Nursing Special Report

The Influence of Nurse Work Environment on Patient, Payment and Nurse Outcomes in Acute Care Settings

New cross-domain analyses suggest that the work environment of nurses can have as much or greater impact than staffing on many safety, quality, experience and value measures.

Introduction

Effective nursing practice is essential to the delivery of high-value care in inpatient acute-care settings. Because the quality of nursing practice is influenced by multiple internal and external factors, hospitals seeking to improve the effectiveness and efficiency of nursing care in an era characterized by narrow networks, transparency of performance and the rise of consumerism must make understanding and responding to these influences a strategic imperative.

Nurse staffing—frequently the single biggest line item in health system budgets—tends to dominate discussions about the relationship between nursing and key performance measures (KPMs). Findings of new integrated analyses of data from multiple performance domains indicate that although aspects of nurse staffing such as hours of care and skill mix definitely influence outcomes, the overall work environment of nurses has a much larger influence across most measures.

This report presents the state of the science examining the impact that work environment has on the safety, quality and patient experience of care, including the findings of new cross-domain analyses showing:

- The work environment of nurses can have a greater impact than nurse staffing on many safety, quality, experience and value measures.
- Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores across all patient experience domains respond favorably to better nursing work environments, regardless of staffing composite scores.
- Performance on Value-Based Purchasing (VBP) patient experience scores increases with improving work environments.
- Higher-quality nurse work environments enhance patient and nurse perceptions of care quality.

These data provide actionable insights to help health system leaders, managers and front-line caregivers understand the relationship between nurse work environment and key performance measures; identify the areas in which nurse work environment has the greatest impact on patient, pay-for-performance and nurse outcomes; and prioritize improvement opportunities.

Background

Today's nurses work in highly complex environments characterized by multiple competing challenges, including interdependent processes, a growing population of older, more acutely ill hospitalized patients, the need to stay current with rapid advances in medical knowledge and technology, and a multi-generational and multi-cultural nursing workforce. The ever-changing demands of new health care delivery models exacerbate the complexity by orders of magnitude.

Nurses work across all sectors and settings and are integral to the delivery of a range of health services. They monitor and respond to changes in patients' health status, develop care plans, deliver clinical nursing interventions and educate patients about their self-care. As key players on the front lines of health care delivery, nurses play a critical role in providing care, coordinating care, preventing adverse events, and optimizing patient outcomes.

Outcomes depend largely on the structure that underlies a nursing organization and the scope and standards of its practice. Nursing structure comprises many distinct elements, including staffing ratios, education and certification, availability of resources, nurse engagement, team culture and skill mix. These elements combine to shape nurses' work environment, which is the foundation for their success. Defects or dysfunction in the nursing work environment can lead to minor local disruptions or major systemic consequences, both of which influence the quality, safety, cost and patient experience of care.

There is a growing body of evidence linking outcomes to practice environment characteristics, such as workplace culture, staffing levels, skill mix, interprofessional collaboration, job satisfaction; and burn-out to care quality, productivity and experience (Aiken et al., 2011; Hinno et al., 2012; McHugh et al., 2011; Nantsupawat 2011; Roche et al., 2012; Trinkoff 2011; Twigg et al., 2013; You et al., 2013; Van Bogaert et al., 2014). Given the breadth of the evidence linking nursing care to patient and organizational outcomes, and the financial stakes associated with value-based incentives and penalties tied to patient outcomes and engagement, the business case for scrutinizing and optimizing nurse work environments is strong.

The Importance of Considering Structure, Process and Outcomes

Understanding the influences that contribute to or detract from an optimal work environment for nurses is essential for health systems seeking to better meet patient needs, reduce harm and improve value across the care continuum. This can be achieved through in-depth analyses of the relationships between the structure, process and outcomes measures that directly relate to nursing care.

Nurse-sensitive structure, process and outcome indicators are those elements of patient care that are directly affected by nursing practice. Specifically, structure indicators include the supply, skill level, education and certification levels of nursing staff; process indicators measure methods of patient assessment and nursing interventions; and outcome indicators reflect both patient clinical and experience outcomes, such as pressure ulcers and falls, and nurse outcomes such as job satisfaction or turnover.

The National Database of Nursing Quality Indicators® (NDNQI®) is a national nursing database that provides quarterly and annual reporting of structure, process and outcome indicators to evaluate nursing care at the unit level. The database includes two data streams: quarterly clinical and staffing data based on information from chart reviews, prevalence surveys, incident reports, patient census, payroll and human resources; and a survey of nurses in direct patient care roles.

The NDNQI data represent more than 2,000 hospitals nationally, including 98% of Magnet-recognized hospitals. Additionally, approximately 350,000 nurses respond to the annual RN Survey and more than 20,000 nursing units submit data quarterly. The valid and reliable quality indicators are sensitive to nursing practice on a large scale, allowing staff nurses and nursing leadership the opportunity to review their data and evaluate nursing performance relative to patient outcomes. Multiple analyses of NDNQI data have demonstrated important correlations between and among structure, process and outcome measures, specifically in relation to patient falls (Lucero et al, 2010) and hospital-acquired pressure ulcers (Lyder and Ayello, 2008).

Combining NDNQI data with patient experience (HCAHPS, Press Ganey Patient Experience Survey), pay-for-performance (Hospital VBP program), and engagement (Press Ganey Employee Engagement Survey, Press Ganey Nursing Excellence Survey) data provides actionable insight into the influence of nursing practice on overall health system performance. This holistic perspective enables health system leaders to better understand key aspects of the clinical, operational, cultural and behavioral domains that shape the patient experience and to prioritize improvement opportunities.

The Influence of Staffing on Patient Experience

Previous research has established significant associations between nurse staffing and adverse events (Dunton et al., 2007; Kane et al., 2007) and patient experience outcomes (Kutney-Lee et al., 2009). Data integration and cross-domain analytics allow an understanding of what drives the relationship between nurse staffing and patients' clinical and experience outcomes.

Recent analyses combining NDNQI data with patient experience data confirms and extends the previous studies. These analyses show that HCAHPS patient experience performance is significantly correlated with nursing hours per patient day and with RN hours per patient day, with the latter revealing stronger associations across every dimension of the patient experience (Figure 1).

Figure 1

SPEARMAN CORRELATION COEFFICIENTS FOR NURSE STAFFING AND HCAHPS

CMS QUESTION/STAFFING MEASURE	TOTAL NURSING HOURS PER PATIENT DAY	TOTAL RN HOURS PER PATIENT DAY
Communication with Nurses	0.27005	0.31265
Communication with Doctors	0.24184	0.24871
Responsiveness of Hospital Staff	0.28594	0.31854
Cleanliness and Quietness	0.23359	0.24057
Pain Management	0.190	0.2344
Discharge Information	0.34744	0.409
Communication About Meds	0.31328	0.35432
Overall Rating	0.29526	0.37618
Likelihood to Recommend	0.27299	0.36181

Significant at the .01 level:

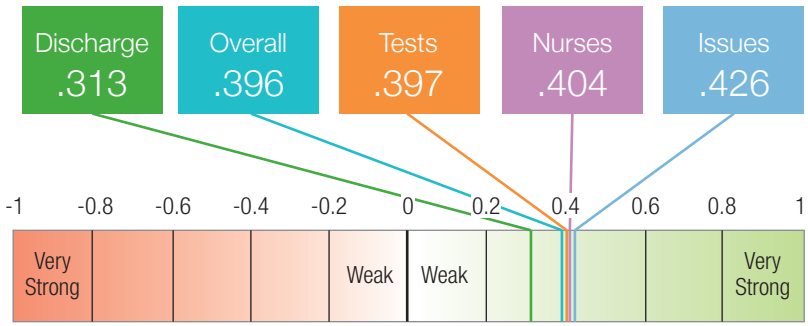
rho < .2	.2 <= rho < .3	.3 <= rho < .4	rho >= .4

Similarly, correlations of RN staffing with Press Ganey patient experience domains show strong associations between RN staffing and patients' perceptions of discharge processes (speed, readiness and clarity of instructions), the overall experience (likelihood to recommend and overall rating), tests (wait time, information, courtesy of technician), nurses (courtesy, communication, respect, attitude regarding requests, attention to personal needs) and issues (privacy, pain control, attention to personal needs, attention to emotional needs, response to concerns, inclusion in decision-making). In other words, nurse staffing influences more than patients' perceptions of nurses and their interaction with nurses. It affects the entire patient experience (Figure 2).

