Acute vs Chronic Pain

Acute pain - a symptom that signals that something is not normal and requires attention (illness, trauma, surgery)

Chronic pain – no longer a symptom; it has become a pathology; pain that lasts longer than healing time and/or lasts > 3 months (sequel of illness, trauma, surgery or unknown etiology)

Chronic Low Back Pain (CLBP)

• Contributes to:
  - disability
  - impaired quality of life
  - work absence
  - decreased ability to work

• Variable responses to interventions

• It is estimated that:
  - 5 million Americans live with CLBP
  - $25 million in direct care
  - $100 – $200 billion annually
**Challenge: CLBP Scope & Impact**

- 51% of people have CLBP on regular basis
- 32/1000 Americans live with CLBP
- 1 in 3 community dwelling elders
- #1 reason for px limits in < 45 yrs (15-45%)
- 2nd cause of disability in US
- 40 – 70% recurrence (with aging)
- US cost $50-100 billion (1990)
- > 15 million physician visits per year
- 2nd cause MD visits & 5th cause hospitalization

**Current Interventions**

- Multi-modal analgesia
- Traditional Western Medicine:
  - NSAIDS & acetaminophen
  - opioids
  - surgery
  - spinal cord stimulation
  - percutaneous electrical nerve stimulation
  - TENS

**Non-traditional Therapies**

- Non-traditional Approaches:
  - exercise and physical therapy
  - meditation
  - yoga
  - herbs
  - vitamins/supplements
  - acupuncture
  - chiropractic
  - music
  - CBT
Links of Anger with CLBP

- Anger at self
- Anger at source of pain
- Anger at inadequate treatment
- Anger at not being heard
- Anger at source of pain
- Anger at not knowing cause of pain
- Anger at Loss of lifestyle
- Anger at not being believed

Relationship of CLBP & Anger

- Anger potential central component in CLBP
- Comparatively little is known
- Anger Expression – Suppression
- Anger Control
- Anger directed toward self or others

CLBP & Anger Rumination

- Burns et al (2008) suggested AR as possible key component in relationship between chronic pain and anger
- Anger Rumination involves continually revisiting angry feelings or events
- Potential salient feature of AX-I
CLBP & Gender

- Women experience LBP with greater frequency
- Potential differences regarding responses to chronic pain and foci of distress
- May be psychological, social, physiological or genetic differences
- Additional research needed among community dwellers

“anger = passing pain to others”

- Connotes aggression & revenge
- Spousal relationships literature:
  - anger of PLWCP $\rightarrow$ spouse
  - anger of spouse $\leftrightarrow$ PLWCP
- Ambivalence over Expression of Emotions
  - Caregiver’s AEE correlated with pain
  - Patients’ AEE correlated with pain and anger
- Employee - employer
Theoretical Links of Anger & Pain

Negative Affect

Anger Expression Inventory

- ruminations
- repression
- Experiential suppression
- Hypervigilence
- Sxs of distress
- Chronic depression
- Chronic anxiety

Burns et al

Preliminary Work

- Feasibility Pilot Study
- 55% return rate (11/20)
- 50% Gender division
- Tools feasible with PLWCLBP
- Offers to recommend participants

Specific Aims

- Explore the relationship of pain with anger in PLWCLBP
  - how anger rumination is involved
  - identify differences by gender
- Intention for Results
  - to be used by Health Care Professionals
  - to help PLWCLBP better manage pain
1st Research Question

What is the distribution of pain perception, pain intensity, pain behavior, State Anger (SA), Trait Anger (TA), Anger Control (AC), Anger Expression (AX), and Anger Rumination (AR) among Persons Living With Chronic Low Back Pain (PLWCLBP) and do these differ by gender?

2nd Research Question

What are the relationships of SA, TA, AC, AX, and AR with pain perception, pain intensity and pain behavior scores reported by PLWCLBP and do these relationships differ by gender?

