Development of a Scale for Assessment of Patient Comfort After Hip Replacement*

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School of Nursing, Gulhane Military Medical Academy, Ankara, Turkey

* Surgical Nursing Doktoral Thesis
<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Gulhane Military Medical Academy, Ankara, Turkey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflict of interest</td>
<td>None</td>
</tr>
<tr>
<td>Employer</td>
<td>Turkish Armed Forces</td>
</tr>
<tr>
<td>Sponsorship/ Commercial Support</td>
<td>None</td>
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</tbody>
</table>
Goals and Objectives

• Session Goal:
  – To explain the Hip Replacement Comfort Scale’s development phases

• Session Objectives
  – The learner will be able to learn about the Hip Replacement Comfort Scale
  – The learner will be able to know the usage of the Hip Replacement Comfort Scale
The aim of this study is to develop a "Hip Replacement Comfort Scale" and to analyze the validity and reliability of the scale.
After Hip Replacement Surgery...

Patients are affected both:

- Physical
- Psychospiritual
- Sociocultural
- Environmental
The desired outcome of being strengthened by having needs for relief, ease and transcendence met in physical, psycho spiritual, social and environmental context.
Comfort Scales

Hip Replacement Comfort Scale ???

General Comfort Scale

Urinary Incontinence & Frequency Comfort Questionnaire

Psychiatric Comfort Questionnaire

Nurses Comfort Scale

Immobilization Comfort Scale

Katharine Kolcaba

27th International Nursing Research Congress, Cape Town, South Africa

24.07.2016
This study was conducted as a \textit{methodological study} to develop a new scale to assess patient comfort after hip replacement.
Methods

January 2014 – December 2015

3 Education and Research Hospitals in Ankara, TURKEY

180 patients who underwent hip replacement surgery
Methods

GMMA and Other Hospitals’ Local Ethics Committees

Participants
## Methods

<table>
<thead>
<tr>
<th></th>
<th>Data Collection Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data Collection Form for Demographics</td>
</tr>
<tr>
<td>2</td>
<td>Data Collection Form for Surgery</td>
</tr>
<tr>
<td>3</td>
<td>Hip Replacement Comfort Scale</td>
</tr>
<tr>
<td>4</td>
<td>General Comfort Scale</td>
</tr>
</tbody>
</table>
Methods

1st stage
Item Development
- Literature Review
- Individual interviews
- Expert Opinion

2nd stage
Trial Application
- Data Collection Forms

3rd stage
Psychometric Analysis
- Item analysis
- Reliability
- Validity
# Results

<table>
<thead>
<tr>
<th>1st stage</th>
<th>Item Development</th>
<th></th>
<th></th>
<th>Literature Review</th>
<th>Individual interviews</th>
<th>Expert Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
## Results

<table>
<thead>
<tr>
<th>1st stage</th>
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<tr>
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<td></td>
<td>Expert Opinion</td>
</tr>
</tbody>
</table>

### 2nd stage

Trial Application

Data Collection Forms

### 3rd stage

Psychometric Analysis

Item analysis

Reliability

Validity
## Results

### 1st stage

**Item Development**

- Literature Review
- Individual interviews
- Expert Opinion

### 2nd stage

**Trial Application**

**Data Collection Forms**

### 3rd stage

**Psychometric Analysis**

- **Item analysis**
- **Reliability**
- **Validity**

- 43 items were developed

- 22 patients

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24.07.2016

27th International Nursing Research Congress, Cape Town, South Africa
## Results

<table>
<thead>
<tr>
<th>1st stage</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Individual interviews</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expert Opinion</td>
</tr>
</tbody>
</table>
Expert Opinion

1st

- 20 experts
  - Orthopedics and traumatology doctors
  - Surgical nursing instructors
  - Experts in scale development
  - Orthopedics and traumatology nurses
  - Physiotherapists
  - A psychologist
  - A patient who underwent hip replacement surgery

