Europe: Levels of Intensive Care Nurses’ Knowledge Survey

E-LINKS

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Purpose

• Obtain baseline information
  – knowledge levels of European intensive care nurses

• Enable comparisons
  – different countries
  – different levels of experience

• Enable identification of strong and weak areas of critical care nursing knowledge

• Provide information
  – curriculum development
  – education standards
  – European Union
Background

- Europe: two surveys:
  - European Commission, 2000
  - Baktoft et al., 2003
  - Neither provided information about nurses’ knowledge level

- Previous study using BKAT (Toth, 2003)
  - some subjects from outside of the USA but no European nurses

- Only one European (single-nation) study of critical care nurses’ knowledge (Aari et al., 2004).
  - Finland
  - Translated
  - Newly qualified nurses

- **Declaration of Madrid 1993 WFSICCM**
  - Adopted by both EfCCNa (2004) and WFCCN (2005)

- Critical care nurses must possess the appropriate knowledge and skills . . .

- When a basic nursing education program does not include the specialised knowledge and skills needed, these must be provided to nurses who will take care of critically ill patients and their families.
Recruitment

• National co-ordinators in each country
  – Select up to 20 ICUs
• Local co-ordinators in each ICU
  – Select 6 ICU nurses
• Participants de-identified
Data collection

- 100-item knowledge questionnaire
  - 11 knowledge areas
  - Originally developed in Australia
  - Modified for Europe
  - Cronbach’s Alpha 0.87
- Translated into 15 languages
- Data collection commenced May 2009
  - Target response rate 60%
Sample characteristics

- 318 ICUs participated
  Individual ICU response rate: 23.1-93.3%

- Sample size
  n = 1142 (59.9% return)

- Gender
  77.3% female

- Age
  < 30  n = 463 (40.5%)
  30-39 n = 421 (36.9%)
  ≥ 40  n = 258 (22.6%)

- Years’ experience
  0-2 years n = 326 (28.5%)
  2-5 years n = 367 (32.1%)
  > 5 years n = 449 (39.3%)

- Public/state hospital
  n = 1077 (94.3%)

- University hospital
  n = 666 (58.3%)
Sample by country of practice
Return rates

ELINKS returns % 31.12.9

Countries
Overall mean score = 65.7%
Mean score

- $n = 1142$
- Mean = 65.7% (SD 11.88)
- Range 22-91%
- If 50% was the pass mark, 89.8% of nurses passed
<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>Austria</th>
<th>Croatia</th>
<th>Cyprus</th>
<th>Denmark</th>
<th>Finland</th>
<th>France</th>
<th>Germany</th>
<th>Greece</th>
<th>Italy</th>
<th>Slovenia</th>
<th>Spain</th>
<th>Sweden</th>
<th>Turkey</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50% (n)</td>
<td>1</td>
<td>15</td>
<td>1</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>20</td>
<td>13</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>&lt;50% (%)</td>
<td>2.6</td>
<td>25.9</td>
<td>3.7</td>
<td>10.0</td>
<td>8.1</td>
<td>15.0</td>
<td>4.8</td>
<td>33.3</td>
<td>15.1</td>
<td>4.8</td>
<td>5.0</td>
<td>5.6</td>
<td>27.7</td>
<td>4</td>
</tr>
<tr>
<td>Sample (n)</td>
<td>39</td>
<td>58</td>
<td>27</td>
<td>90</td>
<td>86</td>
<td>40</td>
<td>83</td>
<td>60</td>
<td>86</td>
<td>21</td>
<td>60</td>
<td>72</td>
<td>112</td>
<td>25</td>
</tr>
</tbody>
</table>

The table above shows the number of samples and the percentage of samples with values below 50% for each country, with specific highlight on certain countries.
Overall scores (%)

- Female: 
  - < 30 years: 61.6
  - 30-39 years: 62.5
  - > 40 years: 70.8

- Male: 
  - < 30 years: 61.6
  - 30-39 years: 65.1
  - > 5 years: 69.2

- University: 
  - < 30 years: 56
  - 30-39 years: 58
  - > 5 years: 66.1

- Non-University: 
  - < 30 years: 61.6
  - 30-39 years: 64.6
  - > 5 years: 65.8