3rd Research Question

Can pain perception, pain intensity, and pain behavior scores be explained by SA, TA, AC, AX, AR, and gender?
Conceptual Definitions of Anger

In an agitated state of mind ... desire to respond

Powerful emotion ... state of mind ... all animals defend self

Emotional state with feelings range mild irritation or annoyance to rage

Engendered by unmet expectations and unacceptable behavior by others

Mental, psychic close link to physical biochemical

At least 3 response channels physiology, behavior & subjective experience

Aristotle    Darwin    Spielberger et al.    Williams & Williams    Thich Nhat Hanh    Burns et al.

Physiologically, it simply doesn’t matter whether your anger is justified or not. The body doesn’t make moral judgments about feelings; it just responds.” Doc Childre & Howard Martin, 2008

Anger Sub-types

Trait Anger

State Anger
Conceptual Definitions Anger

- **Anger Expression-In (AX-I)**
  - tend to suppress feelings of anger rather than expressing them either physically or verbally

- **Anger Expression-Out (AX-O)**
  - “frequently express anger in aggressive behavior directed toward other persons or objects in the environment;” may be physical expression or verbal (sarcasm, threats, insults)

- **AX-I and AX-O**
  - alternates in different situations

Conceptual Definitions Anger

- **Anger Control (AC-I)**
  - work hard to control anger
  - “when high AC-I score is combined with low AX-O there is risk for developing medical issues”

- **Anger Control-Out (AC-O)**
  - tend to work hard to monitor and avoid expressing anger outward

Anger Management Styles

- Anger In
- Anger Out
Conceptual Definition
Anger Rumination

• **Anger Rumination (AR)** is passively but repetitively thinking about the emotion of anger or the mood of anger

(Nolen-Hoeksema, 2000; Sukhodolsky, Golub, & Cromwell, 2001)

Assumptions

• Pain & anger are multifaceted & unique
• Pain & anger experiences may differ by gender
• Abstract perceptions & emotions can be approximated statistically
• Treating pain without treating anger may be treating the symptom, not the cause
• By better understanding the relationship of pain & anger, more effective therapy is possible

Research Design

• Descriptive
• Correlational
• Cross-sectional
• IRB approved
Setting and Recruitment

• Wilmington & Charlotte, NC

• Sites
  – chiropractor offices (2)
  – acupuncturist offices (2)
  – physician offices (orthopedist, pain, spine)

• Social Nomination

Anticipated Sample

• Power Analysis
  – based upon pilot study
  – need minimum 80 participants

• Goal: recruit 110 participants
  – 55 women and 55 men
  – community dwelling adults (> 21 y/o)
  – chronic low back pain > 3 months duration

Data Collection

• Demographics via Demographic Survey
• Pain via McGill Pain Questionnaire-Short Form
  – SF-MPQ Total Score
  – VAS
• Pain Behavior via Pain Behavior Checklist
• Anger via STAXI-2
  – Trait Anger via STAXI-2 TA test
  – State Anger via STAXI-2 SA test
  – Anger Expression via STAXI-2 AX tests
  – Anger Control via SATXI-2 AC tests
  – Anger Intensity Inventory via STAXI-2 AXI tests
• Anger Rumination via ARS
Demographic Survey

Sample Number __ __ __ __

1) Age: __________

2) Gender: ____ Male ____ Female

3) Race/Ethnicity:    ___ Caucasian    ___ African-American    ___ Hispanic
___ Asian    ___ American Indian
___ Other, please specify ______________

4) Marital Status:    ___ Married    ___ Widowed    ___ Divorced    ___ Single
___ Committed Relationship

5) Employment Status: ___ Employed outside home ___ Self-employed
___ Retired ___ Unemployed due to pain
___ Unemployed not related to pain

6) Year pain began: ____________

7) Pain resulted from: ___ Motor Vehicle Accident    ___ assault    ___ unknown cause
___ other type of accident please specify ______________
___ illness please specify _________________________
___ other cause please specify_____________________

8) Pain is like: ____________________________________________________
____________________________________________________________

