Published in final edited form as:

Am J Hosp Palliat Care. 2016 July ; 33(6): 568–573. doi:10.1177/1049909115575506.

The influence of nursing unit characteristics on RN vacancies in specialized hospice and palliative care

Lisa C. Lindley¹, Sandra J. Mixer¹, and Melanie J. Cozad²

¹College of Nursing, University of Tennessee-Knoxville, Knoxville, TN, USA

²Department of Economics, Furman University, Greenville, SC, USA

Abstract

The nursing shortage is projected to intensify in the US. Organizations providing specialized hospice and palliative care will be particularly hard hit. The purpose of our study was to examine the influence of the nursing unit on RN vacancies and test the moderating role of recruitment strategies in perinatal hospices. We estimated the association between the nursing unit and RN vacancies and tested the interaction effects of recruitment strategies (signing bonus and recruitment bonus). Our findings showed that increasing RN unit size and nursing leadership directly affected vacancies and that recruitment bonuses had stronger influence on reducing vacancies than signing bonuses. The findings offer critical insights for hospice administrators in attracting nurses among specialized hospice and palliative care providers.

Keywords

perinatal; palliative care; hospice care; work environment; vacancies

The nursing shortage is projected to intensify in the United States over the next few decades.¹ The Bureau of Labor Statistics has identified nursing as one of the top growing occupations, with expected growth from 2.71 million in 2012 to 3.24 million in 2022.² This growth is coupled with projections that over 500,000 additional nurse replacements will be needed in the workforce by 2022 for approximately a million more nurses. The recent reforms of the health care system, combined with a strengthening of the economy suggest that there is current ongoing need for nurses.¹ It is estimated that there will be over 100,000 open registered nurse (RN) position with almost a quarter of those on long-term care agencies.^{3, 4} The shortage of RNs is also a concern in hospice and palliative care. Although data on the depth of the shortage of hospice and palliative nurses is very limited, the magnitude of the problem has been acknowledge by such organizations as the Hospice and Palliative Nurses Association.²¹ In addition, agencies providing specialized hospice and palliative care, such as perinatal hospice and palliative care with its need for trained pediatric and labor and delivery nurses, have been particularly hard hit by the shortage of qualified nurses.^{5, 6}

The consequences of unfilled RN vacancies are substantial, with nurses reporting decreased quality of their work life and reduced time spent with patients.⁷ In an environment where nurses often must work additional shifts to cover open positions, job dissatisfaction and emotional exhaustion are now commonplace.⁸ Ultimately, patient care is negatively affected by understaffing, which leads to increased patient mortality,^{9, 10, 11} hospital readmission rates,¹² and incidences of infection.¹⁰

Although the literature is replete with over 30 years of research evaluating RN turnover,^{13, 14, 15, 16, 17} approaches to understanding RN vacancies has been limited to reporting findings of vacancy rates and discussing national efforts to improve nursing school enrollment and expand faculty capacity.^{1, 6, 18, 19} Yet, there is a growing consensus that creating an environment within the nursing unit that attracts nurses may be important to filling vacancies.^{20, 21} As an example, organizations with defined career paths commensurate with education, training, and experience may create a culture of talent management and succession planning that is attractive to RNs joining the organization.²² Additionally, when this supportive career climate is coupled with recruitment strategies such as signing and targeted recruitment bonuses, organizations may find it even easier to attract RNs to their unfilled positions.²³ Understanding the predictors of RN vacancies and the role of recruitment strategies may offer critical insights for hospice administrators in attracting nurses among specialized hospice and palliative care providers.

In this study, the influence of the nursing unit on RN vacancies was examined and the moderating role of recruitment strategies was tested. A sample of perinatal hospices was used because perinatal hospice nurses deliver highly specialized end-of-life care for the fetus, infant, mother, and family before, during and after birth.^{24, 25} It was hypothesized that certain characteristics of the nursing unit, such as unit size, leadership, support services, and career climate would reduce RN vacancies, and that a combination of nursing unit characteristics and recruitment strategies would be most effective.

