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Achieving Kaiser Permanente Quality

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Abstract

Background—The Kaiser Permanente model of integrated health delivery is highly regarded for high quality and efficient health care. Efforts to reproduce Kaiser's success have mostly failed. One factor that has received little attention and that could explain Kaiser's advantage is its commitment to and investment in nursing as a key component of organizational culture and patient-centered care.

Purpose—The aim of this study was to investigate the role of Kaiser's nursing organization in promoting quality of care.

Methodology—This was a cross-sectional analysis of linked secondary data from multiple sources, including a detailed survey of nurses, for 564 adult, general acute care hospitals from California, Florida, Pennsylvania, and New Jersey in 2006–2007. We used logistic regression models to examine whether patient (mortality and failure-to-rescue) and nurse (burnout, job satisfaction, and intent-to-leave) outcomes in Kaiser hospitals were better than in non-Kaiser hospitals. We then assessed whether differences in nursing explained outcomes differences between Kaiser and other hospitals. Finally, we examined whether Kaiser hospitals compared favorably with hospitals known for having excellent nurse work environments — Magnet hospitals.

Findings—Patient and nurse outcomes in Kaiser hospitals were significantly better compared with non-Magnet hospitals. Kaiser hospitals had significantly better nurse work environments, staffing levels, and more nurses with bachelor's degrees. Differences in nursing explained a significant proportion of the Kaiser outcomes advantage. Kaiser hospital outcomes were

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comparable to Magnet hospitals, where better outcomes have been largely explained by differences in nursing.

Implications—An important element in Kaiser's success is its investment in professional nursing, which may not be evident to systems seeking to achieve Kaiser's advantage. Our results suggest that a possible strategy for achieving outcomes like Kaiser may be for hospitals to consider Magnet designation, a proven and cost-effective strategy to improve process of care through investments in nursing.

Keywords

hospital quality; nursing; organizational culture; Magnet hospitals; Kaiser Permanente

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The Kaiser model of integrated health delivery evolved from experiments to deliver prepaid hospital and physician care to construction workers in rural California during the late 1930s (Hendricks, 1993). The model is now well regarded for the quality and efficiency of health care it provides (Feachem, Sekhri, & White, 2002; McCarthy, 2009). The Kaiser model encompasses three mutually interdependent companies: a hospital system (Kaiser Foundation Hospitals), a capitated insurance system (Kaiser Foundation Health Plans), and a network of organized physicians (Kaiser Permanente Medical Groups). Since the rise of integrated delivery networks (IDNs) in the early 1990s, hospital and physician providers have sought to emulate prominent models of integration including Kaiser (California) and others like it, such as Geisinger (Pennsylvania), Scott & White (Texas), and Carle (Illinois). During the 1990s, some providers tried to integrate by acquiring physician groups and starting their own in-house health plans; these were alternatively known as provider sponsored organizations or integrated health organizations. Others developed strategic alliances with physicians and engaged in capitated contracting with outside managed care companies, using vehicles such as physician-hospital organizations.

The immediate goal in such efforts was to construct settings that could coordinate the continuum of care across sites and providers, align their incentives, attract managed care contracts, and assume capitated risk. The ultimate goals of these efforts were to improve the quality of care (e.g., via coordination and linkages), to control the cost of that care, and to improve access. There is evidence that integrated medical groups like Permanente Medical Groups (as well as Geisinger, Mayo, and Cleveland Clinic) achieve higher quality of care than less integrated groups (Mehrotra, Epstein, & Rosenthal 2006).

There is considerable evidence, however, that most providers did not succeed with this approach. During the 1990s, IDNs failed spectacularly in attracting risk-based lives (i.e., the covered patients for whom the IDN bears the risk and responsibility for care), controlling costs, improving quality, and fostering alignment between physicians and hospitals (Burns & Pauly, 2002). Efforts to develop in-house health plans were also financial disasters (Burns & Thorpe, 2001). Some providers like the Carilion Clinic in Roanoke tried to develop the three-pronged model like Kaiser as well as become a regional referral center like Geisinger, Mayo Clinic, and Cleveland Clinic; this effort failed (Agee, 2012). Other integrated providers sought to replicate their own model in markets outside of the Western United States; they too failed (Gitterman, Weiner, Domino McKethan, & Enthoven 2003).

Despite continuing efforts through the first decade of the new millennium, provider attempts to develop integrated models of health care delivery have consistently met with limited success. Recent reviews of the horizontal and vertical integration strategies of hospitals show little or no impact of integrated structures on either quality improvement or cost containment (Burns & Pauly, 2002). Instead, a handful of successfully integrated models have existed for decades because of unique geographic and historical path-dependent advantages, with few new entrants (Burns, Goldsmith, & Sen, 2013). Kaiser, for example, has a unique history, starting in a rural setting (Mojave Desert) with few competitors (like Geisinger) in 1933, and was shaped by the need to provide comprehensive care to a growing industrial workforce in its service area many years ago.

