Organization of hospital nursing, provision of nursing care, and patient experiences with care in Europe

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Katholieke Universiteit Leuven, Belgium
WHO AM I: BUILDING A CAREER IN HEALTH SERVICES

RESEARCH EXPERIENCE, FURTHER EDUCATION, LINK TO POLICY MAKING

- Master in Nursing
- Master in Economic Policy
- Master in Statistics
- Research associate/project manager of RN4CAST: Registered Nurse Forecasting in Europe
- PhD study in patient related and public health research
- Post-doctoral research at King’s College London

Young Gasteiner

...
NURSING: KEY TO PATIENT SAFETY

RN4CAST: A UNIQUE STUDY

Europe (12 countries)
33,731 nurses in 486 hospitals
11,318 patients in 210 hospitals

Portugal
2,204 nurses and 2,223 patients in 31 hospitals

US (PA, CA, NJ, FL)
27,509 nurses in 617 hospitals
Millions of patients in 430 hospitals

China (6 prov., 2 mun., 1 aut. reg.)
9,698 nurses in 181 hospitals
6,494 patients in 181 hospitals

South Africa (6 provinces)
4,657 nurses in 62 hospitals
NURSING: KEY TO PATIENT SAFETY

RN4CAST: FINALLY GENERATING EUROPEAN EVIDENCE

- **2002**: Staffing and patient mortality
  Aiken et al. JAMA
- **2004**: Staffing and patient complication rates
  Needleman et al. NEJM
- **2006**: Education and patient mortality
  Aiken et al. JAMA
- **2008**: Staffing, education and patient mortality
  Aiken et al. Lancet for RN4CAST
- **2009**: Work environment, staffing and patient experiences
  Aiken et al. BMJ for RN4CAST
- **2012**: Staffing, education and patient mortality
  Aiken et al. Lancet for RN4CAST
NURSING: KEY TO PATIENT SAFETY

GENERATING WORLDWIDE EVIDENCE

Migratory status and non-nursing tasks
*International Journal of Nursing Studies & Second book volume PROMeTHEUS*

Nurse work environment and burnout
*International Journal of Nursing Studies*

Staff nurses’ versus managers’ perceptions of work environments
*Medical Care*

Care left undone and patient experiences with care
*Medical Care Research and Review*

PhD

RN4CAST

+50 publications in international peer-reviewed journals
CARE LEFT UNDONE AND PATIENT EXPERIENCES

SAMPLE

Europe
10,741 nurses and 11,549 patients in 217 hospitals in 8 countries
CARE LEFT UNDONE AND PATIENT EXPERIENCES

WHAT IS ALREADY KNOWN

- High quality care inheres in the interaction of nurses with patients
- Increased research interest in process variables such as care left undone

NEW CONTRIBUTION

- Patient experiences are an indicator of quality deficiencies in structures and processes of nursing care
- Emphasis of the synergy between nursing education and nurse staffing
CARE LEFT UNDONE AND PATIENT EXPERIENCES

STUDY AIMS

1. Specify the extent to which nursing care that is left undone *mediates* the relationship between the organization of hospital nursing and patient experiences with hospital care.

2. Specify how the importance of tasks left undone, as an intervening variable, is *moderated* by the effects of the educational level of hospital staff nurses.
# CARE LEFT UNDONE AND PATIENT EXPERIENCES

## FINDINGS: VARIATION IN PATIENT SATISFACTION/CARE LEFT UNDONE

<table>
<thead>
<tr>
<th>Country</th>
<th>Patient survey</th>
<th>Nurse survey</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Patients rating the hospital 9 or 10</td>
<td>% Patients definitely recommending the hospital</td>
</tr>
<tr>
<td>Belgium</td>
<td>46.50 (24.56-82.76)</td>
<td>58.31 (19.23-80.77)</td>
</tr>
<tr>
<td>Finland</td>
<td>58.70 (25.81-77.23)</td>
<td>65.22 (35.71-8.00)</td>
</tr>
<tr>
<td>Germany</td>
<td>47.42 (23.53-71.43)</td>
<td>65.23 (17.65-85.71)</td>
</tr>
<tr>
<td>Greece</td>
<td>41.96 (15.00-76.47)</td>
<td>56.64 (20.97-84.62)</td>
</tr>
<tr>
<td>Ireland</td>
<td>60.18 (36.00-80.00)</td>
<td>74.10 (60.00-96.67)</td>
</tr>
<tr>
<td>Poland</td>
<td>54.17 (33.57-76.32)</td>
<td>56.61 (34.43-69.75)</td>
</tr>
<tr>
<td>Spain</td>
<td>34.87 (0-68.18)</td>
<td>54.11 (18.52-83.33)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>61.20 (36.11-100)</td>
<td>76.94 (40.00-100)</td>
</tr>
</tbody>
</table>
FINDINGS: VARIATION IN NURSE STAFFING (PATIENTS PER NURSE)