Methods

Design, Data Source, and Sample

This study used a cross-sectional, correlational design. The data for the study came from the 2007 National Home and Hospice Care Survey (NHHCS) that was collected by the Centers for Disease Control and Prevention (CDC) between August 2007 and February 2008.²⁶ We used the 2007 NHHCS because it was the most current data available. Participants were a nationally representative sample of hospices and home health agencies.²⁷ The data were collected via in-person interviews with agency directors. Although 1,036 respondents were included in NHHCS, only participants who answered a key question about providing perinatal hospice care were included in the data analysis for the present study. The study focused on perinatal hospices because of the specialized nature of the nurse work environment and nursing care delivered that includes both hospice/palliative and labor/delivery care for mothers, babies, and families.²⁸ The participant agencies in this study included 226 agencies that were licensed hospice providers and certified by Medicare or Medicaid. Agencies were excluded from the sample if they had no RNs, provided only home health services, or had missing data.

A power analysis was conducted to determine the minimum sample size necessary to detect the effects of nursing unit characteristics on RN vacancies, if such an effect exists. The calculation was based on widely accepted conventions for statistical power (0.80), Type II error rate ($\beta=1.0-0.80=0.20$), and significance level ($\alpha=0.05$). A conservative effect size of 0.15 was used in calculating the sample size. Using a power calculator for multiple regression, it was determined that a minimum of 213 hospice participants would be needed based on 40 regressors.²⁹ Thus, this study had sufficient power to detect the effect of the nursing unit on RN vacancies. This study was approved by the Institutional Review Board of the University of Tennessee, Knoxville.

Measures

RN vacancies—The RN vacancy rate was calculated by the number of reported vacant RNs positions divided by the total number of RN positions in specialized perinatal hospice and palliative care.

Nursing unit characteristics—Ten measures of nursing unit characteristics were created based on our prior conceptualization of the nursing environment. 28 Nursing unit characteristics were RN unit size, patient acuity, RN leadership, RN support services, RN proportion, RN education, RN certification, safety climate, career climate, and technology climate. RN unit size was computed as the number of full-time equivalent (FTE) RNs on staff per patient. Patient acuity was derived from whether or not nurses cared for patients receiving continuous home care. Whether the agency's director had a nursing degree was the measure of RN leadership, and whether there was a clinical nurse specialist or nurse practitioner on staff was the measure of RN support services. RN proportion was constructed based on the number of RN FTEs divided by the total number of RN and LPN FTEs. RN education was defined as whether or not the nursing unit had RNs with their highest degree as a baccalaureate in nursing (BSN). RNs with any medical specialty certifications was the measure of RN certification. A proxy measure was created for safety climate and was defined as whether influenza vaccinations were encouraged for nurses. Career climate was constructed as a binary measure of whether or not a hospice agency provided a career ladder for nurses. Whether nurses currently used an electronic medical records system was the measure of technology climate.

Recruitment strategies—Recruitment strategies for new hires included signing bonus and recruitment bonus. A signing bonus was defined as whether or not a hospice offered a monetary incentive to new employees joining the organization. A recruitment bonus, which is a specific type of signing bonus, was defined as whether or not a hospice offered targeted monetary incentives to new hires for specific positions that are difficult to fill.

Confounding variables—Potential confounding variables included in this study were hospice characteristics. Affiliation was constructed as a categorical variable indicating whether hospices were freestanding or not freestanding agencies (e.g., hospital based, home-health based, long-term care based). Service area was defined as whether hospices delivered care in metropolitan, micropolitan, or rural locations, using Metropolitan Statistical Area (MSA) status. Metropolitan was the referent group. As a measure of organization size,

hospices were categorized as small if a hospice had less than or equal to 100 patients per day and large if they had over 100 patients per day. Organization age was defined as the total number of years a hospice had operated as a licensed hospice. Whether a hospice reported its profit status as for-profit or other (i.e., private not-for-profit, government) was a measure of ownership. Teaching status was defined as hospices that were used as a clinical training site for students. Accreditation was measured as whether the agency was accredited by the Joint Commission.

