

## Association of Nurse Education Level and Nurse Staffing With Hospitalized Patient Perception of Hospital Care

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**Introduction:** Patient perception of hospital care has been a focus of health care system with the increasing attention to patient-centered care (Sacks et al., 2015; Stimpfel, Sloane, McHugh, & Aiken, 2016). As nurses are the health care providers who undertake the most direct care, growing evidence showed that nurse education level and staffing of nurses were associated with patient safety (Aiken et al., 2014; Cho et al., 2015; Liu et al., 2018). However, little is known about the associations between nurse education level, nurse staffing, and hospitalized patient perception of hospital care.

**Objective:** To examine the associations between unit nurse education level, unit nurse staffing, and hospitalized patient perception of hospital care in Guangdong province, China.

**Method:** This was a cross-sectional study conducted on 111 medical and surgical units from 23 hospitals in Guangdong province, China in 2014. All nurses ( $n=1,582$ ) responsible for direct care and randomly sampled patients ( $n=1,330$ ) who were aged 14 years and above and had been hospitalized for at least 3 days on selected units participated in the survey. A set of items from the Hospital Consumer Assessment of Healthcare Providers and Systems Scale were used to measure patient perception of hospital care including communication with nurses, responsiveness of hospital staffs, pain management, education about medications, unit environment cleanliness and quietness, and overall hospital rating and recommendation (Westbrook, Babakus, & Grant, 2014). The items are rated using 4-point Likert-type scales except for one overall hospital rating item using a 1-10 scale. The unit nurse education level was measured by the proportion of nurses holding a baccalaureate or higher degree on the unit. The unit nurse staffing was measured by the nurse-patient ratio (dividing the unit nurse number obtained from the nurse manager by average patient number reported by nurses on the unit). Structural equation modeling analysis implemented in Mplus Version 7 was conducted to estimate a hypothesized model that units' nurse educational attainment and nurse-patient ratios are related to various aspects of patient perception of hospital care directly, thereby related to overall hospital rating and recommendation indirectly at the patient level of analysis. Variables controlled in the models included hospital level, unit type, unit nursing practice environment measured by Practice Environment Scale of Nursing Work Index (Lake, 2002), unit nurses' average age, and patient characteristics (i.e., age, gender, education level, health status, and length of stay).

**Results:** The results showed the final model fit the data well [Comparative Fit Index (CFI)=.947 ( $>.90$ ), Tucker-Lewis Index (TLI)=.903 ( $>.90$ ), Standardized Root Mean Square Residual (SRMR)=.033 ( $<.08$ ), and Root Mean Square Error of Approximation (RMSEA)=.030 (90%CI:.025-.036) ( $<.08$ )]. Higher proportion of nurses holding baccalaureate or higher degrees on a unit was related to better patient perception of hospital care on communication with nurses ( $\beta= .145, p<.01$ ), responsiveness to patient needs ( $\beta= .064, p<.05$ ), pain management ( $\beta= .349, p<.01$ ), and unit environment ( $\beta= .133, p<.01$ ) directly, and thereby related to overall hospital rating and recommendation through communication with nurses ( $\beta= .039, p<.01$ ) and unit environment ( $\beta= .062, p<.05$ ) indirectly. Higher nurse-patient ratio on a unit was associated with better patient perception of hospital care on communication with nurses ( $\beta= .092, p<.01$ ), education about medications ( $\beta= .146, p<.01$ ), and unit environment ( $\beta= .130, p<.01$ ) directly, and further associated with overall rating and recommendation indirectly through communication with nurses ( $\beta= .025, p<.05$ ), explanation about medications ( $\beta= .051, p<.05$ ), and unit environment ( $\beta= .060, p<.01$ ). The variance of various aspects of patient perception of hospital care the model estimated

were: communication with nurses (6.0%), responsiveness to patient needs (2.7%), education about medications (15.6%), pain management (28.5%), unit environment (11.6%), and overall hospital rating and recommendation (63.6%).

**Conclusion:** Increasing nurse staffing and upgrading nurses' education level may be potentially helpful to improve patient perception of hospital care. However, considering the weak effect size among variables and the low variance explained by the model, more studies in the future are needed to explore strategies improving patient experience.

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**Keywords:**

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**Abstract Summary:**

Patients' voice was limited in previous research focused on optimizing patient outcomes. This study discussed the association of nurse education level and nurse staffing with hospital care perceived by patients.

#### **Content Outline:**

- **Introduction :**
- Why this topic is important? Importance of hospital care assessment from patient perspective.
- What is already known? Relationships between nursing workforce and hospital care assessed by care providers.
- Aim of this study. Relationships between nursing workforce and hospital care assessed by patients.
- **Main findings:**

**Main point #1:** Improving proportion of nurses prepared with baccalaureate degree may promote patient perception of hospital care.

**Supporting point:** Higher proportion of nurses holding a baccalaureate or higher degree was related to better patient perception of hospital care on communication with nurses, responsiveness to patient needs, pain management, and unit environment directly, and related to overall hospital rating and recommendation indirectly.

**Main point #2:** Increasing nurse staffing was a potential strategy to improve patient perception of hospital care.

**Supporting point:** Higher nurse-patient ratio was associated with better patient perception of hospital care on communication with nurses, education about medications, and unit environment directly, and further associated with overall ratings and recommendation indirectly.

- **Conclusion:**

Increasing nurse staffing and upgrading nurses' education level may be potentially helpful to improve patient perception of hospital care.

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