HHS Public Access

Author manuscript

J Nurs Adm. Author manuscript; available in PMC 2017 September 20.

Published in final edited form as:

J Nurs Adm. 2012 October ; 42(10 Suppl): S44–S49. doi:10.1097/01.NNA.0000420394.18284.4f.

Nurse Outcomes in Magnet® and Non-Magnet Hospitals

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Abstract

The important goals of Magnet® hospitals are to create supportive professional nursing care environments. A recently published paper found little difference in work environments between Magnet and non-Magnet hospitals. The aim of this study was to determine whether work environments, staffing, and nurse outcomes differ between Magnet and non-Magnet hospitals. A secondary analysis of data from a 4-state survey of 26,276 nurses in 567 acute care hospitals to evaluate differences in work environments and nurse outcomes in Magnet and non-Magnet hospitals was conducted. Magnet hospitals had significantly better work environments ($t = -5.29$, $P < .001$) and more highly educated nurses ($t = -2.27$, $P < .001$). Magnet hospital nurses were 18% less likely to be dissatisfied with their job ($P < .05$) and 13% less likely to report high burnout ($P < .05$). Magnet hospitals have significantly better work environments than non-Magnet hospitals. The better work environments of Magnet hospitals are associated with lower levels of nurse job dissatisfaction and burnout.

Despite a strong evidence base over 2 decades showing superior work environments and better nurse and patient outcomes in Magnet®-recognized hospitals,[1] a recent study[2] published in *Journal of Nursing Administration* generated renewed debate over whether Magnet and non-Magnet hospitals are significantly different. Trinkoff and colleagues[2] were unable to find differences in the work environment of Magnet-credentialed hospitals compared with others. There are multiple reasons for null findings in a particular study that could relate to the study design, sample, measures, and statistical power and do not necessarily negate the findings of past studies or suggest a new trend. That publication motivated us to revisit with new data from a large study of hospitals our earlier findings[3,4] suggesting better work environments and better nurse outcomes in American Nurses Credentialing Center (ANCC) Magnet-recognized hospitals.

Background

During the 1980s, there was a significant nursing shortage and high turnover at hospitals. Nurse leaders observed that some hospitals were better able to retain nurses and fill

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The authors declare no conflict of interest.

vacancies compared with similar hospitals in the same labor markets. A study by the American Academy of Nursing (AAN) identified 41 hospitals that acted as “magnets” for nurses because of their more supportive work environments.[5] Research by Kramer and Hafner[6] confirmed that AAN Magnet hospitals had common organizational features not found in other hospitals that were associated with higher nurse satisfaction and retention. Aiken and colleagues[7] followed with a study showing that the AAN-identified hospitals also had better patient outcomes, namely lower hospital mortality, than matched hospitals.

In 1990, the ANCC, an organizational component of the American Nurses Association, developed a voluntary recognition program for formally credentialing Magnet organizations, and the first Magnet hospital was credentialed[8] in 1994. Aiken and associates[3] compared the first 7 ANCC Magnet®-recognized facilities with the original AAN reputational Magnet hospitals, finding the ANCC hospitals to have better nurse work environments and nurse outcomes, such as higher job satisfaction, lower burnout rates, and lower intent to leave, than the original AAN hospitals.

The ANCC Magnet Recognition Program® has grown exponentially in recent years. To date, approximately 7% of US hospitals, close to 400, have achieved Magnet Recognition.[9,10] Magnet hospitals have been recognized thus far in 5 countries besides the United States (England, Australia, New Zealand, Singapore, and Lebanon). Magnet-credentialed hospitals have consistently been shown to have better nurse work environments and better nurse and patient outcomes.[1,11–14] In addition, Magnet-recognized hospitals have demonstrated higher nurse-physician collaboration and safer work environments.[15,16]

Recent research has focused on the work environment of nurses as a potential contributor to nurse outcomes.[4,17,18] Many hospitals use the process of Magnet credentialing as a road map for improving the quality of care and the work environment of their hospital.[19] In a case study of the first hospital outside the United States to become Magnet recognized, a hospital in England was shown to significantly improve its work environment after Magnet Recognition as compared with that before preparing for Magnet credentialing.[20] Ulrich et al[21] examined the practice environments of Magnet hospitals, finding that the improved environment in Magnet-credentialed hospitals is demonstrated through significantly higher emphasis on patient care, more opportunities for advancement, and a greater ability to influence decisions. In addition, Lake and Friese[4] confirmed that Magnet-credentialed hospitals documented better practice environments than other hospitals in a single-state sample of Pennsylvania.