Data Analysis

Univariate analysis was performed on the variables in the study. Regression analysis was conducted to estimate the association between the characteristics of the nursing unit and RN vacancies in perinatal hospices (model 1). To examine the direct interaction effects of recruitment strategies (signing bonus and recruitment bonus) and nursing unit characteristics on RN vacancies, the regression analysis was re-run with the interaction variables (model 2).³⁰ Using procedures described by Aiken and West,³¹ variables were multiplied to create interaction terms. Only significant interactions were reported in Model 2. Post estimation analysis of the significant interactions included plotting and evaluating the nature of the interactions.³² The complex nature of the NHHCS data necessitated that survey weights be applied to all analyses, and results of analysis are reported as weighted totals based on a population size of 728 agencies. Stata 12.0 software (Statacorp LP, College Station, TX) was used to compute results.

Results

Descriptive Statistics

Table 1 summarizes the weighted descriptive statistics for the variables included in the analytical model. The RN vacancy rate among perinatal hospices averaged 7.0% with a range of 0.0% to 63.0%. On average, hospices had less than one full-time equivalent RN on staff per patient. Few hospices had patients receiving continuous home care (14.3%), and most had an agency director with a nursing degree (70.3%). Less than a quarter of the agencies (23.4%) had a clinical nurse specialist or nurse practitioner supporting the nursing staff. Perinatal hospices generally had a high rate of RNs on staff with a BSN degree (89.4%). Over half of the nurses had a medical specialty certification (65.5%). Most perinatal hospices operated in a climate of safety (94.6%) and technology (63.8%), but few offered a climate for career development (22.1%). Sixteen percent of perinatal hospices offered signing bonuses and 27.5% offered recruitment bonuses. Most perinatal hospices were non-freestanding (56.2%), served a metropolitan area (43.6%), and were small size (87.8%). On average, the hospices operated for 16 years. They were commonly owned by non-profit/government entities (83.0%) and used as a clinical training site for students (87.1%); however, less than half were accredited by the Joint Commission (35.3%).

Nursing Unit Characteristics and RN Vacancies

The results of the weighted multiple regression analysis are shown in Table 2. The findings of the first research question—do the nursing unit characteristics affect RN vacancies while controlling for the hospice environment?—are displayed in Model 1. This model explained

22.0% of the variance in RN vacancies ($R^2=0.22$). An increase in RN unit size was associated with a lower RN vacancy rate ($\beta = -0.01$). Nursing leadership ($\beta = -0.06$) also predicted a decreased RN vacancy rate. No other nursing unit characteristics were significant. With regards to control variables, increasing organization age ($\beta = -0.01$) predicted lower levels of RN vacancies. Compared to non-teaching hospices, teaching hospices ($\beta = 0.05$) were related to increased RN vacancies. Other hospice environment characteristics were not associated with RN vacancies.

Interactions of Nursing Unit Characteristics and Recruitment Strategies

Model 2 in Table 2 displays the results of the second research question: do recruitment strategies moderate the relationship between nursing unit characteristics and RN vacancies? Significant interactions between patient acuity ($\beta = -0.13$), RN support services ($\beta = 0.13$), and RN education ($\beta = -0.14$) and signing bonuses were found. Using the methods of Aiken and West,³¹ these interactions were probed. Post-estimation analysis of the interactions revealed that perinatal hospices with signing bonuses and staff with their highest education as BSN reported lower vacancies. The association between patient acuity and RN vacancies was also attenuated by a signing bonus. Conversely, the relationship between RN support services and RN vacancies was moderated by a signing bonus.

The interactions between patient acuity ($\beta = -0.12$), RN leadership ($\beta = -0.15$), RN support services ($\beta = -0.17$), and RN education ($\beta = 0.20$) and recruitment bonuses were also significant. Post-estimation analysis of the interactions found that the relationship of RN leadership to RN vacancies was buffered by recruitment bonuses, wherein a higher frequency of RN leadership is associated with diminished RN vacancies, particularly when a hospice has a recruitment bonus. The association of patient acuity and RN support services to RN vacancies was also buffered by recruitment bonuses in the same direction. However, hospices with recruitment bonuses and staff with their highest education as BSN had increased RN vacancies.

