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Better Nurse Autonomy Decreases the Odds of 30-Day Mortality and Failure to Rescue

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Abstract

Research Purpose—Autonomy is essential to professional nursing practice and is a core component of good nurse work environments. The primary objective of this study was to examine the relationship between nurse autonomy and 30-day mortality and failure to rescue (FTR) in a hospitalized surgical population.

Study Design—This study was a secondary analysis of cross-sectional data. It included data from three sources: patient discharge data from state administrative databases, a survey of nurses from four states, and the American Hospital Association annual survey from 2006–2007.

Methods—Survey responses from 20,684 staff nurses across 570 hospitals were aggregated to the hospital level to assess autonomy measured by a standardized scale. Logistic regression models were used to estimate the relationship between nurse autonomy and 30-day mortality and FTR. Patient comorbidities, surgery type, and other hospital characteristics were included as controls.

Findings—Greater nurse autonomy at the hospital level was significantly associated with lower odds of 30-day mortality and FTR for surgical patients even after accounting for patient risk and structural hospital characteristics. Each additional point on the nurse autonomy scale was

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web site:

Table S1. Hospital Characteristics and Autonomy Scores (n = 570).

Table S2. Characteristics of Surgical Patients (n = 1,222,870).

Table S3. Odds Ratio Indicating Effect of Autonomy on 30 Day Mortality and Failure to Rescue.

Figure S1. Distribution of autonomy by hospital.

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associated with approximately 19% lower odds of 30-day mortality ($p < .001$) and 17% lower odds of failure to rescue ($p < .01$).

Conclusions—Hospitals with lower levels of nurse autonomy place their surgical patients at an increased risk for mortality and FTR.

Clinical Relevance—Patients receiving care within institutions that promote high levels of nurse autonomy have a lower risk for death within 30 days and complications leading to death within 30 days. Hospitals can actively take steps to encourage nurse autonomy to positively influence patient outcomes.

Keywords

Autonomy; nursing; surgery; teamwork

Autonomy is central to both professional and interprofessional practice in health care. For nurses, autonomy translates into the ability to act on professional knowledge to exercise judgment over patient care and clinical decision making (Kramer & Schmalenberg, 2003; Traynor, Boland, & Buus, 2010; Wade, 1999). Nurses working in settings supporting greater nurse autonomy, in comparison to those in settings with less autonomy, are more satisfied in their jobs, are less likely to be burned out, and are more likely to plan to continue working in their hospitals; they also report greater teamwork and better quality of care (Rafferty, Ball, & Aiken, 2001). Despite clear benefits to nurses, empirical evidence demonstrating the relationship between nurse autonomy and patient outcomes is limited (Kramer, Maguire, & Schmalenberg, 2006; Traynor et al., 2010).

Given their continuous presence at the bedside, nurses have a central role in the care of hospitalized patients and are well positioned to provide clinical and operational insight that influences patient care. As such, in hospitals where nurse autonomy is fostered to leverage nursing knowledge and insight, leaders might expect improved patient outcomes. This study tests this expectation, aiming to examine if patient outcomes, 30-day mortality, and failure to rescue (FTR) are better when patients receive care in hospitals where nurses report greater levels of autonomy.

Background and Significance

In the simplest terms, nurse autonomy is defined as the nurse's freedom to act upon what he or she knows (Kramer & Schmalenberg, 1993). Nurse autonomy is not, however, an individual characteristic; rather, it is a function of the complex and dynamic decision-making authority nurses are granted within their hospitals. This decisional authority unfolds at three distinct levels— clinical, operational, and professional (Kramer et al., 2006; Varjus, Leino-Kilpi, & Suominen, 2011; Wade, 1999). Each of these levels is tied to discrete conceptions of autonomy. First, clinical autonomy refers to nurses' application of independent and interdependent clinical judgment to make patient care decisions (Kramer et al., 2006). Second, job autonomy refers to operational decisions nurses make in collaboration with managers employing participatory approaches. Third, control over nursing practice refers to shared decisions nurses make to govern their professional practices and policies within an organization. Clinical autonomy relies on nurses' clinical knowledge

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and judgment and serves to benefit patients directly, while job autonomy and control over nursing practices rely on nurses' organizational knowledge and influence (Kramer et al., 2006).