Figure 2

NURSE STAFFING LEVELS HAVE A BROAD IMPACT ON PATIENT EXPERIENCE

Pearson Correlations of RN Staffing with Press Ganey Patient Experience Domains



While these domain-level correlations confirm the association between nurse staffing and the patient experience, item- and question-level analyses identify specifically where staffing levels make a difference in meeting patients' needs and highlight areas where staffing can be used as a lever to improve performance. In an examination of question-level HCAHPS top box scores (Figure 3) and Press Ganey mean scores (Figure 4), every item is sensitive to staffing levels. The patient experience scores of hospitals in the top percentile of nursing hours per patient day were consistently higher than the scores of hospitals in the bottom decile for staffing.

Figure 3

THE EFFECT OF STAFFING LEVELS ON MEETING PATIENT NEEDS

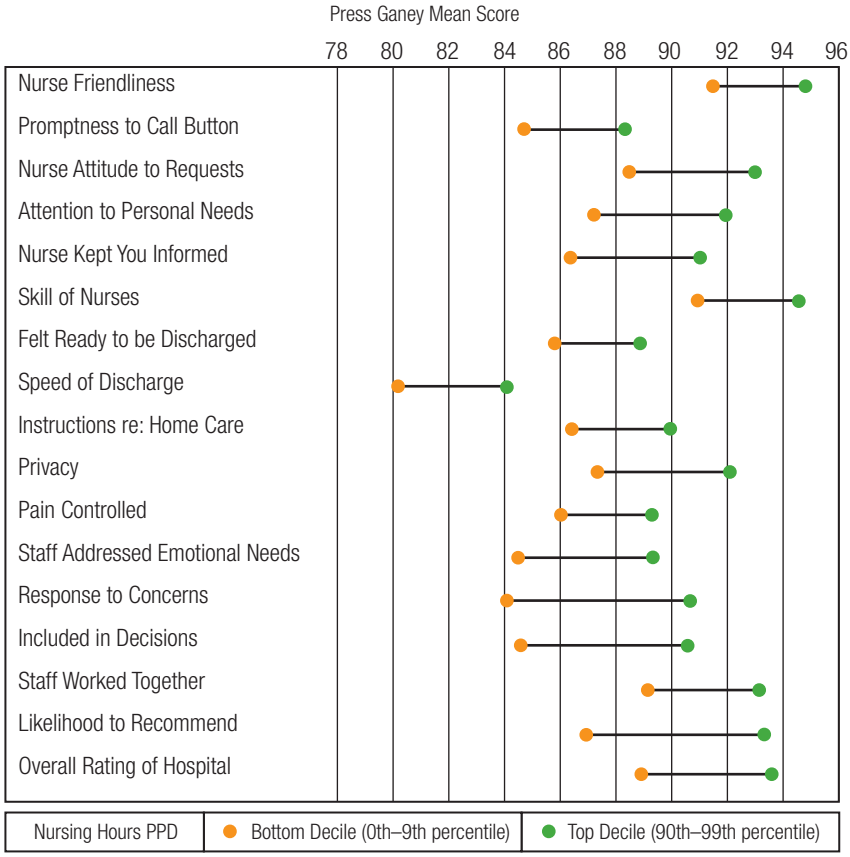
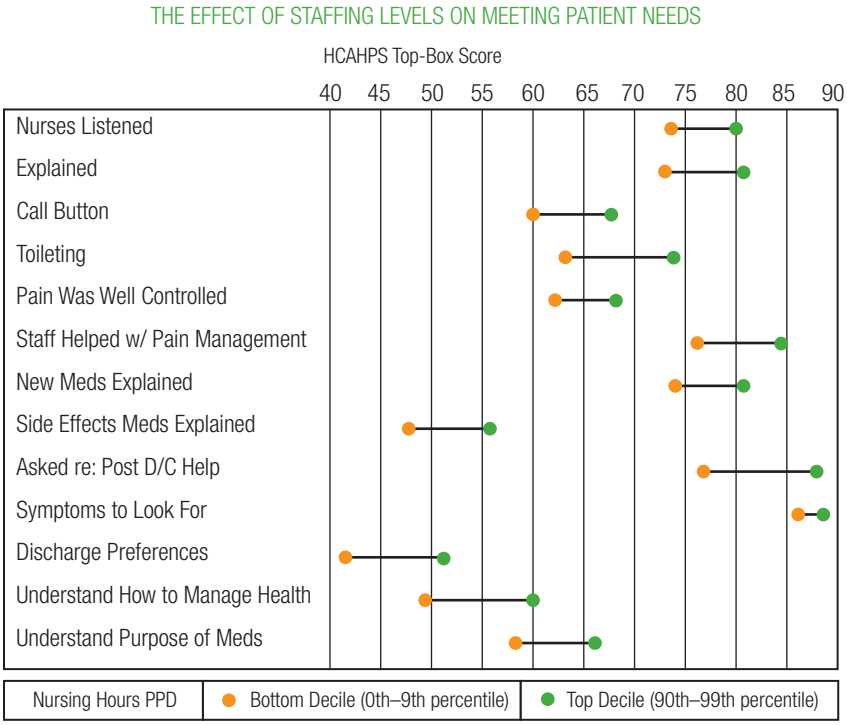


Figure 4



Where the spread in performance between top-decile and bottom-decile hospitals is greater, staffing can be considered a more powerful lever for performance improvement. On the Press Ganey survey, the differential is quite pronounced among the nursing-focused questions and discharge-related questions, at three to four points each (Figures 5 and 6). The differential is even greater for survey items focused on meeting patients' emotional and social needs and those reflecting patients' global perceptions (Figures 7 and 8).

