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The Impact of Mindfulness-Based Interventions on Pain, Mental Health, and Well-Being

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Short Course Objectives

The use of mindfulness as a therapeutic concept in OT
The subjective experience of pain
Neural mechanisms that support mindfulness interventions
Examples of mindfulness based treatment approaches
Evidence that supports mindfulness based interventions (MBI)
Role of OT?

Not substantiated as an evidence-based intervention for occupational therapy

Emerging evidence exists that mindfulness interventions fit within the “Scope of Practice” for occupation-based treatment


Definition of Mindfulness

Based on Eastern tradition

Cognitive practice

Development of nonjudgmental awareness of sensory events

Produces a sense of well being across experimental and clinical populations (Zeiden, et al, 2015)

Mindfulness

Mindfulness Based Interventions (MBI) include mindfulness of breath, thoughts, bodily sensations, sounds, and everyday activities or occupations.

<table>
<thead>
<tr>
<th>Mindful eating</th>
<th>Mindful attention</th>
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<tbody>
<tr>
<td>Mindful thinking</td>
<td>Mindful seeing</td>
</tr>
<tr>
<td>Mindful smelling</td>
<td>Mindful engagement</td>
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Daily Living and Meaningful Occupational Engagement

Autopilot
Wandering mind
Suppressing unwanted experiences
Our minds wander 47% during the day and correlates with unhappiness

“When are humans most happy? To gather data on this question, Matt Killingsworth built an app, Track Your Happiness, that let people report their feelings in real time. Among the surprising results: We're often happiest when we're lost in the moment. And the flip side: The more our mind wanders, the less happy we can be. (Filmed at TEDxCambridge.)”

Challenge in Obtaining a Mindful State

Default state of attending “mind wandering”
Self-criticism
Worrying about the past
Worrying about the future
Challenge in Obtaining a Mindful State

A recent study showed that participants preferred electric shocks over being left alone with their thoughts.


Implication for OT

Can mindfulness assist individuals to engage in meaningful daily occupations, habits, and routines?
Mindfulness as a Somatosensory Focus

Experiential awareness of the current moment


Subjective Experience of Pain

Definition: An experience based on a complex interaction of physical and psychological processes

Unpleasant sensory and emotional experience associated with actual or potential tissue damage or associated with depression and anxiety
Subjective Experience of Pain

A complex interaction between:

Sensory
Affective
Cognitive Factors

All employ the same neural pathways and share the same neural mechanisms

Nociceptors, or pain receptors, are free nerve endings that respond to painful stimuli. Nociceptors are found throughout all tissues except the brain, and they transmit information to the brain. They are stimulated by biological, electrical, thermal, mechanical, and chemical stimuli.
The basic sensation of pain occurs at the thalamus. It continues to the limbic system (emotional center) and the cerebral cortex, where pain is perceived and interpreted.

**Pain and Mindfulness**

Melzak and Wall proposed the Gate Control Theory where level of attention spent on pain, emotions associated with the pain, and past experience with pain all contribute to our interpretation of pain.
Pain and Mindfulness

McCaul and Malott indicated that humans have a limited ability to attend to more than one stimulus. Pain has to be focused on.

Therefore, if they attend to another stimulus other than the noxious pain experience the pain experience will seem less intense.


Neural Pathways for Mindfulness-Based Pain Relief

Mindfulness meditation activates brain regions that mediate cognitive control of pain and emotional modulation.

Anterior Cingulate Cortex
Neural Pathways for Mindfulness-Based Pain Relief

Sensory processing regions:
Secondary somatosensory cortex and insula.

Orbitofrontal cortex – contextual evaluation of sensory events

Anterior cingulate cortex – cognitive regulation of nociceptive processing

Zeidan, et al, found that mindfulness meditation deactivates the thalamus which is the interpretive pain center and deactivates brain regions that promote low-level sensory procession and nociceptive processing.
The study claims that 4 days of mindfulness meditation training reduced "pain unpleasantness by 57%" of "the noxious stimulation" and the "pain intensity ratings" were reduced by 40%. The study noted that meditation reduced the activation of the "contralateral primary somatosensory cortex" which affects one's pain related experience.

Zeiden, et al, found that mindfulness meditation significantly decreased neural activation in brain regions that facilitate and modulate nociceptive information

Mindfulness based pain relief engaged brain mechanisms that mediate the cognitive modulation of pain
Neural Pathways for Mindfulness-Based Pain Relief

The mindfulness-based cognitive practice of directing attention toward breath corresponds to the activation of the somatotopic representation of nose and mouth.

Mindfulness and Chronic Pain

A study on chronic pain found the immediate effects of a 10 min mindfulness-based body scan when compared with a control intervention. The data suggest that, in a clinic setting, a brief body scan has immediate benefits for those experiencing chronic pain. Further research needs to be done.

Body Scan Exercise Example


Mindfulness or Distraction from Pain?

The study by Prins and Van Damme claims that mindfulness works better than distraction when pain catastrophizing is high, whereas the opposite is true when pain catastrophizing is low.

Catastrophizing is defined as an exaggerated negative mental during actual or anticipated painful experience, including cognitions related to excessive threat appraisal, rumination, and helplessness.