This study was conducted to use a unique recent database derived from a survey of hospital nurses in 4 states to determine whether organizational nursing characteristics and nurse job-related outcomes differ in Magnet compared with non-Magnet hospitals. We compare differences in nurses’ work environment and nurses’ educational qualifications in Magnet hospitals compared with nurses in non-Magnet hospitals. We also evaluated nurses’ satisfaction, burnout, and intention to leave their position in Magnet and non- Magnet hospitals, controlling for individual nurse, hospital, and hospital-level nursing characteristics.

Methods

Sample

Our data are from a study of hospitals in 4 states (California, Florida, Pennsylvania, and New Jersey) in 2006 to 2007. Researchers mailed a survey to the homes of a random sample of RNs using the state licensure lists for 2006 to 2007. Nurses who worked in hospitals were asked to provide the name of their employer, which allowed us to aggregate responses by hospital for the analysis. Our final sample included 567 hospitals, 46 of which were ANCC Magnet recognized. The response rate of hospitals was 86%; most of the hospitals not included were very small. Within participating hospitals, 4,562 nurses working in Magnet hospitals and 21,714 nurses working in non-Magnet hospitals were surveyed by mail at their homes, an average of 45 nurses per hospital. Thus, the nurse respondents in this study were not directly recruited from their hospitals but responded to the population-based survey of RNs in their states and provided information on their hospital of employment and their employer's name. This study was approved by the institutional review board of the University of Pennsylvania.

Measures

Nurse Characteristics—Nurse characteristics included nurses' age, years of experience, educational level, specialty certification, sex, and whether basic nursing education was attained in the United States.

Nurse Staffing—Staffing was created from the nurse's report of the number of patients he/she cared for on his/her last shift. Responses from nurses in all clinical areas including ICUs were averaged to determine the average patient-to-nurse ratio for the hospital. Previous research on nurse workload has shown this measure of staffing to have better predictive validity for staff nurses in the hospital than administrative data that often include nurses who do not directly care for patients.[22,23]

Work Environment—The work environment was measured using the 31-item Practice Environment Scale of the Nursing Workforce Index,[24] endorsed by the National Quality Forum. Nurses are asked to indicate the degree to which various organizational features are present in their practice setting. We created hospital-level measures by aggregating nurses' responses to items comprising 5 subscales and calculating a continuous hospital-level summary measure. Subscales include nurse participation in hospital affairs; nursing foundations for quality care; nurse manager ability, leadership, and support; staffing and resource adequacy; and nurse-physician relations.

Education—A hospital-level measure of proportion of nurses with a baccalaureate degree or higher was created from individual nurse reports of highest education in nursing.[25]

Hospital Characteristics—Hospital characteristics describing the features of the nurse's hospital included teaching status designation, where teaching hospitals were designated as hospitals with postgraduate trainees, whether the hospital was a high-technology facility defined by having open heart surgery or organ transplantation or both, number of hospital

beds set up and staffed, and not-for-profit status. We also included a variable indicating the state where the hospital was located to capture differences attributable to state-specific policies or markets.

Outcomes—Job-related burnout was measured using the emotional exhaustion subscale of the Maslach Burnout Inventory Human Services Survey (MBI-HSS).[26] The MBI-HSS is a highly reliable and valid instrument that contains 22 Likert-type items that assess 3 domains: emotional exhaustion, depersonalization, and personal accomplishment. As in previous work,[22,27] we used the emotional exhaustion sub-scale of the MBI-HSS as it best reflects our theoretical and practical interests in factors that could erode nurse vigilance and satisfaction. We used standardized cutoff points, developed by Maslach et al,[26] to categorize nurses with high burnout as those with a score equal to or greater than 27. Job dissatisfaction and intent to leave were derived from single survey items. To measure job satisfaction, we used a single-item question asking nurses "How satisfied are you with your current job." Response options on a 4-point Likert scale were dichotomized with either "very dissatisfied" or "a little dissatisfied" categorized as "dissatisfied." Nurses reporting being "moderately satisfied" and "very satisfied" were categorized as "satisfied." Intent to leave was characterized by nurses answering yes, that they intended to leave their current employer within 1 year.

Analysis

We used *t* tests for continuous variables and χ^2 tests for categorical variables to estimate differences between Magnet and non-Magnet hospitals. We tested differences between the groups at the hospital level to estimate differences between the hospitals (Magnet and non-Magnet). To estimate differences between nurse job dissatisfaction, burnout, and intent to leave in Magnet and non-Magnet hospitals, we implemented a series of logistic regression models. In the first step, we estimated the likelihood of outcomes in Magnet hospitals when controlling only for nurse characteristics (age, experience, etc). Next, we estimated models controlling for nurse and hospital characteristics (eg, teaching status, bed size). The final model estimated the effects of Magnet status while accounting for individual nurse factors, hospital characteristics, and hospital-nursing characteristics (staffing, work environment, and education). We estimated these models sequentially to understand the effects of Magnet status in relation to each of the controls. All analyses were conducted with STATA version 11 (StataCorp, College Station, Texas).