This is troubling news for providers now caught up in the rollout of the Affordable Care Act. Health reform calls for providers to develop coordinated care solutions that are accountable to public and private payers for the cost, quality, and accessibility of the care they provide. During his visit to the Cleveland Clinic in 2009, President Obama asked why more providers are not organized in the Clinic's integrated fashion. Given the dearth of hospitals that have been successful in implementing existing models, how are providers to respond?

Conceptual Framework

Scholars have long suggested that the solution to improved quality and lower costs lies not in the structure, but in the process of health care delivery. Past research has had difficulty identifying strong linkages between the structural elements of health care organizations and their quality performance (Landon et al., 2008). One problem is that the three dimensions of quality identified by Donabedian (1966) — structure, process, and outcome — are weakly coupled. In his original paper, Donabedian (1966) noted that linkages were not necessarily direct and that "the complexity and ambiguity of the relationships" was the result of many contributing factors. Since then, researchers have found that evidence for direct effects between structure and outcomes, as well as process and outcomes, is far less conclusive than depictions of the structure, process, and outcomes model would suggest. For example, research suggests that process performance measures are only weakly associated with better outcomes, if at all (Jha, Joynt, Orav, & Epstein, 2012; Werner, 2006). Another issue is that the structural dimension is more removed from outcomes than the process dimension. Hearld et al. (2008) reported that the vast majority of the structure-outcome linkages examined at the hospital level were either negative or insignificant.

Outside health care, this insight has been long recognized in quality improvement efforts such as those led by General Electric to diminish structural barriers and develop the "boundary-less organization." Inside health care, this has been recognized in efforts to adopt lean manufacturing techniques and promote clinical microsystems such as patient care teams (Alexander, Weiner, Shortell, Boher, & Becker 2006). Unfortunately, most research has focused on structural elements without a clear linkage to process, often because of the differential availability of data on organizational variables (Hearld et al., 2008). This structural focus with limited attention to process may explain the resultant failure of innovations to improve quality (Nembhard, Alexander, Hoff, & Ramanujam, 2009).

Thus, to improve quality, providers may not need to assemble the complex structural components of IDNs and accountable care organizations to deliver on quality metrics and obtain shared savings. Instead, they might focus on modifying elements of existing infrastructure that more clearly align with processes of care that are often found in integrated groups with a track record for quality. There are discussions of the infrastructure within the Kaiser model that contribute to quality outcomes (McCarthy, 2009). This infrastructure includes a patient-centered focus, information technology, group accountability, collaborative culture, multispecialty teams, care coordination, evidence-based practice, peer review, and intraorganizational learning. A lesser known infrastructure component, on which many of those listed above rely and perhaps a source of Kaiser's quality advantage, is its nursing practice that has flowed historically from its commitment to patient-centered care. A means of more directly influencing processes of care and improving outcomes may be by investing in and providing optimal conditions for bedside nurses to provide care. This has enormous implications, particularly in hospital settings, given nurses' key role in the process of clinical surveillance: They are at the bedside 24 hours a day every day, they are responsible for early warning system monitoring, they have direct knowledge of patient condition and changes in condition, and they initiate and coordinate the activities of others to prevent complications and save a patient's life when complications do occur. Research over the past decade has shown that favorable nurse staffing levels, more nurses with at least a Bachelor of Science in Nursing (BSN) degree, and favorable work environments facilitate nurses' effectiveness in the process of surveillance — a principal mechanism for the relationship between nursing and patient outcomes (Institute of Medicine, 2003).

This study investigates the role of Kaiser's nursing organization in promoting quality of care. It is important because, of all of the components of Kaiser's model that contribute to quality, it may be most easily adopted and copied by other hospitals without hefty capital investments in medical groups and health plans. We examined whether outcomes for patients treated in Kaiser hospitals and their nurses are significantly better than in non-Kaiser hospitals. We then assessed the degree to which differences in nursing explained any differences in outcomes between Kaiser and other hospitals. Finally, we examined how Kaiser hospitals compared with hospitals known for having an excellent work environment for nurses — Magnet hospitals — and whether Magnet hospitals and Kaiser hospitals had comparably superior outcomes compared with hospitals that were neither Magnet nor Kaiser hospitals (no Kaiser hospitals are Magnet hospitals).

The Magnet hospital concept, which became formalized as a voluntary accreditation program in the 1990s through the American Nurses Credentialing Center (ANCC) Magnet Recognition Program, originally evolved from the observation that hospitals that were successful in attracting and retaining qualified nurses resembled the most highly ranked US corporations (McClure, Poulin, Sovie, & Wandelt, 1983). Hospitals with these characteristics were identified as being good places for nurses to work (Kelly, McHugh, & Aiken, 2011), and they have also been shown to have better outcomes for patients (Aiken, Smith, & Lake, 1994; McHugh et al., 2013). Thus, Magnet hospitals make an excellent comparison group to evaluate how nursing is organized in Kaiser hospitals and how nursing is associated with patient and nurse outcomes.

