta of Jacksonville, Florida performed the reflexology sessions. Certified Reflexologist/Occupational Therapist Christy Ruggiero conducted the screening and measured the progress of the participants. Karen Ball, Director of the Academy of Ancient Reflexology in Saint Augustine, Florida provided oversight and review.

The study was conducted over a 12-week period from February to April 2014. Each participant received a weekly 45-minute hand reflexology session. Pre- and post-study evaluations would include: functional daily living skills of participants, non-standardized 7-hole pegboard activity (fine motor skills), and informal interviews with participant, participant's family and clubhouse

staff regarding level of functioning. We chose Hand Reflexology because: a) we could find no other studies using this approach and, b) because of the ease of access to the hands versus feet.

The selection of candidates was determined after Christy Ruggiero reviewed the medical histories and treatment records of the potential participants, talked to Clubhouse staff, reviewed participant availability and transportation challenges, and completed above stated Pre-Evaluation. Christy discussed her findings with Ken Cook, Brooks Clubhouse Manager Kathy Martin and myself. The initial selection included eight participants; six primaries and two alternates. Ultimately six candidates were selected to participate.

Subjects: The six subjects selected for the study, while all suffered from TBI, had different types of injury, different degrees of impairment, and different post injury and post treatment times. As a result this study could also be viewed as six individual studies. Here is a brief synopsis of the health/history of each subject in the study as it pertains to this study:

Subject#1

Female

Age 77

History: Patient had a left Cardiovascular Accident (CVA) April 2008. Patient completed formal rehabilitation program in November of 2011: occupational therapy (OT), physical therapy (PT) and speech therapy (ST). Subject has cognitive challenges as well as difficulty with verbalization and expression. Slow upper extremity (UE) function

Subject#2

Male

Age 29

History: Patient has primary diagnosis of TBI secondary to Motor Vehicle Accident (MVA) with history of seizures since accident February 2009. Patient continues to receive ongoing therapies. Right UE tremors and partially flexed right hand (RH).

Subject #3

Male

Age 26

History: Patient had a TBI secondary to a MVA August 2008. Patient was in a coma for 2 months following accident. Patient completed formal rehabilitation program in 2009 (OT, PT, ST). Left UE challenges, partially flexed left hand (LH).

Subject #4

Female

Age 47

History: Patient suffered a TBI as passenger in MVA May 2010. Additionally, patient suffered two strokes while in rehabilitation following accident. Patient completed formal rehabilitation program in 2010 (OT, PT, ST). During 12 weeks of reflexology treatments patient was undergoing radiation treatments for right breast cancer. Some difficulty organizing thoughts, right UE affected.

Subject #5

Female

Age 29

History: Auto accident 2010. Patient has a diagnosis of TBI, CVA, and third cranial nerve palsy secondary to MVA November 2010. Patient completed formal rehabilitation program in 2011 (OT, PT, ST) and additional OT ending in January 2014. R eye decreased vision, decreased vision & movement of R eye, R CVA at accident, with L UE weakness.

Subject #6

Male

Age 28

History: Patient had a right CVA with left UE hemiparesis, June 2012. Patient completed formal rehabilitation program in August 2013 (OT, PT, ST). He continues to have L UE weakness, unable to grasp, carpal tunnel R UE, numbness.

Treatment plan: It was decided the frequency of the hand reflexology sessions would be one 45-minute session per week for 12 consecutive weeks (Tuesday was chosen as the treatment day.). A protocol was developed targeting reflexes that would support upper extremity mobility improvement. A variety of techniques were employed including; alternating pulls, press and roll, point work, thumb and finger walking. Target reflex points included: thyroid, adrenals, spine, solar plexus, cervical muscles, brain, eyes, ears, auditory tubes, kidneys and shoulder reflexes.

Summaries below from the Occupational Therapist (OT) and Reflexologists reflect the overall progress of each subject at the completion of 12 weeks of hand reflexology treatments:

Summary:

Subject #1

OT summary: Patient continues to not be oriented to day of week, month, or year. She has difficulty with language comprehension and expression making her responses to simple directions inconsistent and performance of evaluation challenging. Patient continues to show mild to moderately impaired fine motor skills with functional activities with no significant change with non-standardized 7-hole peg activity. When asked half way through study if she thought she was benefitting from reflexology she said, "Yes!" and when asked if she wanted to continue she said, "Yes!" Patient showed increased initiation throughout course of Study by being ready for her session and not needing encouragement or supervision to go to treatment area by the end of the 12 weeks. At end of study, patient reported that reflexology "helped my thinking skills". Patient's daughter reported that after six weeks of hand reflexology patient was initiating greater involvement in kitchen activities at home, for example washing dishes without cuing.