Figure 5

THE EFFECT OF STAFFING LEVELS ON MEETING PATIENT NEEDS

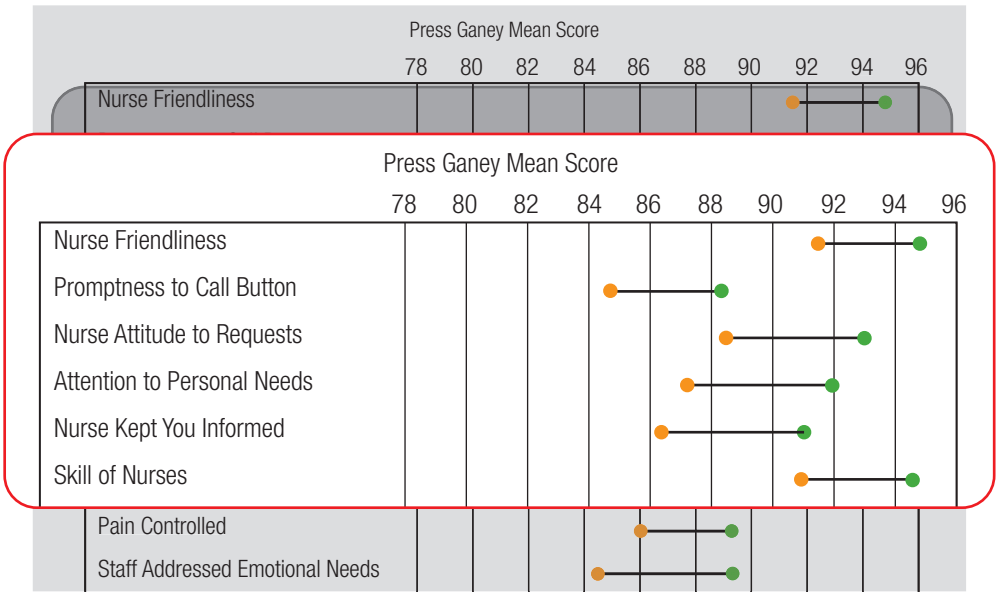


Figure 6

THE EFFECT OF STAFFING LEVELS ON MEETING PATIENT NEEDS

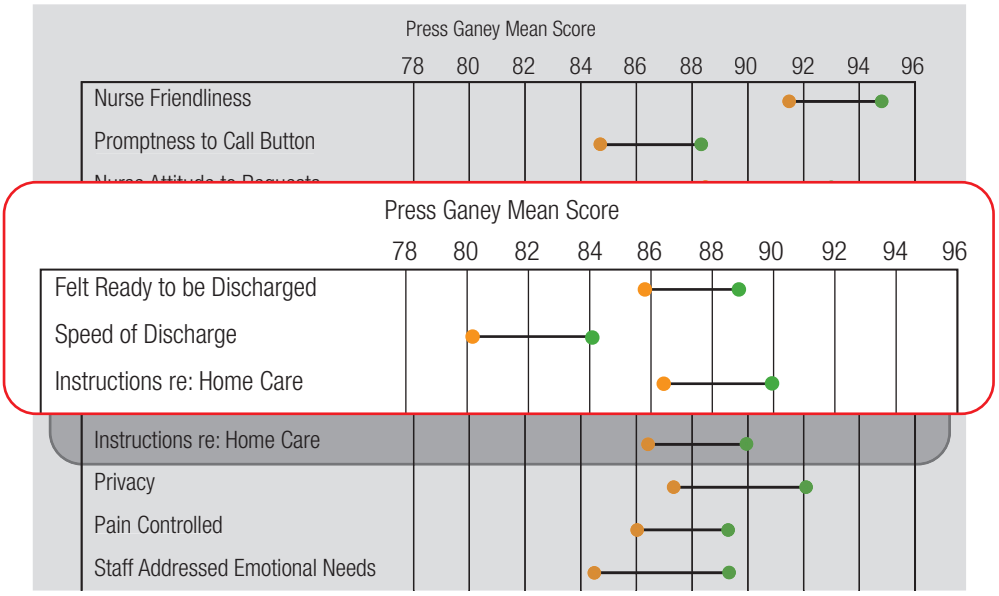


Figure 7

THE EFFECT OF STAFFING LEVELS ON MEETING PATIENT NEEDS

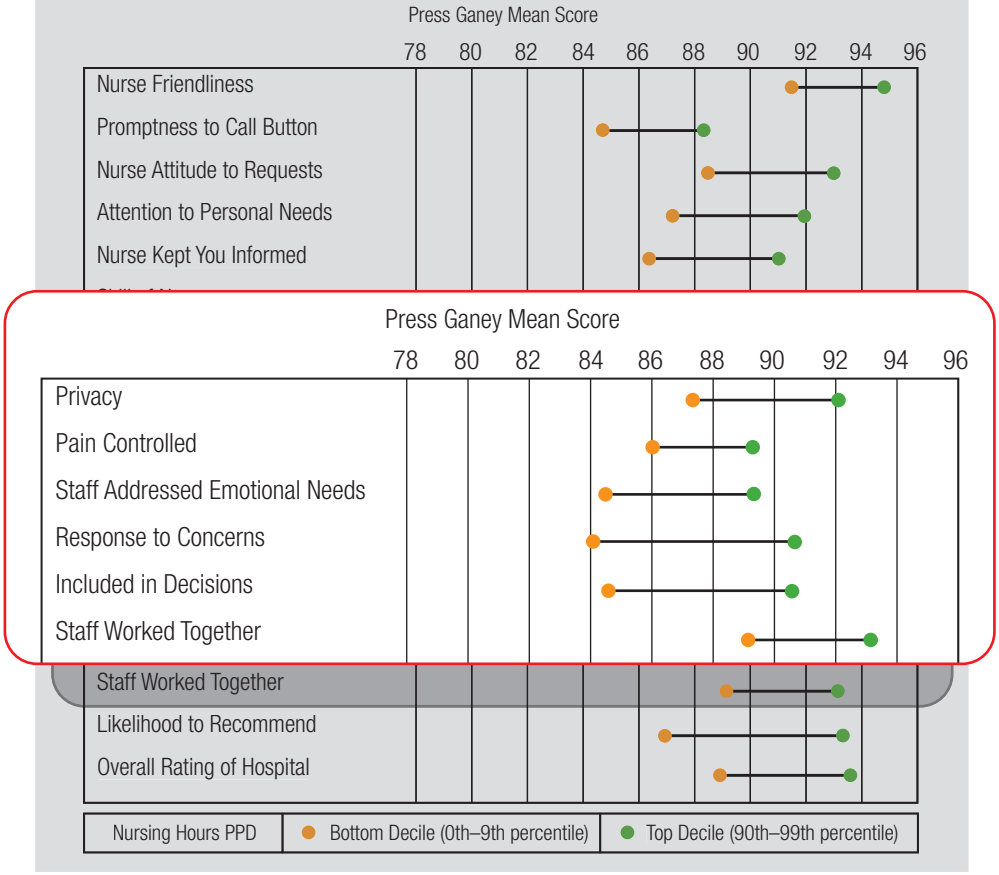
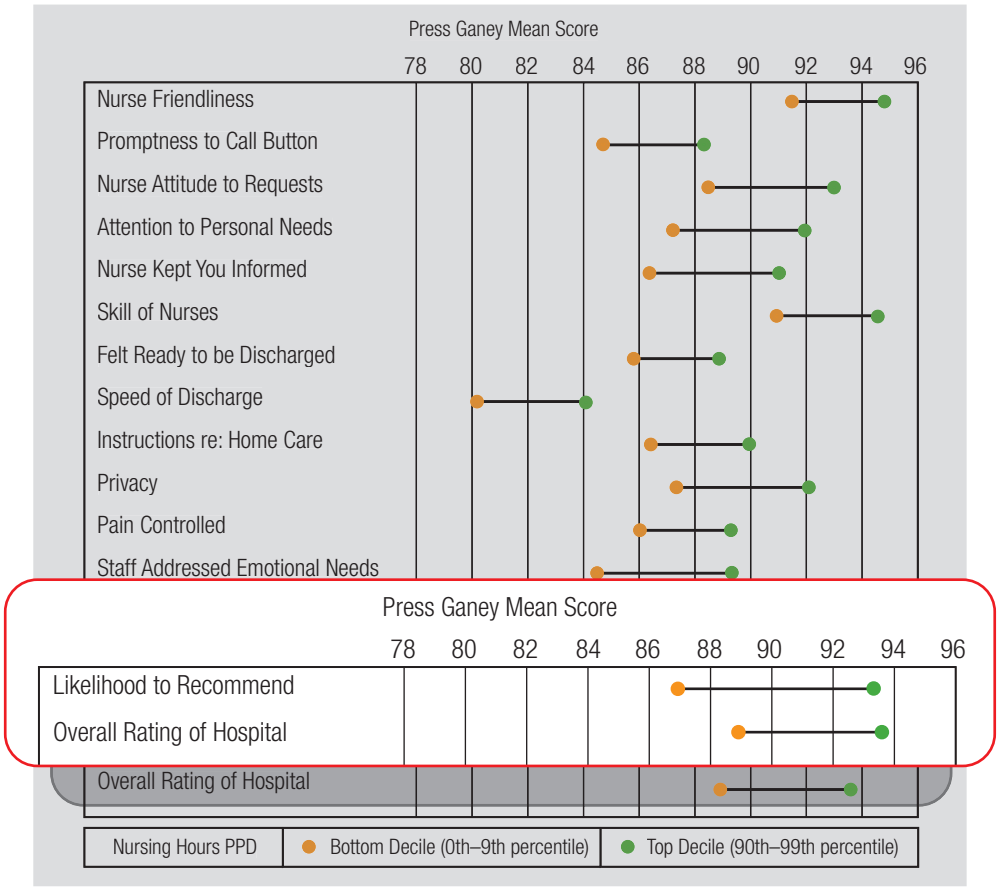


Figure 8

THE EFFECT OF STAFFING LEVELS ON MEETING PATIENT NEEDS



Nurse staffing is clearly an essential variable in the quality equation, but outcomes are influenced by more than nurse-to-patient ratios. High-quality nursing care depends on multiple underlying structure and process factors, such as nurses' skills and education, the availability of sufficient supplies and equipment, staff training, facilities, reliable use of demonstrated nursing best practices, inter-professional relationships, nurse engagement and job satisfaction—all of which influence outcomes.

For example, hourly nurse rounding—a process intervention—has been linked to lower rates of patient falls, pressure ulcers and medication errors, and higher patient experience scores (Halm, 2009). Similarly, studies have shown that bedside shift reporting decreases patient fall rates and the average number of call lights on by the end of shift change, and improves both patient experience

outcomes and nurse satisfaction outcomes (Chaboyer et al., 2010; Athwal et al., 2009, Kelly 2005; Anderson et al., 2006). Staffing can help facilitate the consistent and effective execution of such best practices, but staffing by itself is no guarantee that they will be employed reliably and well.

Evidence also supports the relationship between nurse engagement and the safety and quality of patient care (Cho et al., 2006; Greco, Laschinger and Wong, 2006; Simpson, 2009). Engaged nurses feel a sense of ownership, loyalty and dedication to creating a safe environment for patients and an effective and efficient working environment for staff (Gokenbach and Drenkard, 2011). Empowering a nursing workforce that enacts professional nursing standards has also been positively related to overall quality of performance and patient care (Laschinger et al., 2009).

In other words, patient clinical, safety and experience outcomes are influenced by the number and skill mix of nurses, the degree to which nurses are doing the right things to meet patients' needs and the nature of the environment in which they are working.

Work Environment Drives Outcomes

Research has shown that hospitals with better RN staffing and nursing work environments have better nurse outcomes, including lower burnout rates, less job dissatisfaction and lower intent-to-leave rates. Patient outcomes also improve with better nurse staffing and work environments. Specifically, both have been associated with reduced 30-day readmission rates for Medicare patients with heart failure, myocardial infarction and pneumonia (McHugh et al., 2013).

