Exploring Mindfulness Techniques in Physical Therapy to Address Motor Skill Acquisition: A Perspective Piece

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Abstract: This perspectives piece provides a theoretical frame supporting the exploration of mindfulness techniques as a complimentary interventions strategies for physical therapy interventions to promote motor skill learning especially under dual tasking conditions.

Keywords: Mindfulness, physical therapy.

INTRODUCTION

Physical therapists are evidenced based health care professionals who assist individuals in learning or relearning motor skills. As evidenced based health care professionals we utilize diverse evidenced based strategies to meet the challenges of patients within an interprofessional healthcare environment. Recognizing that the processes associated with motor learning for patients are internal and influenced by task demands and environmental conditions, as part of the interprofessional healthcare team, physical therapists seek to create rich learning environments that encourage patients to be active problem solvers.

In the literature various theories seek to explain the learning process associated with motor skill learning. Two of the most frequently cited are that of Schmidt's Schema Theory and Newell's Ecological Theory [1]. Schmidt defines a class of tasks as actions which have the same relative amplitude and timing. Based upon task characteristics generalized motor programs are developed and stored for individual classes of tasks. In the Schema Theory variability in the practice of these class tasks enhances learning, even if error occurs during practice, because practice helps the learner develop rules that are task specific. Newell, in the Ecological Theory, emphasizes the relationship that exists between the performer, task and the environmental constraints as one seeks to learn a motor tasks. Newell suggests that when practicing tasks under various conditions the learner secures a better understanding of the relationship between the motor action and perceptual cues. For example, the relationship between the motor action of walking and the perceptual cue of water on the floor, assist the learner in recognizing the benefit of walking slower so as not to fall. Interestingly, both theories acknowledge the impact of task repetition across different conditions as a source of motor skill learning and view motor skill learning as a process.

Fitts and Posner [1] divide the process of learning into 3 stages: 1) cognitive, 2) associative, and 3) autonomous. During the cognitive stage the learner requires a high degree of attention to the task demands as they seek to understand and develop a strategy to help them get in the "ballpark" when performing the task. In the associative stage the learner further refines the efficiency of the task performed and seeks to use less attentional demands when executing the task. In the final autonomous stage, successful performance of the task results in an automatic execution of the task requiring little to no attention. Only, when the environmental conditions change does the task performance require modification such that the learner must attend to the task characteristics again.

Recognizing that motor skill learning is a process which requires attention and is influenced by the characteristics and relationship between the learner, task and environmental conditions, physical therapists continue to explore, evaluate and integrate evidence from diverse fields of study to assist them in understanding what can be done in the clinical environment to promote motor skill learning for patients.

Guadagnooli and Lee [2] offer the "Challenge Point Framework" as a guide to direct physical therapists as

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they seek to promote patients' motor skill learning. The Challenge Point Framework considers the learner and task characteristics as well as the practice condition options. For example, as the patient's motor skill level improves and thus the task difficulty decreases, task difficulty can be further increased by changing the environmental condition. One of the ways in which task difficulty can be increased is by introducing "dual tasking." Dual tasking is the performance of two or more tasks at the same time while requiring both tasks to be performed effectively and efficiently.

To better understand the impact of dual tasking researchers have explored the dual task paradigm in adults and children and in individuals experiencing cognitive and motor impairments, while manipulating the primary and secondary tasks. In general, the findings support that in the primary task of ambulating, variability in the spatial and temporal characteristics of gait is increased while, in the secondary cognitive tasks deterioration in task performance is observed when engaging in dual tasking. Not surprising these changes have been found to be greater in older adults, individuals with neurological impairments and when the secondary task required increased attentional demands [3]. Physical Therapists working with older adults and individuals with neurological impairments continually seek evidenced based intervention strategies to aide patients in meeting the demands associated with dual tasking and motor learning.