Ireland: 7.0
5.4-8.9

Finland: 8.3
5.3-15.6

Belgium: 10.7
6.2-16.2

Greece: 9.8
6.3-15.5

Germany: 13.0
7.5-19.2

Spain: 12.4
9.4-17.9

Switzerland: 7.9
4.6-12.6

Poland: 10.4
7.2-14.9

Weighted by hospital level
CARE LEFT UNDONE AND PATIENT EXPERIENCES

FINDINGS: VARIATION IN NURSE EDUCATION LEVEL (% BACHELOR NURSES)

![Chart showing variation in nurse education level across different countries.](chart.png)

- Belgium: 54%
- England: 53%
- Finland: 0%
- Germany: 26%
- Greece: 60%
- Ireland: 22%
- the Netherlands: Not included
- Norway: Not included
- Poland: 10%
- Spain: Not included
- Sweden: Not included
- Switzerland: Not included

Weighted by hospital level
## CARE LEFT UNDONE AND PATIENT EXPERIENCES

### ANALYTIC STRATEGY

Three linked data sources

<table>
<thead>
<tr>
<th>Common identifiers</th>
<th>Patient survey data</th>
<th>Nurse survey data</th>
<th>Adm. data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country (c)</td>
<td>Hospital (h)</td>
<td>Nurse staffing ($x_{hc}$)</td>
<td>Clinical care undone ($m_{hc}$)</td>
</tr>
<tr>
<td>BE 1</td>
<td>1</td>
<td>9.45</td>
<td>3.2</td>
</tr>
<tr>
<td>BE 1</td>
<td>2</td>
<td>9.45</td>
<td>3.2</td>
</tr>
<tr>
<td>BE 1</td>
<td>3</td>
<td>9.45</td>
<td>3.2</td>
</tr>
<tr>
<td>BE 2</td>
<td>6</td>
<td>7.50</td>
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<tr>
<td>BE 2</td>
<td>7</td>
<td>7.50</td>
<td>2.05</td>
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<tr>
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<td>6.50</td>
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</tr>
<tr>
<td>NL 1</td>
<td>2</td>
<td>6.50</td>
<td>1.60</td>
</tr>
</tbody>
</table>

**IND. LEVEL**

**SYSTEM LEVEL**
CARE LEFT UNDONE AND PATIENT EXPERIENCES

ANALYTIC STRATEGY

Three-level (moderated) mediation

Level 3: Country
Random effect $u_c$

Level 2: Hospital
Random effect $u_{hc}$

$x_{hc}$ (staffing), $z_{hc}$ (work environment), $w_{hc}$ (nurse education), $x_{hc}w_{hc}$ (interaction effect), $m_{hc}$ (missed care), ...

Level 1: Patient

$Y_{phc}$, outcome for binary measures of patient experiences with care

$m_{hc} = \gamma_0 + \gamma_x x_{hc} + \gamma_w w_{hc} + \gamma_{xw} x_{hc} w_{hc} + \epsilon_{jk}$
CARE LEFT UNDONE AND PATIENT EXPERIENCES

FINDINGS

**Structure**
- Education levels
- Patient-to-nurse ratio
- Work environment
- Overtime
- Non-nursing tasks
- Years of experience

**Process**
- Clinical care left undone
- Planning/communication left undone

**Outcome**
- Patient experiences with care

**SYSTEM LEVEL**

**INDIVIDUAL LEVEL**
GENERAL DISCUSSION

AVENUES FOR FURTHER RESEARCH

- Evaluating cost offsets of nursing system delivery strategies
- Extension to non-hospital settings

POLICY CONSIDERATIONS

- Place a premium on well-educated nurses
  ... and effectively leverage nurses’ roles
  ... and allow nurses to engage in lifelong learning
- Nurse staffing ratios
  - Mandate specific ratios
  - Matching skills and experience of nurses to the need of patients
  - Reporting staffing levels to the public/regulatory body
- Level-specific interventions to create positive work environments
THANK YOU

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