New analyses looking at the relative contributions of nurse staffing and work environment on patient and nurse outcomes suggest that the work environment of nurses can have as much or a greater impact than staffing on many safety, quality, experience and value measures. Specifically, the analyses explore the relationships between an RN Work Environment Composite score and a Nurse Staffing Composite score on patient outcomes (falls, pressure ulcers, quality of care ratings, and patient experience ratings), nurse outcomes (job enjoyment, intent to stay and turnover), and publicly reported value outcomes (value-based purchasing, readmissions and hospital-acquired conditions).

The RN Work Environment Composite measure comprises four of the subscales of the Nursing Work Index Practice Environment Scale (NWI-PES): Foundations for Nursing Quality of Care, Nurse Manager Leadership and Ability, Nurse Participation in Hospital Affairs, and Nurse-Physician Interactions (Lake, 2002). The Nurse Staffing Composite measure consists of RN Hours per Patient Days, RN Skill Mix, and Education and Certification of Nurses.

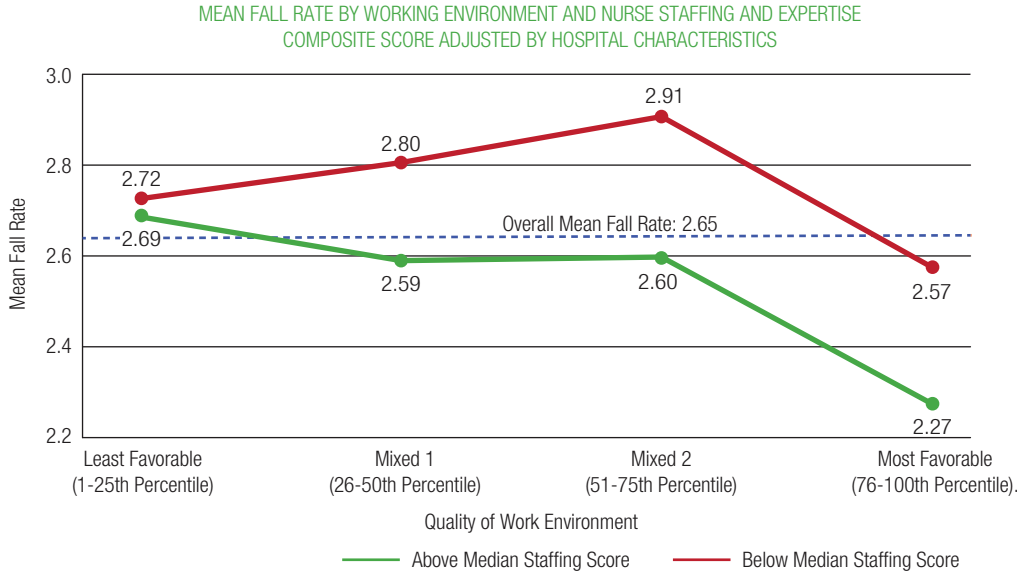
For the analyses, multiple regression models were fit to each outcome examining the individual impact of RN staffing characteristics and the nursing work environment, as well as the interaction effect of staffing and the work environment, with all results adjusted for the effect of hospital bed size, teaching status, ownership and metropolitan status. Performance in the analyses is categorized using the following reference points:

- Staffing: above the median (50th percentile) and below the median.
- Work environment: Quartiles of performance from least favorable (1st quartile: 1-24%) to most favorable (4th quartile: 76-100%).

The Influence of Nurse Work Environment and Staffing Factors on Patient Outcomes

The analysis of patient falls by Work Environment and Staffing Composite scores demonstrates the powerful influence of work environment on outcomes (Figure 9). Organizations with above-median staffing composite scores outperform those with below-median staffing composites in each work environment quartile. However, hospitals with below-median staffing composites in the highest quartile of work environment outperform the hospitals with above-median staffing composites in the first three quartiles. Further, the difference in fall rates between above- and below-median staffing is virtually indistinguishable among hospitals in the least favorable work environment—demonstrating that in the least-optimal work environments, improving the staffing factors cannot be counted on to reduce falls.

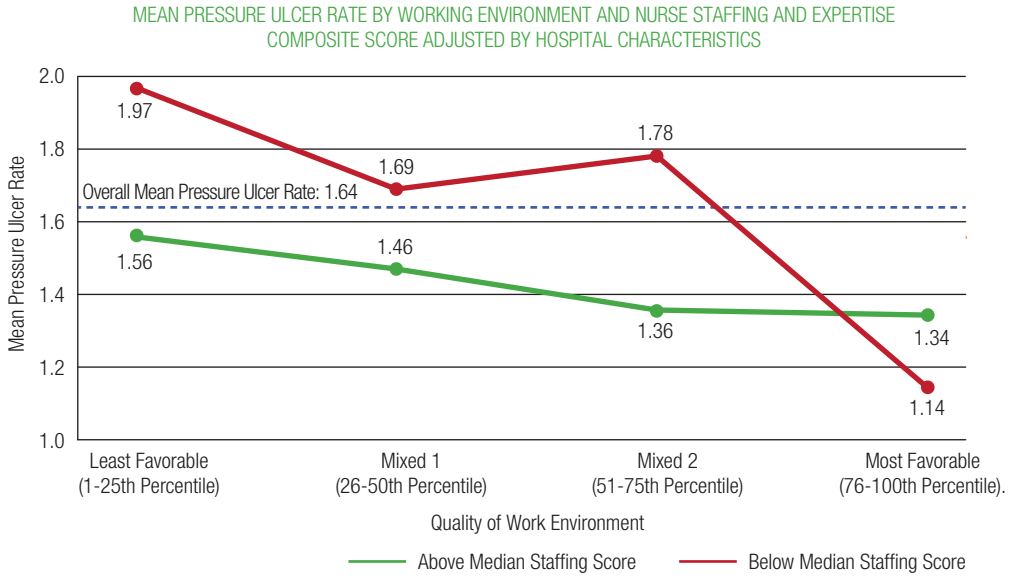
Figure 9



A similar pattern of performance emerges when looking at pressure ulcer rates through the lenses of the Work Environment Composite and the Staffing Composite measures. Mean pressure ulcer rates are significantly influenced by higher Staffing Composite scores. However, when quartile of work environment is integrated into the analysis, the beneficial impact of optimal work environments is brought into sharp focus.

Generally, pressure ulcer scores are lower in each successive quartile of work environment, even among hospitals with below-median Staffing Composite scores. In fact, hospitals with below-median staffing scores whose work environment scores placed them in the highest quartile for that composite outperformed all of the other groups of hospitals. Again, the impact of nurse staffing and skill mix is diminished when a certain level of the nursing working environment is reached (Figure 10).

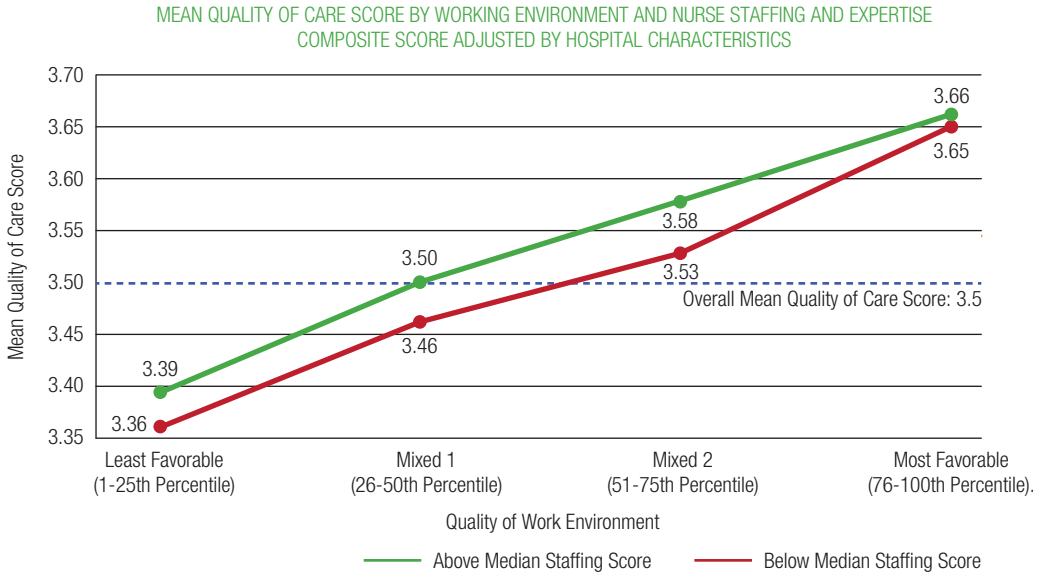
Figure 10



Nurses' perceptions of the quality of care provided on their units and at their hospitals are also more sensitive to work environment scores than to staffing scores. In the integrated analysis for this outcome, quality-of-care ratings are progressively and dramatically higher for each successive quartile of nursing work environment. Interestingly, the differential performance driven by higher Staffing Composite scores is relatively small in each quartile and virtually nonexistent in hospitals falling into the highest quartile of Work Environment Composite scores (Figure 11).

