Avoidant Coping Moderates the Association between Anxiety and Physical Functioning in Patients with Chronic Heart Failure

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Heart Failure

- Most costly cardiovascular disease in the US
- Leading cause for hospitalization in older adults
- Hospitalizations due to heart failure have risen by approximately 30% over the past decade

(Sullivan et al., 2002; Thomas et al., 2003; American Heart Association, 2005)
Anxiety and Heart Failure

- Negative mood state characterized by symptoms such as worry, tension, feeling frightened and restlessness
- Prevalence rates range from 20-45%
- In heart failure patients, anxiety is associated with:
  - Severe limitation in activities of daily living at one year follow-up
  - Mortality at two year follow-up

(American Psychiatric Association, 1994; Haworth et al., 2005; Friedmann, et al., 2006; De Jong et al., 2004; Riedinger, 2002; De Jong, 2004; Clarke et al., 2000; Friedmann et al., 2006)
Coping Strategies

- Methods individuals utilize in their efforts to manage stressors

<table>
<thead>
<tr>
<th>Approach Coping</th>
<th>Avoidant Coping</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Approaching source of stress</td>
<td>• Avoiding source of stress</td>
</tr>
<tr>
<td>• Linked to improved quality of life</td>
<td>• Linked to poorer clinical outcomes and mortality</td>
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</table>

(Lazarus, 1993; Taylor & Stanton, 2007)
Coping Strategies

• Mediator
  – Coping strategies partially account for the association between anxiety and physical functioning

• Moderator
  – Coping influences the strength of the association between anxiety and physical functioning

(Taylor & Stanton, 2007)
Study Objectives

• Examine the association between anxiety and physical functioning in patients with chronic heart failure

• Understand how the relationship between anxiety and physical functioning is influenced by patients’ coping strategies
  – Mediator
  – Moderator
Participants (N = 273)

- **Age:**
  \[ M = 53.63, \quad SD = 11.18 \]

- **Months Since Diagnosis:**
  \[ M = 63.69, \quad SD = 66 \]
Design & Measures

• Cross-sectional, correlational design
• Structured Medical Interview
  – NYHA class and history of mental health treatment
• Medical Chart Review
  – Medical history, comorbidities and medications
  – Demographic Questionnaire
    • Age, gender, marital status, education level and ethnicity
Psychosocial Questionnaires

- Hospital Anxiety and Depression Scale-Anxiety Subscale
- Modified Brief COPE
  - Approach Coping
    - Active coping, positive reframing, planning, acceptance, seeking emotional support, and seeking informational support
  - Avoidant Coping
    - Denial, substance use, venting, behavioral disengagement, self-distraction, and self-blame
- Minnesota Living with Heart Failure Questionnaire
  - Physical Functioning Subscale

(Zigmond & Snaith, 1983; Eaton et al., 2004; Sherborne & Stewart, 1991; Carver, 1997; Rector et al., 1987)
Results

Prevalence of Anxiety

- No Anxiety: 55%
- Borderline Anxiety: 24%
- Severe Anxiety: 21%
Hypothesis 1

- Anxiety will be significantly associated with poorer physical functioning in patients with chronic heart failure

Covariates
- Age, gender, marital status, education level, ethnicity, NYHA class, history of mental health treatment
Results: Hypothesis 1

- Significant association between anxiety and poorer physical functioning

\[ \beta = 0.46, \ p < 0.001 \]
Hypothesis 2

• Approach and avoidant coping will mediate the association between anxiety and physical functioning.
Approach and Avoidant Coping

Approach Coping → Poorer Physical Functioning
\[ \beta = 0.02, p = 0.86 \]

Avoidant Coping → Poorer Physical Functioning
\[ \beta = 0.16, p < 0.01 \]
Results: Hypothesis 2

• Mediation Analyses

- Anxiety → Avoidant Coping: $\beta = .44^{***}$
- Avoidant Coping → Poorer Physical Functioning: $\beta = .43^{***}$
- Anxiety → Poorer Physical Functioning: $\beta = .04$ NS

*** Significant at $p < 0.001$ level
Hypothesis 3

- Approach and avoidant coping will moderate the association between anxiety and physical functioning.
Results: Hypothesis 3a

- Significant interaction between anxiety and avoidant coping

$\beta = 0.14, p < 0.01$. 
Post-Hoc Analyses

Figure 1. Simple slopes of association between anxiety and physical functioning at high, mean and low levels of avoidant coping.

*a Higher physical functioning scores indicate poorer functioning.
Results: Hypothesis 3b

- Approach coping did NOT moderate association between anxiety on physical functioning

\[ \beta = -0.02 \text{ NS} \]
Summary

- Almost half of the patients experienced moderate to severe anxiety symptoms.
- Anxiety was associated with poorer physical functioning.
- Association between anxiety and poorer physical functioning was more pronounced in those patients who frequently employed avoidant coping strategies.
- Approach coping neither mediated nor moderated the association between anxiety and poorer physical functioning.
Possible Mechanisms

• Physiological
  – Sympathetic hyper-arousal
  – Reduced heart rate variability
  – Elevated inflammation

• Behavioral
  – Lack of self-care or unhealthy lifestyle
  – Adherence
    • Diet
    • Medication
Limitations & Strengths