Methods

Parent Study

Data on nurse work environments and the composition and characteristics of the hospital nurse workforce for this study came from 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 four study states (California, Florida, Pennsylvania, and New Jersey). The four states were a convenience sample, but the characteristics of the hospitals in these states are similar to hospitals nationwide and represent a significant proportion of the nation's total hospitalizations. Nurses were surveyed by mail at their home address based on a successful double sample protocol that has now been carried out in both 1999 and 2006–2007 (Aiken et al., 2011; Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). The response rate was 39%; however, an intensive survey of non-responders was also conducted, with a response rate of 91%, which allowed us to establish that there were no concerns related to response bias, particularly in relation to the variables of interest for this work (Aiken et al., 2011; Smith, 2009). Nurses provided detailed information on the work environment and also identified their employing institution, which allowed us to create aggregate measures of the work environment by hospital.

Data and Sample

The current study was a cross-sectional analysis of secondary data. Linked data from multiple sources were analyzed for general acute hospitals from four states in 2006–2007 corresponding with the parent study. Our study included three groups of hospitals in the four states in 2006–2007 for comparison: 25 Kaiser hospitals (none of which were Magnet), 483 non-Magnet hospitals, and 56 Magnet hospitals. Hospitals that had 10 or more nurse respondents to the parent study survey were included; aggregation statistics support reliable hospital-level aggregation with a minimum of 10 nurse respondents per hospital (McHugh et al., 2013), but the average number of nurse respondents per hospital was 47, with as many as 250 or more for some hospitals. Our approach resulted in representation of virtually all of the hospitals with 100 beds or more and allowed us to study the relationship between nurse work environments and a range of patient and nurse outcomes. Hospitals in the four states that were not included in the analysis were primarily small hospitals with fewer than 10 nurse respondents, which would be too few to provide reliable estimates of the hospital-level nursing characteristics. We identified Kaiser hospitals by name and address and confirmed this using the Kaiser Web site directory. We used ANCC data to identify Magnet hospitals that were recognized as of 2006–2007.

Additional structural data on hospital characteristics, such as teaching status and size, that have been associated with differences in patient outcomes and with organizational innovation (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004) were drawn from the 2006 and 2007 American Hospital Association Annual Surveys.

Patient data came from hospital discharge databases from the four states. We focused on patients aged 21–85 years (excluding discharges against medical advice) who underwent

general, orthopedic, or vascular surgeries common in nearly all acute care hospitals (Silber et al., 2009).

Measures

Nursing characteristics—Our focus was on three hospital-level nursing characteristics with a strong evidence base suggesting a relationship with nurse and patient outcomes: the nurse work environment, nurse staffing, and proportion of BSN nurses.

The Practice Environment Scale of the Nursing Work Index (PES-NWI) (Lake, 2002) was our primary measure of the overall nurse work environment. The PES-NWI includes subscale items on nurse participation in hospital affairs; nursing foundations for quality care; nurse manager ability, leadership, and support of nurses; staffing and resource adequacy; and collegial nurse-physician relations. As in prior work (Aiken et al., 2011; McHugh et al., 2013), subscale scores were averaged for all nurses in the hospital and aggregated to create one composite score for each hospital by averaging the subscales. The composite has a theoretical range of 0–4, with higher scores reflecting better work environments. The PES-NWI is endorsed by the National Quality Forum as an aggregated measure. The ICC(k) ranged from .76–.89 for subscales and was .84 for the composite. These levels are above standard thresholds (LeBreton & Senter, 2007) and are consistent with other reports (McHugh et al., 2013).

Nurse staffing was measured by aggregating individual bedside nurse reports of patients cared for during the last shift. The ICC(k) was .78. The staffing measure employed has been shown to predict nurse and patient outcomes more effectively than administrative data, as it includes only direct care nurses (Aiken et al., 2011).

Nursing education at the hospital-level was calculated as a percentage of direct care registered nurses with a BSN degree (Aiken, Clarke, Cheung, Sloane, & Silber, 2003).

The nurse survey also allowed for analysis of hospital-level measures of the characteristics and composition of the nurse workforce. The variables included skill mix (percentage of all nursing personnel (registered nurses [RNs], licensed practical nurses, and unlicensed assistive personnel), average nurse age and years of experience, and hospital percentage of specialty-certified nurses, foreign educated nurses, medical-surgical nurses, intensive care unit nurses, supplemental or agency nurses, and male nurses.

We also created a composite measure summarizing each hospital's nursing characteristics. To do this, we used logistic regression to estimate the probability of a hospital being a Kaiser hospital based on its nursing characteristics. The model was composed of each of the hospital-level nursing characteristics outlined above. The propensity score estimation function can be thought of as a summative, weighted index of the indicators (Smith, 1997). Thus, this composite variable characterized how "Kaiser-like" a hospital was in terms of nursing characteristics.

Hospital structural characteristics—Our analytic models included variables characterizing the hospitals in which the nurses worked and the patients received care.