2nd

- 5 experts
Results

1st stage Development

Item Development

- Literature Review
- Individual interviews
- Expert Opinion

5 items removed
38 items left
## Results

### 1st stage: Item Development
- Literature Review
- Individual interviews
- Expert Opinion

### 2nd stage: Trial Application
- Data Collection Forms

### 3rd stage: Psychometric Analysis
- Item analysis
- Reliability
- Validity
# Results

## 1st stage
- **Development**
  - Literature Review
  - Individual interviews
  - Expert Opinion

## 2nd stage
- **Trial Application**
- Data Collection Forms

## 3rd stage
- **Psychometric Analysis**
  - Item analysis
  - Reliability
  - Validity
Results

Post-operative 2nd day

<table>
<thead>
<tr>
<th>Data Collection Forms</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>1 Data Collection Form for Demographics for descriptives</td>
<td></td>
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<tr>
<td>2 Data Collection Form for Surgery for descriptives</td>
<td></td>
</tr>
<tr>
<td>3 Hip Replacement Comfort Scale for scale development</td>
<td></td>
</tr>
<tr>
<td>4 General Comfort Scale for testing validity</td>
<td></td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>1st stage</th>
<th>Item Development</th>
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<tr>
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<td></td>
<td>Expert Opinion</td>
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<table>
<thead>
<tr>
<th>2nd stage</th>
<th>Trial Application</th>
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<tbody>
<tr>
<td></td>
<td>Data Collection Forms</td>
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</table>

<table>
<thead>
<tr>
<th>3th stage</th>
<th>Psychometric Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Item analysis</td>
</tr>
<tr>
<td></td>
<td>Reliability</td>
</tr>
<tr>
<td></td>
<td>Validity</td>
</tr>
</tbody>
</table>
Results

3th stage

Psychometric Analysis

Item analysis
Reliability
Validity
Results

3rd stage

Psychometric Analysis

Item Correlations

Lower-Higher Group Averages

Item analysis
Reliability
Validity
Results

3rd stage
Psychometric Analysis

Lower-Higher Group Averages

Item analysis
- Reliability
- Validity

1st stage
Item Development

2nd stage
Trial Application

Literature Review
Individual interviews
Expert Opinion
Lower-Higher Group Averages

%27 Lower Group

%27 Higher Group

Independent samples t test

Items removed from the scale

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>4</td>
<td>t=-1.349</td>
<td>p=0.181</td>
</tr>
<tr>
<td>19</td>
<td>t=-1.267</td>
<td>p=0.209</td>
</tr>
<tr>
<td>26</td>
<td>t=-1.982</td>
<td>p=0.050</td>
</tr>
</tbody>
</table>
Results

3rd stage

Psychometric Analysis

Item Correlations

Item analysis

Reliability

Validity
Item Correlations

- If corrected item-total item correlation score is negative
- If corrected item-total item correlation score is lower than 0.20
- If Cronbach alfa score increases when item removed