• Limitations
  – Cross-sectional, correlational design
  – Self report measures

• Strengths
  – Fairly large sample size
  – Anxiety measure not confounded with heart failure symptoms
Clinical Implications

• Both anxiety and coping strategies warrant assessment in patients with chronic heart failure

• Patients who demonstrate both high anxiety and a tendency to employ avoidant coping strategies may benefit from more careful monitoring for physical impairments

• Interventions designed to reduce anxiety may be helpful
Future Directions

- Longitudinal design
- Diagnostic interview
- Intervention studies
Acknowledgments

• This research was supported by a grant from the American Heart Association
• Uta Maeda
• Tiffany Ju
• Kristen Farrell
Statistical Analyses

- Hierarchical multiple regression
  - Mediation
    - Baron and Kenny (1986) approach
  - Moderation
    - Significant regression coefficient for interaction term
    - Examine simple slopes for significant interactions

- Covariates
  - Age, gender, marital status, education level, ethnicity
  - NYHA class, history of mental health treatment (psychotherapy, antidepressant use, or benzodiazepine use)
Possible Mechanisms

• Physiological
  – Sympathetic hyper-arousal
  – Reduced heart rate variability
  – Elevated inflammation
  – Hypercortisolemia

• Behavioral
  – Lack of self-care or unhealthy lifestyle
  – Adherence
    • Diet
    • Medical
Anxiety without #s 4 and 6

- Anxiety --> physical functioning
  - Beta=.383, p<.001

- Anxiety x avoidant coping interaction
  - Beta=.193, p<.05
## Pairwise Correlations

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### Main effect of anxiety

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## Descriptive Statistics for Psychological Variables

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<td>Approach coping (Brief COPE)</td>
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<td>Social support (MOS-Social Support Scale)</td>
<td>3.99 (1.02)</td>
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Interaction between anxiety and avoidant coping in their effect on physical functioning

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<td>Final R²</td>
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Effect of avoidant coping on physical functioning at 3 levels of anxiety
General Adherence

- General adherence → physical functioning $\beta = -0.161, p = 0.003$
- Test for mediation

Beta $= -0.157, p = 0.017$

Beta $= -0.103, p = 0.035$

Beta $= 0.400, p < 0.001$
(Beta $= 0.416, p < 0.001$)
Specific Adherence

- Specific Adherence $\rightarrow$ physical functioning $\beta = -.043$, $p=.420$
- Also not sig. associated with anxiety
Controlling for depression

- Direct effects
  - Anxiety $\rightarrow$ Physical functioning $\beta = .321, p < .001$
  - Depression $\rightarrow$ physical functioning $\beta = .131, p = .07$
- Moderation
  - Anxiety x avoidant coping interaction (controlling for depression) $\beta = .119, p = .02$
  - Depression x avoidant coping interaction $\beta = .093, p = .087$
Hospital Anxiety Depression Scale-Anxiety Subscale (Zigmond and Snaith, 1983)

- Anxiety symptomatology, not specific clinical anxiety disorders
- Medically ill patients
  - Excludes symptoms related to physical disorders such as dizziness, heart palpitations, and sweating
- Internal consistency: Chronbach’s alpha: .76-.93
- Concurrent validity with established measures of state and trait anxiety: Spielberger State-Trait Anxiety Inventory ($r= .64-.81$), Clinical Anxiety Scale ($r = .69-.75$)
- Discriminant validity with depression
HADS-A discriminant validity with depression and physical functioning

- Depression

- Physical Functioning
  - physically ill patients, who were not assessed as having mood disorder, had similar scores to the normal sample and that scale scores were therefore not affected by physical illness.

Table 2: Correlations between interview ratings and patient ratings of subsample

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<td>Depression</td>
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<td>Anxiety</td>
<td>+ 0.19</td>
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<tr>
<td>Depression</td>
<td>+ 0.79**</td>
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* P < 0.05
** P < 0.01
Brief COPE (modified)
Carver, 1997

- Designed to assess how participants cope with a certain stressor (physical health problems).
- Modified, 14-item version
  - one item from each of the 14 subscales
- Subscales: active coping, planning, positive reframing, acceptance, using emotional support, using instrumental support, self-distraction, denial, substance use, behavioral disengagement, self-blame, humor, religion
Alternative Conceptualizations of Coping

• Problem-Focused vs. Emotion-Focused
  – “Coping that is aimed at managing or altering the problem causing the distress” vs.
  – “Coping that is directed at regulating emotional responses to the problem” (Lazarus & Folkman, 1984, p. 150).
    • Not clear distinction
      – Focusing on your emotions might solve the problem

• Individual subscales

• Higher order goals
  • Regaining control
  • Regaining relationships
  • Maintaining homeostasis
Minnesota Living with Heart Failure (Rector et al., 1987)

- Designed to assess patient’s perception of effect of heart failure/treatment on life
  - Indicate the degree to which each heart failure related problem prevented them from living as they wanted during the last two weeks
  - 21 items: heart failure related physical, psychological, and social impairments
- Meta-analysis: Chronbach’s alpha = .94 and test-retest reliability of .84
- Concurrent validity with other measures of quality of life including the SF-36 physical functioning (r=.74), SF-36 Social Functioning (r=.70), and the NYHA class (r=.60)