Hospital size was measured as the number of staffed and licensed beds. We measured teaching intensity as the ratio of physician residents and fellows to hospital beds. Hospitals were designated as high (vs. low) technology hospitals if they performed open heart surgery, organ transplantation, or both. Ownership was dichotomized as nonprofit versus for-profit. We included indicators to identify the state where the hospital was located, as well as location in a rural, micropolitan, metropolitan, or division core-based statistical area. The Herfindahl-Hirschman index was used as an indicator for market competition.

Nurse outcomes—Nurse outcome measures of job dissatisfaction, burnout, and intent to leave the job were also created based on nurse responses. Prior work has established the approach for measuring these outcomes and has shown their utility (Aiken et al., 2002; Kutney-Lee, Wu, Sloane, & Aiken, 2013; McHugh, Kutney-Lee, Cimiotti, Sloane, & Aiken, 2011). We measured job-related burnout using the emotional exhaustion subscale of the Maslach Burnout Inventory Human Services Survey, a reliable and valid instrument (Maslach & Jackson, 1986). Standardized cutoff points were used to categorize nurses with high burnout as those with a score equal to or greater than 27 (Maslach & Jackson, 1982).

We used a well-established single item asking nurses: "*How satisfied are you with your current job?*" to measure job satisfaction. Response options on a 4-point Likert scale were dichotomized so that nurses reporting that they were very dissatisfied or a little dissatisfied were categorized as dissatisfied. Nurses reporting being moderately or very satisfied were categorized as satisfied. Intent to leave was characterized as present if nurses answered "*Yes*" to a question asking whether they wished to leave their current employer within a year.

Models estimating effects on nurse outcomes included controls for individual nurse characteristics including age, sex, years of experience as a nurse, and education level (a binary variable indicating whether the nurse had a BSN degree).

Patient outcomes—The patient outcomes were 30-day inpatient mortality and failure to rescue (FTR, i.e., death for surgical patients who experienced 1 of 39 possible complications) (Silber, Williams, Krakauer, & Schwartz, 1992). We used The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-P-CM) codes to identify clinical events indicating complications. Patient characteristics for risk adjustment included comorbidities based on the Elixhauser approach (Elixhauser, Steiner, Harris, & Coffey, 1998), as well as gender, age, and 61 dummy variables indicating the various surgery types (Silber et al., 2009).

Data Analysis

We first created the analytic files for nurse and patient outcomes (separately). The first step in this process involved creating the aggregated hospital nursing characteristics including nurse work environment, nurse staffing, percentage of BSN nurses as well as the nurse workforce characteristics of average age and years of experience and the percentage of specialty-certified nurses, foreign educated nurses, medical-surgical nurses, intensive care unit nurses, supplemental or agency nurses, and male nurses. We linked these hospital-level nursing characteristics to the hospital-level data on structural hospital features (hospital size,

teaching intensity, technology, ownership, geographic area, state, and market competition), as well as data from the ANCC identifying Magnet hospitals. With these data, we conducted descriptive comparisons of structural hospital characteristics and hospital nursing characteristics across three groups of hospitals: Kaiser, Magnet, and hospitals that were neither Magnet nor Kaiser (referred to henceforth as non-Magnet hospitals; no Kaiser hospitals were Magnet hospitals).

For analysis of nurse outcomes, we then linked the hospital-level file of aggregate hospital nursing and structural characteristics with individual nurse-level data on outcomes (job satisfaction, burnout, and intent to leave) of the nurses working in those hospitals as well as demographic characteristics of those nurses. To estimate the effects of Kaiser hospitals on nurse outcomes (i.e., burnout, job dissatisfaction, and intent to leave), we estimated a series of logistic regression models that included controls for individual nurse characteristics (each nurse's age, sex, years of experience as a nurse, and education level) and hospital characteristics (hospital size, teaching intensity, technology, ownership, geographic area, state, and market competition). First, we estimated the difference in outcomes for nurses working in Kaiser hospitals compared to non-Magnet hospitals. Next, we estimated the effect of nursing factors on outcomes, principally the nursing factors in which Kaiser hospitals were significantly different from non-Magnet hospitals and have been associated with outcomes differences — nurse work environment, nurse staffing, percentage of BSN nurses. We did this in two ways: first, we estimated the effect of work environment, staffing, and percentage of BSN nurses individually on outcomes. We then estimated the relationship between outcomes and the nursing composite variable. Then, we estimated models that included an indicator for Kaiser hospitals as well as the nursing composite. This allowed us to understand whether any Kaiser advantage could be explained by the nursing differences observed in Kaiser hospitals. Finally, we added an additional comparison group of hospitals known for excellence in nursing — Magnet hospitals — to evaluate how any Kaiser advantage in terms of better outcomes compared with the advantage for Magnet hospitals.

We took a similar approach to create the analytic file for patient outcomes (i.e., 30-day inpatient mortality and failure-to-rescue) analysis, linking the hospital-level nursing and structural characteristics with individual-level patient outcomes and patient characteristics data. The patient outcomes models followed the same sequence outlined above for the analysis of nurse outcomes, but instead of individual nurse characteristics, we included individual patient characteristics for risk adjustment along with the hospital control variables.