Reflexologists' summary: Although seemingly little improvement was made in UE mobility, subject seemed to “brighten” over the 12 weeks study. Subject started study with very little communication and eventually became more animated and talkative. She seemed to enjoy and benefit from the relaxation provided by the sessions as well.

Subject #2

OT summary: Patient showed improvement by 25% with left hand and 30% with right hand on non-standardized 7-hole peg activity fine motor (FM) skills at end of treatment. Bilateral ataxia continued to cause patient to frequently drop pegs so improvement was seen with patient's fastest time at start of treatment (out of seven trials) and fastest time at end of treatment (out of seven trials) but overall average of trials showed no change. Patient reports improved fine motor skills with daily activities (“Things are easier for me now”) and staff at Brooks Clubhouse have noted an increased confidence with Clubhouse chores and less shakiness. Subject has also been receiving weekly personal training sessions to include use of Armeo device that targets fine and gross motor skills with computer driven activities. Trainer reported increased confidence in subject and increased follow through with following directions and independently navigating through Neuro-Recovery Center over the past three months. Subject reported excitement with weekly reflexology sessions feeling they were helping him “relax” and “better my skills”. He also reported improved ability to wake up in the morning without having to rely heavily on an alarm clock. He expressed wanting to continue to receive reflexology after the study was over.

Reflexologists' summary: Subject enjoyed the relaxation he felt during the sessions and expressed this verbally. He also stated that over the course of the study he was able to “do more” with his RH. He reports that his RH tremors stopped, and he also reported he felt more rested and peaceful after the weekly reflexology sessions.

Subject #3

OT Summary: Patient increased left fine motor skills by 34% on non-standardized 7-hole peg activity and showed improved left fine motor skills and gross motor skills to WNL with functional activities. Patient demonstrates improved independent initiation of functional use of left UE with kitchen chores at Clubhouse. Patient reported at end of study, “I now automatically use my left arm and hand, before I had to always think about it or I would neglect it. I feel my body is more relaxed and my left eye now stays closed when I nap, before I had to tape my eye closed or it would drift open when I slept. I feel reflexology changed my life, I am so happy with all my progress! I plan to continue with my home reflexology program and I want to continue to have reflexology sessions for relaxation.” Patient received no other therapies or training during 12-week period except hand reflexology.

Reflexologists' summary: Subject seemed to increase the use of LH over the course of the study. Subject was enthusiastic and positive throughout the 12 weeks. Subject claimed to benefit from the relaxation during the sessions.

Subject #4

OT Summary: Patient increased ROM: Right wrist radial deviation from 10 degrees to 17 degrees. Right wrist ulnar deviation from 23 degrees to WNL. Right wrist extension from 37 degrees to WNL. Right shoulder extension from 23 degrees to 30 degrees and Right shoulder flexion from 64 degrees to 75 degrees. Patient increased right fine motor skills on non-standardized 7-hole peg activity by 57% (utilizing thumb and middle finger) and patient increased ability to also perform activity using a pincer grasp which she had been previously unable to do. Patient demonstrates improved independent initiation of functional use of right UE with maintenance chores at Clubhouse. Patient now using right UE WNL with fine motor and gross motor daily activities. Patient's husband reports marked improvement with patient's use of right UE. Patient reports, "Reflexology is a non-invasive, non-drug feel good therapy that has helped me a lot. I can now use my right arm to perform all my self-care activities and I use my arm without having to think about it, before I would neglect my right arm. I feel more relaxed and I don't worry and stress as much, I feel that is from receiving reflexology. I would like to continue with reflexology to see if it can help my legs too".

Reflexologists' summary: From the first session to the last subject tried to relax as much as was possible. Her breathing became slow and she would only speak for the first few minutes of the session. By the 3rd session she reported that she was using more fingers to write with. Prior to the sessions she was using her fifth digit and thumb only to write. Between sessions 3 and 4 she reported that she seemed to be calmer and not as easily upset. She would still drop things and had to keep trying to use more of her hand. By #5 she was writing with all her fingers except index finger of R hand. She stated, "I'm able to work through it with conscious effort". By #7 she reported she's using her right hand a lot more and not dropping stuff near as often... only drops things when she's really tired. #8 she reported, "I'm consciously aware of my hand and I try to use it more. Allergies aren't bothering me as much." #10 subject stated she was dizzy and nauseated probably due to the radiation treatments. Subject reports she sleeps well and that "overall usage of her right hand is greatly improved". #11 subject reports "feeling in my right hand index finger is coming back" and that she's making a conscious effort to use it more. #12 subject reports she is extremely pleased with results. "My right hand is a part of me; not dead to me." She says she is able to trim her right index fingernail. Throughout the sessions her ROM in both hands improved.