Discussion

This study was one of the first to examine how nursing unit characteristics affect RN vacancies within perinatal hospices, while controlling for the hospice environment. In addition, it makes a novel contribution by considering how recruitment strategies can attenuate or moderate the association between the nursing unit characteristics and RN vacancies. Understanding the impact of these strategies in combination with the nursing unit characteristics offers critical insights that potentially can enhance recruitment policies within perinatal hospices and other institutions that deliver similar specialized care to patients in this age range.

The analysis considering nursing unit characteristics associated with RN vacancies demonstrated that RN unit size and RN unit leadership significantly decreased the RN vacancy rate. These findings suggest that organizations with larger RN units may create economies of scale that are cost advantageous for the perinatal hospice.³³ For example, hospices may offer more generous benefits and spread the burden of covering paid time off across many staff. In addition, RN leadership may reduce RN vacancies because agency

directors with a nursing degree may have experience and training that garners respect and support from the RNs within the organization. 34 Future research might examine the effect of the nursing unit characteristics on other staffing outcomes such as turnover.

Recruitment strategies such as signing and recruitment bonuses also demonstrated significant attenuating or moderating effects on RN vacancies, when interacting with the nursing unit characteristics. The findings revealed that recruitment bonuses had a stronger significance interaction effect, compared to signing bonuses. This difference likely reflects the targeted nature of the recruitment bonus towards a specific set of nursing skills that is in short supply within the organization, while the signing bonus is extended to all new RNs joining the organization.²³ The recruitment bonus interactions with RN support services contributed to a decrease in RN vacancies. One possible explanation is that the combination of these variables creates a higher quality work environment. In this study the perinatal hospice work environment was unique in that ninety percent of RNs were BSN-prepared. Advance practice nurses were reflected as the RN support services variable. The combination of highly educated nursing staff supported by advance practice nurses may contribute to enhanced perinatal care and job satisfaction. These factors then contribute to a reduction in RN vacancies.

The findings from this study have important implications for hospice administrators and leaders as they develop recruitment strategies aimed at reducing RN vacancies. Addressing the factors that influence RN vacancies within an organization is critical because of the consequences these vacancies have on patient care and the cascading effect on the morale of RNs who remain with the organization. 1 In general, offering recruitment and signing bonuses initially compensates RNs for working in an environment where patients require a higher level of care. However, hospice administrators and nurse leaders should also consider that some perinatal RNs have unique skills and, as BSN-prepared nurses, that makes them highly sought after in the hospice marketplace. The fact that the recruitment bonus interaction with RN education attenuated vacancies illustrates the competition for these types of individuals. Therefore, creating opportunities for promotion, enhanced leadership, continuing education, and a sense of loyalty within the organization may help reduce the incentive highly qualified RNs have to accept other competing job offers, thereby reducing vacancies.

The study had several limitations. First, no causal conclusions can be drawn because the data were cross-sectional rather than longitudinal. Second, the most recent data available from the CDC were from 2007 and made available to researcher in 2010/2011. The study data may be dated given the significant recent changes in the hospice industry including the updated 2008 Conditions of Participation. In addition, there has been changes in the RN job market, which includes seasoned RNs remaining in the workforce and an increasing number of new graduates entering the labor market. However, this study represents one of the first attempts to explore RN vacancies using these data. The detailed nature of the survey questions with respect to workforce issues provided rich insight into the nursing unit. Our findings, especially those with regards to recruitment strategies, are still very appropriate and relevant to perinatal hospice and palliative care agencies, which anecdotally still struggle to recruit skilled RNs. Without such comprehensive hospice data collected, hospice

leaders and policymakers may be limited in their evidence-based decision-making in the future. Finally, there may be responder bias in the data because the data were self-reported by hospices. Even though the CDC maintains the quality of the data, hospice administrators may have been reluctant to report negative information through a government survey.

