8-18-2015

I Think Therefore I Can. A Systematic Review of Metacognitive Strategies and their Impact on Occupational Performance in Adults Following Stroke

Kerry Canton, OTS
Thomas Jefferson University

Chelsea DiFrancesco, OTS
Thomas Jefferson University

Christy Geaney, OTS
Thomas Jefferson University

Sarah Jamieson, OTS
Thomas Jefferson University

Jessica Talarico, OTS
Thomas Jefferson University

I think *therefore* I can.

A SYSTEMATIC REVIEW OF METACOGNITIVE STRATEGIES AND THEIR IMPACT ON OCCUPATIONAL PERFORMANCE IN ADULTS FOLLOWING STROKE

Presented By: Kerry Canton, Chelsea DiFrancesco, Christy Geaney, Sarah Jamieson & Jessica Talarico
Faculty Mentor: Dr. Teal Benevides

Presented in Partial Fulfillment of the Master of Science in Occupational Therapy degree, Thomas Jefferson University

Objectives of Presentation:

1. ***Explain*** the role of metacognition in everyday activities
2. ***Discern*** the quality of evidence regarding metacognitive strategies in adults who have sustained a stroke.
3. ***Conceptualize*** a metacognitive intervention to utilize within stroke rehabilitation based on the evidence presented in this session.

PICO: What is the evidence for the impact of metacognitive interventions on occupational performance in adults who have sustained a stroke?

Methods:

Databases Searched**:** CINAHL, PubMed, and additional articles selected through a "hand search" using Google Scholar

Search terms utilized**:** *MeSH = Medical Subject Headings

- Stroke*
- Rehabilitation*
- Cognition*
- Metacognition
- Self Regulation
- Self Monitoring
- Self Awareness
- Mental Practice
- Executive Function
- Task Performance

Articles found and reviewed:

- Out of 1007 total articles gathered using pre-specified research criteria and limitations, **16 articles qualified** to be retained for further review.

Methods used for article analysis:

Levels of Evidence I-IV ~ Law & MacDermid's Appendix N: Evaluation of Quality of an Intervention Study Checklist

Results:

The themes are identified based on the evidence gathered:

1. Mental Practice Interventions (n=10)

Audiotape/script (n=6) [6,21,22,23,24,25]	**Moderate evidence** to support use of audiotape/script to improve occupational performance in patients with chronic UE hemiparesis
Visually Guided (n=2) [17, 28]	**Mixed evidence** for interventions for improved task performance via visually guided mental practice
Embedded (n=1)[4]	**Insufficient evidence** to support embedded mental practice to improve daily task performance
Mixed (n=1) [9]	**Insufficient evidence** to support the use of mixed mental practice to improve task performance in adults with UE hemi paresis

2. External Feedback Interventions (n= 6)

a. Prospective (Cognitive Orientation to Occupational Performance: CO-OP) (n=4) [8, 18, 19, 26]
   Moderate evidence to support CO-OP interventions to improve occupational performance
b. Retrospective (self regulation) (n=2) [14, 16]
   Two Types: video feedback & direct attention training
   Limited evidence to support self-regulation

Implications for the future:

Practice:

- Utilize clinical judgement to select patients in practice
- Daily intervention is beneficial if using mental practice and self-regulation
- Audiotape delivery of mental practice

Research:

- Location of stroke and its effect on metacognitive abilities
- Best measures of self-awareness
- Efficacy of combined mental practice and external feedback strategies

- Use of more advanced technology to deliver mental practice (i.e. apps)

Education:

- Greater emphasis on metacognition in curriculum
- Development of mental practice/motor imagery protocol for students to learn
- Development of continuing education course for practitioners