The minimal differential impact of staffing factors and the larger differential impact of work environment factors on an overall measure of this nature underscores the importance of establishing an optimal work environment. An organization's own caregivers are uniquely qualified to comment on the quality of care delivered by the organization. The strong relationship between nurses assessment of quality and work environment creates further imperative for focusing on this foundational aspect of leadership.

Figure 11



The finding that nurses report that they are able to provide higher-quality care when they practice in better work environments is especially relevant given that nurses' and patients' perceptions of care quality are generally consistent.

The Influence of Nurse Work Environment and Staffing on Patient Experience Outcomes

Consistent with the trends reported for patient safety outcomes, HCAHPS scores across all patient experience domains respond favorably to better nursing work environments, regardless of staffing composite scores. While above-median Staffing Composites provide a boost in scores for hospitals in the lower quartiles of work environment, the "staffing benefit" diminishes considerably among hospitals in the higher quartiles of work environment. Notably, even hospitals with high nurse staffing scores fall below the overall mean of patient experience scores when nursing work environments are poor (Figures 12-16).

Figure 12

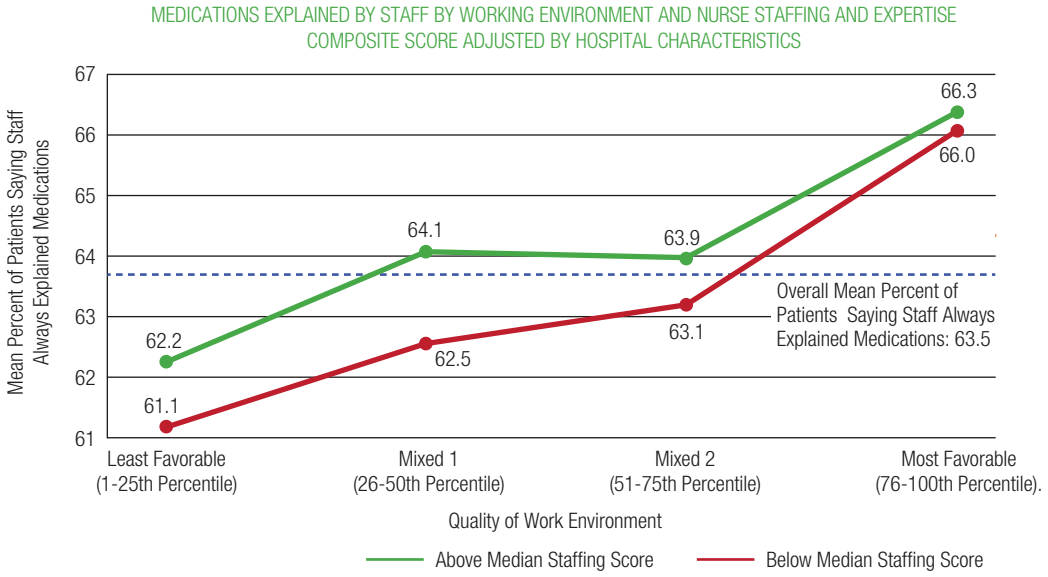


Figure 13

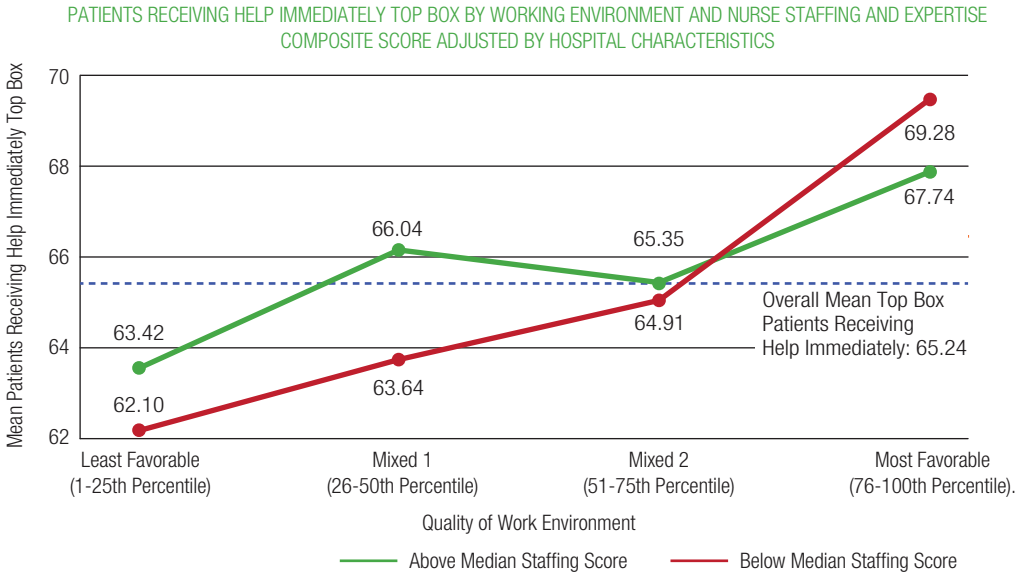


Figure 14

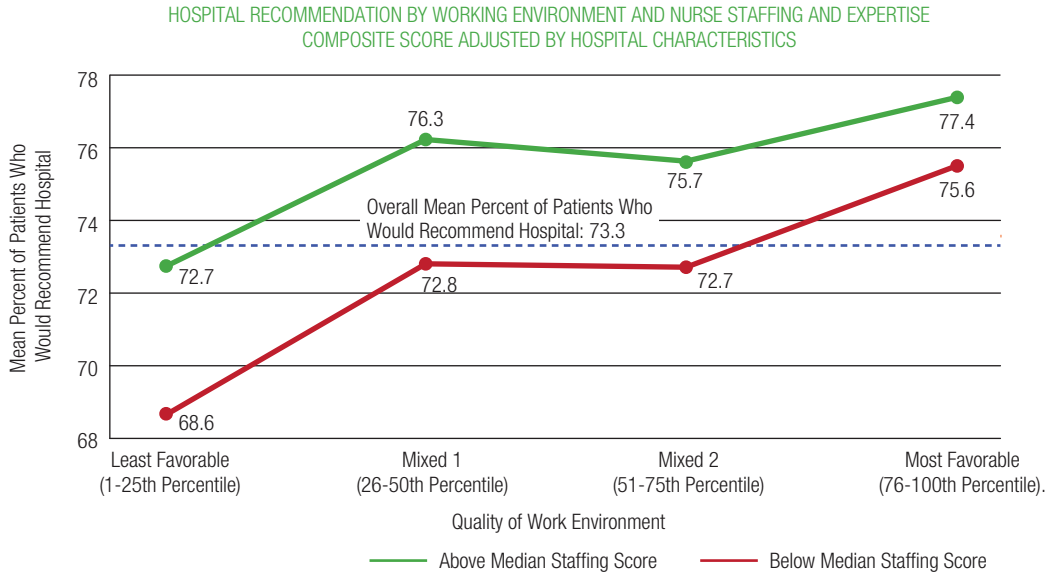


Figure 15

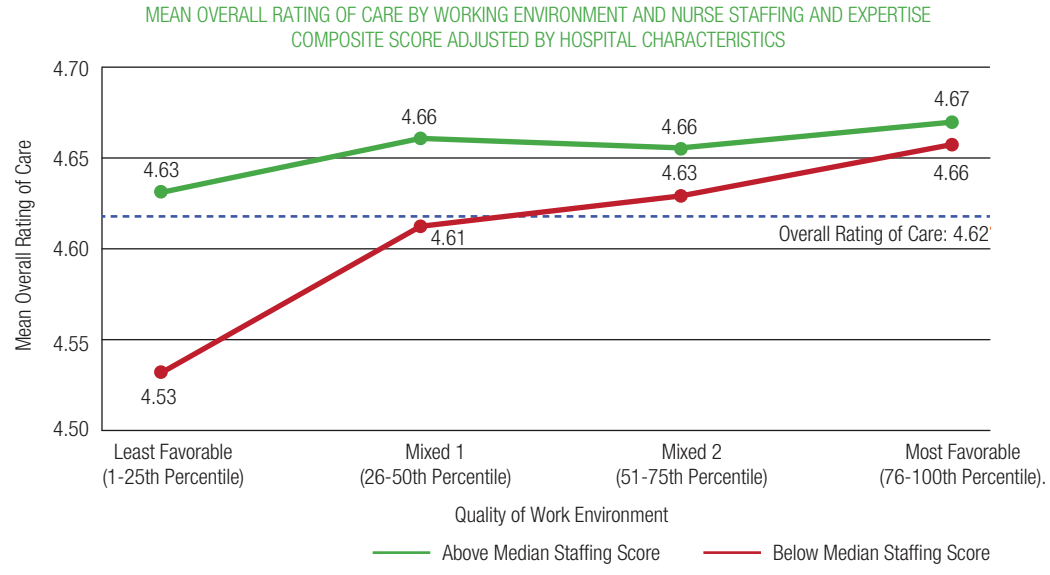
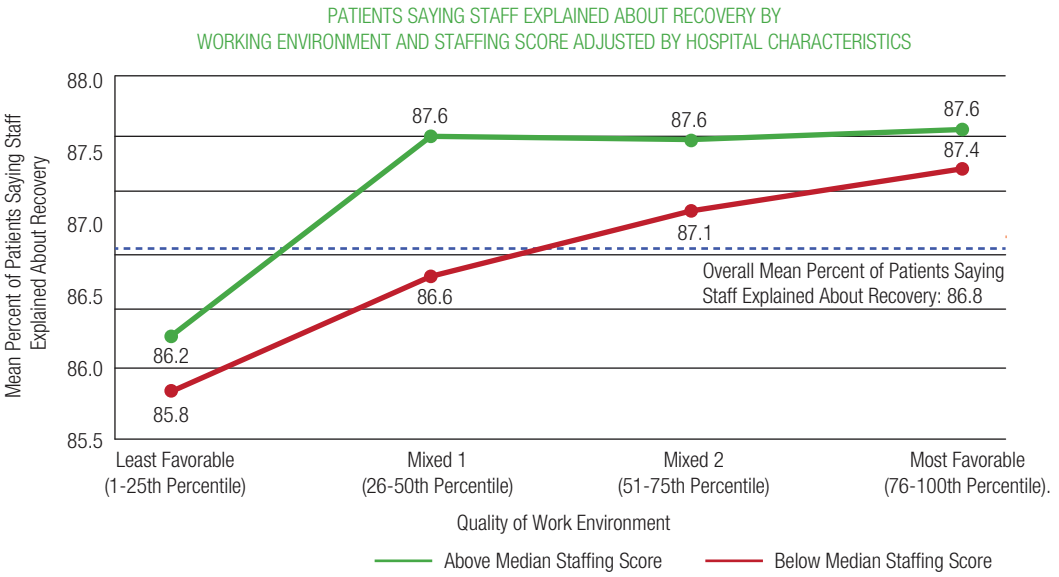


Figure 16



The differential impact of each measure on the patient experience across all domains shows generally higher scores among hospitals in each successive nursing work environment quartile. Further, in hospitals with higher nurse Staffing Composites, patient experience scores fall above the overall mean in mid-range and favorable work environments, but hospitals with lower staffing only achieve patient experience scores above the mean in the most favorable environments.

Two domains of the patient experience showed some deviation from the above pattern: staff responsiveness and patients' overall rating of the hospital experience. In the case of patients' perceptions of staff responsiveness, organizations with lower Staffing Composite scores outperformed those with higher scores in the highest quartile for work environments (Figure 13).

This key finding adds to the body of evidence that, in the best work environments, RN staffing factors can have less impact than the quality of the work environment and the cohesiveness of the team providing the care. In fact, in a suboptimal work environment, staffing factors add little value. Organizations with optimal work environments facilitate effective and efficient teamwork—as evidenced by their performance in multiple domains.

The overall rating domain also shows a somewhat different pattern from other patient experience domains (Figure 16). While performance generally is higher with each successive work-environment quartile, organizations with higher Staffing Composite scores fall above the mean in all quartiles