Results

We first compared structural characteristics of Kaiser, non-Magnet, and Magnet hospitals (Table 1). Kaiser hospitals were similar to non-Magnet hospitals in terms of size (measured as number of beds) and teaching status. Kaiser hospitals, however, were more likely to be nonprofit and less likely to be engaged in high technology procedures such as major organ transplant and cardiac surgery compared with non-Magnet hospitals. Kaiser hospitals were significantly smaller and low technology compared with Magnet hospitals. Magnet hospitals

had the highest percentage of teaching hospitals, but differences were not significant across the groups.

Kaiser and Magnet hospitals were comparably rated in terms of nurse work environment, and both were rated significantly higher than the non-Magnet hospitals. Kaiser hospitals had the lowest patient-to-nurse ratios. All of our Kaiser hospitals were in California, however, which mandates minimum staffing levels (McHugh, Kelly, Sloane, & Aiken, 2011). When we compared staffing levels within California, Kaiser hospitals still had significantly lower patient-to-nurse ratios than non-Magnet California hospitals (4.0 vs. 4.3, respectively).

Kaiser hospitals had the highest level of education in terms of the percentage of BSN nurses, but there was not a statistically significant difference between Kaiser and Magnet hospitals. Both groups, however, had a significantly higher level of education compared with the non-Magnet hospitals. Likewise, Kaiser hospitals had a higher skill mix compared with both Magnet and non-Magnet hospitals. Kaiser hospitals had a slightly higher percent of male nurses compared with Magnet and the other hospitals. Magnet and non-Magnet hospitals were more similar to each other in terms of non-U.S. educated nurse workforce than they were to Kaiser hospitals, which had a higher percentage of non-U.S. educated nurses comprising their workforce. Although California has a relatively high percent of non-U.S. educated nurses, a difference was present even within California hospitals only (20% on average for Magnet and other hospitals in California, and 27% for Kaiser). The groups did not differ in terms of their use of supplemental nursing staff, average years of nurse experience, or average age of the nurse workforce.

There were few significant differences in patient characteristics across Kaiser, non-Magnet, and Magnet hospitals (Table 2). Differences were significant, however, for patient outcomes. The unadjusted odds of dying in both Kaiser and Magnet hospitals were significantly lower than in other hospitals. Kaiser hospital patients had a higher risk of complication compared to Magnet hospital patients, whereas the risk of complication was lowest among non-Magnet hospital patients. The odds of death when a complication occured (FTR), however, were significantly lower for patients in Kaiser and Magnet hospitals compared with those in other hospitals.

Kaiser hospital nurses had significantly lower odds of job dissatisfaction and of intending to leave the job compared with non-Magnet hospital nurses (Table 3). There was no significant difference in burnout for nurses in Kaiser, Magnet, and non-Magnet hospitals. Better nurse work environments and better patient-to-nurse ratios, however, were significantly associated with a lower likelihood of nurse burnout and job dissatisfaction. A higher percentage of BSN nurses was associated with lower odds of job dissatisfaction but not burnout or intent to leave, although the direction of the relationship was consistent. The composite nursing measure, estimated as the likelihood of being a Kaiser hospital as a function of nursing factors, was significantly associated with lower odds of job dissatisfaction, burnout, and intent to leave. In our model that included the Kaiser indicator and the nursing composite, the differences in nursing between Kaiser and non-Magnet hospitals largely accounted for the Kaiser advantage in terms of job dissatisfaction and intent to leave, resulting in a smaller and statistically insignificant Kaiser effect.

On the basis of fully adjusted models, Kaiser hospital patients had significantly lower odds of both mortality and FTR compared to non-Magnet hospital patients (Table 4). Patients in hospitals with better work environments, lower patient to nurse ratios, and a higher percentage of BSN nurses had lower odds of mortality and FTR. We found that the more similar a hospital was to Kaiser hospitals in terms of nursing based on the composite score, the lower the odds of mortality and FTR. Furthermore, the differences in nursing between Kaiser and non-Magnet hospitals largely accounted for the better patient outcomes in Kaiser hospitals.

Finally, we examined whether the better nurse and patient outcomes in Kaiser versus non-Magnet hospitals were similar to those seen when we compared Magnet with non-Magnet hospitals (Table 5). Kaiser and Magnet hospital nurses were equally less likely to be dissatisfied than non-Magnet hospital nurses. Magnet hospital nurses were significantly less likely to be burned out than Kaiser and non-Magnet hospital nurses. The difference between Kaiser and Magnet hospital nurses, however, was not significantly different. Nurses in both Kaiser and Magnet hospitals were significantly less likely to intend to leave their job compared to nurses in other hospitals, but the difference was significantly larger for Kaiser nurses. We also carried out this analysis restricting our attention to California only (n=25 Kaiser hospitals, n=10 Magnet hospitals, n=184 non-Magnet hospitals). Results were consistent, except we did not observe lower odds of burnout for California's Magnet hospital nurses compared to non-Magnet hospital nurses.