The importance of nurse autonomy has been established in foundational research examining characteristics of healthy professional work environments (Grindel, Peterson, Kinneman, & Turner, 1996). In particular, research documenting the advantageous work conditions within Magnet hospitals point to autonomy as a key feature of work environments that promote high-quality nursing practice and patient care. Nurses practicing in Magnet hospitals demonstrate greater autonomy and experience higher job satisfaction (Rafferty et al., 2001). In this vein, nurse autonomy has traditionally been studied in relation to job satisfaction (Varjus et al., 2011), and research has confirmed that nurse autonomy, as a feature of the work environment, leads to better outcomes for nurses (Aiken, Clarke, Sloane, Lake, & Cheney, 2008). Yet, the direct relationships between nurse autonomy and patient outcomes have not been fully explored.

In an increasingly complex healthcare environment, clinicians' appeal for professional autonomy must be negotiated amidst pressures to comply with regulations and strengthen interprofessional practice. Given these pressures, understanding the extent to which nurse autonomy may influence patient outcomes is critical to conveying the value of nursing; establishing a relationship between these concepts would cement the notion that nurses' professional judgments directly contribute to improved patient outcomes. In this article, nurse autonomy is operationalized at the organizational level, composed of three constructs —clinical autonomy, job autonomy, and control over nursing practice. Operationalizing nurse autonomy as an organizational characteristic accounts for the full breadth of the concept. As such, this study makes a unique contribution to the literature because it articulates the value of nurses in improving patient outcomes, not only via clinical decision making based on clinical knowledge, but also through operational and professional decision making based on nurses' knowledge of and empowerment within the organizations where they provide care.

Methods

Design

This study was a secondary analysis of cross-sectional data of adult, general nonfederal acute care hospitals from four states (California, Florida, Pennsylvania, and New Jersey) in 2006–2007. The data sources included: the Multistate Nursing Care and Patient Safety Survey; the American Hospital Association (AHA) Annual Survey; and general, orthopedic, and vascular surgical patient discharge data from state administrative databases.

Data and Sample

Data pertaining to nurses' perceptions of autonomy were collected via a survey of nurses fielded as part of the Multistate Nursing Care and Patient Safety Study (Aiken et al., 2011). Over 100,000 registered nurses were randomly sampled from nurse licensure lists in the four study states. They were surveyed by mail at their homes based on a successful protocol that

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was carried out in both 1999 and 2006–2007 (Aiken et al., 2011; Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). A survey of nonresponders with a 91% response rate was also conducted and established that there were no concerns related to response bias, particularly in relation to the variables of interest for this work.

Nurse respondents provided detailed information on features of their work environments and identified their employing institutions, allowing for the creation of aggregate measures of autonomy, nurse staffing, and the percentage of nurses with a bachelor's of science in nursing (BSN) degree in each hospital. This approach, based on the sociology of organizations, gathers information on hospitals from the perspective of frontline workers. It has been applied to study outcomes and modifiable institutional features, like autonomy, that have the potential to influence outcomes (Aiken & Patrician, 2000). With this approach, nurses act as key informants, reporting on specific characteristics of the hospitals in which they work (Aiken & Patrician, 2000). Therefore, the measure of autonomy employed in the study effectively reflects the extent to which nurses perceive autonomy within each of the studied hospitals.

Hospitals with 10 or more nurse respondents were included in the study sample; the average number of nurse respondents per hospital was 47, with 250 or more in some institutions, and virtually all of the hospitals with 100 beds or more in the four states were represented. Additional structural data on hospital characteristics, such as teaching status and size, which have been associated with differences in patient outcomes, were drawn from the 2006 and 2007 AHA annual surveys.

Patient outcomes data for patients 18 to 85 years of age were drawn from hospital discharge databases from the four states. The study focus was limited to patients who underwent general, orthopedic, or vascular surgery because they are common in virtually all general acute care hospitals and established risk-adjustment methods exist for these populations (Elixhauser, Steiner, Harris, & Coffey, 1998; Silber et al., 2009). Discharges against medical advice were excluded.