of the work environment, indicating that staffing factors are more influential drivers of the overall patient perception of care and may have as much impact as the nurse work environment for this domain.

Because patient and nurse perceptions of care quality show similar patterns and are both enhanced by higher-quality nurse work environments and favorable staffing, hospital decision makers should make sure that direct-care nurses are involved in decision-making and that quality of care concerns are taken seriously.

The Influence of Nurse Work Environment and Staffing on Pay-for-Performance Outcomes

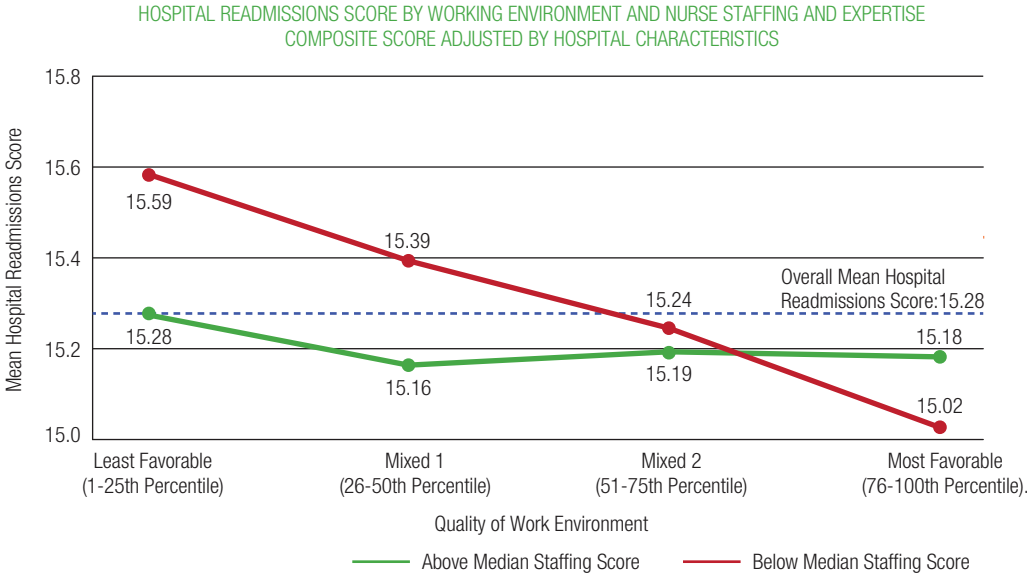
The central goal in health care must be to provide high-value care for patients, with value defined generally as a function of outcomes relative to costs. To this end, the Centers for Medicare & Medicaid Services' (CMS) pay-for-performance programs reward hospitals for delivering services of higher quality and higher value.

One of these programs—the Hospital Readmissions Reduction Program (HRRP)—authorizes Medicare to reduce payments to acute care hospitals with excess readmissions under the CMS Inpatient Prospective Payment System (IPPS). As the program has added readmissions for additional medical conditions into its reimbursement calculation, the share of hospitals receiving penalties for 30-day readmissions and total fines has also risen, leaving some hospitals especially vulnerable to payment reductions, including major teaching hospitals and hospitals with relatively higher shares of low-income beneficiaries.

Staffing and work environments influence the efficacy and the efficiency of nurses' delivery of discharge instructions that ensure patients understand how to care for themselves and when to seek medical attention post discharge. These instructions are critical to reducing readmission rates and must be provided throughout the patient stay. A number of studies have tied lower readmission rates to a range of best practices, such as clarifying patient discharge instructions, coordinating with post-acute care providers and primary care physicians, and reducing medical complications during patients' initial hospital stays (Farad et al., 2013.; and Silo-Carroll et al., 2011.; Jack, B. W. et al., 2009.; Kannan, 2009).

New cross-domain analyses point to the influence of both RN staffing and nurse work environment on readmission rates, with evidence that work environment influences these rates above and beyond nurse staffing. Although readmission rates are generally lower when staffing is better, the nurse work environment has a significant positive impact on readmissions, even in settings with lower staffing scores (Figure 17).

Figure 17

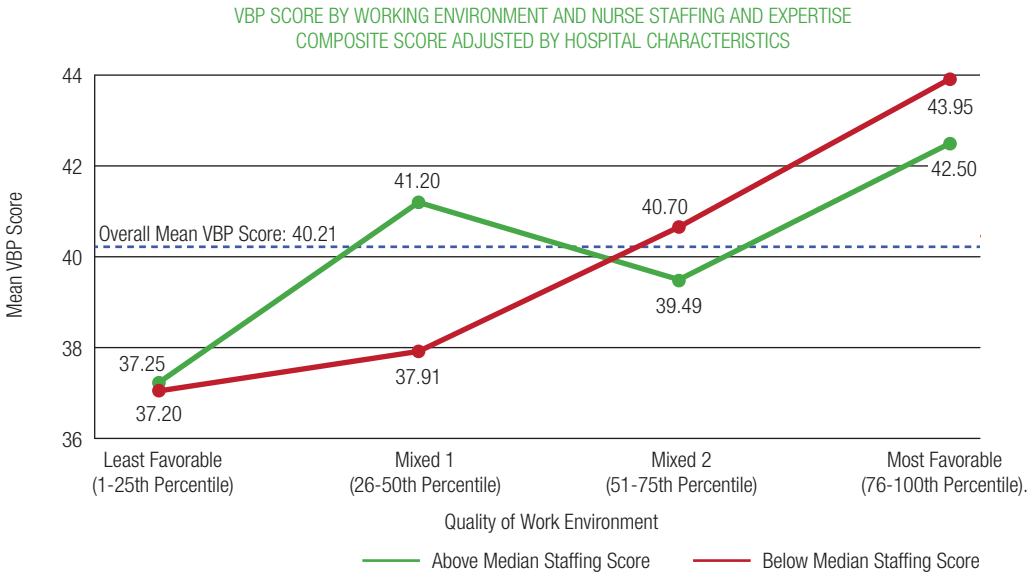


The influences of nurse staffing and environment are also significant for the patient experience of care domain under VBP. In this analysis, staffing factors generally contributed to higher mean VBP patient experience scores, relative to hospitals with below-average staffing. But again, performance generally is higher for each successive work environment quartile, and the staffing benefit diminishes in the higher quartiles. There is virtually no difference in VBP patient experience performance between above-median and below-median staffed hospitals in the highest quartile (Figure 18).