Outcomes were equal for Kaiser and Magnet hospital patients. The odds of dying were 19% and 21% lower for Kaiser and Magnet hospital patients, respectively, suggesting that patients were equally likely to have better outcomes in either Kaiser or Magnet hospitals. Similarly, FTR was lower for Kaiser and Magnet hospital patients compared with that for non-Magnet hospitals. The patient outcome results were consistent when we restricted our analysis to only California.

Practice Implications

Our analysis showed that an important organizational process that helps explain the Kaiser outcomes advantage for both patients and nurses is Kaiser's commitment to professional nursing. Kaiser hospitals have significantly lower nurse workloads, a greater proportion of RNs among all nursing services personnel, a higher percentage of BSN nurses, and better quality of the work environment for nurses compared with non-Magnet hospitals. Kaiser also has a highly visible and empowered nurse in an executive leadership position who is involved in decisions within the organization and is a national leader in nursing and quality of care (Anderson, 2006). In these ways, Kaiser hospitals were similar to Magnet hospitals, which are known for excellence in nursing. Importantly, patients also fared better in terms of mortality and FTR in Kaiser hospitals compared with non-Magnet hospitals and equally as good as in Magnet hospitals. Like Magnet hospitals (McHugh et al., 2013), it appeared that differences in nursing in Kaiser hospitals accounted for a sizable portion of the advantage.

The similarity in the nurse work environment between Kaiser and Magnet hospitals is key because the Magnet hospital model can be replicated by following a blueprint developed by

the ANCC, and evidence suggests that going through the Magnet recognition process leads to improved work environments (Kutney-Lee et al., 2015; McHugh et al., 2013). The Institute of Medicine (2003) report, *Keeping Patients Safe: Transforming the Work Environment of Nurses*, highlighted the value of a good nurse work environment for ensuring quality and safety of care. Good work environments ensure that there is a culture that supports professional nursing practice, engages nurses in organizational decision-making, and provides sufficient staffing and resources for the patient care and surveillance activities that are required for good patient outcomes (Aiken et al., 2011). Thus, the nurse work environment that is important to improve patient outcomes in Kaiser can be adopted and copied by other hospitals aiming to achieve the benefits of Kaiser, without replicating Kaiser's complex structural elements.

A barrier to the more widespread adoption of Magnet recognition (about 7% of US hospitals are Magnet) is the cost associated with pursuing and achieving Magnet recognition. Researchers, however, have found that the costs of becoming a Magnet hospital are likely offset by corresponding net inpatient income (Jayawardhana, Welton, & Lindrooth, 2014).

Magnet recognition provides one pathway to achieving a good work environment, but it is not the only one (Schalk, Bijl, Halfens, Hollands, & Cummings, 2010). Ultimately, efforts that substantially improve nurses' autonomy, provide nurses with control over their practice and resources, support consistent and adequate staffing, develop a highly educated workforce, encourage consistent managerial support, and support and expect excellent working relationships and communication between nurses and physicians can empower nurses to effectively provide the highest level of care and act on behalf of patients to ensure good outcomes.

Nurses working in Kaiser hospitals were significantly less likely to report being dissatisfied or intending to leave their job. Kaiser nurses were even less likely than nurses in Magnet hospitals to intend to leave their job. Intent to leave is especially important because of its relationship to turnover (Hayes et al., 2012). Turnover is expensive because of the costs associated with using supplemental nurses as well as recruiting, orienting, and training new permanent nurses to replace those who leave. Forming an intention to leave a job has multiple antecedents, but it is frequently tied to negative work environment (Hayes et al., 2012). Given the superior work environments reported by Kaiser nurses, it is not surprising that they are less inclined to leave that work environment. In this sense, Kaiser hospitals exemplify a characteristic harkening back to the original idea behind the Magnet hospital concept — they are good places to work (McClure et al., 1983). Thus, nurses are attracted to those hospitals and want to stay there. It is noteworthy that, even after we control for nursing factors, the Kaiser advantage in terms of lower percentages of nurses reporting intent to leave persisted. This suggests that there may be additional factors that we are not measuring that are part of the Kaiser culture and are attractive to nurses, keeping them working there. There are many factors that influence one's intent to leave a job, including factors that extend beyond the job itself. Having direct information on turnover would have been preferable, and further study is warranted on this issue. Another limitation is that small hospitals may be underrepresented in our sample because we restrict our analyses to hospitals with 10 or more nurse respondents to our surveys.

