Original Article

Nurses Work Environment and Patients’ Quality of Care

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Abstract

Background: Nurses’ work environment has been recognized as a crucial variable for the provision of quality healthcare services.

Aims: The aim of the study was to assess the work environment of the nurses and investigate the relation between the work environment and selected patients’ safety indicators.

Methodology: A cross-sectional study was conducted and a convenience sample of 520 nurses, from five public general hospitals of a Regional Health Authority, were recruited to participate in the study. Four hundred thirty-two completed questionnaires were collected and analyzed (response rate 83.07%).

Results: Participants scored collegial nurse – physician relations (Mean = 2.74, SD = 0.47) as the most favorable characteristic of their work environment and nurse manager ability, leadership and support of nurses (Mean = 2.60, SD = 0.59) as the next most favorable. The overall PES-NWI scored < 2.5 (Mean = 2.44, SD = 0.38) indicating a non-favorable nurses workplace. Regarding the patient safety indicators, the catheter-associated infection was the most frequently reported indicator by the nurses, as 51.6% reported it as frequent/very frequent and the next most frequent indicator was pressure ulcers, as 40.3% of the participants reported it as frequent/very frequent. Nurses that stated medication error as frequent/very frequent safety indicator scored lower nurse manager ability, leadership and support of nurses, and collegial nurse-physician relations (p=0.044 and p=0.031 respectively).

Conclusions: The study revealed that nurses work in a non-favorable work environment. Hospital and nurse managers have to work together for the improvement of nurses’ work environment, as it is a prerequisite for the provision of quality and safety patient care.

Key Words: Hospital, nurse, quality, safety, work environment.
Nurses’ work environment consists of an important factor that affects both themselves and the quality of nursing care provided. The characteristics of Magnet Hospitals, that summarized in nursing management and leadership, nurses’ degree of autonomy, staffing, opportunities for promotion, implementation of care models, and professional development through education, contribute to the better quality of health services provided (Friese, Xia, Ghafer, Birkmeyer, & Banerjee, 2015; McClure & Hinshaw, 2002; Stimpfel, Sloane, McHugh, & Aiken, 2016). Also, The American Association of Critical-Care Nurses (American Association of Critical-Care Nurses, 2005) published a work, where presented the six characteristics for creating and maintaining a healthy work environment for nurses, which contributes to providing the best possible care to patients. These characteristics were the skilled communication, true collaboration, effective decision making, the appropriate staffing, meaningful recognition and authentic leadership. Though, there is not a common definition of what a healthy work environment is, however all these characteristics are essential for nurses in order to provide patients with quality care.

Hospital administrations internationally are now under constant pressure and striving to improve the quality of healthcare services (Makary and Daniel, 2016; Kohn, Corrigan and Donaldson, 2000). The characteristics of nurses’ work environment are predictive factors of the quality of health services provided. Particularly, the transformational leadership affects job satisfaction and patient safety outcomes (Boamah, Spence Laschinger, Wong, & Clarke, 2018). Also, a bedside care workforce with a greater proportion of professional nurses is associated with better outcomes and a patient’s length of stay (Aiken et al., 2017; Moisoglou et al., 2019).

The working environment also affects the nursing staff. Studies have linked the characteristics of nurses’ work environment to the appearance of burnout (Liu, You, Zheng, Liu, & Liu, 2019), major depressive episodes, absenteeism and nurses intention to leave their work (Enns, Currie and Wang, 2015; Mudaly and Nkosi, 2015; Burmeister et al., 2019).

Aim: The aim of the study was to assess the work environment of the nurses and investigate the relation between the work environment and selected patients’ safety indicators.

Material and methods

Design: A cross-sectional study was conducted and a convenience sample of 520 nurses, from five public general hospitals at a Regional Health Authority, were recruited to participate in the study. Four hundred thirty two completed questionnaires were collected and analyzed (response rate 83.07%).

The questionnaires were sent by a reply-paid post. Each was given in an envelope, accompanied by a letter describing the personal data of researchers, the aim of the study and ethical aspects (anonymity and voluntary participation). Participants returned the questionnaire to the nurse manager of the ward in a sealed envelope. The period during which the study was conducted was from April 1st to July 31st, 2018. The study protocol was approved by the Ethical Committees of the participated hospitals.

Instruments: The Practice Environment Scale of the Nursing Work Index (PES-NWI) was used to assess nurses’ work environment (Lake, 2002), which has endorsed by the National Quality Forum as a nursing care performance measure (National Quality Forum, 2004). The PES-NWI comprises of 31 items that describe organization characteristics common to Magnet Hospitals.
The items were divided into five subscales: nurses’ participation in hospital affairs, nursing foundations for quality of care, nurse manager ability-leadership-support of nurses, staffing and resource adequacy, and collegial nurse–physician relations. These subscales provide the profile of key structures in the nursing work environment, according to the Magnet Hospitals.