Subject #5

OT Summary: Patient increased ROM. Left shoulder flexion increased from 70 degrees to 78 degrees. Left forearm supination increased from 18 degrees to 27 degrees. Right shoulder flexion increased to WNL. Patient increased left fine motor skills with non-standardized 7-hole peg activity from unable to perform to 72 seconds to remove all pegs with a gross grasp. Left fine motor skills are now improved to moderately impaired with functional activities. Patient increased right fine motor skills with non-standardized 7-hole peg activity by 25% with only

removal of pegs. Right fine motor skills are now improved to mild/moderate impairment with functional activities. Patient increased ability to write name legibly using standard pen and large print. Patient increased ability to feed self with 10% assist using built up handled utensils, was previously requiring 70-90% assist with feeding activities. (Patient required four occupational therapy sessions post completion of study to transfer new fine motor skills to feeding activities at Clubhouse.) Mom reports patient is now using left UE spontaneously in self-care and homemaking activities (laundry, carrying small grocery bags) and she is requiring less encouragement to participate. Patient previously waited for mom and staff at Clubhouse to do things for her. Patient's left UE appears more relaxed and she reports it feels, "less tight". Patient shows increased enthusiasm with willingness to try things and work on them at Clubhouse and she reports, "Reflexology really helped me be more aware of my hands. I loved it and want to continue to improve and receive more reflexology".

Reflexologists' summary: #1 subject reports that her left hand gets tense, "like it spasms". Feels tight all the time, "like I can't control my fingers" and "left thumb can be uncooperative". #3 subject reports that her Mom notices a big change, ie. she's not balling her fist up any more. "Left thumb isn't as droopy". #4 subject reports she has more use of her left hand. She knows it's there and wants to use it more. The left thumb still wants to curl up but it's not as bad as it was. I notice that her left hand is relaxed & not tensed up after sessions. #8 subject reports, "I'm using my left hand a lot more. I used to neglect it and act like I only had one hand". #11 subject reports she is aware that her left hand curls up when she lies down but she will relax it and it will straighten out. #12 subject reports that her left hand not clenching up, she notices it when it does and she straightens it. "I am fully aware of my left hand and it makes me want to use it more".

Throughout the sessions subject enjoyed talking; she never relaxed to the point of closing her eyes and drifting off. Her ROM in both hands remained good with few instances of stiffness.

Subject #6

OT Summary: Patient continues to have no functional use of left UE at end of treatment. Patient reports UE feels more "relaxed" and immediately after hand reflexology session hand appears visually to have decreased flexor tone, however, as soon as patient attempts any active movement left UE goes into flexor pattern. Patient continues to have a flat affect when asked about his current functional status but he does report feeling less stressed and worried about school and overall "life" since the start of reflexology. Patient attributes improvement in his perception of stress to receiving reflexology and he states, "I enjoyed treatments".

Reflexologists' summary: Subject rarely stayed awake during sessions. Usually he wore headphones so there was little to no communication with him during sessions. The following observations were from the session indicated by the number preceding it. #1 I observe while working on his left hand he will clench his fist. His right hand does not do this. #3 subject is restful to the point of snoring. #4 subject reports that he is not feeling any difference. #6 subject arranged to be picked up early and I am not able to perform all of protocol on his left hand. #7 subject reports "same ole, same ole" when asked about any changes. #8 subject reports "no particular change in his hands" #9 subject reports his left hand is "staying open more". #11 "nothing noticed in particular" #12 subject reports "not particularly" when I ask if there are any changes or differences.

Conclusion: This study examined the effects of 12 sessions (one per week) of hand reflexology on functional fine motor skills with six subjects that were post formal rehabilitation program. Findings suggest that in addition to hand reflexology being enjoyable and relaxing to receive (as reported by 6/6 participants) it has the potential to improve functional fine motor skills and proprioceptive feedback (as demonstrated by 4/6 participants).

Interesting to note: Post study two of the study participants (subjects 3 and 4) independently transferred newly acquired fine motor skills to daily activities and one of the participants (subject 5) benefitted from additional occupational therapy to assist in transfer of skills to feeding activities. Subject 1 and 6 did not receive OT post study due to limited functional changes noted and subject 2 did not receive OT post study due to limited opportunities with scheduling.

Further research is needed using randomized controlled trials to better determine statistical significance of improvements noted and to evaluate therapeutic value of reflexology with adults with brain injury, and pairing occupational therapy with reflexology therapy in the treatment of adults with brain injury.

References:

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