Persons characterized by high pain catastrophizing focus intently on pain and cannot focus on a task while in pain.

An opposing strategy is mindfulness, which involves paying attention to one's pain.

Impact of Mediation and Breath Control on Pain


Impact on Physical Health

Chronic Pain and Stress Reduction

CBT (training to change pain-related thoughts and behaviors) and MBSR (training in mindfulness meditation and yoga) were delivered in 8 weekly 2-hour groups. Usual care included whatever care participants received.

Impact on Physical Health

Perception of Well-Being

Study by Zivnuska et al, focused on mindfulness at work, defined as a psychological state in which employees intentionally pay full attention to the present moment while executing job tasks.

Depicts how mindfulness at work may help employees develop resources (work-family balance and job engagement) which may be associated with greater well-being (less psychological distress and more job satisfaction) and organizational attitudes such as job commitment.


Impact on Physical Health

Health Behaviors-

Five Facet Mindfulness Questionnaire

observing,
describing
acting with awareness
non-judging of inner experience


CONTINUED
Relationship between Mindfulness and Mental Health

Mindfulness “3rd Wave” treatment approach following behavioral and cognitive behavioral treatment approaches.


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Mindfulness and Mental Health

Web based training in mindfulness to promote mental health

Mindfulness Training for Adolescents with Co-Occurring Mental Health Disorders

- improved mood,
- enhanced relationship to self
- increased self-control
- improved problem-solving
- awareness of the present
- and enhanced interpersonal relationships


Types of Mindfulness Interventions

- Mindfulness-Based Stress Reduction (MBSR)
- Group-Based Mindfulness Interventions
- Mindfulness Intervention Retreats
- Brief Interventions
- Internet and Smartphone Application Interventions
- Acceptance and Commitment Therapy (ACT)
- Dialectical Behavior Therapy (DBT)
- Cognitive Behavioral Stress Management (CBSM)
- Integrative Body-Mind Training (IBMT)

Mindfulness Based Stress Reduction (MBSR)

8 week training and retreats
Perception- How you see things or don’t see them
Body scan and how you react to stress
Mindful Practice – Hatha Yoga
  Sitting meditation
  Walking meditation
Stress Hardiness – Ability to respond to stress using mindful practice
Internet and Smartphone Application Interventions

Calm.com- 7 step meditation (different lengths and backgrounds)

Promodoro Pro – Time management app for work that promotes breaks for mindfulness

Omvana – Life coach of meditation websites and apps, inspires to live in the moment

Mindbody Connect – App locates yoga classes, day spas, and meditation centers in your vicinity, and lets you book and pay for it on your phone

Headspace – Helps with breathing exercises and breaks for yourself

Youtube-RainbirdHD- Nature sounds to go to sleep by

Best Meditation Apps for 2016 -

Acceptance and Commitment Therapy (ACT)

ACT breaks mindfulness skills down into 3 categories:

1) defusion: distancing from, and letting go of, unhelpful thoughts, beliefs and memories

2) acceptance: making room for painful feelings, urges and sensations, and allowing them to come and go without a struggle

3) contact with the present moment: engaging fully with your here-and-now experience, with an attitude of openness and curiosity
Dialectical Behavior Therapy

**Mindfulness**
- Being focused and learning to live in the present moment.

**Regulating Emotions**
- Reduce the intensity of emotional pain until the feelings pass.

**Distress Tolerance**
- Learn to defuse stressful or painful situations resulting in better health.

**Interpersonal Effectiveness**
- Understand how to set boundaries and clearly express your needs.

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**MINDFULNESS WORKSHEET 2C**

<table>
<thead>
<tr>
<th>Name(s) of skill(s)</th>
<th>How did you practice the skill?</th>
<th>Describe your experience, including body sensations, emotions, and thoughts while practicing the skill</th>
<th>What is your experience now, after using the skill?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example:</strong> Participating</td>
<td>I went to a party and joined in conversations with other people. I felt a tight knot in my stomach, shallow breathing, dry mouth, anxiety that other people would not like me. I forgot the conversation, walked, talked, and lucked around one hit, and ended up having a good time.</td>
<td>I felt assured that I managed to do this and felt good about myself. I am thinking maybe I should do this again.</td>
<td></td>
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**Monday:**

**Tuesday:**

**Wednesday:**

(continued on next page)
Cognitive-behavioral stress management (CBSM)

Combination of meditation with a variety of cognitive-behavioral strategies:
- problem solving
- interpersonal communication
- recognize and alter responses to negative thoughts
- often done in a group setting.

Integrative Body Mind Training (IBMT)

- Avoids struggle to control thoughts
- Promotes restful alertness
- Relies on body-mind awareness
- Uses breath adjustment and imagery while music is playing the background
- Thought control is achieved gradually through posture, relaxation, body-mind harmony, balanced breathing.
- Adapted from traditional Chinese medicine in the 90’s
- Emerging technique in the US

Dosing Recommendations

5-10 minute guided mindfulness training over 3 to 4 sessions decreased pain.

8 week interventions produced a wider effect