A 4-point Likert scale (strongly disagree, disagree, agree, strongly agree) was used to rate the extent to which the items are present in participants’ current job. Nurses could rate each item on a scale of 1–4. Higher scores indicate more agreement that the subscale items are present in the current job. Values above mean 2.5 indicate agreement, and values below mean 2.5 indicate disagreement. The Greek translated version was used (Prezerakos, Galanis, & Moisoglou, 2015). Cronbach’s alpha for the subscales in the present ranged from 0.60 to 0.85 (nurse participation in hospital affairs=0.83, nursing foundations for quality of care=0.79, nurse manager ability, leadership, and support of nurses=0.85, staffing and resource adequacy=0.75, collegial nurse-physician relations=0.6), and for the PES-NWI was 0.92, indicating very good reliability.

The selected patient safety indicators were the catheter-associated infection, patient fall, medication error, deep venous thrombosis and pressure ulcer. Nurses were asked to report on a 4-point Likert scale (never, rarely, frequently and very frequently) how often the indicators have occurred in their working unit under the nursing care during the previous 3 months.

Data analysis
Continuous variables are expressed as mean, standard deviation, median, minimum and maximum value, while categorical variables as numbers and percentages. Kolmogorov–Smirnov criterion (P > 0.05 for all variables) and normal probability plots were used to test the normality assumption. Scores on PES-NWI and subscales followed the normal distribution. Comparisons between scores on PES-NWI and subscales and patient safety outcomes were performed with independent samples t-test. All tests of statistical significance were two-tailed, and p-values of less than 0.05 were considered significant. Statistical analysis was performed using the Statistical Package for Social Sciences software (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.).

Results
Study sample
The majority of the participants were female registered nurses and working in medical wards. The demographic characteristics of the participants are presented in Table 1.

Nurses work environment
Nurses scored three subscales above mean 2.5 and two subscales below. Particularly, participants scored collegial nurse – physician relations (Mean = 2.74, SD = 0.47) as the most favorable characteristic of their work environment and nurse manager ability, leadership and support of nurses (Mean = 2.60, SD = 0.59) as the next most favorable. The overall PES-NWI scored < 2.5 (Mean = 2.44, SD = 0.38) indicating a non - favorable nurses workplace. Descriptive statistics for The Practice Environment Scale of the Nursing Work Index are presented in Table 2.

Patient safety indicators
Regarding the patient safety indicators, the catheter-associated infection was the most frequently reported indicator by the nurses, as 51.6% reported it as frequent/very frequent during the last 3 months and the next most frequent indicator was pressure ulcers, as 40.3% of the participants reported it as frequent/very frequent. Patient safety indicators frequency during the last three months are presented in Table 3.

Associations between work environment and patient safety indicators
Relations between PES-NWI scores and patient safety indicators frequency are presented in Table 4. Mean PES-NWI score was higher among nurses that stated that ulcers and deep venous thrombosis were frequent/very frequent during the last 3 months and the next most frequent indicator was pressure ulcers, as 40.3% of the participants reported it as frequent/very frequent. Patient safety indicators frequency during the last three months are presented in Table 3.
adequacy (p=0.02, p=0.012, p<0.001 and p<0.001 respectively), while nurses that stated deep venous thrombosis and ulcers as frequent/very frequent safety indicator scored higher nursing foundations for quality of care (p=0.014 in both cases). In contrast, nurses that stated medication error as frequent/very frequent safety indicator scored lower nurse manager ability, leadership, and support of nurses and collegial nurse-physician relations (p=0.044 and p=0.031 respectively).

Table 1. Demographic characteristics of the participants (n=432).

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>41</td>
<td>9.5</td>
</tr>
<tr>
<td>Female</td>
<td>391</td>
<td>90.5</td>
</tr>
<tr>
<td>Age</td>
<td>41.4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.6&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Years of experience</td>
<td>15.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.9&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Workplace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General ward</td>
<td>171</td>
<td>39.6</td>
</tr>
<tr>
<td>Surgical ward</td>
<td>111</td>
<td>25.7</td>
</tr>
<tr>
<td>Units</td>
<td>150</td>
<td>34.7</td>
</tr>
<tr>
<td>Profession</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered nurse</td>
<td>313</td>
<td>72.8</td>
</tr>
<tr>
<td>Assistant nurse</td>
<td>117</td>
<td>27.2</td>
</tr>
<tr>
<td>Master/PhD degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>394</td>
<td>91.8</td>
</tr>
<tr>
<td>Yes</td>
<td>35</td>
<td>8.2</td>
</tr>
<tr>
<td>Continuous education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>211</td>
<td>49.2</td>
</tr>
<tr>
<td>No</td>
<td>218</td>
<td>50.8</td>
</tr>
<tr>
<td>Seminars during last year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>219</td>
<td>50.7</td>
</tr>
<tr>
<td>No</td>
<td>213</td>
<td>49.3</td>
</tr>
<tr>
<td>Journal subscriber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>96</td>
<td>22.2</td>
</tr>
<tr>
<td>No</td>
<td>336</td>
<td>77.8</td>
</tr>
</tbody>
</table>

