The RAFAELA system - a research based workforce planning tool for nurse staffing and skillmix

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International benchmarking?  
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The history of the RAFAELA system

- The OPCq was developed in the early 1990’s at Oulu University Hospital, further developed at Vasa Central Hospital in Finland 1995-2000
- During 1995-2000 the PAONCIL method was developed and tested, an alternative to time studies
- National testing and standardization of the system in Finland 2000 – 2002, multi-centre study
- Systematic benchmarking by RAFAELA system, 2002 -
- Over 1 000 units in Finland as users, 90% of all hospitals
- Implementation of the RAFAELA system in Iceland (2010-), Holland (2013) and Sweden (2013)

- Testing the validity and reliability in Norwegian context at the Oslo University Hospital (2010-2014)

The theoretical model


NICCON-network, the Research Network for Nursing Intensity, Competency, Context and Outcome in the Nordic Countries.

Why do we need to measure nursing intensity by the RAFAELA™ system?

A. To guarantee patient outcomes – a part of evidence based nursing
   ‘To show that nurses make a difference for the outcome of health care’

B. To be able to allocate personnel resources, a central task of human resource management – both the quality aspects of personnel resources = staff mix and competence, and the quantity aspects of resources = number of nurses
   ‘To make good nursing possible’

C. To be able to perform an evidence based nursing management – leading by using reliable information as facts for decision making.
   ‘To make the invisible nursing visible’


Definition of nursing intensity

- The classification of nursing intensity is defined as measuring patients’ individual care needs and the nursing interventions that the nursing staff have performed in order to meet these needs during a certain period of time.

- Systematic and continuous classification of each patient once per day (between 2.00 and 3.00 p.m.)
Theoretical framework of the RAFAELA system

• Developed from a nursing science perspective
• Holistic view of man
• Patient’s care needs – ’Measuring the unmeasurable’
• Making ’the invisible nursing visible’
• ’Nursing makes a difference’ -
• Evidence-based ’human resource management’
• Nursing intensity and patient safety

The main components of RAFAELA™

- **PC**: Patient classification. (Assessment of six areas of care. Outcome: Five categories of care)
- **HR**: Human resource, the daily number of nurses and assistant nurses in providing nursing care at the bedside
- **QL**: Quality level for good nursing care – starting point!!!
- **WL**: Workload assessment. Professional Assessment of Optimal Nursing Care Intensity Level for each unit (PAONCIL)
The structure of the RAFAELA system

- OPC instrument: 6-24 points per patient, 24 hrs
- Nursing resources: Number of nurses during 24 hrs
- PAONCIL study: About 4 weeks, Regression Analyses, >0.25
- Workload per nurse: OPC points/nurse
- Result of the study: Optimal NI point as NIpoints/nurse

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Result of the study: Optimal NI point as NIpoints/nurse

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Implementation process of the RAFAELA™ System


**Introducing the RAFAELA™ System**

**Training of nurses; OPC classification in 2-3 months**

**Reliability testing through Parallel Classification**
- Consensus > 70%
- Consensus < 70% → Renewed Parallel Classification

**PAONCIL assessments, at least 3-4 weeks**
- \( R^2 > 0.25 \) (25 %)
- \( R^2 < 0.25 \) (25 %) → Renewed PAONCIL assessment

**The optimal workload – expressed in recommended level of OPC points per nurse and unit**
The Oulu Patient Classification Instrument OPCq

Areas of nursing care to be assessed 1-6:

1. Planning and coordinating nursing care
2. Respiration, circulation and symptoms of illness
3. Nutrition and medication
4. Hygiene and secretion
5. Activity, sleeping and rest
6. Teaching and supervision of treatment and follow-up, emotional support

One of four patient acuity levels is selected for each area of nursing care according to patient need:

- A = 1p relatively low need for care
- B = 2p occasional need for care
- C = 3p recurring need for care
- D = 4p fully or almost fully dependant

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Patient nursing intensity classes

- Class I  6-8p  minimum need for care
- Class II  9-12p  medium need for care
- Class III  13-15p  high need for care
- Class IV  16-20p  maximum need for care
- Class V  21-24p  intensive care required
Components of the RAFAELA™ System

1. Instruments for measuring nursing intensity in different contexts
   - OPCq (Oulu Patient Classification)
     - For hospital wards (generic for all specialities), first version developed in Oulu, modified in Vaasa, Finland
   - PPCq (Pitkäniemi Patient Classification)
     - For psychiatry, developed in Tampere, Pitkäniemi
   - POLIHOIq
     - For out-patient departments and emergency rooms, developed in Oulu
   - PERIHOIq
     - For Operating and recovery rooms, day-surgery
   - SÄDEHOIq
     - For Radiation Therapy, developed in Oulu

2. Personnel resources
   - Information gathering included in all patient classification indicators

3. Determination of optimal nursing care intensity level
   - PAONCIL instrument

4. Financial information
Validity testing of the OPCq

Validation from a patient perspective:

Content validity:

Construct validity:


RELIABILITY IS TESTED EACH YEAR ON EVERY UNIT (<70%)
Why not traditional time studies?