1. Al Banna, M., Abdulla Redha, N., Abdulla, F., Nair, B., Donnellan, C. (2015). Metacognitive function poststroke: a review of definition and assessment. Journal of Neurology, Neurosurgery, and Psychiatry. doi:10.1136/jnnp-2015-310305
2. American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain and process (3rd ed.). American Journal of Occupational Therapy, 68(Suppl. 1), S1– S48. http://dx.doi.org/10.5014/ajot.2014.682006
3. Arbesman, M., Lieberman, D., & Metzler, C. A. (2014). Using evidence to promote the distinct value of occupational therapy. American Journal of Occupational Therapy, 68(4), 381-385. doi:10.5014/ajot.2012.005207
4. Braun, S., M., Beurskens, A., J., Kleynen, M., Oudelaar, B., Schols, J., M., & Wade, D., T. (2012). A multicenter randomized controlled trial to compare subacute 'treatment as usual' with and without mental practice among persons with stroke in Dutch nursing homes. Journal of the American Medical Directors Association, 13(1), 85.e1-7. doi:10.1016/j.jamda.2010.07.009
5. Fernandez-Duque, D., Baird, J. A., & Posner, M. I. (2000). Executive attention and metacognitive regulation. Consciousness and Cognition, 9(2), 288-307. doi:10.1006/ccog.2000.0447
6. Guttman, A., Burstin, A., Brown, R., Brill, S., & Dickstein, R. (2011). Motor imagery practice for improving sit-to-stand and reach-to-grasp in individuals with post-stroke hemiparesis. Journal of the Israeli Physical Therapy Society, 13(2). doi: 10.1310/tscir1904-306
7. Hartman-Maeir, A., Soroker, N., Ring, H., Avni, N., & Katz, N. (2007). Activities, participation and satisfaction one-year post stroke. Disability and Rehabilitation, 29(7), 559-566. doi:10.1080/09638280600924996
8. Henshaw, E., Polatajko, H., McEwen, S., Ryan, J. D., & Baum, C. M. (2011). Cognitive approach to improving participation after stroke: Two case studies. The American Journal of Occupational Therapy, 65(1), 55-63. doi:10.5014/ajot.2011.09010
9. Ietswaart, M., Johnston, M., Dijkerman, H. C., Joice, S., Scott, C. L., Macwalter, R. S., & Hamilton, S. J. (2011). Mental practice with motor imagery in stroke recovery: Randomized controlled trial of efficacy. Brain: A Journal of Neurology, 134, 1373-1386. doi:10.1093/brain/awr077
10. Ikiugu, M. N. (2013). The validity of occupational performance assessments: A validity generalization meta-analysis. Occupational Therapy in Health Care, 27(4), 372-391. doi: 10.3109/07380577.2013.847298
11. Katz, N. (3rd Ed.). (2011). Cognition & occupation across the life span: Models for intervention in occupational therapy. Bethesda, MD: AOTA Press.
12. Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P., & Letts, L. (1996). The person-environment-occupation model: A transactive approach to occupational performance. Canadian Journal of Occupational Therapy, 63(1), 9-23.
13. Law, M., & MacDermid, J. (2003). Appendix N (418-423). Evidence-based rehabilitation: A guide in practice (2nd ed.). Thorofare, NJ: SLACK, Inc.
14. Lee, J., B., & Sohlberg, M. M. (2013). Evaluation of attention training and metacognitive facilitation to improve reading comprehension in aphasia. American Journal of Speech-Language Pathology, 22(2), 318-333. doi:10.1044/1058-0360(2013/12-0099)
15. Liu, K. P., & Chan, C. C. (2009). Metacognitive mental imagery strategies for training of daily living skills for people with brain damage: The self-regulation and mental imagery program. In International Handbook of Occupational Therapy Interventions (233-239). New York: Springer. doi:10.1007/978-0-387-75424-6_21
16. Liu, K. P., & Chan, C. C. (2014). Pilot randomized controlled trial of self-regulation in promoting function in acute poststroke patients. Archives of Physical Medicine and Rehabilitation, 95(7), 1262-1267. doi:10.1016/j.apmr.2014.03.018
17. Liu, K. P., Chan, C. C., Wong, R. S., Kwan, I. W., Yau, C. S., Li, L. S., & Lee, T. M. (2009). A randomized controlled trial of mental imagery augment generalization of learning in acute poststroke patients. Stroke; a Journal of Cerebral Circulation, 40(6), 2222-2225. doi:10.1161/STROKEAHA.108.540997
18. McEwen, S. E., Polatajko, H. J., Huijbregts, M. P., & Ryan, J. D. (2009). Exploring a cognitive-based treatment approach to improve motor-based skill performance in chronic stroke: Results of three single case experiments. Brain Injury, 23, 1041-1053. doi:10.3109/02699050903421107
19. McEwen, S. E., Polatajko, H. J., Huijbregts, M. P., & Ryan, J. D. (2010). Inter-task transfer of meaningful, functional skills following a cognitive-based treatment: Results of three multiple baseline design experiments in adults with chronic stroke. Neuropsychological Rehabilitation, 20(4), 541-561. doi:10.1080/09602011003638194
20. Moher, D., Liberati, A., Tetzlaff, J. & Altman, D.G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. Annals of Internal Medicine, 151(4), 264-269. doi:10.7326/0003-4819-151-4-200908180-00135
21. Nilsen, D. M., Gillen, G., DiRusso, T., & Gordon, A. M. (2012). Effect of imagery perspective on occupational performance after stroke: A randomized controlled trial. The American Journal of Occupational Therapy, 66(3), 320-329. doi:10.5014/ajot.2012.003475
22. Page, S. J., Levine, P., & Hill, V. (2007). Mental practice as a gateway to modified constraint-induced movement therapy: A promising combination to improve function. American Journal of Occupational Therapy, 61(3), 321-327. doi:10.5014/ajot.61.3.321
23. Page, S. J., Levine, P., & Leonard, A. C. (2005). Effects of mental practice on affected limb use and function in chronic stroke. Archives of Physical Medicine & Rehabilitation, 86(3), 399-402. doi:10.1016/j.apmr.2004.10.002
24. Page, S., J., Murray, C., Hermann, V., & Levine, P. (2011). Retention of motor changes in chronic stroke survivors who were administered mental practice. Archives of Physical Medicine & Rehabilitation, 92(11), 1741-1745. doi:10.1016/j.apmr.2011.06.009
25. Park, J. H. (2015). The effects of modified constraint-induced therapy combined with mental practice on patients with chronic stroke. Journal of Physical Therapy Science, 27(5), 1585-1588. doi: 10.1589/jpts.27.1585
26. Polatajko, H. J., McEwen, S. E., Ryan, J. D., & Baum, C. M. (2012). Pilot randomized controlled trial investigating cognitive strategy use to improve goal performance after stroke. The American Journal of Occupational Therapy, 66(1), 104-109.
27. Sackett,D. L., Rosenberg, W. M., Muir Gray, J. A., Haynes, R. B., & Richardson, W. S. (1996). Evidence-based medicine: What it is and what it isn't. British Medical Journal, 312(7023), 71–72. http://dx.doi.org/10.1136/bmj.312.7023.71
28. Timmermans, A. A., Verbunt, J. A., van Woerden, R., Moennekens, M., Pernot, D. H., & Seelen, H. A. (2013). Effect of mental practice on the improvement of function and daily activity performance of the upper extremity in patients with subacute stroke: A randomized clinical trial. Journal of the American Medical Directors Association, 14(3), 204-212. doi:10.1016/j.jamda.2012.

CONTACT: kerry.canton@jefferson.edu • chelsea.difrancesco@jefferson.edu
christine.geaney@jefferson.edu • sarah.jamieson@jefferson.edu • jessica.talarico@jefferson.edu