Short Form- McGill Pain Questionnaire (SF-MPQ)

• 11 sensory & 4 affective descriptors
• Visual Analog Scale
• Approximately 2 to 5 minutes to complete
• Reliability and validity
  – Reliability ranging from 0.75 to 0.96
  – Concurrent validity with long form ranged from $r = 0.70$ to 0.88

STAXI-2

• 57 item tool
• 6 scales (SA, TA, AC-I, AC-O, AX-I, AX-O)
• Validity & Reliability
  – 0.93 SA
  – 0.86 TA
  – 0.73 – 0.85 subscales
  – consistently high in variety of populations and languages
Anger Rumination Scale (ARS)

- 19 item tool
- Reliability and validity
  - internal consistency coefficient 0.93
  - test – retest coefficient 0.77
  - total alpha 0.93
- Cultural testing
  - Great Britain & Hong Kong supported validity

Pain Behavior Checklist (PBC)

- 19 item questionnaire
- Rated on a seven point scale
- Four subscales
  - Affective Distress
  - Distorted Ambulation
  - Facial/Audible Expression
  - Seeking Help
- Reliability & Validity
  - reliability coefficient alpha - total instrument of 0.85
  - stability coefficients - total instrument was 0.80

Procedures

- Coordination with Staff at Sites
- Advertising Flyers in offices
- Packets assembled with:
  - information Letter Conferring Consent
  - demographic survey first
  - other data collection tools
- $5.00 gift card incentive
- Packets returned in person or via mail
Sample

- Convenience sample

- Inclusion criteria
  - adult men and women (> 21 y/o)
  - experiencing CLBP for three months or more
  - able to read and understand English
  - able to understand the research process

Questionnaires Returned

<table>
<thead>
<tr>
<th>Site</th>
<th>Number Distributed</th>
<th>Number Returned</th>
<th>CM</th>
<th>CF</th>
<th>AAM</th>
<th>AAW</th>
<th>O</th>
<th>Number Ret'd</th>
<th>Percent Ret'd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accupuncturist</td>
<td>20</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>50%</td>
</tr>
<tr>
<td>Chiropractors</td>
<td>17</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>12</td>
<td>70%</td>
</tr>
<tr>
<td>Orthopedist</td>
<td>14</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>13</td>
<td>93%</td>
</tr>
<tr>
<td>Pain Clinic</td>
<td>25</td>
<td>7</td>
<td>13</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>23</td>
<td>92%</td>
</tr>
<tr>
<td>Spine Clinic</td>
<td>50</td>
<td>11</td>
<td>23</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>40 **</td>
<td>80%</td>
</tr>
<tr>
<td>Social Nom.</td>
<td>87</td>
<td>29</td>
<td>39</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>75 **</td>
<td>86%</td>
</tr>
<tr>
<td>Total</td>
<td>213</td>
<td>56</td>
<td>98</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>173*</td>
<td>81%</td>
<td></td>
</tr>
</tbody>
</table>

Questionnaires with Incomplete STAXI-2

<table>
<thead>
<tr>
<th>Site</th>
<th>Total Returned Questionnaires</th>
<th>Number with Incomplete STAXI-2</th>
<th>Percent with Incomplete STAXI-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accupuncturist</td>
<td>10</td>
<td>2</td>
<td>20%</td>
</tr>
<tr>
<td>Chiropractor</td>
<td>12</td>
<td>2</td>
<td>16%</td>
</tr>
<tr>
<td>Orthopedist</td>
<td>13</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Pain Clinic</td>
<td>23</td>
<td>5</td>
<td>22%</td>
</tr>
<tr>
<td>Spine Clinic</td>
<td>40</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>Social Nomination *</td>
<td>75</td>
<td>9</td>
<td>12%</td>
</tr>
<tr>
<td>Total</td>
<td>173</td>
<td>26</td>
<td>15%</td>
</tr>
</tbody>
</table>

* One additional participant through Social Nomination was less than the inclusion age.
### Usable Questionnaires by Site

