Meditation and Mindfulness in Physical Therapy Practice
Improved Outcomes, Happy Clinicians, Healthy Workplace

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Learning Objectives
• Describe neuroplasticity and the neurophysiological changes that result from (chronic) stress and from meditation
• Define mindfulness and meditation
• Evaluate current evidence for the use of meditation and mindfulness to reduce stress, pain, prevent/treat clinician burn-out
• Practice and teach basic meditation and mindfulness techniques

Session Outline
• Neuroscience: stress, pain, neuroplasticity
• Clinician burnout
• Mindfulness and Meditation
• Lab 1: mindfulness
• Research review
• Lab 2: awareness/attention, relaxation response
• Case studies, resources
• Q and A
Stress

Perceived physical or psychological threat to safety, status, well-being

- Demands > resources
- Lack of control
- Lack of meaning
- **Perception** and stress

Stress

- Not wanting what you have
- Not having what you want
- “Stress is resisting what is”
  ~ Eckhart Tolle

“Good” Stress

“Bad” Stress

THE HUMAN FUNCTION CURVE

Adapted from: Nilson, P. Practitioner, 1979.
Internal Stress: Thoughts

Stress Response

Autonomic Nervous System (ANS)

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Cortisol
- Catabolic hormone
- Produced by adrenal cortex
- Higher levels in the morning
- Maintains blood glucose levels
- Suppresses non-essential organs (to increase E to brain and neuromuscular system)
- Anti-inflammatory
- Chronic elevated cortisol: immune suppression, HBP, hyperglycemia, reduced libido, obesity, etc

Limbic System

Neuroplasticity
- "Neuroplasticity can be defined as the ability of the nervous system to respond to intrinsic or extrinsic stimuli by reorganizing its structure, function and connections." (Cramer, S.C, 2011)

Brain changes with chronic stress
- Hippocampus (memory):
  - new neurons, connection between cells, memory loss
- Amygdala (fear center):
  - size, reactivity to perceived threat, “amygdala hijack” = emotional reactivity
- Medial prefrontal cortex (learning and memory):
  - size

Effects of chronic stress
- Anxiety, depression
- Digestive problems
- Heart disease
- Insomnia
- Weight gain
- Memory and concentration impairment
- Muscle pain/tension
- Type II diabetes
- Sexual dysfunction, etc.
population-based prospective cohort study  
N=267, free of CWP but at future risk based on their psychosocial profile  
Assessment of HPA axis function (cortisol levels)  
Follow up 15 months

CONCLUSION: Among a group of psychologically at-risk subjects, dysfunction of the HPA axis helps to distinguish those who will and will not develop new-onset CWP.

CLBP (16) vs healthy controls (18)  
• Cortisol levels (7 days)  
• Hippocampus volume  
• Brain response to thermal stimuli (fMRI)  
• Pain is a stressor (allostatic load), ↑cortisol  
• ↑cortisol from chronic pain can cause  
• Reduction/change in cortical thickness  
• Dysregulation HPA axis  
• ↓size hippocampus

Results  
• Cortisol levels in patients with CLBP > controls  
• Patients with CLBP with smaller hippocampal volumes have higher levels of cortisol  
• Cortisol levels and chronic pain intensity are associated with a stronger pain response in the anterior hippocampal formation

Conclusion  
• Supports “stress model of chronic pain”: maladaptive stress responses in the transition from acute to chronic pain.  
• Interventions aiming at stopping/reversing chronic pain-related allostatic load could prove to be as important as treating the source of nociception itself  
• Cultivating mental states aimed at down-regulating the impact of stress and further implementing clinical interventions promoting anxiety and stress reduction may be essential to prevent and relieve chronic pain.

Meditation for Chronic Pain  
• Baseline anxiety scores: predictors of pain, depression, and a reduced quality of life.  
• Pain is a stressor, and a maladaptive response to acute pain may intensify the pain experience and condition a sensitized physiologic stress response to pain-provoking stimuli.  
• Exaggerated, prolonged, or recurrent activation of a sensitized stress response to pain or non–pain-related stressors may initiate or exacerbate pain and disability

Let's get personal!  
Stresses in physical therapy: General “life stressors” + work specific stress  
• Demands>resources  
• Lack of control  
• Lack of meaning
Compassion

Satisfaction: the pleasure a clinician derives from being able to do his/her work well, finding their contribution meaningful.

Compassion Fatigue components:
- Burnout
- Secondary traumatic stress

Reduce risk for BO in PT
- Boundaries
- Realistic expectations
- Support from management
- Finding best job fit
- Hobbies
- Social activities/support
- SELF-CARE! Exercise, sleep, relaxation, meditation, etc.

• Increase PSN and decrease SNS activity

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Why is a PT teaching meditation and mindfulness?

• Burnout (BO): “a syndrome of emotional exhaustion, depersonalization, and reduced accomplishments that can occur among individuals who do ‘people work’ of some kind”

• Causes for BO:
  - personality characteristics
  - work-related attitudes
  - work/organizational characteristics

• BO: chronically over activated SNS!
Mindfulness

Mindfulness means maintaining a moment-by-moment awareness of our thoughts, feelings, bodily sensations, and surrounding environment, w/o judgment, with acceptance.

-Greater Good Science Center, Berkeley

Mindfulness in practice

- Breathing
- Moving
- Hand washing
- Walking
- Eye-contact
- Hand shake
- Eating
- Etc.
Meditation

Directing one’s attention toward a symbol, sound, thought, or breath to alter the state of consciousness to attain a state of relaxation and stress relief; used for spiritual growth, healing, deepening concentration, and unlocking creativity.