Criterias for removing items from the scale
## Item Correlations

<table>
<thead>
<tr>
<th>Ölçek maddeleri</th>
<th>Madde silindığında ölçek puan ortalamaları</th>
<th>Madde silindığında ölçek puan varyansı</th>
<th>Düzeltilmiş madde toplam puan korelasyonu</th>
<th>Madde silindığında ölçek Cronbach alfa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madde 1</td>
<td>114.70</td>
<td>164.680</td>
<td>0.263</td>
<td>0.755</td>
</tr>
<tr>
<td>Madde 2</td>
<td>115.32</td>
<td>160.586</td>
<td>0.266</td>
<td>0.753</td>
</tr>
<tr>
<td>Madde 3</td>
<td>115.51</td>
<td>158.676</td>
<td>0.243</td>
<td>0.755</td>
</tr>
<tr>
<td>Madde 5</td>
<td>115.89</td>
<td>157.190</td>
<td>0.256</td>
<td>0.754</td>
</tr>
<tr>
<td>Madde 6</td>
<td>115.95</td>
<td>155.132</td>
<td>0.331</td>
<td>0.749</td>
</tr>
<tr>
<td>Madde 7</td>
<td>116.44</td>
<td>160.639</td>
<td>0.156</td>
<td>0.761</td>
</tr>
<tr>
<td>Madde 8</td>
<td>117.29</td>
<td>160.265</td>
<td>0.175</td>
<td>0.759</td>
</tr>
<tr>
<td>Madde 9</td>
<td>115.74</td>
<td>158.831</td>
<td>0.234</td>
<td>0.755</td>
</tr>
<tr>
<td>Madde 10</td>
<td>114.53</td>
<td>166.384</td>
<td>0.145</td>
<td>0.758</td>
</tr>
<tr>
<td>Madde 11</td>
<td>115.41</td>
<td>160.210</td>
<td>0.239</td>
<td>0.754</td>
</tr>
<tr>
<td>Madde 12</td>
<td>114.98</td>
<td>161.614</td>
<td>0.255</td>
<td>0.754</td>
</tr>
<tr>
<td>Madde 13</td>
<td>114.82</td>
<td>163.670</td>
<td>0.240</td>
<td>0.755</td>
</tr>
<tr>
<td>Madde 14</td>
<td>114.69</td>
<td>164.247</td>
<td>0.242</td>
<td>0.755</td>
</tr>
<tr>
<td>Madde 15</td>
<td>117.49</td>
<td>161.413</td>
<td>0.211</td>
<td>0.756</td>
</tr>
<tr>
<td>Madde 16</td>
<td>116.54</td>
<td>152.093</td>
<td>0.406</td>
<td>0.744</td>
</tr>
<tr>
<td>Madde 17</td>
<td>116.84</td>
<td>155.942</td>
<td>0.310</td>
<td>0.751</td>
</tr>
<tr>
<td>Madde 18</td>
<td>115.77</td>
<td>159.197</td>
<td>0.319</td>
<td>0.751</td>
</tr>
<tr>
<td>Madde 19</td>
<td>116.14</td>
<td>163.420</td>
<td>0.119</td>
<td>0.761</td>
</tr>
<tr>
<td>Madde 20</td>
<td>114.92</td>
<td>163.614</td>
<td>0.190</td>
<td>0.757</td>
</tr>
<tr>
<td>Madde 21</td>
<td>117.14</td>
<td>161.342</td>
<td>0.190</td>
<td>0.757</td>
</tr>
<tr>
<td>Madde 22</td>
<td>115.61</td>
<td>157.726</td>
<td>0.312</td>
<td>0.751</td>
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<tr>
<td>Madde 23</td>
<td>115.31</td>
<td>158.919</td>
<td>0.277</td>
<td>0.753</td>
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<tr>
<td>Madde 24</td>
<td>115.24</td>
<td>161.549</td>
<td>0.262</td>
<td>0.754</td>
</tr>
<tr>
<td>Madde 25</td>
<td>114.78</td>
<td>166.383</td>
<td>0.090</td>
<td>0.760</td>
</tr>
<tr>
<td>Madde 26</td>
<td>115.34</td>
<td>156.562</td>
<td>0.434</td>
<td>0.746</td>
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<tr>
<td>Madde 27</td>
<td>114.92</td>
<td>160.597</td>
<td>0.370</td>
<td>0.750</td>
</tr>
<tr>
<td>Madde 28</td>
<td>117.22</td>
<td>158.531</td>
<td>0.238</td>
<td>0.755</td>
</tr>
<tr>
<td>Madde 29</td>
<td>117.01</td>
<td>159.207</td>
<td>0.251</td>
<td>0.754</td>
</tr>
<tr>
<td>Madde 30</td>
<td>116.12</td>
<td>154.644</td>
<td>0.403</td>
<td>0.746</td>
</tr>
<tr>
<td>Madde 31</td>
<td>115.36</td>
<td>158.880</td>
<td>0.302</td>
<td>0.751</td>
</tr>
<tr>
<td>Madde 32</td>
<td>116.04</td>
<td>158.210</td>
<td>0.228</td>
<td>0.756</td>
</tr>
<tr>
<td>Madde 33</td>
<td>116.76</td>
<td>158.085</td>
<td>0.286</td>
<td>0.742</td>
</tr>
<tr>
<td>Madde 34</td>
<td>115.12</td>
<td>157.165</td>
<td>0.437</td>
<td>0.746</td>
</tr>
</tbody>
</table>

