Differences in the prevalence of item specific Neuropsychiatric Inventory Nursing Home Version in Asian countries

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Background

- Rapidly aging population in Asia indicates the increase in the number of elderly with dementia.
- The behavioral psychological symptoms of dementia (BPSD) cause a severe strain on patients and their care providers.
- BPSD are often measured using Neuropsychiatric Inventory Nursing Home version (NPI-NH), but few studies reported the subscale items.
- Comparison of neuropsychiatric symptoms in different cultures would enable to examine the factors associated with the prevalence of symptoms.
Objective

The aim of this study was to investigate the difference in the item specific prevalence of BPSD measured by NPI-NH in cognitively impaired long-term care residents in Asia.
Methods

- **design**: cross-sectional study
- **study period**: September 2015～April 2016
- **participants**: (1) diagnosed with dementia or Mini Mental State Exam (MMSE) <24 (2) independently mobile
- **data collection**: Data collected from medical records included age, sex, diagnosis of dementia.
  - BPSD was measured by NPI-NH.
  - The cognitive function was measured by MMSE.
  - The severity of dementia was measured by CDR.
Methods

* Neuropsychiatric Inventory Nursing Home version (NPI-NH): To measure the neuropsychiatric symptoms of patients with dementia in nursing homes.

- This scale has 12 domains: Delusions, Hallucinations, Agitation, Depression, Anxiety, Elation, Apathy, Disinhibition, Irritability, Aberrant Motor Behavior, Sleep disorders, Appetite.

- Each category has 5-8 items.
Methods

* **Mini Mental State Examination (MMSE):** To test orientation, memory, calculation ability and so on.
  - This scale has 4 stages of cognitive function: 25-30 (Questionably significant), 20-25 (Mild), 10-20 (Moderate), 0-10 (Severe).

* **Clinical Dementia Rating (CDR):** To measure the severity of dementia.
  - This scale has 5 stages: CDR=0 (None), 0.5 (Questionable), 1 (Mild), 2 (Moderate), 3 (Severe).
## Methods: Type of 7 facilities surveyed

<table>
<thead>
<tr>
<th>region</th>
<th>facility</th>
<th>feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan-Hospital</td>
<td>Special dementia care units</td>
<td>hospital wards for patients with dementia</td>
</tr>
<tr>
<td>Japan-LTCF</td>
<td>Long-Term Care Facility (LTCF)</td>
<td>facility for medical care and rehabilitation</td>
</tr>
<tr>
<td>Japan-GH</td>
<td>Group Home (GH)</td>
<td>communal living for elderly with dementia</td>
</tr>
<tr>
<td>South-Korea</td>
<td>Nursing home (NH), GH</td>
<td>facility for elderly patients (group home and day service)</td>
</tr>
<tr>
<td>China</td>
<td>NH</td>
<td>facility for elderly (public servants)</td>
</tr>
<tr>
<td>Taiwan</td>
<td>NH</td>
<td>facility for retired veterans</td>
</tr>
<tr>
<td>Thailand</td>
<td>3 NH</td>
<td>facility for the poor</td>
</tr>
</tbody>
</table>
Ethical consideration

This study was approved by the ethics committee in each academic institution and care facility.
Results: outline

- basic demographic and clinical information
- prevalence of BPSD measured by NPI-NH
- prevalence of selected BPSD by CDR score
- prevalence of selected NPI-NH subscale item (CDR=3)
## Results: basic information

<table>
<thead>
<tr>
<th>Country</th>
<th>Participants (n)</th>
<th>Female (%)</th>
<th>Age (years)</th>
<th>Mean MMSE score</th>
<th>Dementia diagnosis (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan-HP</td>
<td>75</td>
<td>50.7</td>
<td>79.1±7.7</td>
<td>14.0±6.9</td>
<td>97.3</td>
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<tr>
<td>Japan-LTCF</td>
<td>91</td>
<td>74.7</td>
<td>85.8±7.9</td>
<td>14.0±7.2</td>
<td>60.4</td>
</tr>
<tr>
<td>Japan-GH</td>
<td>99</td>
<td>85.9</td>
<td>85.1±6.8</td>
<td>9.3±8.5</td>
<td>97.0</td>
</tr>
<tr>
<td>South Korea</td>
<td>100</td>
<td>77.0</td>
<td>84.5±7.3</td>
<td>9.1±7.4</td>
<td>62.0</td>
</tr>
<tr>
<td>China</td>
<td>100</td>
<td>64.0</td>
<td>80.8±7.9</td>
<td>7.2±7.0</td>
<td>38.0</td>
</tr>
<tr>
<td>Taiwan</td>
<td>99</td>
<td>0.0</td>
<td>86.7±7.1</td>
<td>14.1±6.1</td>
<td>100.0</td>
</tr>
<tr>
<td>Thailand</td>
<td>98</td>
<td>50.0</td>
<td>75.4±7.7</td>
<td>11.4±5.5</td>
<td>4.1</td>
</tr>
</tbody>
</table>
The highest median prevalence of BPSD was “agitation” (39%) and the lowest one was “elation” (8%).
Results: Prevalence of Agitation and Apathy by CDR score

- **Agitation**: Higher prevalence in moderate/severe dementia than in mild dementia
- **Apathy**: The prevalence increases with severity

![Bar chart showing the proportion of agitation and apathy by CDR score.](chart.png)

- Agitation: 
  - CDR ≤ 1 (mild): 30%
  - CDR = 2 (moderate): 40%
  - CDR = 3 (severe): 50%

- Apathy: 
  - CDR ≤ 1 (mild): 20%
  - CDR = 2 (moderate): 30%
  - CDR = 3 (severe): 40%
Results: Prevalence of item-specific agitation in agitation positive residents by CDR score.

Three subcategories emerged: 1) care resistance, 2) stubbornness, 3) physical manifestation of agitation.

- Care resistance
- Behavioral manifestation of agitation

Legend:
- CDR≤1 (mild)
- CDR=2 (moderate)
- CDR=3 (severe)
Results: Prevalence of item-specific apathy in apathy-positive residents by CDR score.

Increased severity of dementia was associated with the increased prevalence of apathy for all apathy items.

- CDR≤1 (mild)
- CDR=2 (moderate)
- CDR=3 (severe)
Results: Prevalence of item-specific agitation in agitation positive residents (CDR=3) by region

- Variation in item-specific prevalence greater than regional variation in the prevalence.
- In Japan, prevalence tended to be higher in Japan-GH than Japan-HP.
Results: Prevalence of item-specific apathy in apathy positive residents (CDR=3) by region

Korean data show less variation in item-specific prevalence than the other sites. → This may be affected by care, activity or environment.


**Discussions/conclusions**

- We compared the prevalence of 2 symptoms by severity of dementia and by regions.
- Prevalence of agitation and apathy were associated with severity of dementia.
- Agitation may have three subconstructs based on the content of the item and pattern of prevalence by CDR score.
- All the item-specific prevalence of apathy showed dose-response relationship with CDR score.
- Non-representative sample of the area, but high validity.
- Cultural comparison of BPSD will contribute to the better understanding of BPSD and refine constructs of BPSD as shown in our analysis.