Symptom Clusters in Persons Undergone Abdominal Surgery

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Introduction

• Abdominal surgery
• Post abdominal surgery symptoms
  – Suffering
  – Complication
  – Delay recovery
  – Decrease activity of daily living
Symptoms

• **Symptom**
  
  – *(Single)* Subjective evidence of disease or physical disturbance (Merriam-Webster’s dictionary)

• **Symptoms associated with abdominal surgery**
  
  – Caused by disease, treatment (surgery, anesthesia, medication etc.)
  
  – Pain, Fatigue, Insomnia, Distention, Anxiety, Nausea-Vomiting
Symptom cluster

• **Definition:**
  – Three or more concurrent symptoms that are interrelated (Dodd, Miaskowski & Paul, 2001)
  – Two or more symptoms (with other criteria) (Kim, McGuire, Tulman & Barsevick, 2005)

• **Interrelation:**
  – A common mechanism or etiology
  – Share common variance
  – Produce different outcomes (compare with individual symptom)
Symptom cluster identification

- **Expert opinion**: develop diagnostic criteria, assessment and management guidelines
- **Correlation coefficients**
- **Factor analysis**: Find a set of latent factors with shared variance among groups of symptoms
  - Principal component analysis (PCA)
  - Common factor analysis (Principal axis factoring [PAF] or Maximum likelihood factor analysis [ML])
  - Confirmatory factor analysis
  - Yield component/factor scores to further analyses
• **Cluster analysis:** Comparing similarity among symptoms/ Individuals
  – Find individuals who have similar symptom profile
  – Find symptoms that have similar pattern/ performance across a group of individuals

• **Path analysis /Structural equation modeling (Test mediation model)**
  – Identification of mediator (understand how one symptom influence others)
  – Examination of both direct & indirect effects
Study Purposes

1. Explore the existence of symptom clusters among patients having abdominal surgery
2. Explore if the symptom clusters are consistent between two original studies

Methods

• Secondary data analysis: 2 cross-sectional studies
• Sample: 250 patients post abdominal surgery
  Research 1: 150 subjects from one general (secondary-level) hospital
  Research 2: 100 subjects from three tertiary-level hospitals
**Methods**

- **Instruments**: Post abdominal surgery complication and symptom assessment scale adapted from the Memorial Symptom Assessment Scale (MSAS) (Portenoy et al., 1994) (severity, frequency, impact)

- **Data collection**: Day 1 and Day 3, after operation

- **Data analysis**:
  - Extract - Common Factor analysis (CFA) - Principal Axis Factoring (PAF)
  - Eigenvalues > 1
  - Rotation - Direct Oblimin

  (Skerman, Yates & Battistutta, 2009)
Results

Characteristics of the samples

Gender
Co-morbidity
Operation Experience
Type of operation

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Research 1</th>
<th>Research 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>52.7</td>
<td>47.3</td>
</tr>
<tr>
<td>Female</td>
<td>86.0</td>
<td>47.3</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>14.0</td>
<td>14.0</td>
</tr>
<tr>
<td>No Comorbidity</td>
<td>86.0</td>
<td>86.0</td>
</tr>
<tr>
<td>Experience</td>
<td>40.7</td>
<td>24.0</td>
</tr>
<tr>
<td>No experience</td>
<td>59.3</td>
<td>76.0</td>
</tr>
<tr>
<td>Elective</td>
<td>59.3</td>
<td>77.0</td>
</tr>
<tr>
<td>Emergency</td>
<td>69.3</td>
<td>69.3</td>
</tr>
<tr>
<td>Age</td>
<td>56.6</td>
<td>51.6</td>
</tr>
<tr>
<td>(Years)</td>
<td>42.3</td>
<td>42.3</td>
</tr>
<tr>
<td>Operation time</td>
<td>7.38*</td>
<td>7.37*</td>
</tr>
<tr>
<td>(Minutes)</td>
<td>77.0</td>
<td>90.9</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 29.7^* \]
\[ \chi^2 = 7.4^* \]
\[ t = 7.38^* \]
\[ t = 7.37^* \]
Symptoms

Day 1

Day 3
Correlation coefficients among symptoms in Research 1 & Research 2

- $r = 0.23^*$
- $r = 0.49^*$
- $r = 0.41^*$
- $r = -0.04$
- $r = 0.12$
- $r = 0.49^*$
## Factor Analysis

### Day 1

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Research I (n=150)</th>
<th>Research 2 (n = 100)</th>
<th>Total (N=250)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Pain*</td>
<td>.46</td>
<td>.89</td>
<td>.94</td>
</tr>
<tr>
<td>Insomnia</td>
<td>.66</td>
<td>.61</td>
<td>.81</td>
</tr>
<tr>
<td>Distention</td>
<td>.32</td>
<td>.75</td>
<td>.77</td>
</tr>
<tr>
<td>Fatigue</td>
<td>.90</td>
<td>.82</td>
<td>.67</td>
</tr>
<tr>
<td>Anxiety*</td>
<td>.21</td>
<td>.62</td>
<td>.81</td>
</tr>
<tr>
<td>Explained variance</td>
<td>35.2% (54.8%)</td>
<td>47.0% (74.7%)</td>
<td>56.5% (79.9%)</td>
</tr>
<tr>
<td>Communality</td>
<td>.55</td>
<td>.75</td>
<td>.80</td>
</tr>
</tbody>
</table>

* In PCA: Research 1 Pain cross loaded on factor 2 [.53]  
  Anxiety loaded on factor 2 [.43]
## Day 3

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Research I (n=150)</th>
<th>Research 2 (n = 100)</th>
<th>Total (N=250)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>2</td>
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<td>Pain</td>
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<td>.83</td>
</tr>
<tr>
<td>Insomnia*</td>
<td>.27</td>
<td>.23</td>
<td>.81</td>
</tr>
<tr>
<td>Distention</td>
<td>.63</td>
<td>.68</td>
<td>.70</td>
</tr>
<tr>
<td>Fatigue</td>
<td>.45</td>
<td>.41</td>
<td>.73</td>
</tr>
<tr>
<td>Anxiety</td>
<td></td>
<td>.46</td>
<td>.75</td>
</tr>
<tr>
<td>Explained variance</td>
<td>38.1% (59.0%)</td>
<td>20.9%</td>
<td>52.2%</td>
</tr>
<tr>
<td>Communality</td>
<td>.59</td>
<td>.57</td>
<td>.63</td>
</tr>
</tbody>
</table>

* In PCA: Research 1- Insomnia cross loaded on factor 1 [.43] and factor 2 [.50]
Discussion

• **Inconsistency of identified symptom clusters:** conceptual definition, study design, sample selection, measurement, timing of symptom measures, received treatment/ intervention, symptom inclusion, statistical analysis (Barnsevick et al, 2006)

• **This study:** Differences in settings (levels of care)
  – disease severity $\rightarrow$ operation time/ procedures, practice guidelines [pain medication]
  – Correlations among symptoms

• **Difference in analytical methods**


