Motivational Interviewing to Improve Exercise Attitudes and Behavior: Implications for Antihypertensive Therapy

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Purpose of the Current Study:

- To determine how Motivational Interviewing (MI) impacts hypertension patients’ adherence to exercise recommendations in primary care.

- Specifically, the current study examines how MI influences:
  1. Exercise behaviors
  2. Behavior change factors
     - Stages of Change
     - Intrinsic Motivation
     - Self-Efficacy
Overview of Hypertension

- More than 73 million people in the U.S. have a diagnosis of hypertension (140/90 mm Hg) and over 1 billion worldwide (AHA, 2009)

- Hypertension is a primary or contributing cause of 319,000 deaths annually and is a risk factor for stroke, heart attack, and CHF which account for more than 50% of all deaths nationwide (Gatchel & Oordt, 2003)

- Total expenditures are estimated at $73 billion annually which is nearly twice the costs in 1999 (AHA, 2009)
Treatment Failure and Non-Adherence

- **Only 25%** of hypertension patients have well-controlled blood pressure despite an abundance of lifestyle and pharmacologic treatments available (JNC, 2004)

- **Non-adherence** is one of most common obstacles to treatment success, with 30% to 60% of patients NOT following recommendations (Baum et al., 1997)

- Among all antihypertensive therapies, physical **exercise** programs account for the **lowest levels of adherence**, with rates as low as 14% to 17% (Brodie & Inoue, 2005)

- However, exercise significantly reduces blood pressure in **monotherapy** (Bacon et al., 2004) and **combination therapy** (Villareal et al., 2006) while also leading to additional **CV risk reductions** (Reaven et al., 1996)
Motivational Interviewing to Improve Adherence

- Motivational Interviewing (MI) is “a directive, client-centered counseling style for eliciting behavior change by helping patients explore and resolve ambivalence” (Rollnick & Miller, 1995, p. 325)

- MI is well-researched and has been shown to have positive outcomes for alcohol, drugs, diet, and exercise (Burke et al., 2003; Dunn et al., 2001)

- Only 3 studies total have examined MI and exercise in a cardiovascular population, with only 1 study including patients whose primary diagnosis was hypertension (Woollard et al., 1995).

- Although understudied, these trials provide some support for MI to improve treatment adherence for a cardiovascular population (Brodie & Inoue, 2005; Brodie, Inoue, & Shaw, 2008; Woollard et al., 1995)
Purpose of Current Study

1) To determine if MI can impact exercise behavior change for patients with hypertension

(Goal: Improve adherence by increasing exercise behaviors)

Hypothesis:

Patients receiving MI would have better increases in exercise behavior compared to those receiving a standard recommendation.
Purpose of Current Study

2) To determine how MI influences behavior change factors for hypertension patients

(Goal: Improve exercise adherence by impacting change factors)

A) Stages of Change

B) Intrinsic Motivation

C) Self-Efficacy

Hypothesis:

Patients receiving a MI session will experience better gains in exercise change factors when compared to those receiving a standard recommendation
Methods

Participants
Recruited from outpatient primary health care clinic for low income and uninsured

Inclusion Criteria
- Age $\geq$ 18 years
- Hypertension diagnosis (SBP $\geq$ 140 mm Hg or DBP $\geq$ 90 mm Hg)
- Medically Suitable for Exercise
- Available for 30 day follow-up appointment

Exclusion Criteria
- Age < 18 years
- No diagnosis of hypertension
- Contraindication or Inability to Exercise
- Patients leaving clinic or Unavailable for 30 day follow-up
Methods

Procedures

- Patients who met inclusion criteria were contacted by phone
- Those who agreed to participate were asked to arrive approximately 1 hour prior to their scheduled appointment
- After informed consent, patients were randomly assigned to MI Group or ST Group

**MI Group**
- Completed measures, received 30 minute MI session

**ST Group**
- Completed measures, received standard exercise recommendation and psychoeducational handout

- **ALL** patients were scheduled for 30 day follow-up to complete measures
Methods

Measures

- **Godin Leisure-Time Exercise Questionnaire** (LTEQ)  
  (Godin & Shepard, 1985)

- **University of Rhode Island Change Assessment – Exercise 2** (URICA-E2)  
  (Marcus et al., 1992; Reed, 1994)

- **Intrinsic Motivation Inventory** (IMI)  
  (Buckworth et al., 2007)

- **Barriers Self-Efficacy Scale** (BARSE)  
  (McAuley, 1992)
# Results

## Table 1

**Participant Demographic Characteristics by Motivational Interviewing (MI) Group versus Standard Treatment (ST) Group**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>MI Group</th>
<th>ST Group</th>
<th>Test Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observations</td>
<td>n</td>
<td>30</td>
<td>29</td>
<td>-</td>
</tr>
<tr>
<td>Age, years (mean ± SD)</td>
<td>50.8 ± 8.6</td>
<td>46.9 ± 10.8</td>
<td>2.4(^a)</td>
<td>.128</td>
</tr>
<tr>
<td>Gender n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>20 (66.7)</td>
<td>16 (55.2)</td>
<td>0.8(^b)</td>
<td>.366</td>
</tr>
<tr>
<td>Female</td>
<td>10 (33.3)</td>
<td>13 (44.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnicity n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>24 (80.0)</td>
<td>23 (79.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>5 (16.7)</td>
<td>6 (20.7)</td>
<td></td>
<td>.126</td>
</tr>
<tr>
<td>Asian</td>
<td>1 (3.3)</td>
<td>0 (0.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^a\)Based on F ratio. \(^b\)Based on chi-square. \(^c\)Based on Fisher’s exact test which does not yield a table value, only a probability.
## Results