Measures

Autonomy—The hospital-level measure of autonomy utilized in this study was derived from the autonomy scale of the Nursing Workload Index-Revised (NWI-R; Aiken & Patrician, 2000). The original NWI was developed based on findings from early Magnet hospital research (Kramer & Hafner, 1989); the NWI-R is composed of 55 items assessing the presence or absence of factors that characterize unit or institutional features related to the professional work environment (Aiken & Patrician, 2000). From the 55 items in the NWI-R, 5 items were employed to create the autonomy subscale, including: "freedom to make important patient care and work decisions," "support for new and innovative ideas about patient care," "nursing controls its own practice," "not being placed in a position of having to do things that are against my nursing judgment," and "involvement of staff nurses in the internal governance of the hospital" (Rafferty et al., 2001). Each of these items were measured on a 4-point Likert scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*) and indicating a respondent's level of agreement that each feature was present in their

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current job. Nurses' responses to each item were aggregated to the hospital level, and the hospital-level items were then averaged to create the hospital-level autonomy subscale score.

Hospital structural characteristics—The analytic models also included variables characterizing the hospitals in which the nurses worked, and the patients received care in order to account for potentially confounding associations between these factors and the independent or dependent variable. Specifically, hospital size was measured as the number of staffed and licensed beds and subsequently categorized as small (fewer than 100 beds), medium (100–250 beds), or large (more than 250 beds). Teaching intensity was measured as the ratio of physician residents and fellows to hospital beds. Hospitals were then categorized as major teaching, minor teaching, or nonteaching hospitals. Major teaching hospitals had a resident-to-bed ratio higher than 1:4; minor teaching hospitals had a resident-to-bed ratio less than or equal to 1:4; and nonteaching hospitals did not have postgraduate trainees. In addition, hospitals were designated as high (vs. low) technology if they performed open heart surgery, organ transplantation, or both.

Patient outcomes and characteristics—The patient outcomes examined in this study were 30-day inpatient mortality and FTR, an indicator of death within 30 days following one of 39 defined complications in a surgical patient population (Silber, Williams, Krakauer, & Schwartz, 1992). Clinical events indicative of complications were identified using ICD-9 codes. Patient characteristics for risk adjustment included comorbidities based on the Elixhauser approach (Elixhauser et al., 1998), as well as sex, age, and 61 dummy variables indicating the various surgery types (Silber et al., 2009).

Analysis

After linking the data using a common hospital identifier, descriptive analyses of the hospitals and the general, orthopedic, or vascular surgery patients treated in them were conducted. Subsequently, the relationships between hospital-level nurse autonomy and patient mortality and FTR were examined using a series of logistic regression models, beginning with examining the unadjusted bivariate relationship between autonomy and the outcomes (separately). Covariates accounting for the various patient characteristics, structural hospital characteristics, and other hospital nursing characteristics (staffing and percentage of BSN nurses) were included. We estimated standard errors and significance using procedures that corrected for heteroscedasticity and accounted for clustering patients within hospitals. All analyses were conducted with Stata version 14 (StataCorp LP, College Station, TX, USA).

Results

The final study included 570 adult, nonfederal, acute care hospitals within the four states. Autonomy levels varied across hospitals (Table S1). Although the mean level of autonomy was 2.81, levels ranged from 2.03 to 3.56 with a standard deviation of 0.23. Figure S1 displays the distribution of nurse autonomy scores across all 570 hospitals. This variation was not, however, systematically associated with structural characteristics of hospitals

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except that small hospitals had higher levels of reported autonomy than medium and large hospitals ($p = .007$).

Table S1 presents the extent to which hospital-level autonomy scores varied specifically with respect to size and teaching status. The results demonstrate that nurses practicing in small (<100 beds) and nonteaching hospitals reported the highest levels of autonomy (2.87 and 1.82, respectively), followed by nurses in large (>250 beds; 2.83) and major teaching hospitals (2.83). Nurses in medium (101–250 beds) and minor teaching hospitals, on the other hand, reported the lowest levels of autonomy (2.77 and 2.78, respectively). These results likely reflect the reduced complexity and bureaucracy in small and nonteaching hospitals that enable nurses to interface more directly with interprofessional and administrative colleagues to contribute to clinical and organizational decisions. Conversely, large and major teaching hospitals are highly complex; for example, working alongside medical residents who frequently turn over can complicate communication and, in turn, the collaborative decision-making that might otherwise be achieved among well-established, highly familiar teams.

Table S2 displays characteristics of the 1,222,870 surgical patients represented in the study hospitals. The majority of patients were orthopedic (52%) compared to general (43%) and vascular (6%) surgery patients. The distribution of comorbidities is consistent with other literature using a similar patient group.