The clinical process of care, outcomes and efficiency domains of VBP were not significantly influenced by either nurse staffing or nurse work environment, likely because of the complexity of these measures. These clinical and efficiency measures are more dependent on the reliable functions of an interdisciplinary team and therefore not as sensitive to a sole focus on nurse staffing or environment.

Based on these findings, hospitals seeking to optimize Medicare reimbursements should make improving nursing work environments a strategic priority.

Figure 18



The Influence of Nurse Work Environment and Staffing on Nurse Outcomes

Nurse turnover continues to be one of the most disruptive problems facing health care systems and organizations. According to the Bureau of Labor Statistics' Employment Projections 2012-2022 released in December 2013, registered nursing is listed among the top occupations in terms of job growth through 2022. The RN workforce is expected to grow from 2.71 million in 2012 to 3.24 million in 2022, an increase of 526,800 or 19%. The Bureau also projects the need for 525,000 replacements nurses in the workforce bringing the total number of job openings for nurses due to growth and replacements to 1.05 million by 2022.

Replacement and training of new nurses is expensive. Costs of turnover are estimated at $82,000 and upward of $125,000 for specialty nurses (Jones & Gates, 2007), or up to $8,449,000 annually (Jones, 2008). The costs of insufficiently replacing or training new RNs or of failing to retain existing ones may be even higher—both financially, in dollars spent to engage and continually train staff and utilize contract nurses, and dollars lost to poor pay-for-performance outcomes, as well as in the emotional toll on the existing nursing workforce which affects both recruitment and retention.

Understanding the factors that contribute to relevant nurse outcomes as defined by intention to stay on the job, job enjoyment and turnover is a critical step in the development of workforce strategies to improve the value of care for patients and care providers.

The connection between adequate levels of RN staffing and nurse outcomes is well established in the literature, with the prevailing sentiment being that nurses are more satisfied with their jobs and more likely to stay in their jobs when their units are well-staffed. In fact, new cross-domain analyses looking at the impact of nurse staffing and the nurse work environment on mean Intent to Stay and mean Job Satisfaction scores at the unit level indicate that there is no significant difference between above- and below-median staffing on these nurse outcomes. A substantial difference does emerge for both outcomes across levels of the nursing work environment (Figures 19 and 20).

Figure 19

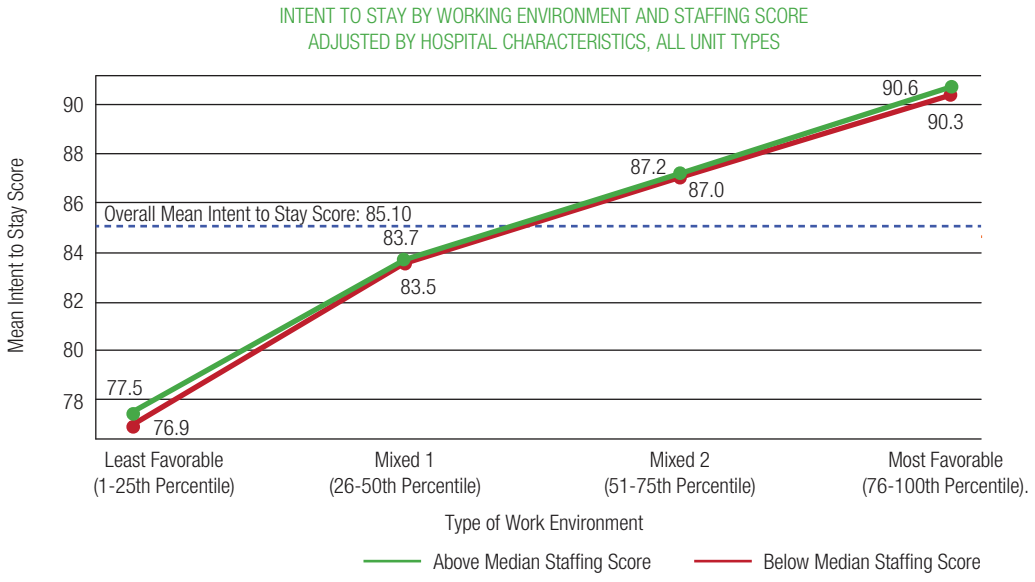
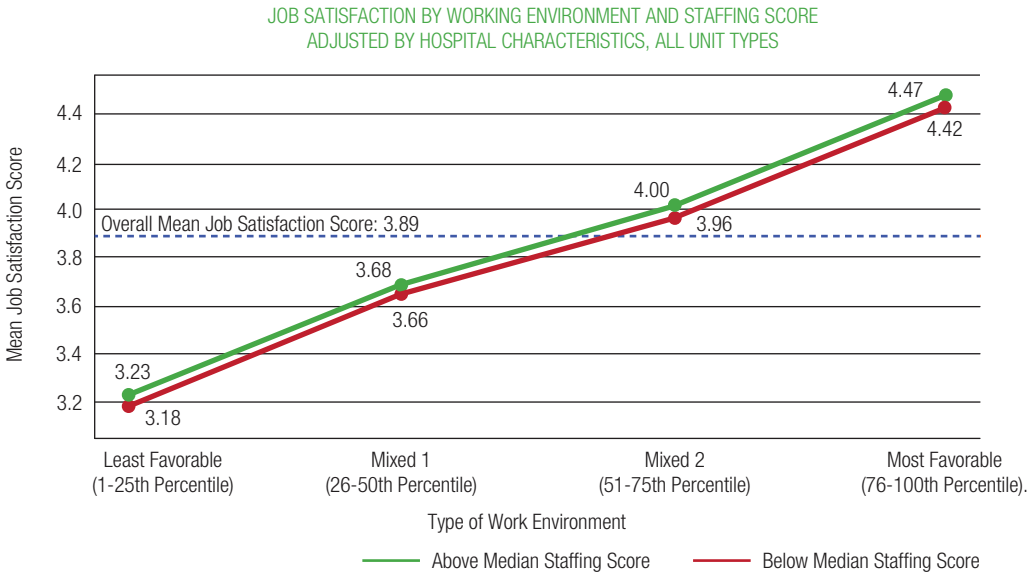


Figure 20

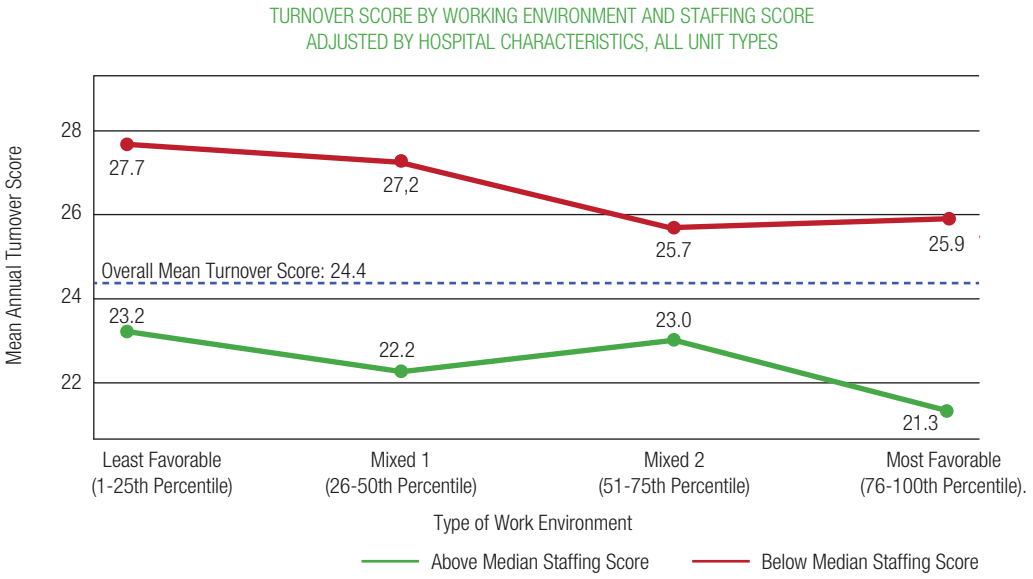


An examination of these outcomes across unit types suggests that while the overall levels of Intent to Stay and Job Satisfaction differ across unit types, with the highest levels of both in pediatric units and the lowest levels in adult units, the quality of the RN work environment is significantly associated with both nurse outcomes across all unit types.