<table>
<thead>
<tr>
<th>Site</th>
<th>Total Ret'd Questionnaires</th>
<th>Total Usable Questionnaires</th>
<th>Percent Ret'd Usable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men (n = 51)</td>
<td>Women (n = 95)</td>
<td>(n = 146)</td>
</tr>
<tr>
<td>Acupunctureist</td>
<td>10</td>
<td>8</td>
<td>2 6 20%</td>
</tr>
<tr>
<td>Chiropractor</td>
<td>12</td>
<td>10</td>
<td>5 5 16%</td>
</tr>
<tr>
<td>Orthopedist</td>
<td>13</td>
<td>11</td>
<td>0 11 15%</td>
</tr>
<tr>
<td>Pain Clinic</td>
<td>23</td>
<td>18</td>
<td>7 11 22%</td>
</tr>
<tr>
<td>Spine Clinic</td>
<td>40</td>
<td>34</td>
<td>10 24 15%</td>
</tr>
<tr>
<td>Social Nomination</td>
<td>75</td>
<td>65</td>
<td>27 38 12%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>173 **</td>
<td>146</td>
<td>51 95 84% **</td>
</tr>
</tbody>
</table>

* One additional participant, through Social Nomination, was excluded because he was younger than the inclusion age.

### Sample Demographics

#### Mean Age (Std Dev)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Men (n = 51)</th>
<th>Women (n = 95)</th>
<th>Total (n = 146)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>50.43 (14.41)</td>
<td>48.41 (12.67)</td>
<td>49.12 (13.29)</td>
</tr>
</tbody>
</table>

#### Race & Ethnicity

<table>
<thead>
<tr>
<th>Race &amp; Ethnicity</th>
<th>Men (%)</th>
<th>Women (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caucasian</td>
<td>48 (32.88%)</td>
<td>83 (56.85%)</td>
<td>131 (89.73%)</td>
</tr>
<tr>
<td>African American</td>
<td>2 (1.37%)</td>
<td>6 (4.11%)</td>
<td>8 (5.48%)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1 (0.67%)</td>
<td>4 (2.74%)</td>
<td>5 (3.43%)</td>
</tr>
<tr>
<td>American Indian</td>
<td>0 (0.07%)</td>
<td>0 (0.07%)</td>
<td>0 (0.07%)</td>
</tr>
<tr>
<td>Asian</td>
<td>0 (0.07%)</td>
<td>0 (0.07%)</td>
<td>0 (0.07%)</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0.07%)</td>
<td>1 (0.07%)</td>
<td>1 (0.07%)</td>
</tr>
</tbody>
</table>

### Sample Marital Status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Men (n = 51)</th>
<th>Women (n = 95)</th>
<th>Total (n = 146)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>36 (24.66%)</td>
<td>56 (38.36%)</td>
<td>92 (63.01%)</td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (0.07%)</td>
<td>3 (2.05%)</td>
<td>4 (2.74%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>4 (2.74%)</td>
<td>20 (13.70%)</td>
<td>24 (16.44%)</td>
</tr>
<tr>
<td>Single</td>
<td>6 (4.11%)</td>
<td>11 (7.53%)</td>
<td>17 (11.64%)</td>
</tr>
<tr>
<td>Committed</td>
<td>2 (1.37%)</td>
<td>5 (3.22%)</td>
<td>7 (4.79%)</td>
</tr>
<tr>
<td>No Response</td>
<td>2 (1.37%)</td>
<td>0 (0.07%)</td>
<td>2 (1.37%)</td>
</tr>
</tbody>
</table>
### Sample Employment Status

