Impact of nursing practice environment on job outcomes and safety climate: testing a model

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<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Gisele Hespanhol Dorigan University of Campinas (Unicamp, Brazil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conflicts of interest:</td>
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</tr>
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<td>Sponsorship/ Commercial Support:</td>
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<tr>
<th>Faculty Name</th>
<th>Daniela Fernanda dos Santos Alves University of Campinas (Unicamp, Brazil)</th>
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Funding: Grant #483515/2013-2. National Council for Scientific and Technological Development (CNPq), Brazil.
Goals and Objectives

• **Session Goal:**
  - To describe the results of a survey on nurses' practice environment and discuss strategies in order to improve job outcomes and safety climate in healthcare organizations.

• **Session Objectives:**
  - To test the theoretical model of the effect of nursing practice environment on safety climate, job satisfaction, intention to stay in the job and in the nursing profession, and burnout.
  - To discuss strategies for improving the nursing practice environment, which could result in improving the nurses’ job satisfaction and perception of the safety climate.
Background

Positive nursing practice environment

- Job satisfaction
- Quality of care
- Patient safety
- Burnout levels
- Intention to leave the job and the profession

(Alenius et al., 2014; Kirwan et al., 2013; Van Bogaert et al., 2014)
Background

What's this study adds?

- The theoretical model showed a direct and strong impact on safety climate, job satisfaction and reduced burnout levels
Methods

• **Design:** cross-sectional correlational study

• **Sample:** probabilistic sample of 465 registered nurses (RN) from the State of São Paulo, Brazil

• **Inclusion criteria:** nurses who reported performing direct patient care activities and with time experience of ≥ six months

• **Exclusion criteria:** nurses who reported work exclusively with management or teaching activities, and nurses were in medical licenses for any reasons
Methods

Data collection:

Ethical approval by Ethical Review Board

Recruitment of participants

Online data collection

Protocol nº: 673228/ 2014

Randomised by the number registration in the Regional Nursing Council of São Paulo State (COREN-SP, Brazil)

Period between December 2014 to June 2015
Methods

Variables and measures

Nurse characteristics

✓ Age, gender, time of experience in the institution, hour work per week, and if there is another job

✓ Intention to stay in the current job next year
✓ Intention to stay in nursing

Ranges from 0 to 10
(Meaning: as closer from “0”: no intention)
Methods

Variables and measures

Nursing practice environment

• Nursing Work Index – Revised (NWI-R)
  ✓ Autonomy (5 items, $\alpha = 0.80$)
  ✓ Control over the work environment (7 items, $\alpha = 0.80$)
  ✓ Nurse-physician relationships (3 items, $\alpha = 0.88$)

4-point Likert scale
(Ranged from: 1 = strongly disagree to 4 = strongly agree)

(Gasparino et al., 2011; Aiken & Patrician, 2000)
Methods

Variables and measures

Job satisfaction and Safety climate

• Subscales of the Safety Attitudes Questionnaire (SAQ) – Short form 2006
  ✓ Safety climate (7 items, $\alpha = 0.77$)
  ✓ Job satisfaction (5 items, $\alpha = 0.85$)

5-point Likert scale
(Ranged from: $1 = $strongly disagree to $5 = $strongly agree)

(Carvalho & Cassiani, 2012; Sexton & Thomas, 2003)
Methods

Variables and measures

Burnout

• Maslach Burnout Inventory (MBI)
  ✓ Emotional exhaustion (9 items, \( \alpha = 0.92 \))
  ✓ Depersonalization (5 items, \( \alpha = 0.68 \))
  ✓ Personal accomplishment (8 items, \( \alpha = 0.81 \))

5-point Likert scale
(Ranged from: 1 = never to 5 = ever)

(Tamayo, 1997; Maslach et al., 1986)
Data analysis

• Structural Equation Modeling (SEM) with the Partial Least Squares Path Modeling approach (PLS-PM): two stage approach:

Measuring model evaluation

Convergent and discriminant validity
• Average Variance Extracted (AVE) values: > 0.5
• Cross loadings and Fornell & Larcker criterion
• Reliability (Composite reliability)

(Hair et al., 2014; Ringle et al., 2014)

Structural model evaluation

- Significance and values of path coefficients
- Indicators of quality of fit of the model
  Explicated Variance ($R^2$)
  Predictive validity ($Q^2 > 0$)
  Effect size ($f^2$)

  Low effect: 2%
  Moderate: 13%
  High effect: 26%

  Low: 0.02
  Moderate: 0.15
  High: 0.35
Figure 1. Theoretical model
Results

Sample (n = 465)

- Mean age: 35.7 (SD = 8.8)
- Gender female: 84.1%
- Time of experience in the job ≥ four (4) years: 46.5%
- Average hours worked per week: 42.8 horas (SD = 13.2)
- No other job: 78.7%
- Percentual of nurses that intend to stay in the job: 65.0%
- Percentual of nurses that intend to stay in nursing: 73.9%
Results