-Mosby’s Dictionary of Complementary and Alternative Medicine-

Types of Meditation

• Mindfulness meditation
• Mantra meditation
• Guided visualization
• Transcendental meditation (TM)
• Vipassana (insight) meditation
• Walking meditation
• Loving Kindness meditation
• Centering prayer
• Etc.

Scientifically validated benefits

• Decreased stress
• Reduced symptoms associated with:
  • Depression
  • Anxiety
  • Pain
  • Insomnia
• Enhanced ability to pay attention
• Increased quality of life

Meditation ingredients

• Willingness to take time to practice
• Gentle non-judgmental attention
• A point of focus
  • Kinesthetic
  • Visual
  • Auditory

Let’s Practice!

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Research Challenges

- Interpretation of results
- Selection bias
- Lack of blinding
- Placebo effect
- Practitioner bias
- Publication bias
- Co-interventions
- Lack of follow up

Evidence for meditation benefit-NIH

- Reduce HBP
- Reduce IBS symptoms
- Reduce flare-ups with ulcerative colitis
- Reduce anxiety, depression, insomnia
- Supports smoking cessation
- Improved immune function in people with HIV and cancer
- Improved QoL in people with breast cancer

Mindfulness practice leads to increase in regional brain gray matter density

Britta K. Hölzel, James Carmody, Mark Vangel, Christine Congleton, Rita M. Viamonte, Tim Gard, Sanne W. Lauer

- 8 weeks MBSR vs wait list
- N=16 new meditators
- MRI before and after program
“The results suggest that participation in MBSR is associated with changes in gray matter concentration in brain regions involved in learning and memory processes, emotion regulation, self-referential processing, and perspective taking.”

**Meditation Programs for Psychological Stress and Well-being**

A Systematic Review and Meta-analysis

- 47 trials with 3515 participants
- 9 RCTs evaluating the effect on pain: moderate evidence that MBSR reduces pain severity to a small degree when compared with a nonspecific active control
- Variable across painful conditions, visceral more effect than MSK

**Conclusion:**

“Mindfulness meditation programs could help reduce anxiety, depression, and pain in some clinical populations. Thus, clinicians should be prepared to talk with their patients about the role that a meditation program could have in addressing psychological stress.”

**Effects of Mindfulness Meditation on Chronic Pain: A Randomized Controlled Trial**

- N=109
- Non-specific chronic pain
- MBSR (“mindfulness meditation”) vs waitlist
- SF-36
- Baseline, course completion, 6 months
- Decreased anxiety and depression, better psychological well-being, feeling in control of the pain, higher pain acceptance. Small effect sizes were found for pain measures.
• 93 HCP
• MBSR based course
  • 4 mindfulness practices/mindfulness at work
• 2.5 hours/week plus 7-hour retreat
• 45 min/day, 6 days/week: home practice (CD)
• Maslach Burnout Inventory, SF12-v2

Outcome
• Improved Maslach Burnout Inventory scores
  • Emotional exhaustion
  • Depersonalization
  • Personal Accomplishment
• Improved mental wellbeing
  “A continuing education course based on MBSR was associated with significant improvements in burnout scores and mental wellbeing for a broad range of HCP”

Facilitators:
  • Interventions fit into HCP schedule
  • Financial assistance

Barriers:
  • High work demand
  • Time limitations
  • Personal time management
  • Lack of appropriate space
  • Lack of evidence

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Putting it into practice
• Clinician—“Physical Therapist heal thyself!”
• Patient
  • Education: [link]
  • Teach techniques
  • Integrate in existing treatment
• PT practice/clinic/workplace
“Often physical therapists undertake to teach people to do healing things for their bodies while neglecting two of the most powerful allies people have for healing: the breath and the mind.”

Jon Kabat-Zinn: “Full Catastrophe Living”

Case Study 1

• 47 y/o female
• Stage 2 breast cancer (recurrence)
• s/p mastectomy, 6 weeks chemo, undergoing radiation
• Expander in place
• Referral: “Exercise program for general conditioning”

Symptoms: fatigue and bilateral leg pain
Goals (pt): improve energy level, go back to executive job, lose weight
Findings:
  • “Recovering workaholic”, dislikes exercise, fear of moving the shoulder and arm
  • Poor posture, limited left shoulder ROM, shoulder muscle weakness, soft tissue restrictions left upper quarter, shallow breathing

Treatment

• Education/Meditation
• Breath awareness and 3 part breath
• Body awareness (“sensations without story”)
• Coaching (walking program)
• Yoga-based range of motion exercises, full body
• Manually assisted left shoulder/chest stretches and relaxation techniques.
• Yoga-based strengthening full body, focus on correct alignment

Resources

Books:
• Soul Centered-Sarah McLean
• Buddha’s Brain-Rick Hanson PhD
• Full Catastrophe Living-Jon Kabat-Zinn
• The Mayo Clinic Guide to Stress-Free Living-Amit Sood MD
• How God Changes Your Brain-Andrew Newberg MD

Resources

• Dr. Sarah Lazar TED talk: https://www.youtube.com/watch?v=m8rRtT7TC
• NIH Meditation information: https://nccih.nih.gov/health/meditation/overview.html#ned2
• Free guided meditations UCLA http://marc.ucla.edu/body.cfm?id=22
• Insight Timer App
• Mayo Clinic Meditation App
I wish you well!

References


* Assessing mindfulness and acceptance processes in clients-Ruth Baer, 2010*