N=180  
Madde sayısı=33  
Cronbach alfa=0.759

7 items removed with item correlations analysis and 26 items left
Results

2nd stage

Trial Application

Data Collection Forms

3rd stage

Psychometric Analysis

Item analysis

Reliability

Validity

internal consistency

test re-test analyses
Results

<table>
<thead>
<tr>
<th>Item Analysis</th>
<th>Reliability</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognistic Consistency</td>
<td>Cronbach Alfa</td>
<td>0.756</td>
</tr>
</tbody>
</table>

- **1st stage**
  - Development
  - Literature Review
  - Individual Interviews
  - Expert Opinion

- **2nd stage**
  - Trial Application
  - Data Collection Forms

- **3rd stage**
  - Psychometric Analysis
  - Item Analysis
  - Reliability
  - Validity
Results

<table>
<thead>
<tr>
<th>3th stage</th>
<th>Psychometric Analysis</th>
<th>Item analysis</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reliability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Validity</td>
</tr>
</tbody>
</table>

Individual interviews

Expert Opinion

Data Collection Forms

test re-test analyses
## Test-retest analysis

### Participants

- **44 Patients (24.4%)**

### Data Summary

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>M±SD</th>
<th>p</th>
<th>r*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>44</td>
<td>3.58±0.42</td>
<td>&lt;0.001</td>
<td>0.817</td>
</tr>
<tr>
<td>Re-test</td>
<td>44</td>
<td>3.68±0.49</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The values in the table are indicative of the test-retest analysis results, with a significant p-value and a high correlation coefficient.
Results

3rd stage
Psychometric Analysis

Item analysis
Reliability
Validity

Scope validity
Surface validity
Criterion validity
Construct validity
Results

1st stage
- Item Development
  - Literature Review
  - Individual interviews
  - Expert Opinion

2nd stage
- Trial Application
  - Data Collection Forms

3rd stage
- Psychometric Analysis
  - Scope validity
  - Surface validity
  - Expert opinion and pilot testing

3rd stage
- Psychometric Analysis
  - Item analysis
  - Reliability
  - Validity
## Results

### 3rd stage

**Psychometric Analysis**

<table>
<thead>
<tr>
<th>General Comfort Scale (0-4)</th>
<th>(2.97±0.30)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Hip Replacement Comfort Scale (0-5)</th>
<th>n=180</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3.64±0.43)</td>
<td>r=0.701*</td>
</tr>
<tr>
<td></td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>

**Criterion validity**

<table>
<thead>
<tr>
<th>Item analysis</th>
<th>Reliability</th>
<th>Validity</th>
</tr>
</thead>
</table>
Results

Construct validity

3rd stage

Psychometric Analysis

Item analysis

Reliability

Validity

Exploratory factor analysis

- 10 factors
- 4 factors
- 3 factors

Confirmatory factor analysis

- 4 factors
- 3 factors

Result

- ?

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Results

HRCS Score Average

3.64±0.43 (1-5)
# Results

<table>
<thead>
<tr>
<th>Gender</th>
<th>n(%)</th>
<th>M±SD</th>
<th>p</th>
<th>t*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>123 (68.3)</td>
<td>3.60±0.43</td>
<td>0.045</td>
<td>-2.018</td>
</tr>
<tr>
<td>Male</td>
<td>57 (31.7)</td>
<td>3.74±0.42</td>
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</tr>
</tbody>
</table>

*<sup>t</sup>: Student-t test
## Results

The reason to have surgery

<table>
<thead>
<tr>
<th>Reason</th>
<th>n(%)</th>
<th>$M \pm SD$</th>
<th>$p$</th>
<th>$F^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Femur fractures</td>
<td>42 (23.3)</td>
<td>3.59±0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary osteoarthritis</td>
<td>79 (43.9)</td>
<td>3.74±0.42</td>
<td>0.011</td>
<td>4.670</td>
</tr>
<tr>
<td>Secondary osteoarthritis</td>
<td>58 (32.2)</td>
<td>3.52±0.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tumor</td>
<td>1 (0.6)</td>
<td>4.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*t: ANOVA test
Conclusion

HRCS is a valid and reliable scale with 26 items to assess comfort after hip replacement surgery.
Suggestions

HRCS can be used by nurses and other healthcare staff

HRCS can be used for researches that effects comfort after hip replacement surgery

Other researchers can develope the HRCS for their countries
THANK YOU