Results

Our sample included 26,276 registered direct patient care nurses working in 567 hospitals (Table 1). Within that sample, 4,562 nurses were working in 46 Magnet hospitals and 21,714 nurses were working in non-Magnet hospitals. Magnet hospitals nurses were demographically similar to non-Magnet hospitals. On average, Magnet hospitals were larger in bed size and had a higher proportion of teaching facilities and amount of technology (Table 1).

In Table 2, we provide results from testing differences between Magnet and non-Magnet hospitals. Magnet hospitals were more likely to be teaching institutions ($\chi^2 = 3.93$, $P = .05$),

have high technology (χ^2 = 14.90, P < .001), have nonprofit status (χ^2 = 11.11, P < .001), and have a smaller average number of beds (t = −5.04, P < .001). There were no significant differences in the mean years of nurses' experience between Magnet and non-Magnet (t = −1.06), P = .29) or the proportion of nurses educated in the United States (t = 0.29, P = .77). Magnet hospitals had a higher proportion of specialty-certified nurses (t = −2.80, P < .05). Our results show that Magnet hospitals have significantly better work environments (t = −5.29, P < .001) and a higher proportion of nurses with BSN or higher education (t = −2.27, P < .05) than non-Magnet hospitals.

We did not initially find a significant difference in staffing (t = 1.13, P = .26) between Magnet and non-Magnet hospitals. Because 1 of the states, California, has mandated staffing ratios[28] that might erase differences between Magnet and non-Magnet hospitals, we examined state-specific staffing between Magnet and non-Magnet hospitals (Table 3). When California hospitals are excluded, we found the number of patients per nurse in Magnet hospitals to be significantly lower than in non-Magnet hospitals (t = −5.29, P < .001). When we test the state of California alone, we find staffing to not be significant between the 2 groups (t = 1.36, P = .18), as might be expected given the California staffing legislation. It is notable, however, that the mean (SD) patient workload in California Magnet hospitals is lower at 3.89 (0.32) compared with 4.27 (0.74) in non-Magnet hospitals in California. The relatively small number of Magnet hospitals in our sample of California hospitals (n = 7) may have impacted the significance level.

As shown in Table 4, nurses in Magnet hospitals were 18% less likely to be dissatisfied (P < .05) and 13% less likely to have high levels of burnout (P < .05), when controlling for individual nurse, hospital, and hospital-level nursing characteristics (Table 4, model 3). Nurses in Magnet hospitals were significantly less likely to report intent to leave their current position (P < .05). However, when hospital characteristics like teaching status and size were introduced, the intent to leave variable became only marginally significant.

Discussion

We provide evidence from a large study that Magnet hospitals have better work environments and a more highly educated nurse workforce. Outside of California where nurse staffing mandates decrease variation in staffing, Magnet hospitals have significantly better nurse staffing reflected in nurses caring for fewer patients each. Nurses in Magnet hospitals are significantly less likely to experience high burnout or be dissatisfied with their jobs than nurses in non-Magnet hospitals. Our results are consistent with a substantial and growing research base on Magnet hospitals that has accumulated over several decades showing significantly better work environments in Magnet hospitals and better nurse outcomes.

It may be the case that the study by Trinkoff et al[2] was underpowered to detect differences with only 14 Magnet hospitals out of 171 studied compared with the 47 Magnet hospitals among 567 hospitals in the present study. The results of our study suggest that there is no reason to believe that the long established positive differences for nurses between Magnet and non-Magnet hospitals are any different today than they were 2 decades ago. Magnet

hospitals still show superiority in nurse work environments and nurse outcomes over non-Magnet hospitals.

Limitations

The cross-sectional nature of our study limits our ability to make causal inferences. In 2006, approximately 220 hospitals in the country were Magnet credentialed. With only 46 captured in the 4 states in our study, or slightly higher than 20% of Magnet hospitals at the time, we cannot be certain that those studied are representative of all Magnet hospitals. However, we note that the total number of hospitals in our study accounted for almost 25% of patients hospitalized in the United States during the study period.

Conclusions

Our results provide continued evidence demonstrating superior nurse work environments in Magnet hospitals compared with non-Magnet hospitals. Better work environments in Magnet hospitals are associated with lower nurse job dissatisfaction and burnout. Three decades of evidence showing superior outcomes for Magnet hospitals place this organizational innovation into a class all of its own as “best practice,” which deserves the attention of hospital leaders, nurses, and the public.

Acknowledgments

Funding: This study was supported by funding from the Margretta M. Styles Scholar/American Nurse Foundation (L. Kelly, PI); the National Institute for Nursing Research, National Institutes of Health (T32-NR-007104 and R01NR04513, L. Aiken, PI); and the Agency for Healthcare Research and Quality (K08-HS017551, M. McHugh, PI).