- The complexity of nursing, the nurse is doing several tasks at the same time
- The context is not comparable to the industrial context
- The quality of nursing is not included
- Repeated time studies will not give the same results
- Expensive study design
- Time consuming design
- The idea of controlling how the nurses are using their time
PAONCIL method – an alternative to classical time studies

- Study period of 4-6 weeks - Professional Assessment of Optimal Nursing Care Intensity Level Instrument
- A PAONCIL assessment is the responsible nurse's assessment of how the resources meet the nursing care needs in the cases of the patients they nursed during the shift in total.
- Optimum nursing intensity is defined as the intensity which every trained professional nurse working in the unit can handle without compromising the standard of good nursing care determined for the unit.
- A regression analysis is performed to relate the PAONCIL assessments to the information of nursing intensity/nurse.

Study nr 1. PAONCIL instrument (first version) (Fagerström & Rainio, 1999, p. 374)

Professional assessment

Date: 1996  Work shift: Morning / Evening / Night

Occupational group (circle your own): Ward nurse  Special nurse  Nurse  Assistant nurse

Paediatric assistant nurse

How many years have you worked as a nurse?

Assessment of nursing care intensity level during the shift. Indicate as exactly as possible!

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<th>-1.25</th>
<th>-0.75</th>
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Very low  Low  Fairly low  Optimal  Fairly high  High  Very high

Other factors that influenced workload during the shift:

__________________________________________________________________________

__________________________________________________________________________
Research about the PAONCIL method


1. **Improve Person-centered Care for the Patients:**
   Nursing becomes even more professional. Patients are different and their needs vary over time. The starting point is the patient’s actual care needs.

2. **Improve Workforce Planning and Decrease Personnel Costs:**
   Savings come from e.g. effective resource allocation, the decreased need of deputy nurses as well as acute replacements and permanent reserves.

3. **Improve Quality and Manage Risks Better:**
   Patients’ real care needs - not just the number of beds or some other similar factor - are taken into account, optimal workload per nurse reduces mistakes and adverse events and improves patient safety.

4. **Increase Nurses’ Job Satisfaction:**
   The resources are allocated optimally, which means better balanced and more equally distributed workload.

5. **Enhance Patient Documentation Quality:**
   Knowing more about the patients and especially the factors correlating with the nursing effort needed.
Benefits of Using the RAFAELA™ System

1. Improve Person-centered Care for the Patients
2. Improve Workforce Planning and Decrease Personnel Costs
3. Improve Quality and Risk Management
4. Increase Nurses’ Job satisfaction
5. Enhance Patient Documentation Quality
Report Example #1:
Nursing Intensity Category Distribution

November

<table>
<thead>
<tr>
<th>Category</th>
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<tr>
<td>PC1</td>
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<tr>
<td>PC2</td>
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<td>PC3</td>
<td>37%</td>
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<tr>
<td>PC4</td>
<td>16%</td>
</tr>
<tr>
<td>PC5</td>
<td>1%</td>
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Report Example #2:
An Example of the Patients’ Need for Care

![Bar chart showing nursing care intensity points in sectors of nursing for different DRGs.

- Green bar: DRG 14 infarct of brain
- Blue bar: DRG 139 rhythmic cardiac disease

- Average nursing care intensity points in sectors of nursing.
Report Example #3:
Breakdown of Nursing Care Areas

<table>
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<tr>
<th>Month</th>
<th>Area 1 (%)</th>
<th>Area 2 (%)</th>
<th>Area 3 (%)</th>
<th>Area 4 (%)</th>
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</table>
Report Example #4:
Average Nursing Care Intensity/Workload per Nurse by Specialization
Report Example #5: Nursing Intensity/Nurse/Optimum Nursing Intensity, Monthly Report
Report Example #6:
An example of describing the resource allocation of nursing resources

Over optimum (red) 31 % of days, under optimum (yellow) 26 % of days, optimum level (green) 43 % of days
Report Example #7:
Nursing staff daily payroll costs (€) per nursing care intensity point per speciality in university hospitals
The RAFAELA system in Nursing Homes and Home Health Care


**Prerequisites for the PANCIL method** has been tested:


Ongoing research project in the home healthcare in Drammen:

Modifying and testing the RAFAELA system for measuring nursing intensity in home healthcare nursing.
Developing International Benchmarking

Our goal is to establish an international research network for the RAFAELA users

The aims are to

• Improve the quality of the Healthcare services worldwide by evidence based knowledge

• Help the Healthcare staff to manage the services professionally and based on reliable information

• Bring Healthcare – if possible – even closer to the patients’ needs.

ARE YOU INTERESTED IN BEING THE FIRST TO TEST THE RAFAELA SYSTEM – IN A HOSPITAL OR IN NURSING HOMES?

PLEASE CONTACT ME!
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www.fcg.fi; www.rafaela.fi
Doctoral thesis about the RAFAELA system


+ Many master thesis at the universities of Finland and project reports
Thank you for your attention!