The Association Between Nurse Shift Patterns and Nurse-Nurse and Nurse-Physician Collaboration in Acute Care Hospital Units

March, 13, 2019
Acknowledgement

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Disclosure:
Neither STTI or Press Ganey were involved in any stage of the study
RN Work Patterns

Collaboration

Patient Care
Hospital Nurses Work Patterns

- 12-hour shifts are dominant
- Shift over-runs are common
- Voluntary and mandatory overtime vary
- 24/7 care requires night shift and rotating shift schedules
So what?
Collaboration

an interactional process in which different parties in a team share objectives, responsibility, decision making, and power, in order to accomplish team goals¹

Critical component of patient safety and patient-centered care
Conceptual Framework

Shift work, work stress, and overtime can all lead to sleep loss for nurses, and collaboration becomes more difficult because of impaired emotional, social, and cognitive processing.
The purpose

To examine the impact of nurse shift patterns on nurses’ collaboration with nurses and physicians in US acute care hospital units using the RN Survey from the National Database of Nursing Quality Indicators (NDNQI).
Research Methods

Data source:

Registered Nurse (RN) Survey from the National Database of Nursing Quality Indicators

Study population:

Responses from 24,013 RNs:

Analytical sample: 957 adult units from 168 hospitals
Methods

Measures (unit level):

Collaboration:
- Nurse-nurse collaboration by nurse-nurse interaction scale
- Nurse-physician collaboration by nurse-physician interaction scale

Nurse shift
- Nurse shift length on a unit
- Overtime (hours) on a unit
- Proportion of nurses worked overtime on a unit
- Proportion of nurses perceived an increase in overtime on a unit over the past year
Methods

Plan for data analyses:

Standard descriptive analyses

ANOVA

Multilevel linear regression

Controlling for unit and hospital characteristics: e.g., patient-to-nurse ratio, unit type, hospital ownership

Adjusted for clustering of units with hospitals
Results

Characteristics of Nurse Respondents (n=24,013)

- Age: 37.6 ± 11.3 years
- Years as RN: 10.0 ± 9.7 years
- Years on current unit: 5.7 ± 6.3 years
- Female: 89.1%
- White: 68.6%
- BSN: 68%
- Specialty certified: 64.2%
- Full-time: 83.9%
Results

Characteristics of study hospitals (n=168)
Results

Study units, n=957

Unit nurse staffing: 5.01 ± 1.70 patients per nurse
Results

Collaboration by unit type

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCU</td>
<td>4.62</td>
</tr>
<tr>
<td>Step-down Medical</td>
<td>4.63</td>
</tr>
<tr>
<td>Medical</td>
<td>4.59</td>
</tr>
<tr>
<td>Surgical Medical</td>
<td>4.58</td>
</tr>
<tr>
<td>Medical-surgical</td>
<td>4.54</td>
</tr>
<tr>
<td>Overall</td>
<td>4.59</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th>Nurse Shift by Unit Type</th>
<th>Overall</th>
<th>Critical care</th>
<th>Step-down</th>
<th>Medical</th>
<th>Surgical</th>
<th>Med-surg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift length (hours)*</td>
<td>11.88(0.97)</td>
<td>12.17(0.47)</td>
<td>12.17(0.55)</td>
<td>11.71(1.15)</td>
<td>11.76(1.08)</td>
<td>11.65(1.14)</td>
</tr>
<tr>
<td>Overtime (hours)*</td>
<td>0.37(0.35)</td>
<td>0.30(0.29)</td>
<td>0.32(0.35)</td>
<td>0.40(0.35)</td>
<td>0.47(0.33)</td>
<td>0.38(0.38)</td>
</tr>
<tr>
<td>Proportion of nurses worked overtime*</td>
<td>0.33(0.20)</td>
<td>0.28(0.18)</td>
<td>0.31(0.20)</td>
<td>0.34(0.20)</td>
<td>0.38(0.21)</td>
<td>0.34(0.21)</td>
</tr>
<tr>
<td>Proportion of nurses perceived an increase in overtime in the past year</td>
<td>0.35(0.26)</td>
<td>0.38(0.26)</td>
<td>0.38(0.27)</td>
<td>0.34(0.27)</td>
<td>0.36(0.27)</td>
<td>0.32(0.24)</td>
</tr>
</tbody>
</table>

*p<0.05
## Results

### Association between unit nurse shift pattern and collaboration

<table>
<thead>
<tr>
<th></th>
<th>Nurse- Nurse Interaction</th>
<th>Nurse-Physician Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>95% CI</td>
</tr>
<tr>
<td>Shift length (hours)</td>
<td>-0.01</td>
<td>-0.04 - 0.02</td>
</tr>
<tr>
<td>Overtime (hours)</td>
<td>-0.17***</td>
<td>-0.24 - -0.11</td>
</tr>
<tr>
<td>Proportion of nurses worked overtime</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Quartile</td>
<td>-0.02</td>
<td>-0.08 - 0.04</td>
</tr>
<tr>
<td>3rd Quartile</td>
<td>-0.07*</td>
<td>-0.13 - -0.01</td>
</tr>
<tr>
<td>4th Quartile</td>
<td>-0.12**</td>
<td>-0.19 - -0.05</td>
</tr>
<tr>
<td>Proportion of nurses perceived an increase in overtime in the past year</td>
<td></td>
<td></td>
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<td>-0.01</td>
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<td>3rd Quartile</td>
<td>-0.07**</td>
<td>-0.13 - -0.02</td>
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<tr>
<td>4th Quartile</td>
<td>-0.15***</td>
<td>-0.21 - -0.09</td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01, ***p<0.001
Discussion

Summary of findings

12 hour shifts dominant & shift over runs common
Overtime significantly associated with collaboration

Next steps

Link to patient outcomes
Expand to more hospitals and settings
Strategies for Front Line Staff

Limit number of consecutive shifts and voluntary overtime

Rotate in a forward pattern (if rotating shifts)

Get adequate rest before and between shifts

Use caffeine strategically

Wear blue light blocking sunglasses on the way home and blue light blocking app for smartphones (night shift) and use an app to reduce blue light from smart phone, tablet (night shift)

Maintain a healthy sleep environment (quiet/white noise, dark, cool, no electronics)

Seek supportive work environments that allow breaks, limit overtime & excessive consecutive shifts, have adequate staffing
Strategies for Managers

Monitor schedules for excessive number of shifts/flips between days/night

Use technology to help manage schedules and staffing

Create a culture of safety where staff can say ‘no’ to overtime

Provide professional development on sleep hygiene, managing shift work, shift work sleep disorder

Partner with physicians to educate staff on effective collaboration

Create opportunities for continuing education across disciplines on successful collaboration
References


Thank you

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Chenjuan Ma, PhD | @tina_CMA