Table S3 examines the association between nurse autonomy at the hospital level and the odds of 30-day all-cause mortality and FTR for patients in those hospitals. The final column represents results from models that were fully adjusted for patient characteristics, hospital characteristics, and hospital nursing characteristics. Each additional point on nurse autonomy was associated with approximately 19% lower odds of 30-day mortality ($p < .05$) and 17% lower odds of FTR ($p < .05$).

Discussion

Over the past 50 years, a robust body of literature exploring the value of autonomy in the workplace has emerged. Still, empirical evidence examining the impact of nurse autonomy on patient outcomes has not yet been explored. This study is the first to directly investigate this link, building upon a strong body of previously published literature that documents how the organization of hospital nursing affects patient outcomes. Our findings reveal that nurse autonomy varies significantly across hospitals. More significantly, it reveals a clear relationship between nurse autonomy and patient outcomes; greater nurse autonomy is associated with lower odds of 30-day mortality (19%) and lower odds of FTR (17%).

Previous studies have established the influence of BSN-prepared nurses, positive work environments, and optimal nurse staffing levels on improved outcomes such as mortality, FTR, nurse burnout, job satisfaction, and patient satisfaction (Aiken et al., 2011; Aiken, Clarke, Cheung, Sloane, & Silber, 2003; Aiken et al., 2008; Kutney-Lee et al., 2009). In these studies, nurse autonomy is conceptualized as an organizational feature that, in conjunction with several other factors, contributes to nursing clinical care. This evidence

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alludes to the likelihood that nurse autonomy influences patient outcomes but does not empirically demonstrate a clear relationship. Our study bridges this gap in the literature, demonstrating that both mortality and FTR are improved in hospitals where nurses report greater levels of autonomy even when we account for nurse staffing and education. Given the association between nurse autonomy and education, disentangling their influence on patient outcomes is challenging. Yet the relationships uncovered in this study suggest that BSN-preparation results in improved outcomes due, in part, to the nurses' enhanced predisposition toward exercising their professional judgment in decision making. To achieve these advantageous outcomes, hospital administrators must empower nurses to apply their knowledge in autonomous practice.

Hospital leaders can promote autonomy by creating structures and processes that involve nurses in decision making at multiple levels (Kanter, 1993; Varjus et al., 2011). Most often, nurses report greater autonomy with patient care decisions than operational or organizational decisions (Varjus et al., 2011). To cultivate not just clinical autonomy but also job autonomy and control over nursing practice, hospital leaders must employ various methods. For nurses to exercise job autonomy, they need to be engaged in operational decisions about how nursing work is organized and carried out on their units (Kramer et al., 2006). In practice, nurses can contribute to these operational decisions via meaningful committee involvement aimed at designing and implementing process improvements or when managers delegate authority to supervisory or charge nurses to, for example, adjust staffing, scheduling, and patient assignments. Similarly, for nurses to demonstrate control over nursing practice, they need to be active participants in venues, such as organizational committees and shared governance councils, where decisions that influence nursing practice are made. They can also demonstrate control over nursing practice via involvement in evidence-based practice initiatives and by providing peer review (Kramer et al., 2006).

Clinical autonomy is enhanced when nurses are engaged as equal partners in the interprofessional patient care team to contribute meaningfully to patients' plans of care (Kramer et al., 2006; Rafferty et al., 2001; Wade, 1999). An example of a strategy organizations can employ to support clinical autonomy is nurse-driven protocols, which provide a path to delegate clinical authority to nurses. This allows them to independently make decisions around specific circumstances and procedures, particularly around care issues for which they are primarily responsible. Importantly, these are not mindless algorithms; rather, they engage and allow for nurses to make critical decisions within their professional expertise. For instance, many hospitals now enable nurses, as a default, to exercise discretion with urinary catheter removal utilizing nurse-driven protocols. These protocols assign nurses responsibility for ongoing catheter assessment and management to determine when maintaining a catheter is appropriate for specific patients without unnecessarily delaying action by requiring physician direction. By enabling nurses' authority to make decisions and take action, this approach takes advantage of nurses' primary role of inserting, managing, and assessing urinary catheters and has the potential to significantly reduce catheter days and risk for catheter-related infection.

Administrators can also consider organizational strategies that improve the work environment such as the Magnet recognition program. Evidence suggests that work

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environment, including nurse autonomy, are not just better in Magnet hospitals, but improve as a result of engaging in the Magnet process (Witkoski Stimpfel, Rosen, & McHugh, 2014). Likewise, patient outcomes have been shown to improve as hospitals go through the Magnet process (Kutney-Lee et al., 2015).