- Public/state: 
  - < 30 years: 62.5
  - 30-39 years: 66.1
  - > 5 years: 69.2

- Private: 
  - < 30 years: 61.6
  - 30-39 years: 65.1
  - > 5 years: 66.1

P-values:
- Female vs. Male: p = ns
- Female vs. University: p < 0.001
- Female vs. Non-University: p = ns
- Female vs. Public/state: p < 0.001
- Female vs. Private: p = ns
Mean scores by category

- Miscellaneous
- Infection/sepsis
- Neurological
- Renal
- Drugs
- Cardiac
- Haemodynamic
- Gastrointestinal
- Fluids/electrolytes
- Ventilation/respiration

Mean scores (%):
- Miscellaneous: 44.6
- Infection/sepsis: 58.9
- Neurological: 66.1
- Renal: 66.2
- Drugs: 67.6
- Cardiac: 68.8
- Haemodynamic: 73.4
- Gastrointestinal: 74.3
- Fluids/electrolytes: 79.5
- Ventilation/respiration: 68.4
51. When intubating a patient, which of the following statements is NOT correct?

- Applying cricoid pressure occludes the oesophagus to prevent potential aspiration of gastric contents
- Cricoid pressure increases as the patient becomes sedated and paralysed
- Cricoid pressure should be released as soon as the endotracheal tube is inserted
- Cricoid pressure can assist in the visualisation of the vocal cords

48. A post-operative patient in your care is ventilated using a VOLUME LIMITED mode. His arterial oxygenation deteriorates and it is decided to increase the level of positive end expiratory pressure. Nursing observations to assess the effects of the increase in positive end expiratory pressure should include all of the following EXCEPT:

- Measuring urine output
- Recording partial pressure of arterial oxygen (PaO2) and haemoglobin saturation
- Recording blood pressure
- Measuring expiratory tidal volume
50. A patient, who is intubated and receiving positive pressure ventilation, has an intercostal chest drain with an underwater seal system. Air is bubbling out of the chest drain through the water. Which of the following statements concerning the changing of the underwater sealed drain bottle is correct?

44. An intubated patient has just returned from the operating room after undergoing an abdominal aortic aneurysm repair and soon after exhibits jerky uncoordinated limb movements, becoming hypertensive and tachycardic. His spontaneous ventilatory efforts are ineffective. On the basis of these observations, which of the following is the most likely problem?

21.7%  
27.0%
52. Humidification and warming of inhaled gas is essential for the health and function of the airway mucosa and the lungs. Which statement best describes the inhaled gas of a person quietly breathing at normal room temperature?
   - 35.2%

45. The main purpose of an underwater seal when used with an intercostal chest drain is to?
   - 38.5%

49. Your spontaneously breathing patient is receiving oxygen via a continuous positive airways pressure system. To provide effective continuous positive airways pressure, which of the following is required?
   - 43.5%
Other scores below 50%

- **Cardiac**
  - Oxygen delivery determinants • 34.3%
  - Ventricular dysrhythmia • 44.5%
  - VF defibrillator settings • 44.7%

- **Haemodynamics**
  - Arterial line trace - meaning • 43.3%

- **Infection/sepsis**
  - Definition of sepsis • 44.9%

- **Renal**
  - CRRT mechanism of solute removal • 31.7%
  - Urine specific gravity interpretation • 48.1%

- **Drugs**
  - Effects of beta 2 receptor agonists • 30.8%

- **Neuro**
  - Causes of neurogenic shock • 43.1%
  - Intracranial pressure nursing care • 44.9%
Summary

• Knowledge increases with age and experience
• Nurses’ weakest area of knowledge is ventilation/respiration
• Around 10% of nurses have poor knowledge levels
• There is no significance difference in knowledge levels depending upon hospital type
Conclusions

- E-LINKS is the first study that has investigated the theoretical and applied knowledge base of intensive care nurses in multiple European countries.
- Levels of knowledge vary by country
  - On the whole, there are no major variations
  - Generalisation is difficult due to limitations
  - Some countries have limited specialist courses for nurses
- Nursing curricula should place greater emphasis on ventilation/respiration.
- Weaker knowledge areas have been shown in some areas.
- What level of knowledge is acceptable?
- What is the relationship between knowledge level and practice competence?
- Online surveys can be problematic
  - Incompletions/difficulty & time factors