Evaluating the Effects of a Cardiac Rehabilitation Program Gender-tailored for Women with Coronary Artery Disease: A Systematic Review

Rachel Conniff, SPT
Alana Papa, SPT
Angela Parry, SPT
John Sanko, PT, EdD
Outline

- Background
- Purpose
- Search Terms
- Limitations
- PRISMA
- PEDro

- Results
- Conclusion
- Discussion
- Clinical Relevance
- Acknowledgements
Cardiovascular disease (CVD) is the leading cause of morbidity and mortality worldwide. Secondary preventions following a cardiac event are vastly underused by patients due to:

- Lack of physician endorsement
- Female gender
- Higher levels of depression and anxiety
- Lack of social support
- Lack of transportation
Women in Cardiac Rehab

- Only 15-20% of women utilize CR services \(^4\)
- Compared with men, women are at a 2-fold increased risk of non-completion of CR \(^4\)
- Women exhibit higher levels of depression and anxiety compared to their male counterparts with CVD \(^4,5\)
Implications

- There is a need for CR programs to address the needs of women (a gender-tailored approach).

- There is a need to look closely at those CR programs that are gender tailored (if any currently exist) to determine their effectiveness.

- There is a growing need to determine which interventions not only improve mortality and morbidity, but also quality of life due to the importance of evidence-based medicine.
Purpose

- To evaluate the effectiveness of gender tailored cardiac rehabilitation (GTCR) vs. traditional cardiac rehabilitation (TCR) in women with coronary artery disease (CAD)
Methods

- Databases:
  - PubMed
  - Academic Search Elite
  - Science Direct
  - CINAHL
  - Ovid
  - Cochrane Library
- Two reviewers independently assessed each study
  - PEDro scale
Methods

- **Search Terms**
  - (Cardiac Rehab* OR Cardiac Rehabilitation)
  - AND (Gender Tailored OR Gender Specific OR Sex Tailored OR Women Tailored)

- **Search Limits**
  - English, published 2007-2017, human subjects, and peer reviewed scholarly journals using RCT study design
Eligibility Criteria

- Adult women >18 years of age
- Attending cardiac rehab for CAD
- GTCR vs. TCR
- Must look at least one psychosocial or physiological outcome measure
Records identified through database searching (n=88) → Records screened (n=91) → Records after duplicates removed (n=69) → Full-text articles assessed for eligibility (n=19) → Studies Included (n=10) → Record identified through other sources (n=3) → Records excluded (n=50) → Full-text articles excluded (n=9) Not RCT (n=6) Not women-tailored (n=2) No CR intervention (n=1)
<table>
<thead>
<tr>
<th>Study</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>PEDro Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beckie et al. (2013)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>Beckie et al. (2010)-QOL</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>Beckie et al. (2010)-depression</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>8</td>
</tr>
<tr>
<td>Beckie et al. (2010)-attendance</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>6</td>
</tr>
<tr>
<td>Beckie et al. (2014)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>Beckie et al. (2011)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>8</td>
</tr>
<tr>
<td>Andraos et al. (2015)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>Grace et al. (2016)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>8</td>
</tr>
<tr>
<td>Midence et al. (2015)</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>7</td>
</tr>
<tr>
<td>Beckie et al. (2010)-METs</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>7</td>
</tr>
</tbody>
</table>

Avg: 7.2
○ **Traditional CR interventions included:**
  ■ Stationary bicycle, treadmill, and walking at target heart rate

○ **Gender-tailored CR interventions included:**
  ■ Stationary bicycle, treadmill, and walking at target heart rate
  ■ Motivational counseling based on the transtheoretical model (TTM)
  ■ Educational sessions on co-morbidities commonly seen among women
Results

- **Treatment parameters varied at:**
  - 1-2 sessions per week
  - 60-150 minutes
  - Moderate intensity exercise
  - 12 weeks average duration
    - Treatment durations ranged from 12-26 weeks
<table>
<thead>
<tr>
<th>Phase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engaging</td>
<td>The provider and patient establish a working relationship. The provider makes it clear that he or she is not there to tell the client what to do.</td>
</tr>
<tr>
<td>Focusing</td>
<td>The patient–provider dyad settles on an agenda. The provider maintains patient autonomy by focusing on the patient’s most pressing concern.</td>
</tr>
<tr>
<td>Evoking</td>
<td>The provider elicits the patient’s personal reasons for change. When done successfully, the patient will be voicing the arguments for change.</td>
</tr>
<tr>
<td>Planning</td>
<td>This phase is marked by the shift from the “why” of change, to the “when” and “how.” The provider guides the patient to come up with the best options for him- or herself.</td>
</tr>
</tbody>
</table>
Results