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>Men (n = 51)</th>
<th>Women (n = 95)</th>
<th>Total (n = 146)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed Outside Home</td>
<td>16 (10.96%)</td>
<td>51 (34.93%)</td>
<td>67 (45.89%)</td>
</tr>
<tr>
<td>Self Employed</td>
<td>7 (4.79%)</td>
<td>3 (2.05%)</td>
<td>10 (6.85%)</td>
</tr>
<tr>
<td>Retired</td>
<td>10 (6.85%)</td>
<td>13 (8.90%)</td>
<td>23 (15.75%)</td>
</tr>
<tr>
<td>Unemployed due to pain</td>
<td>15 (29.41%)</td>
<td>21 (22.10%)</td>
<td>36 (24.66%)</td>
</tr>
<tr>
<td>Unemployed unrelated to pain</td>
<td>3 (2.05%)</td>
<td>7 (4.79%)</td>
<td>10 (6.85%)</td>
</tr>
</tbody>
</table>

### Causes of the CLBP

<table>
<thead>
<tr>
<th>Cause of Back Pain</th>
<th>Men (n = 51)</th>
<th>Women (n = 95)</th>
<th>Total (n = 146)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVC</td>
<td>8</td>
<td>19*</td>
<td>27</td>
</tr>
<tr>
<td>Other accident</td>
<td>26</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>Illness</td>
<td>4</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>Assault</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Unknown etiology</td>
<td>12</td>
<td>33</td>
<td>45</td>
</tr>
<tr>
<td>No Response</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

* One respondent reported both MVC and other accident

### Data Analysis for 1st Research Question

To determine the distribution of pain perception, pain intensity, pain behavior, State Anger (SA), Trait-Anger (TA), Anger-control (AC), Anger-expression (AX), and Anger Rumination (AR) among PLWCLBP, and how they differ by gender:

- Descriptive statistics were calculated
  - each of the variables for the sample overall
  - separately for men and women
- Student’s t-tests were used to assess the differences in these variables by gender
Summary Findings Question #1

• No gender difference found in pain perception, pain intensity or anger variables
• The only gender difference was with Pain Behavior (total score)
• When the anger scores were compared with the normative scores reported by Spielberger
  – they were in the 40 – 55th percentiles
  – except SA was in the 80th percentile

Data Analysis for 2nd Research Question

To determine the relationships of SA, TA, AC, AX, and AR with pain perception, pain intensity, and pain behavior scores reported by PLWCLBP, and how these relationships differ by gender:

– Used Pearson product moment correlation coefficient (r)
– Correlation coefficients were calculated:
  • total sample
  • separately for men and for women
– Relationships of pain perception, pain intensity, & pain behavior and anger variables were analyzed separately

Pain Perception (SF-MPQ) Correlated with Anger Variables

• Weak correlations in the total sample
  – Positive and highly significant (p < .01) correlations with SA, TA, AX-O, AXI and ARS
  – AX-I had a positive correlation but not significant
  – AC-I & AC-O negatively correlated (only AC-O sig)
• Women only, showed similar relationships
• Men only, showed similar relationships except:
  – AC-O was not significant
Pain Intensity (VAS) Correlated with Anger Variables

- Fewer significant correlations than w/SF-MPQ
- Weak to moderate correlations
  - Positive & significant: SA, TA, AX-O, AX-I, & ARS
  - Very weak, negative & non-significant with AC-I & AC-O
- Women only: similar direction & strength but only significant with SA
- Men only: similar direction & strength but only significant with SA & AX-O

Pain Behavior (PBC) Correlated with Anger Variables

- Weak to moderate but significant correlations with all pain variables except:
  - Women not significant with AC-I
  - Men not significant with AX-I
- More moderate and stronger correlations than with other pain variables
- Weak to moderate positive correlations with SA, TA, AX-I, AX-O, AXI and ARS
- Weak to moderate negative correlations with AC-I and AC-O

Summary Findings Question #2

- Correlations positive except with AC-I & AC-O
- By gender: similar strength & directon of correlations but differences in significance
- Strongest correlations: pain variables with SA
- Pain behavior stronger correlations with anger variables than pain intensity or perception
- Neither pain perception or pain intensity were statistically correlated with AC-I or AE-I
Data Analysis for 3rd Research Question

Can pain perception, pain intensity, and pain behavior be explained by AR, SA, TA, AC-I, AC-O, AX-I, AX-O, AR and gender?