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Table 1

Sample Demographics

Individual Nurse Characteristics	**Study Nurses (n = 26,276)**	**Magnet Study Nurses (n = 4,562)**	**Non-Magnet Study Nurses (n = 21,714)**
Age, y[a]	44.68 (10.76)	43.8 (10.67)	44.87 (10.77)
Years of experience[a]	11.67 (9.47)	11.96 (9.41)	11.61 (9.48)
Female[b]	24,384 (93.23)	4,283 (94.17)	20,101 (93.03)
Certified[b]	10,046 (38.74)	2,002 (44.32)	8,044 (37.56)
Educated in the United States[b]	22,564 (86.22)	3,885 (85.44)	18,679 (86.39)
Hospital Characteristics	Study Hospitals (n = 567)	Magnet Study Hospitals (n = 46)	Non-Magnet Study Hospitals (n = 521)
Bed size[a]	275.84 (199.23)	414.83 (190.68)	359.14 (273.79)
Teaching hospital[b]	278 (49.03)	29 (63.04)	249 (47.8)
High-technology status[b]	253 (44.62)	33 (71.74)	220 (42.23)
Not-for-profit ownership[b]	464 (81.83)	46 (100)	418 (80.23)
California hospitals[b]	222 (39.43)	7 (15.22)	215 (41.59)
Florida hospitals[b]	140 (24.87)	12 (26.09)	128 (24.76)
Pennsylvania hospitals[b]	131 (23.27)	9 (19.57)	122 (23.60)
New Jersey hospitals[b]	70 (12.43)	18 (39.13)	52 (10.06)

[a]Mean (SD).

[b]n (%).

Table 2

Differences in Hospital Characteristics Between Magnet and Non-Magnet Hospitals

	Magnet Hospitals (n = 46)	Non-Magnet Hospitals (n = 521)		
Characteristics	**n (%)**	**n (%)**	χ^2	***P***
Classified as teaching hospital	29 (63.04)	249 (47.79)	3.93	.05
High-technology status[a]	33 (71.74)	220 (42.23)	14.90	.00
Not-for-profit ownership	46 (100.0)	418 (80.23)	11.11	.00
	Mean (SD)	**Mean (SD)**	*t*	*P*
Bed size	264 (195)	415 (191)	−5.04	.00
Female	0.94 (0.35)	0.93 (0.54)	−1.41	.16
Years of experience	11.84 (2.87)	11.37 (2.91)	−1.06	.29
Educated in the United States	0.85 (0.11)	0.86 (0.15)	0.29	.77
Certified	0.42 (0.13)	0.36 (0.13)	−2.80	.01
Work environment[b]	2.85 (0.19)	2.67 (0.22)	−5.29	.00
Bachelor of science in nursing education[c]	0.42 (0.10)	0.38 (0.36)	−2.27	.02
Patients per nurse	4.84 (0.73)	5.02 (1.08)	1.13	.26

[a]High technology is defined as a hospital that performs open heart surgery, organ transplantation, or both.

[b]Work environment is measured as average composite score on the Practice Environment Scale of the Nursing Work Index.

[c]Proportion of nurses with baccalaureate degree or higher.

Table 3

Differences in Nurse Staffing in Magnet and Non-Magnet Hospitals by States

	Average Patients Per Nurse (SD)			
States	**Magnet Hospitals**	**Non-Magnet Hospitals**	***t***	***P***
Florida, Pennsylvania, New Jersey	n = 39	n = 306		
	5.00 (0.65)	5.54 (0.98)	−5.29	.00
California	n = 7	n = 215		
	3.89 (0.32)	4.27 (0.74)	1.36	.18

Table 4

Nurse Outcomes in Magnet Hospitals Compared With Non-Magnet Hospitals

	Model 1[a]	*P*	Model 2[b]	*P*	Model 3[c]	*P*
Job dissatisfaction	0.86 (0.07)	.06	0.82 (0.07)	.01	0.82 (0.07)	.01
Burnout	0.91 (0.06)	.12	0.86 (0.06)	.03	0.86 (0.06)	.03
Intent to leave	0.83 (0.06)	.02	0.87 (0.07)	.07	0.87 (0.07)	.07

[a]Model 1 adjusted for individual nurse characteristics only, which include age, years experience, sex, certification, and location of education.

[b]Model 2 adjusted for individual nurse characteristics and hospital characteristics, which include teaching status, bed size, technology status, ownership, and state.

[c]Model 3 adjusted with individual nurse characteristics, hospital characteristics, and hospital-level nursing characteristics, which include staffing, work environment, and proportion of higher educated staff.

J Nurs Adm. Author manuscript; available in PMC 2017 September 20.