With respect to RN turnover, the cross-domain analysis indicates that staffing has more influence than work environment. Not surprisingly, units with below-average staffing and the least-favorable work environments have the highest turnover rates. Turnover in units with above-median staffing were somewhat less sensitive to the factors that shape favorable work environments, but below-median staffed units do show better scores according to work-environment quartile (Figure 21).

This finding suggests that optimizing the work environment may help compensate for the negative effects of below-median Staffing Composite scores. Efforts that support increased unit cohesion, collaboration and nurse autonomy—variables that contribute to nurse satisfaction and have been independently linked to decreased staff turnover, lower staff vacancy rates and increased productivity—are especially important when there are fewer nurses to meet patients' needs (Kalisch et al., 2007; Hayes et al., 2006).

Figure 21



Prioritizing Improvement

These findings reveal that many key performance indicators for hospitals are particularly sensitive to factors that shape the quality of the nursing work environment. They further highlight the foundational nature of work environment as a means of setting nurses up for success in their work. While staffing influences performance, staffing alone often cannot compensate for a suboptimal work environment and confers little or no discernible improvements in these KPMs in the most-optimal work environments. The defining factors of performance are those that shape the work environment, which ultimately allow nurses and other skilled staff to be most successful.

Understanding the discrete elements that define an optimal nursing work environment is a strategic imperative for acute care hospitals. To optimize performance across multiple measures, health care leaders should invest in cultivating work environments that support efforts to deliver safe, effective and compassionate care that meets patients' needs and reduces their suffering. Multiple improvement models have been established and can provide important directional guidance, including:

- The Institute of Medicine's, *The Future of Nursing: Leading Change, Advancing Health* (2010). This landmark report offers recommendations for an action-oriented blueprint for the future of nursing and cites four key messages:
  - Nurses should practice to the full extent of their education and training.

  - Nurses should achieve higher levels of education and training through an improved education system that promotes seamless academic progression.
  - Nurses should be full partners with physicians and other health care professionals, in redesigning health care in the United States.
  - Effective workforce planning and policy-making require better data collection and information infrastructure.
- The Magnet® model for nursing practice. Magnet organizations are recognized for superior nursing processes and quality patient care, which lead to the highest levels of safety, quality and patient experience.
- The Kaiser Permanente Nursing Vision, Values, and Professional Practice Model. Built on an infrastructure that establishes practices, processes and systems to support transformational nursing practice.

Among the specific recommendations for improving the nurse work environment are those that address the individual components of the composite measure, including:

- Robust shared governance (improving RN autonomy, providing RN control over practice and resources)
- Support for excellent interprofessional relationships and communication
- Consistent and adequate staffing and skill mix
- Development of a highly educated workforce
- Appropriate and consistent leadership support

Conclusion

The major implications of the research reported here are that the work environment of nurses, while complex, can be modeled based on composite variables that reflect various dimensions of that environment, and the influence of the model on critical performance outcomes can be mapped using cross-domain analytics. The insights derived from these analyses are valuable to health system leaders and nurse managers seeking to identify key considerations in the nursing work environment that can drive improvement across measures.

Taken together, these cross-domain analyses demonstrate that the quality of the nursing work environment significantly influences outcomes across patient, pay-for-performance and nursing measures in a manner equal to and sometimes beyond RN staffing. The findings suggest that improvement across the relevant measures is a function of more effective staffing, rather than simply more staffing.

Aiken LH, Cimiotti JP, Sloane DM, Smith HL, Flynn L, Neff DF. *Med Care*. 2011 Dec;49(12):1047-53

Anderson CD, Mangino RR. *Nurs Adm Q*. 2006 Apr-Jun;30(2):112-22

Athwal P, Fields W, Wagnell E. *J Nurs Care Qual*. 2009 Apr-Jun;24(2):143-7

Chaboyer W, Johnson J, Hardy L, Gehrke T, Panuwatwanich K. *J Adv Nurs*. 2010 May;66(5):1111-9

Cho J, Laschinger HK, Wong C. *Nurs Leadersh* (Tor Ont). 2006 Sep;19(3):43-60

Dunton, N., Gajewski, B., Klaus, S., Pierson, B., *OJIN: The Online Journal of Issues in Nursing*. Vol. 12 No. 3, Manuscript 3

Gokenbach V, Drenkard K. *Nurs Clin North Am*. 2011 Mar;46(1):89-105

Greco P, Laschinger HK, Wong C. *Nurs Leadersh* (Tor Ont). 2006 Dec;19(4):41-56 Halm MA. Am J Crit Care. 2009 Nov;18(6):581-4

Hayes LJ, O'Brien-Pallas L, Duffield C, Shamian J, Buchan J, Hughes F, Spence Laschinger HK, North N, Stone PW. *Int J Nurs Stud*. 2006 Feb;43(2):237-63

Hinno S, Partanen P, Vehviläinen-Julkunen K. *J Clin Nurs*. 2012 Jun;21(11-12):1584-93

Jack BW, Chetty VK, Anthony D, Greenwald JL, Sanchez GM, Johnson AE, Forsythe SR, O'Donnell JK, Paasche-Orlow MK, Manasseh C, Martin S, Culpepper L. *Ann Intern Med*. 2009 Feb 3;150(3):178-87

Jones CB.*J Nurs Adm*. 2008 Jan;38(1):11-8. Review

Jones, C., Gates, M., *OJIN: The Online Journal of Issues in Nursing*. Vol. 12 No. 3, Manuscript 4 Kalisch BJ, Curley M, Stefanov S. J Nurs Adm. 2007 Feb;37(2):77-84

Kane RL, Shamliyan TA, Mueller C, Duval S, Wilt TJ. *Med Care*. 2007 Dec;45(12):1195-204

Kelly LA, McHugh MD, Aiken LH. *J Nurs Adm* . 2011 Oct;41(10):428-33

Kutney-Lee A, McHugh MD, Sloane DM, Cimiotti JP, Flynn L, Neff DF, Aiken LH. *Health Aff* (Millwood). 2009 Jul-Aug;28(4):w669-77

Lake, E.T. 2002 RINAH, 25, 176-188

Laschinger HK, Finegan J, Wilk P. *Nurs Econ*. 2009 Nov-Dec;27(6):377-83

Lucero RJ, Lake ET, Aiken LH. *J Clin Nurs*. 2010 Aug;19(15-16):2185-95

Ayello EA, Lyder CH. *Adv Skin Wound Care*. 2008 Mar;21(3):134-40

McHugh MD, Berez J, Small DS. *Health Aff* (Millwood). 2013 Oct;32(10):1740-7

McHugh MD, Kutney-Lee A, Cimiotti JP, Sloane DM, Aiken LH. *Health Aff* (Millwood). 2011 Feb;30(2):202-10

McHugh MD, Ma C. *Policy Polit Nurs Pract*. 2014 Aug-Nov;15(3-4):72-80

Nantsupawat A, Srisuphan W, Kunaviktikul W, Wichaikhum OA, Aungsuroch Y, Aiken LH. *J Nurs Scholarsh*. 2011 Dec;43(4):426-32

Roche M, Duffield C, Aisbett C, Diers D, Stasa H. *Collegian*. 2012;19(4):231-8

Silow-Carroll S, Moody G. Issue Brief (Commonwealth Fund). 2011 May;7:1-11

Simpson KR. MCN Am *J Matern Child Nurs*. 2009 Nov-Dec;34(6):396

Trinkoff AM, Johantgen M, Storr CL, Gurses AP, Liang Y, Han K. *Nurs Res*. 2011 Jan-Feb;60(1):1-8

Twigg DE, Geelhoed EA, Bremner AP, Duffield CM. *J Adv Nurs*. 2013 Oct;69(10):2253-61

You LM, Aiken LH, Sloane DM, Liu K, He GP, Hu Y, Jiang XL, Li XH, Li XM, Liu HP, Shang SM, Kutney-Lee A, Sermeus W. *Int J Nurs Stud*. 2013 Feb;50(2):154-61

Van Bogaert P, van Heusden D, Timmermans O, Franck E. *Front Psychol*. 2014 Nov 13;5:1261

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