Measuring model evaluation

1º) Excluded four (4) items to ensure convergent validity
   (Reference value for Average Variance Extracted (AVE): AVE > 0.5)
2º) Excluded one (1) item to ensure discriminant validity
3º) Composite reliability and Cronbach’s alpha coefficients: adequate
   (Reference value: ≥ 0.70)
<table>
<thead>
<tr>
<th>Variables</th>
<th>Factor loadings</th>
<th>AVE</th>
<th>Composite reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>0.59 – 0.80</td>
<td>0.56</td>
<td>0.86</td>
</tr>
<tr>
<td>Control over the work environment</td>
<td>0.58 – 0.82</td>
<td>0.56</td>
<td>0.86</td>
</tr>
<tr>
<td>Nurse-physician relationships</td>
<td>0.85 – 0.93</td>
<td>0.81</td>
<td>0.93</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>0.75 – 0.84</td>
<td>0.62</td>
<td>0.89</td>
</tr>
<tr>
<td>Safety climate</td>
<td>0.51 – 0.79</td>
<td>0.50</td>
<td>0.85</td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>0.62 – 0.90</td>
<td>0.61</td>
<td>0.93</td>
</tr>
<tr>
<td>Depersonalization</td>
<td>0.55 – 0.79</td>
<td>0.52</td>
<td>0.81</td>
</tr>
<tr>
<td>Personal accomplishment</td>
<td>0.67 – 0.81</td>
<td>0.50</td>
<td>0.87</td>
</tr>
</tbody>
</table>
### Results

**Table 2. Discriminant validity (Fornell & Larcker criterion)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Autonomy</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Control over the work environment</td>
<td>0.70</td>
<td>0.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Depersonalization</td>
<td>0.31</td>
<td>0.29</td>
<td>0.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Emotional exhaustion</td>
<td>0.55</td>
<td>0.55</td>
<td>0.49</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Personal accomplishment</td>
<td>0.50</td>
<td>0.45</td>
<td>0.52</td>
<td>0.63</td>
<td>0.71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Nurse-physician relationships</td>
<td>0.66</td>
<td>0.55</td>
<td>0.20</td>
<td>0.40</td>
<td>0.35</td>
<td>0.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Safety climate</td>
<td>-0.64</td>
<td>-0.58</td>
<td>-0.32</td>
<td>-0.44</td>
<td>-0.46</td>
<td>-0.45</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td>8 Job satisfaction</td>
<td>-0.63</td>
<td>-0.55</td>
<td>-0.32</td>
<td>-0.61</td>
<td>-0.58</td>
<td>-0.51</td>
<td>0.60</td>
<td>0.79</td>
</tr>
</tbody>
</table>

Values in bold font along the diagonal line are the square roots of the AVE values for each construct. Values below the diagonal line are Pearson’s correlation coefficients.
## Results

### Table 3. Quality adjustment values of the model

<table>
<thead>
<tr>
<th>Constructs</th>
<th>$R^2$</th>
<th>$Q^2$</th>
<th>$f^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing practice environment</td>
<td>-</td>
<td>-</td>
<td>0.38</td>
</tr>
<tr>
<td>Autonomy</td>
<td>-</td>
<td>0.47</td>
<td>0.34</td>
</tr>
<tr>
<td>Control over the work environment</td>
<td>-</td>
<td>0.42</td>
<td>0.33</td>
</tr>
<tr>
<td>Nurse-physician relationships</td>
<td>-</td>
<td>0.54</td>
<td>0.60</td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>0.43</td>
<td>0.25</td>
<td>0.42</td>
</tr>
<tr>
<td>Safety climate</td>
<td>0.42</td>
<td>0.20</td>
<td>0.30</td>
</tr>
<tr>
<td>Burnout</td>
<td>0.36</td>
<td>0.14</td>
<td>0.35</td>
</tr>
<tr>
<td>Emotional exhaustion</td>
<td>-</td>
<td>0.52</td>
<td>0.51</td>
</tr>
<tr>
<td>Depersonalization</td>
<td>-</td>
<td>0.23</td>
<td>0.21</td>
</tr>
<tr>
<td>Personal accomplishment</td>
<td>-</td>
<td>0.35</td>
<td>0.33</td>
</tr>
<tr>
<td>Intention to stay in the job</td>
<td>0.22</td>
<td>0.22</td>
<td>-</td>
</tr>
<tr>
<td>Intention to stay in nursing</td>
<td>0.17</td>
<td>0.16</td>
<td>-</td>
</tr>
</tbody>
</table>

**Reference value**

- $> 0.13$ (median)
- $> 0.26$ (large)

Positive

- $> 0.15$ (median)
- $> 0.35$ (large)
## Results

**Table 4. Evaluation of hypothesis**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Pathway</th>
<th>Path coefficients ($\Gamma$)</th>
<th>Confidence interval (95%)</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H1</strong></td>
<td>Work environment $\rightarrow$ Burnout</td>
<td>-0.60*</td>
<td>-0.53, -0.66</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>H2</strong></td>
<td>Work environment $\rightarrow$ Intention to stay in the job</td>
<td>0.47*</td>
<td>0.32, 0.49</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>H3</strong></td>
<td>Work environment $\rightarrow$ Intention to stay in nursing</td>
<td>0.41*</td>
<td>0.39, 0.54</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>H4</strong></td>
<td>Work environment $\rightarrow$ Job satisfaction</td>
<td>0.65*</td>
<td>0.60, 0.70</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>H5</strong></td>
<td>Work environment $\rightarrow$ Safety climate</td>
<td>0.65*</td>
<td>0.60, 0.70</td>
<td>Supported</td>
</tr>
</tbody>
</table>

*p-value: p < 0.0001.
Figure 2. Final structural model
Conclusions

Nursing practice environment has a strong impact:

✓ In the job satisfaction and safety climate
✓ In the reduction in burnout levels

A median impact:

✓ In the intention to stay in the job
✓ In the intention to stay in nursing

Implications for nursing practice:

✓ Strategies to improve nurses’ autonomy, control over their practice and good relationship between nurses and physicians showed a positive impact on perception of safety climate, job satisfaction and reduced burnout levels.
References
