Clinical Issue/Practice Problem

- The Neonatal Intensive Care Unit (NICU) environment influences preterm infant development
  - There is a need to simulate the nurturing and protective in utero environment to optimize outcomes
  - Inappropriate positioning the potential to negatively impact sensory and motor development
- Needs Assessment: Improved consistency and appropriate positioning of preterm infants in a 51-bed Level III NICU was identified as an educational need by management and staff nurses
- Project Aim: An evidence-based practice change project was developed and implemented with the ultimate goal to improve outcomes of preterm infants

Summary of the Supporting Literature

- Providing developmentally supportive positioning in the NICU is vital for optimal musculoskeletal and neuromotor development
- Positioning of neonates can influence:
  - Physiologic function and stability
  - Thermal regulation
  - Bone density
  - Neurobehavioral organization and sleep facilitation
  - Calmness and comfort
  - Skin integrity
  - Optimal growth
  - Brain development
- Evidence-based practice guidelines for age-appropriate care of the premature and critically ill hospitalized infant support an educational intervention
  - Highlights the need for competencies in those caring for these infants

Key References


Project Implementation

- Location: Level III NICU at a 464-bed, urban, Midwestern hospital
- Participants: All registered nurses employed within a 51-bed NICU
- Demographics: Nurses were primarily either novice (34%) with 0-5 years, or very experienced (47%) with 16+ years in the NICU
- Key Stakeholders:
  - Director of Maternal-Child Nursing, the unit manager, physical and occupational therapists, and staff nurses
  - Intervention: 30-minute Prezi Presentation on evidence-based therapeutic positioning, 14 different in-services offered
  - Evaluation: 10 question pretest/posttest with 4 demographic questions administered to measure knowledge gained
  - The Theory of Planned Change by Kurt Lewin
    - Unfreezing-change-refreeze model
    - Identified barriers: time constraints, 3 different shifts, resistance to change current practices

Outcomes

- Benchmark hypothesis: 10% increase in nursing knowledge gain of developmental care practices, measured by matched paired pretest/posttest evaluation
- Participation: 49 of 52 available registered nurses in the NICU participated (94%) in the educational intervention
- Improvement: 87% of the participants achieved 10% benchmarked level of improvement
  - The aggregate mean improvement was 42.9% (SD=3.10)
- Statistical significance: a paired two-sample of means t-test indicated a statistically significant knowledge gain from pretest to posttest: t (45) =9.38, p=<0.05
- Qualitative significance: NICU nurses identified improved use of proper positioning devices, indicating at least a short-term successful practice change

Clinical Implications for Practice and Next Steps

- Implications for Advanced Practice Nurses:
  - APNs possess the education to further develop a unit-based therapeutic positioning protocol founded on evidence-based guidelines, as well as evaluate outcomes of infants as a results of the practice change
  - As leaders, APNs can identify and further train unit-based champions on therapeutic positioning, as well as develop an ongoing auditing program to monitor nursing competency and further educational needs
- A multidisciplinary educational intervention could be led an APN to facilitate appropriate and therapeutic positioning by all caretakers of preterm infants
- Next Steps:
  - The Infant Positioning Assessment Tool (IPAT) could serve as evaluation of the effectiveness and consistency of infant positioning after the educational intervention
  - Posttest reevaluation at 6 months and 1 year could confirm knowledge gain or identify an opportunity for further education
  - Adding therapeutic positioning competencies to yearly nursing education, and the educational in service to new staff nurse orientation

Test Results Using Paired Sample t tests for Equality of Means, Grouped by number of years as NICU RN at Hospital

<table>
<thead>
<tr>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>95% CI of the Difference</th>
<th>t</th>
<th>df</th>
<th>One-tailed p</th>
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<tbody>
<tr>
<td>All participants</td>
<td>46</td>
<td>4.28</td>
<td>3.09</td>
<td>-5.16 to -3.42</td>
<td>9.38</td>
<td>45</td>
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<td>0-5 years</td>
<td>16</td>
<td>5.05</td>
<td>3.02</td>
<td>-6.52, -3.60</td>
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<td>15</td>
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<td>3.59</td>
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<td>-10.63</td>
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<td>1</td>
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<td>7</td>
<td>3.00</td>
<td>3.08</td>
<td>-6.06, 0.06</td>
<td>1.94</td>
<td>6</td>
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<tr>
<td>16+ years</td>
<td>21</td>
<td>4.28</td>
<td>2.78</td>
<td>-5.60, -3.16</td>
<td>7.26</td>
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</table>

Note: M= Mean posttest - Mean pretest; SD= standard deviation of Difference of Means; CI= confidence interval; t= t test; df= degrees of freedom; Significant of *p<0.05

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