- Multiple regression was used to test the relationship of the specified independent variables with pain perception, pain intensity, and pain behavior scores

Findings for the 3rd Question

Pain Perception (SF-MPQ) as DV

- The model accounted for 21% (R² = .207) of variance in pain perception scores
- AX-I was only IV excluded from the model
- Only SA significant (p = .002) thus explaining the variance in the DV pain perception
- No other variables contributed to the model
- Additional exploration through stepwise regression was not done

Pain Intensity (VAS) as DV

- The model accounted for 20% (R² = .195) of variance in pain intensity scores
- AX-I was only IV excluded from the model
- Only SA was significant (p< .001) thus explaining variance in the DV pain intensity
- No other variables contributed to the model
- Additional exploration through stepwise regression was not done
Findings for the 3rd Question
Pain Behavior (PBC) as DV

- The model accounted for 37% (R^2 = .373) of variance in pain behavior scores (p < .001)
- AXI was only IV excluded from the model
- SA (p < .01), gender (p = .012), & ARS (p = .025) contributed significantly to the model, thus explaining the variance in DV pain behavior

Findings for the 3rd Question
Pain Behavior (PBC) as DV

- Step-wise regression was done
  - to determine degree to which each IV added to the prediction of pain behavior
- Resulted with SA, AX-O, ARS, and gender as predictors of pain behavior
  - SA alone accounted for 25% (R^2 = .245, p < .01)
  - SA + AX-O accounted for 30% (R^2 = .305, p < .01)
  - SA + AX-O + ARS accounted for 33% (R^2 = .325, p = .039)
  - SA + AX-O + ARS + gender accounted for 36% (R^2 = .355, p = .012) of the variance in the PBC scores

Additional Findings
### Word Descriptors of CLBP

<table>
<thead>
<tr>
<th>Word Descriptor</th>
<th>Frequency Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ache/Aching</td>
<td>43</td>
</tr>
<tr>
<td>Sharp</td>
<td>31</td>
</tr>
<tr>
<td>Constant/continuous</td>
<td>22</td>
</tr>
<tr>
<td>Burning *</td>
<td>20</td>
</tr>
<tr>
<td>Stabbing *</td>
<td>16</td>
</tr>
<tr>
<td>Dull</td>
<td>12</td>
</tr>
<tr>
<td>Radiating *</td>
<td>11</td>
</tr>
<tr>
<td>Shooting *</td>
<td>11</td>
</tr>
<tr>
<td>Throbbing</td>
<td>10</td>
</tr>
</tbody>
</table>

* Consistent with description of neuropathic pain

### Anger Rumination

- Strong positive correlation with TA (.738, p < .01)
- Moderate positive & statistically significant correlations with:
  - SA, AX-I, AX-O, AXI, and PBC total score
- Weak & negative statistically significant correlations with:
  - AC-I and AC-O
- Positive correlations with all pain variables
  - Weak with pain perception and intensity
  - Moderate with pain behavior
    (stronger in women than men or total)

### Unexpected Findings

- Ease with recruiting PLWCLBP
- Social Nomination
- Very few of the participants had help in completing the questionnaires
- Discrepancy between VAS and Present Pain Intensity (PPI)
- Some participants became more aware of their anger
Summary

• Consistent with the literature, 65% of the participants were women

• Except with SA, study participants were very similar to the normative sample described by Spielberger (1999)

• Pain was accompanied by anger, SA in particular, but a gender affect was not found

Summary

• Results did not support a gender difference with anger & pain perception or intensity

• Results did support a gender difference regarding pain behavior (PBC score)

• With State Anger (SA) found positive, moderate & significant correlations with all pain variables

• SA was also the common predictor in all regressions with pain variables

Summary

• Results did not support that AR significantly affects perception or intensity of CLBP

• Correlations between AR & pain behavior were moderate and statistically significant

