Coping with Chronic Pain: Current State of the Science

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For Webinar Series:
Chronic Pain - Improving Life While Living It

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Objectives

1) Learn about the conceptual background for a stress and coping perspective on pain.

2) Become familiar with ways of assessing pain coping in persons having persistent pain.

3) Recognize the strengths and limitations of current psychosocial treatment protocols for pain.

4) Familiarize participants with future directions in research on pain coping.
Conceptual Background
Pain = Poena
The Traditional Model of Pain
The Traditional View

- Pain is the result of tissue damage/injury
- Pain transmission from the periphery to the brain
- Amount of pain is proportional to tissue damage/injury
The Traditional Model:
Mid-1950s
Problems with the Traditional View
Injury → No pain
Phantom Pain
Newer Theories
Gate Control Theory: Melzack & Wall

- Gate in spinal cord opens or closes to allow noxious input to reach brain
- Gate influenced by:
  - cognitive processes
  - motivational-affective processes
Brain

**Pain Inhibition Systems**

**Pain Facilitation Systems**

Pain signals to the brain

Pain Transmission Neurons

Spinal Cord

Stimulus

Sensory Neurons

Gate open
Brain

Pain Inhibition Systems

Pain Facilitation Systems

Sensory Neurons

Spinal Cord

Gate open

Medication
Danger
Coping

Pain Transmission Neurons
Stimulus
Brain
Pain Inhibition Systems
Pain Facilitation Systems
No pain signals get to brain
Gate closed
Medications
Danger Coping
Sensory Neurons
Stimulus
Pain Transmission Neurons
Spinal Cord
Sensory Neurons
Brain

Pain Inhibition Systems

Pain Facilitation Systems

Pain Transmission Neurons

Sensory Neurons

Gate closed

Spinal Cord

Stress
Anxiety
Maladaptive Coping
Brain

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Pain signals to the brain

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Stimulus

Sensory Neurons

Gate open

Spinal Cord

Pain Transmission Neurons
Imaging Studies: The Pain Neural Matrix

Regions of interest:
- S1 and S2
- Insula
- ACC
- Dorsolateral prefrontal cortex
- Thalamus
- Amygdala
- PAG
Neuromatrix Theory: Melzack (1999)

- Sensory inputs
- Visual and other inputs that influence cognitive interpretation
- Phasic and tonic cognitive-emotional inputs from brain
- Intrinsic neural inhibitory modulation
- Activity of body’s stress regulation systems
Studies of Pain Coping
Stress: Human Studies

Stressful Event (Pain) ➔ Outcome
Stress: Human Studies

Stressful Event

Outcome 1
Outcome 2
Outcome 3
Lazarus and Folkman: Stress and Coping Theory

Stressful Event \( \rightarrow \) Coping + Appraisal \( \rightarrow \) Outcome
Coping vs Appraisal

- **Coping=**
  - cognitive and behavioral efforts to master, reduce, or tolerate demands

- **Appraisal=**
  - judgment of event as harm/threat or challenge
  - judgment that coping option(s) will work
How do People Cope with Pain?
Pain Research: Coping & Appraisal

- How do you cope? (coping skills)
  - "I distract myself"
  - "I take rest breaks"
  - "I do things to help myself relax"
  - "I avoid overly negative thinking"
  - "I mentally calm myself"

- How effective is your coping? (appraisal)
  - "I am able to control my pain"
  - "The pain is awful and overwhelms me"

Indices
- Self-efficacy
- Catastrophizing
- Helplessness

Cognitive vs behavioral coping
Active vs passive coping
What Is Pain Catastrophizing?

Pain catastrophizing="the tendency to focus on and exaggerate the threat value of painful stimuli and negatively evaluate one’s own ability to deal with pain”

(Keefe et al., 2000, p.2).
Studies with Chronic Non-Malignant Pain:
Persons Who Catastrophize:

- Report more severe pain

Even after controlling for pain:
- Show more pain behavior (e.g. guarded movement)
- Report higher depression, anxiety, psychological distress, more suicidal ideation
- Exhibit more physical disability
- Have higher intake of pain medication
What Is Pain Catastrophizing?

Pain catastrophizing is “the tendency to focus on and exaggerate the threat value of painful stimuli and negatively evaluate one’s own ability to deal with pain” (Keefe et al., 2000, p.2).
Is Pain Catastrophizing Important in Persons with Disease-Related Pain?
Knee Replacement Surgery for Osteoarthritis

- Pain = primary reason knee replacement
- 30% moderate/severe pain 1 year after surgery
- 40% require assistive device to ambulate
101 consecutive OA patients pre-op and 6-mos later

Covariates:
1) extent of preoperative pain or functional status,
2) severe surgical complications,
3) implant status,
4) comorbidity

Psychological predictors
- Depression
- Anxiety
- pain catastrophizing
- self-efficacy
- fear of movement
Results

- Odds 4.5 times higher that patients with high pain catastrophizing scores were non-responders in terms of clinically significant pain relief.
Next Step

- Multicenter clinical trial
- Will a coping skills intervention improve the outcomes for knee replacement surgery patients with high pain catastrophizing pre-operatively?
Mechanisms
Cortical Responses to Pain: Relationship to Pain Catastrophizing

- Seminowicz & Davis (2006)
- 22 Healthy individuals
- fMRI
- Electrical stimulation median nerve
  - Mild pain
  - Moderate pain
Results

- Pain catastrophizing not related to regions associated with sensory discriminative aspects of pain
- Pain catastrophizing was related to regions associated with affective, attention, and motor aspects of pain
- During more intense pain, activity in prefrontal cortical regions implicated in top down modulation of pain were negatively correlated with pain
Key Findings & Conclusions