This study provides insight into perinatal hospice workforce recruitment and retention strategies because it examines how nursing unit characteristics and their combination with recruitment and signing bonuses influence RN vacancies. Recruitment bonuses combined with nursing unit characteristics to have a stronger influence on vacancies than signing bonuses. A high quality work environment as measured by nursing leadership and RN support services from advance practice nurses, when combined with recruitment bonuses, reduced RN vacancies. Addressing RN vacancies within these organizations is critical because of the influence of vacancies on patient care and the morale of RNs who remain within the organization. The findings indicate that workforce recruitment and retention strategies should focus on creating high quality work environments with educated nursing leadership and advance practice nurses who share expertise with RNs for optimal patient care decisions. Findings from this study may have implications for other nursing hospice and palliative care environments, specifically those in which RNs are highly specialized.

Acknowledgments

Special thanks to Beth Schewe for her assistance with the manuscript.

Funding: This publication was made possible by Grant Number K01NR014490 from the National Institute of Nursing Research. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institute of Nursing Research or National Institutes of Health.

References

1. American Association of Colleges of Nursing. Nursing Shortage Fact Sheet. <http://www.aacn.nche.edu/media-relations/fact-sheets/nursing-shortage>. Published 2014
2. Bureau of Labor Statistics. Employment Projections: 2012–2022. <http://www.bls.gov/news.release/pdf/ecopro.pdf>. Published 2013
3. American Health Care Association. Report of Findings 2007 AHCA Survey Nursing Staff Vacancy and Turnover In Nursing Facilities. http://www.ahcancal.org/research_data/staffing/Documents/Vacancy_Turnover_Survey2007.pdf. Published 2008
4. American Hospital Association. The 2007 State of America's Hospitals - Taking the Pulse. <http://www.aha.org/content/00-10/StateofHospitalsChartPack2007.ppt>. Published 2007
5. American Association of Critical Care Nurses. About Critical Care Nursing. <http://www.aacn.org/wd/publishing/content/pressroom/aboutcriticalcarenursing.pcms?menu=>. Published 2014
6. Benson A. Labor market trends among registered nurses: 2008–2011. Policy, Politics, & Nursing Practice. 2012; 13(4):205–213. DOI: 10.1177/1527154413481810
7. Buerhaus PJ, Donelan K, Ulrich BT, Norman L, Williams M, Dittus R. Hospital RNs' and CNOs' perceptions of the impact of the nursing shortage on the quality of care. Nursing Economic\$. 2005; 23(5):214–221. [PubMed: 16315651]
8. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Silber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. JAMA. 2002; 288(16):1987–1993. DOI: 10.1001/jama.288.16.1987 [PubMed: 12387650]