**Table 2**

<table>
<thead>
<tr>
<th>Measure</th>
<th>MI Group</th>
<th>ST Group</th>
<th>( F )-value</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTEQ</td>
<td>(4.85 ± 0.26)</td>
<td>(2.38 ± 0.27)</td>
<td>42.8</td>
<td>&lt;.001*</td>
</tr>
</tbody>
</table>

*Note.* LTEQ is the Godin Leisure- Time Exercise Questionnaire.
Results

Exercise Behavior (LTEQ) Change
Pre to Post Intervention

![Chart showing exercise behavior changes](chart.png)
## Results

### Table 3

**Participant Exercise Stage of Change (URICA-E2) Results for Motivational Interviewing (MI) Group versus Standard Treatment (ST) Group**

<table>
<thead>
<tr>
<th>URICA-E2 Pre/Post Comparison</th>
<th>MI Group</th>
<th>ST Group</th>
<th>Test Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stages Changed</td>
<td>(1.43 ± 1.25)</td>
<td>(-.14 ± 1.48)</td>
<td>14.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

**Direction of Change**

<table>
<thead>
<tr>
<th></th>
<th>MI Group</th>
<th>ST Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>21 (70.0)</td>
<td>8 (27.6)</td>
</tr>
<tr>
<td>Negative</td>
<td>1 (3.3)</td>
<td>9 (31.0)</td>
</tr>
<tr>
<td>Unchanged</td>
<td>8 (26.7)</td>
<td>12 (41.4)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Based on Kruskal-Wallis test.

*Note. URICA-E2 is the University of Rhode Island Change Assessment – Exercise 2.*
## Results

Table 4
Least Squares Means and Standard Errors for Intrinsic Motivation (IMI) and Self-Efficacy (BARSE)

<table>
<thead>
<tr>
<th>Measures</th>
<th>MI Group</th>
<th>ST Group</th>
<th>F-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMI</td>
<td>(42.71 ± 2.50)</td>
<td>(27.82 ± 2.54)</td>
<td>17.4</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>BARSE</td>
<td>(71.69 ± 3.28)</td>
<td>(55.08 ± 3.34)</td>
<td>12.6</td>
<td>&lt;.001*</td>
</tr>
</tbody>
</table>

*Note.* IMI is the Intrinsic Motivation Inventory. BARSE is the Barriers Self-Efficacy Scale.
Discussion

It was Hypothesized:

Patients receiving MI would have better increases in exercise behavior compared to those receiving a standard recommendation.

- This hypothesis was CONFIRMED

- MI helped increase frequency and/or strenuousness of exercise behaviors according to LTEQ
  - Consistent with previous studies examining MI’s impact on exercise behaviors for CHF (Brodie & Inoue, 2005) and other chronic diseases (Ang et al., 2007; Bennett et al., 2007)

- MI facilitated exercise behavior increases regardless of initial activity level
Discussion

It was Hypothesized:

Patients receiving a MI session will experience better gains in exercise change factors when compared those receiving a standard recommendation.

- This hypothesis was also CONFIRMED.
- The MI Group had a mean increase of nearly 1.5 Stages of Change, while ST Group showed no mean change with a slight decrease.
- Post-intervention, the MI Group had significantly higher mean IMI and BARSE scores when compared to the ST Group.

- Results provide insight into how MI impacts the process of change.
- Addresses gap in literature - Few published trials have demonstrated how MI influences intrinsic motivation and self-efficacy.
Discussion

Limitations

- Small Sample Size (n = 59)
- Racially homogenous sample (80% White)
- Sample predominately middle-aged
- Short duration of follow-up to MI session
- Unequal time spent with MI vs. ST groups

Strengths

- Brief MI session likely adaptable to other primary care/hospital settings
- Low-income sample (greater barriers to adherence)
- Randomization produced homogenous groups for comparison
Discussion

Future Directions

- Replicate current study design with larger, more diverse sample
- Examine MI’s impact over long-term follow-up appointments
- Assess if MI increases adherence for other antihypertensive therapies
Discussion

Implications for Findings

- By demonstrating utility of one brief MI session may lead to increased utilization in primary care.

- Understanding how MI affects behavior change factors may help practitioners become more effective at delivering MI interventions.

- By improving exercise adherence, may rely less on pharmacologic therapy.

- Better adherence to hypertension treatment would lead to decreased costs to the patient and health care system as a whole.
References


References