- In catastrophizers:
  - A cortical vigilance network is engaged during mild pain
  - More intense pain, diminished prefrontal cortical modulation impedes disengaging from and suppressing pain
Problem

Who’s first?
Psychosocial Interventions
Cognitive-Behavioral Therapy

CBT

Cognitive Therapy
- Active learning of new thought patterns
- Identifying overly negative thoughts
- Challenging them
- Developing new ways of thinking

Behavior Therapy
- Active learning of new behaviors
- Structure learning environment
- Positive reinforcement
- Increasing level and variety of adaptive behaviors
Example of a CBT Protocol: Pain Coping Skills Training

- Helping patients reappraise their ability to cope with pain
- Training in pain coping skills (e.g. goal setting, activation, challenging overly negative thoughts, relaxation, imagery)
- Guided practice
- Home practice during pain episodes
Osteoarthritis

- Common (>40% of middle aged adults, >70% of older adults)
- Progressive
- Affects mainly weight bearing joints
- Pain is most common symptom
Keefe et al. (1990)

Ss=99 older adults (mean age=64 years) having osteoarthritis of the knees and persistent knee pain

Ss randomly assigned to:
1. Pain Coping Skills Training
2. Arthritis Education
3. Standard Care Control
Major Findings

1. Pain:
   - CST < Arthritis Ed.
   - CST < Standard Care Control

2. Psychological Disability:
   - CST < Arthritis Education
   - CST < Standard Care Control

3. Key predictor of outcome: Improvements in appraisals of coping skills over the course of CST
Evidence of Efficacy

Meta-analyses and Systematic Reviews

- Arthritis pain
- Cancer pain
- Musculoskeletal pain (low back pain)
- Migraine headache
- Tension headache

Key findings

- Significant decreases in pain
- Improvements in indices of adjustment to pain:
  - Depression
  - Anxiety
  - Pain catastrophizing
  - Self efficacy
  - Activity level
  - Medication intake
Interventions Involving Both Patients and Caregivers

- Partner-Assisted
- Couples-Based
Interventions Involving Partners: Basic Elements

- **Partner-Assisted**
  - Role of partner: coach/assistant
  - Major focus: patient
  - Target: patient skills
  - Keefe et al. (2004)

- **Couples-based**
  - Role of partner: equal participant
  - Major focus: couple
  - Target: couple communication and interaction
  - Baucom, et al. (2009)
Emotional Disclosure
Interventions
Emotional Disclosure Protocols: Basic Elements

- **Rationale:** Suppressing thoughts and feelings about stress predicts more pain and poorer health outcomes.

- **Procedure:** 4 sessions writing about thoughts and feelings about stressful event(s).
Outcomes: Emotional Disclosure

- Lumley, et al. (2012)
- 18 studies with chronic pain
- 13 with positive results
- Limited and inconsistent benefits for other outcomes
- Pain improved in only a small number
Acceptance-Based Interventions
Acceptance-Based Interventions

- Eastern traditions
- J. Kabat-Zinn—mindfulness meditation
- Yoga-based approaches (Wren et al. 2011)
- Acceptance and commitment therapy (ACT, McCracken, Vowles, Eccleston, 2005)

Goals:
- accepting, not fighting pain
- engaging in valued activities
Psychosocial Interventions: Critique and Comparison
## Comparison

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<thead>
<tr>
<th>Intervention</th>
<th>Strengths</th>
<th>Limitations</th>
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<tr>
<td>Cognitive-behavioral</td>
<td>many RCTs</td>
<td>dissemination has been limited</td>
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<td>protocols standardized</td>
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<td></td>
<td>experiential learning</td>
<td>underused</td>
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<tr>
<td>Partner-based</td>
<td>actively involves partners</td>
<td>fewer RCTs</td>
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<td>active learning of couples skills</td>
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<td></td>
<td>good for pain conditions</td>
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<td>where partner is caregiver</td>
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<td>Emotional disclosure</td>
<td>inexpensive</td>
<td>inconsistent effects</td>
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<td></td>
<td>no therapist needed</td>
<td>few studies in older Ss</td>
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<tr>
<td>Acceptance-based</td>
<td>novel approach</td>
<td>fewer RCTs</td>
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<td>integrates with CBT</td>
<td>results similar to CBT</td>
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<td>good fit for some patients (e.g. those who are avoidant)</td>
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Clinical Implications and Future Directions
Clinical Implications

1. Clinicians need to be aware that psychosocial interventions can help many older adults having persistent pain.

2. These interventions not only can help reduce pain, but also enhance older adults psychological and physical adjustment to pain.

3. New strategies are being developed to extend the reach of psychosocial interventions.
Psychosocial Interventions Delivered by Other Health Care Providers
Ways to Deliver Psychosocial Interventions to Older Adults

- Video-over internet
- Interactive voice response technology
Internet-Based Interventions

Advantages
- translate evidence based interventions
- reach large numbers
- low cost (no therapist)
- can provide interactive learning
- tailor to individual needs
- proceed at own pace
- track progress

- Recent studies: Significant gains in access to internet among less educated and low income adults

Conclusions

1. Our understanding of pain and pain coping has advanced considerably over the past 25 years.

2. We can measure pain coping reliably.

3. By incorporating brief measures of pain coping into clinical practice we can understand pain better.
Integrating coping skills training into medical treatment and focusing more directly on early intervention can lead to major advances

- Prevent pain
- Improve the quality of life
- Reduce the suffering of many individuals
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- Patients & caregivers

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Thank you for attending.

QUESTIONS?

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