9. Aiken LH, Sloane DM, Cimiotti JP, et al. Implications of the California nurse staffing mandate for other states. *Health Serv Res.* 2010; 45(4):904–921. DOI: 10.1111/j.1475-6773.2010.01114.x [PubMed: 20403061]
10. Blegen MA, Goode CJ, Spetz J, Vaughn T, Park SH. Nurse staffing effects on patient outcomes: Safety-net and non-safety-net hospitals. *Med Care.* 2011; 49(4):406–414. DOI: 10.1097/MLR.0b013e318202e129 [PubMed: 21407034]
11. Needleman J, Buerhaus P, Pankratz VS, Leibson CL, Stevens SR, Harris M. Nurse staffing and inpatient hospital mortality. *N Engl J Med.* 2011; 364(11):1037–1045. DOI: 10.1056/NEJMsa1001025 [PubMed: 21410372]
12. Tubbs-Cooley HL, Cimiotti JP, Silber JH, Sloane DM, Aiken LH. *BMJ Quality & Safety.* 2013; 22(9):735–742. DOI: 10.1136/bmjqs-2012-001610
13. Fowler NC. Enlightened personnel policies help reduce the high cost of nursing turnover. *Modern Hospital.* 1950; 75(6):61–62. [PubMed: 14796563]
14. Lyons TF. Reducing nursing turnover. *Hospitals.* 1970; 44(20):74–79.
15. Nei D, Snyder LA, Litwiller BJ. Promoting retention of nurses: A meta-analytic examination of causes of nurse turnover. *Health Care Manage Rev.* 2014 epub.
16. Al-Hussami M, Darawad M, Saleh A, Hayajneh FA. Predicting nurses' turnover intentions by demographic characteristics, perception of health, quality of work attitude. *International Journal of Nursing Practice.* 2014; 20(1):79–88. DOI: 10.1111/ijn.12124 [PubMed: 24580978]
17. Gao F, Newcombe P, Tilse C, Wilson J, Tuckett A. Models for predicting turnover of residential aged care nurses: A structural equation modeling analysis of secondary data. *Int J Nurs Stud.* 2014; doi: 10.1016/j.ijnurstu.2014.01.011
18. Beyers M, Mullner R, Byre CS, Whitehead SF. Results of the nursing personnel survey, part 2: RN vacancies and turnover. *J Nurs Adm.* 1983:26–31.
19. Lipley N. Staff survey raises fears of 'dumbed down' care as employers fail to fill vacancies. *Nursing Management.* 2011; 17(10):4.
20. American Academy of Orthopaedic Surgeons. AAOS Position Statement: Shortage of Nursing Professionals. www.aaos.org/about/papers/position/1158.asp. Published 2009
21. Hospice and Palliative Nurses Association. HPNA Position Statement: Shortage of Registered Nurses. www.hpna.org/PicView.aspx?ID=28. Published 2011
22. Matuson, R. Why most recruitment strategies are failing and what you can do to fix this. *Forbes.* Mar 13. 2013 <http://www.forbes.com/sites/robertamatuson/2013/03/13/why-most-recruitment-strategies-are-failing-and-what-you-can-do-to-fix-this/>
23. Burkes D, Ropp AL. Are signing bonuses an effective nursing recruitment and retention strategy? *MCN Am J Matern Child Nurs.* 2003; 28(5):290–291. [PubMed: 14501628]
24. Munson D, Leuthner SR. Palliative care for the family carrying a fetus with a life-limiting diagnosis. *Pediatr Clin North Am.* 2007; 54:787–798.
25. Sumner LH, Kavanaugh K, Moro T. Extending palliative care into pregnancy and the immediate newborn period: State of the practice of perinatal palliative care. *Journal of Perinatal and Neonatal Nursing.* 2006; 20(1):113–116. [PubMed: 16508478]
26. United States Department of Health and Human Services. Centers for Disease Control and Prevention. National Center for Health Statistics. National Home and Hospice Care Survey. Ann Arbor, MI: Inter-university Consortium for Political and Social Research (distributor); 2007. ICPSR28961-v1 (Data File). Retrieved from
27. Centers for Disease Control and Prevention. National Home and Hospice Care Survey. <http://www.cdc.gov/nchs/nhhcs.htm>. Published 2007
28. Lindley LC, Fornehed ML, Mixer SJ. A comparison of the nurse work environment between perinatal and non-perinatal hospice providers. *International Journal of Palliative Nursing.* 2013; 19(11):535–540. [PubMed: 24263897]
29. Soper, D. Statistical Calculators. Retrieved from <http://www.danielsoper.com/statcalc/calc01.aspx>. Published 2009
30. Baron R, Kenny D. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *J Pers Soc Psychol.* 1986; 51(6):1173–1182. DOI: 10.1037/0022-3514.51.6.1173 [PubMed: 3806354]

31. Aiken, LS.; West, S. Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage; 1991.
32. Cohen, J.; Cohen, P.; West, S.; Aiken, L. Applied multiple regression/correlation analysis for the behavioral sciences. Mahwah, NJ: Erlbaum; 2003.
33. Feldstein, PJ. Health Care Economics. Clifton, NY: Thomson Delmar Learning; 2011.
34. Sullivan, EJ.; Decker, PJ. Effective Leadership and Management in Nursing. Upper Saddle River, NJ: Pearson Prentice Hall; 2009.