<sup>a</sup> mean  <sup>b</sup> standard deviation
Table 2. Descriptive statistics for The Practice Environment Scale of the Nursing Work Index.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Median</th>
<th>Minimum value</th>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse participation in hospital affairs</td>
<td>2.33</td>
<td>0.50</td>
<td>2.33</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Nursing foundations for quality of care</td>
<td>2.35</td>
<td>0.44</td>
<td>2.40</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>Nurse manager ability, leadership, and support of nurses</td>
<td>2.60</td>
<td>0.59</td>
<td>2.60</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Staffing and resource adequacy</td>
<td>2.16</td>
<td>0.57</td>
<td>2.25</td>
<td>1</td>
<td>3.75</td>
</tr>
<tr>
<td>Collegial nurse-physician relations</td>
<td>2.74</td>
<td>0.47</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>PES-NWI</td>
<td>2.44</td>
<td>0.38</td>
<td>2.45</td>
<td>1.38</td>
<td>3.66</td>
</tr>
</tbody>
</table>

Table 3. Patient safety indicators frequency during the last three months.

<table>
<thead>
<tr>
<th>Event/error</th>
<th>Never (0 times)</th>
<th>Rarely (one time)</th>
<th>Frequently (2-3 times)</th>
<th>Very frequently (&gt;3 times)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catheter-associated infection</td>
<td>110 (25.5)</td>
<td>99 (22.9)</td>
<td>154 (35.6)</td>
<td>69 (16.0)</td>
</tr>
<tr>
<td>Patient fall</td>
<td>257 (59.5)</td>
<td>90 (20.8)</td>
<td>76 (17.6)</td>
<td>9 (2.1)</td>
</tr>
<tr>
<td>Medication error</td>
<td>309 (71.5)</td>
<td>57 (13.2)</td>
<td>58 (13.5)</td>
<td>8 (1.9)</td>
</tr>
<tr>
<td>Deep venous thrombosis</td>
<td>266 (61.6)</td>
<td>97 (22.5)</td>
<td>64 (14.8)</td>
<td>5 (1.2)</td>
</tr>
<tr>
<td>Ulcer</td>
<td>166 (38.4)</td>
<td>92 (21.3)</td>
<td>109 (25.7)</td>
<td>63 (14.6)</td>
</tr>
</tbody>
</table>

Values are expressed as n (%).

Table 4. Relations between PES-NWI scores and patient safety indicators frequency.

<table>
<thead>
<tr>
<th>Catheter-associated infection</th>
<th>Never/rarely</th>
<th>Frequently/very frequently</th>
<th>P-value^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse participation in hospital affairs</td>
<td>2.31 (0.54)</td>
<td>2.35 (0.45)</td>
<td>0.42</td>
</tr>
<tr>
<td>Nursing foundations for quality of care</td>
<td>2.38 (0.44)</td>
<td>2.33 (0.44)</td>
<td>0.20</td>
</tr>
<tr>
<td>Nurse manager ability, leadership, and support of nurses</td>
<td>2.59 (0.65)</td>
<td>2.61 (0.54)</td>
<td>0.86</td>
</tr>
<tr>
<td>Staffing and resource adequacy</td>
<td>2.16 (0.55)</td>
<td>2.17 (0.59)</td>
<td>0.89</td>
</tr>
<tr>
<td>Collegial nurse-physician relations</td>
<td>2.77 (0.45)</td>
<td>2.72 (0.48)</td>
<td>0.29</td>
</tr>
<tr>
<td>PES-NWI</td>
<td>2.44 (0.41)</td>
<td>2.43 (0.36)</td>
<td>0.81</td>
</tr>
</tbody>
</table>

| Patients fall                                  |               |                            |           |
| Nurse participation in hospital affairs         | 2.30 (0.51)   | 2.45 (0.46)                | 0.012     |
| Nursing foundations for quality of care        | 2.35 (0.44)   | 2.38 (0.47)                | 0.57      |
| Nurse manager ability, leadership, and support of nurses | 2.60 (0.61) | 2.62 (0.52)                | 0.80      |
Discussion