We conclude that an important element in Kaiser's success is its investment in professional nurses, which may not be evident to other systems that seek to obtain Kaiser's good outcomes by replicating Kaiser's structural elements. Perhaps, one explanation for why efforts to replicate Kaiser do not result in equally good quality and affordable care is that the Kaiser commitment to the process of patient care reflected clearly in investments in professional nursing has not been a focus in replication efforts. Our results suggest that a less expensive and less difficult strategy to achieve good outcomes like Kaiser may be for hospitals to consider Magnet designation, a proven strategy to improve care through investments in professional nurses.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Study hospital structural and nursing characteristics (N=564)

Hospital Characteristics	Kaiser (n=25)	Non-Magnet (n=483)	Magnet (n=56)	Kaiser vs. Non-Magnet	Kaiser vs. Magnet
	Mean (SD)*			P value	
Number of beds	252 (105)	261 (197)	398 (195)	0.8193	<0.001
High technology status, n (%)	3 (12)	209 (43.3)	39 (69.6)	0.002	<0.001
Nonprofit ownership, n (%)	25 (100)	381 (78.9)	56 (100)	0.010	--
State, n (%)				<0.001	<0.001
New Jersey	0 (0)	52(10.8)	18(32.1)		
Pennsylvania	0 (0)	123 (25.5)	11 (19.6)		
Florida	0 (0)	124 (25.7)	17 (30.4)		
California	25 (100)	184 (38.1)	10 (17.9)		
Teaching status, n (%)				0.249	0.392
Major	2 (8)	34 (7)	9 (16.1)		
Minor	14 (56)	194 (40.2)	23 (41.1)		
Nonteaching	9 (36)	255 (52.8)	24 (42.9)		
Hospital nursing characteristics					
Nurse Work Environment (PES-NWI)	2.85 (.15)	2.65 (.22)	2.86 (.18)	<0.001	0.7572
Staffing, patients per nurse	4.03 (.69)	5.10 (1.1)	4.82 (.73)	<0.001	<0.001
Proportion of nurses with at least a BSN	.50 (.12)	.39 (.14)	.46 (.12)	<0.001	0.1685
Skill mix (RNs/all licensed staff)	.81 (.05)	.75 (.07)	.75 (.04)	<0.001	<0.001
Supplemental nurse staffing	.04(.03)	.05 (.05)	.04(.05)	0.5772	0.4720
Proportion of medical-surgical unit	.18(.09)	.17(.09)	.16(.07)	0.6744	0.3581
Proportion of intensive care unit nurses	.14(.09)	.17(.09)	.17(.06)	0.1404	0.1059
Proportion of non-U.S. educated nurses	.27(.16)	.14(.15)	.15(.11)	<0.001	<0.001
Age in years	44.26(3.03)	44.88(3.23)	43.26(2.85)	0.8227	0.5339
Years of experience at current hospital	11.35(2.01)	11.38(2.96)	11.47(2.91)	0.9545	0.8420
Proportion of female nurses	.91(.05)	.93(.05)	.94(.04)	0.0765	0.006

*unless indicated otherwise as the n and percentage under Hospital Characteristics.

BSN = Bachelor of Science in Nursing; PES-NWI = Practice Environment Scale of the Nursing Work Index; RNs = registered nurses.

Table 2

Characteristics of surgical patients (N=641,187)

Characteristics	Kaiser Hospitals (n=34,104)	Non-Magnet Hospitals (n=497,993)	Magnet Hospitals (n=109,090)	Kaiser vs. Non-Magnet	Kaiser vs. Magnet
	% (No.)			*P* value	
Age in years, mean (SD)	61.5 (14.9)	59.9 (16.3)	59.9 (15.9)	0.8227	0.5339
Male	43.3 (14763)	43.4 (217439)	43.2 (47080)	0.113	0.709
MAJOR DIAGNOSTIC CATEGORIES					
Hypertension	57.17 (19496)	49.00 (244016)	48.69 (53113)	0.933	0.643
Musculoskeletal system diseases	54.20 (18485)	53.19 (264872)	52.30 (57056)	0.729	0.667
Digestive system diseases	24.48 (8348)	21.67 (107993)	21.82 (23800)	0.179	0.077
Obesity	20.23 (6898)	8.78 (43732)	7.99 (8712)	0.001	0.026
Chronic pulmonary disease	16.81 (5732)	15.06 (75004)	13.87 (15128)	0.652	0.669
Diabetes without chronic complications	13.14 (4482)	15.75 (78448)	14.41 (15715)	0.148	0.300
Depression	10.27 (3504)	7.51 (37411)	7.82 (8533)	0.057	0.015
Hepatobiliary system disease	9.40 (3205)	10.85 (54017)	10.02 (10928)	0.976	0.472
Congestive heart failure	6.37 (2172)	4.97 (24735)	4.29 (4682)	0.018	0.048
Circulatory system diseases	4.93 (1681)	5.56 (27682)	5.91 (6443)	0.264	0.064
Endocrine, nutritional, and metabolic diseases	4.44 (1513)	5.28 (26301)	6.26 (6829)	0.005	0.115
Metastatic cancer	4.29 (1464)	3.03 (15068)	3.90 (4252)	0.216	0.891
Liver disease	2.90 (988)	2.35 (11691)	2.40 (2620)	0.299	0.501
Skin, subcutaneous tissue, breast diseases	2.56 (872)	3.45 (17188)	3.70 (4034)	0.079	0.050
OUTCOMES				Odds Ratio *	
Deaths within 30 days of admission	1.55 (530)	1.81 (8998)	1.51 (1645)	0.86 **	1.03
Complications	35.98 (12271)	33.61 (330614)	34.50 (37631)	1.07 ***	1.04 ***
Failure to rescue	3.7 (454)	4.61 (7704)	3.83 (1440)	0.82 **	0.94