Table 1

Descriptive Statistics of Study Variables, Weighted (N=728)

Variables	No.	Percentage/Mean	Standard Deviation	Minimum	Maximum
RN Vacancies	728	0.07	0.01	0.00	0.63
Nursing Unit Characteristics					
RN Unit Size	728	0.71	0.09	0.07	9.69
Patient Acuity (%)	104	14.29	—	0	1
RN Leadership (%)	512	70.33	—	0	1
RN Support Services (%)	170	23.35	—	0	1
RN Proportion	728	0.87	0.01	0.33	1.50
RN Education (%)	651	89.42	—	0	1
RN Certification (%)	477	65.52	—	0	1
Safety Climate (%)	689	94.64	—	0	1
Career Climate(%)	161	22.12	—	0	1
Technology Climate (%)	465	63.87	—	0	1
Recruitment Strategies					
Signing Bonus (%)	114	15.66	—	0	1
Recruitment Bonus (%)	200	27.47	—	0	1
Hospice Environment					
Affiliation					
*Freestanding (%)	319	43.82	—	0	1
*Non-Freestanding (%)	409	56.18	—	0	1
Service Area					
*Metropolitan (%)	317	43.55	—	0	1
*Micropolitan (%)	227	31.18	—	0	1
*Rural (%)	184	25.27	—	0	1
Organization Size					
*Small (%)	639	87.77	—	0	1
*Large (%)	89	12.23	—	0	1
Organization Age	728	16.07	0.91	1.00	28.00
Ownership					

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Variables	No.	Percentage/Mean	Standard Deviation	Minimum	Maximum
*For-profit (%)	124	17.03	—	0	1
*Non-profit/Government (%)	604	82.97	—	0	1
Teaching Status (%)	634	87.09	—	0	1
Accreditation (%)	257	35.30	—	0	1

Note: RN, Registered Nurse

Table 2

Results of Regression Analysis for RN Vacancies, Weighted (N=728)

Variables	Model 1		Model 2	
	β	(SE)	β	(SE)
Nursing Unit Environment				
RN Unit Size	-0.01	(0.01) *	-0.01	(0.01)
Patient Acuity	-0.02	(0.01)	-0.01	(0.01)
RN Leadership	-0.06	(0.02) **	-0.04	(0.02)
RN Support Services	-0.01	(0.02)	-0.01	(0.02)
RN Proportion	-0.04	(0.03)	-0.05	(0.04)
RN Education	0.04	(0.02)	0.02	(0.02)
RN Certification	-0.03	(0.02)	-0.04	(0.02) *
Safety Climate	0.01	(0.03)	0.01	(0.05)
Career Climate	0.04	(0.02)	0.01	(0.02)
Technology Climate	0.02	(0.01)	0.03	(0.01) *
Hospice Environment				
Freestanding	-0.01	(0.02)	0.01	(0.01)
Micropolitan	-0.02	(0.01)	-0.03	(0.01) *
Rural	0.01	(0.02)	-0.01	(0.02)
Large	-0.01	(0.02)	-0.01	(0.02)
Organization Age	-0.01	(0.01) **	-0.01	(0.01) ***
For-profit	-0.01	(0.02)	-0.02	(0.02)
Teaching Status	0.05	(0.02) *	0.04	(0.02)
Accreditation	0.02	(0.02)	0.02	(0.02)
Intercept	0.12	(0.05)	0.14	(0.06)
R^2	0.22		0.43	
Recruitment Strategies				
Signing Bonus			0.16	(0.11)
Recruitment Bonus			0.10	(0.10)
Interactions				
Patient Acuity $\times$ Signing Bonus			-0.13	(0.05) *
RN Support Services $\times$ Signing Bonus			0.13	(0.06) *
RN Education $\times$ Signing Bonus			-0.14	(0.05) *
Patient Acuity $\times$ Recruitment Bonus			-0.12	(0.05) *
RN Leadership $\times$ Recruitment Bonus			-0.15	(0.05) **
RN Support Services $\times$ Recruitment Bonus			-0.17	(0.06) **
RN Education $\times$ Recruitment Bonus			0.20	(0.05) ***
Intercept			0.14	(0.06)
R^2			0.43	

*
 $p < 0.05$,

**
 $p < 0.01$,

 $p < 0.001$

Note: RN, registered nurse; SE, Standard error

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript