Changes in Health Related Quality of Life, Symptom Experience and Functional Status in ICU Survivors

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*This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korean government (MSIP) (22010-0025461)

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INTRODUCTION
Backgrounds (1)

- Survival rates after discharge from the ICU.

(Cabral et al., 2009; Jackson, Mitchell, & Hopkins, 2009)
ICU survivors experience various symptoms after discharge from the ICU.

(Campbell et al., 2008; Kelly et al., 2010)
ICU survivor's physiological, psychological, and functional status factors affect the HRQoL and survival rate of ICU survivors.

(Stein-Parbury et al., 2000; Baldwin et al., 2009; van der Schaaf et al., 2009)
It is necessary to understand how ICU survivors experience symptoms and functional status and HRQoL after discharge.

Health care providers caring critical patients should be aware of recovery pattern for ICU survivors after treatment.
Purpose

- This longitudinal follow-up study was aimed to

1. Describe change in symptom experiences, functional status and health-related quality of life (HRQoL) after discharge from adult ICU

2. Identify the role of symptom experiences and functional status on HRQoL of intensive care units (ICU) survivors after discharge from adult ICU
Conceptual Framework

- General characteristics
  - Demographics
  - Medical history

- Physical factors
  - APACHE II

- Psychological factors
  - Anxiety, Depression
  - Cognitive function

- Situational factors
  - Social support

Symptom experience
- Frequency
- Intensity
- Distress

Functional status
- Activities of Daily Living

HRQoL
METHODS
Study Design and Participants

*Study design*

Longitudinal prospective study design with repeated measurements of the symptom experiences, functional status, and HRQoL of ICU survivors at the time of discharge and at 1, 3, and 6 months after discharge from the ICU.

**Inclusion Criteria**
- Adult men or women 18 years
- More than 24 hours stay in ICU

**Exclusion Criteria**
- Patients with a history of dementia as well as other mental diseases
- Malignant tumors on other major organs
Flow Chart of Participants

- 213 Included
- 24 Excluded
  - 3 Died after hospital discharge
  - 13 Transferred to nursing home
  - 8 Refused to participate
- 189 alive 1 month after discharge
- 184 alive 3 months after discharge
- 5 Excluded
  - 3 Died after hospital discharge
  - 1 Transferred to nursing home
  - 1 Lost touch with
- 158 alive 6 months after discharge were studied
- 26 Excluded
  - 3 Died after hospital discharge
  - 1 Transferred to nursing home
  - 1 Refused to participate
  - 21 Lost touch with
## Instruments

<table>
<thead>
<tr>
<th>Factors</th>
<th>Instruments</th>
<th>Developer</th>
<th>Cronbach’s $\alpha$ (original / this study)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical factors</td>
<td>APACHE II score</td>
<td>Knaus et al., (1991)</td>
<td></td>
</tr>
<tr>
<td>Cognitive function</td>
<td>Mini-Mental State Examination (MMSE-K)</td>
<td>Modified by Park et al., (1989)</td>
<td>0.79 / 0.87</td>
</tr>
<tr>
<td>Social support</td>
<td>Multidimensional Scale of Perceived Social Support (MSPSS)</td>
<td>Zimet et al. (1988)</td>
<td>0.89 / 0.93</td>
</tr>
<tr>
<td>Anxiety/Depression</td>
<td>The Hospital Anxiety-Depression Scale (HAD)</td>
<td>Zigmond et al., (1983) Translated by Oh et al., (1999)</td>
<td>0.89-0.86 / 0.76-0.81</td>
</tr>
<tr>
<td>Symptom experience</td>
<td>Developed by this researchers through a literature review (15 symptoms)</td>
<td>This researcher</td>
<td>0.95</td>
</tr>
<tr>
<td>Functional status</td>
<td>Korean Version of Modified Barthel Index (K-MBI)</td>
<td>Mahoney and Barthel (1965), translated by Jung et al., (2007)</td>
<td>0.94 / 0.93</td>
</tr>
<tr>
<td>HRQoL</td>
<td>Korean Euroqol-5 Dimensions (KEQ-5D)</td>
<td>EuroQol group (1987), Adapted by Jo et al., (2010)</td>
<td>0.86 / 0.80</td>
</tr>
</tbody>
</table>
Data Collection & Data Analysis

- Ethical approval was done by the Soonchunhyang University Hospital of Choeonan Institutional Review Boards on the June 2011 (IRB No. 2011061601).
- Data were collected from July 18, 2011, to May 30, 2012 by four trained research assistants.
- PASW (Predictive Analytics Soft Ware) 18.0.

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Factors</th>
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</thead>
<tbody>
<tr>
<td>T-test or One-way ANOVA</td>
<td>To analyze the difference of demographics, Disease related factors,</td>
</tr>
<tr>
<td></td>
<td>physical and psychological factors</td>
</tr>
<tr>
<td>Repeated measure ANOVA</td>
<td>To measure subjects’ longitudinal changes in symptom experience,</td>
</tr>
<tr>
<td></td>
<td>functional status, and HRQoL after discharge.</td>
</tr>
<tr>
<td>Hierarchical multiple regression</td>
<td>To analyze factors influencing subjects HRQoL after ICU discharge</td>
</tr>
<tr>
<td>analysis</td>
<td></td>
</tr>
</tbody>
</table>
RESULTS
Socio-demographic Characteristics

Sex:
- Male: 57%
- Female: 43%

Age (yr):
- 65-74: 31%
- ≥75: 31%
- > 65: 53%
Disease-related Characteristics

Diseases
- Cardiologic dis. 39%
- Gastro-intestinal dis. 21%
- Neurologic dis. 10%
- Other 18%
- Respiratory dis. 3%
- Nephrology dis. 5%
- Endocrine dis. 5%

Comorbidities
- Yes 71%
- No 29%

Having caregiver
- Yes 70%
- No 30%

The length of stay in ICU (days)
- 1-2 54%
- 3-4 32%
- ≥5 days 14%
Health-related Characteristics (physical & psychological factors)

APACHE II
- ≥10, 20%
- 0~4, 31%
- 5~9, 49%

Anxiety
- ≥8, 28%
- <8, 72%

Depression
- <8, 22%
- ≥8, 77%

Cognitive Function
- < 20, 7%
- 20~23, 15%
- ≥24, 78%
Changes of **Symptom Experience** after ICU discharge

![Graph showing changes of symptom experience after ICU discharge](image_url)
Changes of **Functional Status** after ICU discharge

![Graph showing changes of functional status after ICU discharge](image)

- Discharge: 86.85
- After 1 M: 96.20
- After 3 M: 97.26
- After 6 M: 97.53

*p < 0.001*

*p = 0.369*
Changes of HRQoL after ICU discharge
## Predictors of HRQoL after ICU discharge

<table>
<thead>
<tr>
<th>Time</th>
<th>Predictors</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discharge</strong></td>
<td>LOC at admission</td>
<td>-.163</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>ADL when transferred from ICU to unit</td>
<td>.133</td>
<td>.033</td>
</tr>
<tr>
<td></td>
<td>The length of stay in ICU</td>
<td>.151</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>HAD-D</td>
<td>-.280</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td><strong>Functional status</strong></td>
<td>.576</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>After 1 Month</strong></td>
<td>Having spouse</td>
<td>.093</td>
<td>.020</td>
</tr>
<tr>
<td></td>
<td>ADL when discharged</td>
<td>.147</td>
<td>.009</td>
</tr>
<tr>
<td></td>
<td><strong>Symptom experience</strong></td>
<td>-.508</td>
<td>&lt;.001</td>
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<tr>
<td></td>
<td><strong>Functional status</strong></td>
<td>.430</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>After 3 Months</strong></td>
<td>The length of stay in ICU</td>
<td>.165</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Cognitive function</td>
<td>.183</td>
<td>.003</td>
</tr>
<tr>
<td></td>
<td><strong>Symptom experience</strong></td>
<td>-.607</td>
<td>&lt;.001</td>
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<tr>
<td></td>
<td><strong>Functional status</strong></td>
<td>.448</td>
<td>&lt;.001</td>
</tr>
<tr>
<td><strong>After 6 Months</strong></td>
<td>Employed</td>
<td>-.101</td>
<td>.042</td>
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<tr>
<td></td>
<td><strong>Symptom experience</strong></td>
<td>-.555</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td><strong>Functional status</strong></td>
<td>.318</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

** Adjusted for General characteristics

** LOC; Loss of Consciousness, ICU; Intensive care unit, ADL; Activities of Daily Living, APACHE II; Acute Physiology and Chronic Health Evaluation II, HAD-A; Hospital Anxiety and Depression-Anxiety, HAD-D; Hospital Anxiety and Depression-Depression
CONCLUSIONS
**Summary**

Symptom experiences and functional status were significantly associated with HRQoL in ICU survivors after discharge.

**Limitation**

First, it might also have been due to the limitation brought about by a 6-month follow-up duration instead of a 1-year or longer on cognitive function would be necessary.

Second, clear definition of symptom experience and a longitudinal study on HRQoL-related factors are still needed.
**Implications**

- **First**, this study was meaningful in showing what intervention would most effectively solve the problems of ICU survivors and promote HRQoL.

- **Second**, proving symptom experience and functional status of Korean patients as well as influencing factors of HRQoL based on Theory of Unpleasant Symptoms and HRQoL model was also meaningful.

- **Finally**, we expect this study to be used as preliminary data for medical staff to no longer overlook these problems but to recognize the significance and strategize appropriate ways of interventions of promote HRQoL.
Thank You!!