* p <0.05;

** p<0.01;

*** p<0.001

Table 3

Odds ratios indicating the effect of working in a Kaiser Permanente hospital and in hospitals with varying nurse work environment factors on nurse outcomes

	Kaiser	Nursing factors individually	Nursing Composite	Kaiser & Nursing Composite
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
JOB DISSATISFACTION				
Kaiser	0.81* (0.67–0.97)	—	—	0.96 (0.75–1.23)
Practice environment	—	0.17*** (0.12–0.18)	—	—
Staffing	—	1.14*** (1.12–1.25)	—	—
% of BSN nurses	—	0.95** (0.90–0.98)	—	—
Nursing composite	—	—	0.56* (0.36–0.88)	0.58*0.38–0.90
BURNOUT				
Kaiser	0.99 (0.85–1.16)	—	—	1.15 (0.97–1.36)
Practice environment	—	0.27*** (0.23–0.32)	—	—
Staffing	—	1.15*** (1.09–1.20)	—	—
% of BSN nurses	—	0.99 (0.96–1.01)	—	—
Nursing composite	—	—	0.75* (0.56–0.99)	0.66** (0.48–0.90)
INTENT TO LEAVE				
Kaiser	0.51*** (0.36–0.72)	—	—	0.71*0.51–0.98
Practice environment	—	0.22***0.18–0.28	—	—
Staffing	—	1.14** (1.06–1.22)	—	—
% of BSN nurses	—	0.97 (0.93–1.01)	—	—
Nursing composite	—	—	0.27*** (0.16–0.48)	0.38*** (0.23–0.63)

Odds ratios come from logistic regression models estimated for each outcome individually. Each model includes a variable indicating whether the nurse is in a Kaiser hospital or a hospital that is neither Kaiser nor Magnet. All results shown are from models that controlled for nurse characteristics.

Table 4

Odds ratios indicating the effect of hospitalization in a Kaiser Permanente hospital and in hospitals with varying nurse work environment factors on patient outcomes

	Kaiser	Nursing factors individually	Nursing Composite	Kaiser & Nursing Composite
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
MORTALITY				
Kaiser	0.80 * (0.67–0.96)	—	—	0.91 (0.72–1.16)
Practice environment	—	0.68 *** (0.56–0.82)	—	—
Staffing	—	1.06 * (1.01–1.12)	—	—
% of BSN nurses	—	0.97 * (0.94–1.00)	—	—
Nursing composite	—	—	0.62 *** (0.47–0.80)	0.67 ** (0.48–0.94)
FAILURE TO RESCUE				
Kaiser	0.80 * (0.67–0.95)	—	—	0.91 (0.73–1.13)
Practice environment	—	0.68 *** (0.56–0.82)	—	—
Staffing	—	1.05 * (1.00–1.11)	—	—
% of BSN nurses	—	0.97 * (0.94–1.00)	—	—
Nursing composite	—	—	0.62 *** (0.47–0.81)	0.68 ** (0.49–0.95)

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$.

Odds ratios come from logistic regression models estimated for each outcome individually. Each model includes a variable indicating whether the patient is in a Kaiser hospital or a hospital that is neither Kaiser nor Magnet. All results shown are from models that controlled for patient characteristics.

Table 5

Odds ratios indicating effect of Kaiser (n= 25) and Magnet (n = 56) hospital status on nurse and patient outcomes compared to other hospitals (n=483)

	Kaiser (n = 25)	Magnet (n = 56)	Significance of difference between Kaiser and Magnet
	OR (95% CI)		*P* value
NURSE OUTCOMES			
Job dissatisfaction	0.78 * (0.60–0.99)	0.81 ** (0.70–0.92)	0.171
Burnout	0.98 (0.83–1.16)	0.85 ** (0.77–0.94)	0.807
Intent to leave	0.49 *** (0.35–0.68)	0.82 ** (0.72–0.93)	0.005
PATIENT OUTCOMES			
Mortality	0.81 * (0.68–0.97)	0.79 *** (0.71–0.89)	0.829
Failure to rescue	0.81 * (0.68–0.97)	0.81 *** (0.72–0.90)	0.958

* p <0.05;

** p<0.01;

*** p<0.001.

Odds ratios come from logistic regression models estimated for each outcome individually. Each model includes a variable indicating whether the nurse, in the case of nurse outcomes, or patient in the case of patient outcomes, is in a Kaiser hospital, a Magnet hospital, or a hospital that is neither Kaiser nor Magnet. All results shown are from models that controlled for hospital characteristics and in the case of nurse outcomes models, included nurse characteristics, and for patient outcomes models, accounted for patient characteristics.