• Found strong correlations between anger rumination with TA and moderate correlations with the other anger variables
Summary

- AC-I and AC-O consistently showed negative correlations with each of the pain variables
- Pain perception, intensity and behavior did not show high correlations
- SA was the only consistent predictor of any measure of pain
- Gender and anger rumination were factors to predict pain behavior only

Study Limitations

- Not as rigorous as RCT
- Anxiety & depression (potential confounding variables) were not measured
- No reference group living without CLBP – however Spielberger’s normative scores were used
- Snapshot of total gestalt of LWCLBP
- Despite efforts sample was predominantly Caucasian
- Small percentage (15%) did not complete the STAXI-2

Future Research

- Investigate discrepancy between VAS scores & PPI
- Expand recruitment of non-Caucasian participants
- Determine meaning of SA scores among PLWCLBP
- AR role in experiences of anger & CLBP particularly AR with AX-I & anger control in PLWCLBP
- Longitudinal study: frequency & intensity of CLBP & anger with emotional, cognitive, & spiritual context
- Test interventions to manage anger with PLWCLBP
- Phenomenological study
- Replication study with other pain & anger tools
- Develop tool to specifically quantify anger r/t CLBP
Implications for Nurses and other Health Care Professionals

- Appreciate complexity of how CLBP is experienced & described
- Connotations of word descriptors
- Chronic pain is more than simply a number
- No gender differences except pain behavior
- Learn techniques to help PLWCLBP better manage their anger
- Learn techniques to help manage response to anger of PLWCLBP & teach to families
- Need for holistic care of PLWCLBP
Analysis of PBC
Affective-Distress Subscale

• On the ADSS of the PBC, one statement “Ask myself, ‘why did this happen to me?’” is consistent with rumination
• The other ADSS statements “Become irritable,” “Become angry,” “Tell others not to bother me,” and “Appear upset of sad” seem reflective of anger
• Found question of anger and those indicating rumination intriguing
• This subscale seemed particularly germane to analysis of anger and rumination

Comparison of Anger Scores with Normative Raw & T Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Men (n = 51)</th>
<th>Women (n = 95)</th>
<th>Total (n = 146)</th>
<th>Raw Score Percentile Men &amp; Women</th>
<th>T Score Percentile Men &amp; Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>20.76 (8.99)</td>
<td>20.74 (8.46)</td>
<td>20.75 (8.62)</td>
<td>80th</td>
<td>54</td>
</tr>
<tr>
<td>TA</td>
<td>16.37 (6.71)</td>
<td>16.83 (5.55)</td>
<td>16.54 (5.96)</td>
<td>40th</td>
<td>46</td>
</tr>
<tr>
<td>AC-I</td>
<td>21.63 (5.46)</td>
<td>22.84 (5.79)</td>
<td>22.4 (5.67)</td>
<td>50th</td>
<td>48</td>
</tr>
<tr>
<td>AC-O</td>
<td>22.06 (5.54)</td>
<td>23.63 (5.50)</td>
<td>23.4 (5.50)</td>
<td>50th</td>
<td>48</td>
</tr>
<tr>
<td>AX-I</td>
<td>15.90 (3.94)</td>
<td>15.86 (4.70)</td>
<td>15.9 (4.43)</td>
<td>40th</td>
<td>48</td>
</tr>
<tr>
<td>AX-O</td>
<td>14.59 (4.97)</td>
<td>13.59 (3.77)</td>
<td>13.9 (4.24)</td>
<td>40th</td>
<td>44</td>
</tr>
<tr>
<td>AXI</td>
<td>33.90 (15.90)</td>
<td>30.98 (14.29)</td>
<td>32 (14.90)</td>
<td>45th</td>
<td>48</td>
</tr>
</tbody>
</table>

1 or 3 Pain Variables?

• Should pain perception, pain intensity and pain behavior be considered different aspects of pain or should they be considered as three different entities?

• If the latter, should canonical correlation be done to assess their relationship with the anger variables?