THEORETICAL FRAME

Mindfulness-based therapies can be used to complement current physical therapy interventions and aide in the promotion of a patient's ability to learn or relearn a motor skill or perform a dual task. Mindfulness has been described as, "a state of presence of mind which concerns a clear awareness of one's inner and outer experiences." A key element of mindfulness is the focusing on the present moment with an open and non-judgmental attitude. Applying mindfulness principles to chronic pain management Jon Kabat-Zinn [4] developed the Mindfulness Based Stress Reduction (MBSR) technique. Teasdale [5] expanded upon Kabat-Zinn work and developed the Mindfulness Based Cognitive Therapy (MBCT) approach to address depression. MBSR has found its way into the management of various chronic conditions, while MBCT has been incorporated into the treatment of various eating disorders, depression, burnout and anxiety disorders given its cognitive focus. Both MBSR and MBCT have also been used as a prevention strategy to promote life style changes. Gotink [6] provides a comprehensive systematic review and meta-analysis of systematic reviews of RCTs exploring the effectiveness of MBSR and MBCT interventions. Overall, the findings from their extensive review supports that MBCT and MBSR aide patients as they deal with primary and secondary impairments resulting from chronic conditions, support preventative medicine practices, and aide in promotion of health education practices. However, the impact of mindfulness therapies on mental health conditions are inconsistent and thus require further investigation.

Although the exact mechanism behind mindfulness has yet to be determined, Bishop [7] offers a two-component model which includes attention and motivation. Specifically, Bishop's model of mindfulness incorporates self-regulation of attention and orientation to experience. Self-regulation of attention requires focusing on the requirements of the task or tasks at hand rather than irrelevant information that might distract ones attention. While the second component of the model, motivation, supports the need for openness to new experiences which results in an increased affect tolerance, body awareness and emotional awareness.

Recognizing that mindfulness techniques aide in self-regulation of attention and enhanced motivation, physical therapists should begin to explore the use of mindfulness techniques to assist in the learning or relearning of motor skills especially when dual tasking. Developing mindful learners (patients) who can secure the required information from the environment needed to effectively generate a motor response while controlling environmental distractions will result in effective and efficient motor skill learning. Additionally, given that employing the strategy of mindfulness is inexpensive, easy to learn and demonstrates positive outcomes in various patient populations, options for its use as a complimentary practice in physical therapy is plausible. However, future work to establish empirical evidence to support the ideas presented here is needed to provide physical therapists and other healthcare professionals the evidence to support the use of mindfulness interventions to promote motor skill learning especially under dual tasking conditions.

REFERENCES

[1] Jensen GM, Mostrom E. Handbook of teaching and learning for physical therapists. 3rd ed. Missouri: Elsevier 2013.

[2] Guadangnoli MA, Lee TD. Challenge point: A framework for conceptualizing the effects of various practice conditions in motor learning. J Mot Behav 2004; 36: 212-24. http://dx.doi.org/10.3200/JMBR.36.2.212-224

[3] Schaefer S, Lang C. Using dual tasks to test immediate transfer of training between naturalistic movements: A proof-of-principle study. J Mot Behav 2012; 44(5): 313-27. http://dx.doi.org/10.1080/00222895.2012.708367

[4] Kabat Zinn J, Lipworth L, Burney R. The clinical use of mindfulness meditation for the self-regulation of chronic pain. J Behav Med 1985; 8: 163-19. http://dx.doi.org/10.1007/BF00845519

[5] Teasdale JD, Segal ZV, Williams JM, Ridgeway VA, Soulsby JM, *et al*. Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. J Consult Clin Psychol 2000; 68: 615-23. http://dx.doi.org/10.1037/0022-006X.68.4.615

[6] Gotink R, Chu P, Busschbach JJV, Benson H, Fricchione GL, Myriam Hunink MG. Standardized mindfulness-based interventions in healthcare: An overview of systematic reviews and meta-analyses of RCTs. PLoS ONE 2015; 10(4): 1-17. http://dx.doi.org/10.1371/journal.pone.0124344

[7] Bishop SR, Lau M, Shapiro S, Carlson L, Anderson ND, *et al*. Mindfulness: A proposed operational definition. Clinical Psychology: Science and Practice 2004; 11: 230-41. http://dx.doi.org/10.1093/clipsy.bph077

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