Contemporary hospital nursing care is highly complex, and cultivating environments that enable nurses to apply autonomous judgment toward patient benefit is imperative. Clinicians and administrators are simultaneously attempting to individualize and standardize care, while also working to make decisions collaboratively and interprofessionally. In this context, the focus on strengthening teams and teamwork has grown (Leonard & Frankel, 2011). It is vital to recognize that autonomy does not erode teamwork. In fact, evidence has shown that nurses who perceive themselves as autonomous also report high levels of teamwork (Rafferty et al., 2001) suggesting that autonomy and teamwork are synergistic; they must both be optimized in tandem. As such, nurse autonomy is not achieved at the expense of teamwork because, in making decisions, nurses do not act alone. Rather, autonomy enhances teamwork when nurses act in a manner consistent with their training and scope of practice, engaging with other members of the patient care team as needed.

For interprofessional teams to function optimally, each profession must be able to execute the accountabilities assigned to his or her role. As a part of this team, nurses are especially accountable for surveillance, a process through which nurses gather, analyze, and synthesize patient data (Clarke & Aiken, 2003; Henneman, Gawlinski, & Giuliano, 2012). To guide decisions, the clinical and personal data nurses collect and interpret must be communicated to the interprofessional team. The team’s shared decision making in response to this information leverages the diversity of expertise inherent among team members to strengthen patient care. Effectively, the quality of teamwork is enhanced when each team member is free to practice autonomously and participate in shared decision making (Hoegl & Parboteeah, 2006). Greater autonomy encourages greater accountability for practice (Wade, 1999), and more engaged and accountable team members are capable of driving improved outcomes.

When every provider is empowered to practice to their fullest scope and teams foster mutual respect for each provider’s role in coordinated care delivery, patients benefit and efficiencies are achieved. Thus, as organizations evolve toward more team-based models of care, leaders must take care to encourage rather than constrain autonomous practice by leveling rather than reinforcing hierarchical structures. The importance of cultivating autonomy by actively engaging nurses in decision making is not limited to practice within the United States. Studies of nursing in various countries have demonstrated improved outcomes and quality of care in organizations

Limitations

One limitation of the study is that it employs observational, cross-sectional data, which does not allow conclusions to be made about the causal relationship between nurse autonomy and patient mortality and FTR. These conclusions could be drawn, however, in future studies by examining results over time to assess differences within institutions based on changes from

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low to high levels of organizational autonomy. Second, this study was a secondary data analysis, allowing only analysis of variables previously present within the dataset employed. Given that the nurse survey used in this study is the broadest and most unique of its kind, this is a minor limitation. Still, the notion that unmeasured aspects that may contribute to autonomy is conceivable. For example, one concept frequently cited in the literature, but not explored in this study, is employee engagement (Saks, 2006). Engagement can overlap with features of autonomy, such as participation in hospital affairs, increased productivity, or increased affiliation with hospital committees or other activities. Further research should include more aspects of autonomy that might contribute to its definition as an independent variable.

Conclusions

Autonomy is the vehicle through which nurses exercise their knowledge to drive quality by improving patient outcomes. Given that value is directly linked to quality, the results of this study highlight the value that can be created through the application of nursing knowledge. When nurses are able to exercise their clinical and organizational knowledge via autonomous practice, they can drive improvements in care quality. In a value-based system where organizations are under increasing pressure to deliver higher performance with limited resource utilization, capitalizing on all existing resources is critical. Nursing, as the core of the hospital workforce, represents a significant resource. Promoting nurses' autonomous practice leverages this vital human resource to the direct benefit of patients and nurses, while failing to do so can diminish this value and erode the advantages that knowledgeable nurses create in their hospitals by contributing to improved patient outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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- American Association of Colleges of Nursing. The Essentials of Baccalaureate Education for Professional Nursing Practice (2008): http://www.aacn.nche.edu/education-resources/BaccEssentials08.pdf
- American Nurses Association. Guide to the Code of Ethics for Nurses (2010): http://www.nursesbooks.org/ebooks/download/CodeofEthics.pdf
- Canadian Health Services Research Foundation. Interprofessional Collaborative Teams (2012): http://www.cfhifcass.ca/Libraries/Commissioned_Research_Reports/Virani-Interprofessional-EN.sflb.ashx