The findings of the present study revealed a non-favorable nurses’ workplace. The overall PES-NWI were scored low by the participants, as well as the work environment characteristics staffing and resource adequacy, nursing foundations for quality of care and nurse participation in hospital affairs. These findings are consistent with the findings of 3 other studies in Greece that assessed nurses’ work environment (Brofidi, Vlasiadis and Philalithis, 2018; Prezerakos, Galanis and Moisoglou, 2015; Gikopoulou et al., 2014). Particularly, the staffing and resource adequacy subscale was the least favorable in all three studies. Healthcare was one of the sectors that affected most by the financial crisis in Greece. Hospital budgets reduction and staff...
cutting were the most significant impact of the economic crisis. Nurses’ appointment was stopped and temporary nurses’ contracts were not renewed (Kaitelidou & Kouli, 2012), shrinking the nursing staff to such an extent that the patients/ to nurse ratio in Greece to be one of the highest in Europe (Aiken et al., 2012) and affects negative the quality of health care services (Moisoglou et al., 2019). Although there are not available official data, many nurses retired, making use of the incentives that the government gave in order to reduce the civil servant's number.

The nursing staff has been recognized as the most important variable for the provision of quality and safe healthcare services. Hospital acquired infections, falls, pressure ulcers and medication errors are adverse patients events that correlate with nursing staff (Cho et al., 2016; Aiken et al., 2017; Brady, Malone and Fleming, 2009; Lake et al., 2010; Cimiotti et al., 2012; Blegen, Goode and Reed, 1998). According to our findings, nurses stated patients’ falls, medication errors, deep venous thrombosis and ulcers as frequent/very frequent safety indicators, although they scored higher staffing and resource adequacy. This finding can be explained by the fact that the overall rating of nursing foundations for quality of care subscale scored as non-favorable (< 2.50). In addition, Greek nurses that participated in a European study (12 countries), assessed the quality of patient care as poor. The percentage of Greek nurses that rated the quality as poor was 47%, the largest among the European nurses. The most frequent adverse events according to that study were pressure ulcers after admission and healthcare associated infections (Aiken et al., 2013).

The nurse manager’s ability and leadership and collegial nurse-physician relations are two of the most important variables in the effort of health care organizations to provide quality services. The findings of the present study revealed the correlation between nurse leadership and nurse-physician relations with medication errors. These findings are consistent with the findings of other studies (Flynn, Liang, Dickson, Xie, & Suh, 2012; Vogus & Sutcliffe, 2007). The medicines’ administration is among the important and frequent interventions that nurses provide during the patient's hospitalization. Medication errors account for a significant proportion of adverse events (Barker, Flynn, Pepper, Bates, & Mikeal, 2002), with effects on hospitalization costs, length of stay and patient mortality (Classen, Pestotnik, Evans, Lloyd, & Burke, 1997). According to Joint Commission sentinel events’ report, medication errors are included among the 10 most frequently reported types of sentinel events (“Quality and safety,” 2018) and leadership has recognized as the second most frequently identified root cause contributor for the sentinel events (“Patient safety,” 2015). Nurse leadership can create, promote and sustain a patient safety culture, which can contribute to a medication error reduction (Vogus and Sutcliffe, 2007).

According to our findings, the collegial nurse-physician relations was the most favorable element of nurses' work environment. This finding is consistent with findings of other studies in Greece, where the collegial nurse-physician was rated with the highest score (Prezerakos, Galanis and Moisoglou, 2015; Gikopoulou et al., 2014). Also, according to present study findings, nurses that stated medication error as frequent/very frequent safety indicator scored lower collegial nurse-physician relations, revealing the important role of nurse-physician collaboration and communication in patients safety care. The healthcare services provision is teamwork and nurses and doctors do not work isolated. Many studies have shown the multidimensional role that nurse-physician collaboration and communication play, affecting both the patient's care and nurses. Particularly, better nurse-physician relations can lead to better patients’ outcomes (Baggs et al., 1999), to medication errors reduction (Manojlovich & DeCicco, 2007), to quality nursing care (Shang, Friese, Wu, & Aiken, 2013) and to the reduction number of patient hospitalizations (Gardner, Thomas-Hawkins, Fogg, & Latham, 2007). Nurses that have good relations with doctors, they state more satisfied with their job and decision making (Baggs et al., 1997; Baggs and Ryan, 1990).

Limitations

The study has some limitations. Although the study population consisted of a large sample across 5 hospitals in a Regional Health Authority, however, the results have to be interpreted carefully as they relate to a specific region of Greece. The data regarding adverse events was collected through nurses’ report as a frequency, while the collection through
administration data and absolute numbers, will be more objective.

Conclusion and implications for nursing practice

The study revealed that nurses work in a non-favorable work environment. Nurse staffing was the least favorable aspect of the work environment and catheter-associated infections and pressure ulcers reported as the most frequent adverse events. Collegial nurse-physician relations and nurse manager ability, leadership, and support of nurses were the most favorable characteristics of the work environment and correlate with the occurrence of medication errors. Hospital and nurse managers have to work together for the improvement of nurses' work environment, as it is a prerequisite for the provision of quality and safety patient care.

References