Primary Outcomes:
- Mood/Affect\(^ {4-6,9,10}\)
  - Depression, anxiety, perception of health
- Adherence\(^ {1,3,9,10}\)
- Quality of life\(^ {4,9}\)
- Diet\(^ {9}\)

Secondary Outcomes:
- Functional capacity (FCE)\(^ {1,2,7-10}\)
  - Metabolic equivalents (METS) and treadmill walking (TWT)
- Fasting lipid profile (FLP)\(^ {2}\)
- Blood pressure (BP)\(^ {1,2,7-10}\)
### Outcome Measures

<table>
<thead>
<tr>
<th>Psychosocial Measures</th>
<th>Physiological Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Anxiety and Depression</strong></td>
<td><strong>Functional Capacity</strong>&lt;sup&gt;1,2,7-10&lt;/sup&gt;</td>
</tr>
<tr>
<td>• Hospital Anxiety and Depression Scale&lt;sup&gt;5,9&lt;/sup&gt;</td>
<td>• Modified Bruce Protocol</td>
</tr>
<tr>
<td>• State Anxiety Inventory (STAI-S)&lt;sup&gt;4&lt;/sup&gt;</td>
<td>• Treadmill Walking Time</td>
</tr>
<tr>
<td>• Center for Epidemiological Studies Depression Scale&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td><strong>Adherence</strong>&lt;sup&gt;1,3,9,10&lt;/sup&gt;</td>
<td><strong>Fasting Lipid Profile</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>• Percentage of Sessions Attended</td>
<td>• Cholestech LDX system</td>
</tr>
<tr>
<td><strong>Perception of Health</strong></td>
<td></td>
</tr>
<tr>
<td>• SF-36 Health Survey&lt;sup&gt;4,6&lt;/sup&gt;</td>
<td><strong>Blood Pressure</strong>&lt;sup&gt;1,2,7-10&lt;/sup&gt;</td>
</tr>
<tr>
<td>• Multiple Discrepancies Theory Questionnaire&lt;sup&gt;10&lt;/sup&gt;</td>
<td>• Calibrated automated oscillometric Monitor</td>
</tr>
<tr>
<td><strong>Diet</strong>&lt;sup&gt;8&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>• Diet Habit Survey</td>
<td></td>
</tr>
<tr>
<td><strong>Quality of Life</strong></td>
<td></td>
</tr>
<tr>
<td>• Patient Health Questionnaire&lt;sup&gt;9&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>• Self-Anchoraging Striving Scale (SASS)&lt;sup&gt;4&lt;/sup&gt;</td>
<td></td>
</tr>
</tbody>
</table>
Results

- **Benefits of gender-tailored cardiac rehabilitation**
  - Eight studies found improvements in adherence $^{1-6,10}$
  - Three studies found improvements in quality of life $^{1,2,9}$
  - Other significant improvements included: $^{1,2,5,6}$
    - Anxiety and depression, patient perceptions of health, diastolic blood pressure, diet

- **Other statistically significant benefits of both CR programs included:**
  - Triglyceride levels $^{1,10}$
  - Systolic blood pressure $^{10}$
  - Functional capacity $^{1,10}$
Conclusion

- Moderate→Strong evidence to support gender-tailored cardiac rehab among women with CAD
  - Due to high PEDro scores secondary to study design
- Findings showed higher reports of psychosocial outcomes and exercise adherence when in gender-tailored cardiac rehab
- Both programs yielded improvements in physiological outcomes
Limitations

- Select databases used
- Different psychosocial outcome measures used
- All women having access to health insurance
- Lack of ethnic diversity among women
Future Research

• Needed to determine the effects of psychosocial outcomes and adherence in women from different ethnicities and socioeconomic status

• I.e. Does gender-tailored cardiac rehab improve psychosocial outcomes and adherence in multiple ethnicities and those not covered by health insurance?
Clinical Relevance

- Physiological outcomes were comparable for both groups at:
  - 12 weeks
  - 1-2 sessions/week
  - 60-150 minutes
  - Moderate-Intensity exercise

- Gender-tailored cardiac rehab is an efficient method to increase psychosocial outcomes and adherence among women with CAD
  - May consider implementing motivational strategies and educational sessions about co-morbidities
Acknowledgements

- Thank you!
  - Dr. Sanko, PT, EdD
  - Dr. Hakim, PT, PhD, NCS
  - Dr. Collins, PT, PhD, MBA, GCS
  - The University of Scranton Physical Therapy Department


