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Organizational Traits, Care Processes, and Burnout Among Chronic Hemodialysis Nurses

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Abstract

In light of evidence linking registered nurse (RN) staffing levels to patient outcomes in chronic hemodialysis facilities, U.S. government regulations have set minimum RN staffing requirements during dialysis. Consequently, facility administrators are focused on decreasing nurse attrition in this crucial practice setting. This study used a cross-sectional, correlational design to investigate the effects of workload, practice environment, and care processes on burnout among nurses in U.S. chronic hemodialysis centers and to determine the association between burnout and nurses' intentions to leave their jobs. Findings indicate that predictors were associated with an increased likelihood of nurse burnout and that nurses experiencing burnout were more likely to be planning to leave their jobs. Findings have important implications for retention of nurses, enhancement of patient safety, and adherence to new federal staffing requirements in chronic hemodialysis units.

Keywords

work environment; burnout; nurse–patient ratio; hemodialysis

By 2020, more than 530,000 U.S. residents will need long-term, outpatient hemodialysis for the treatment of end stage renal disease (U.S. Renal Data System, 2007). Unfortunately, rates of adverse events and mortality among chronic dialysis patients in the United States are among the highest in the world (Saran et al., 2003; Sehgal et al., 1998). Yet findings from studies indicate that higher registered nurse (RN) staffing levels in chronic hemodialysis dialysis facilities are associated with fewer adverse patient events including intradialytic hypotension, skipped treatments, shortened treatments, hospitalization, and mortality (Saran et al., 2003; Gardner, Thomas-Hawkins, Fogg, & Latham, 2007; Thomas-Hawkins, Flynn, & Clarke, 2008). In light of this recent evidence, the Centers for Medicare and Medicaid Services (CMS) recently revised Medicare reimbursement regulations to require that at least one RN be present in chronic dialysis facilities during hemodialysis treatments (CMS, 2007; Flynn, Thomas-Hawkins, & Bodin, 2008). Despite the intended positive impact of the regulation on patient safety, facility administrators express concern about adhering to the new mandate, citing not only the associated costs but also difficulties with RN recruitment and retention in chronic dialysis facilities across many areas of the United States (Levy, 2006). Although occupational

burnout has been identified as a key factor contributing to attrition among RNs in acute care hospitals, little is known regarding its predictors or impact among nurses in other practice venues including chronic hemodialysis settings. Therefore, it was the purpose of this study to identify predictors of nurse burnout and to explore its relationship to intent-to-leave in a nationwide sample of U.S. RNs practicing in chronic hemodialysis facilities.

Antecedents and Consequences of Occupational Burnout

Occupational burnout is a psychological response to chronic stressors in the workplace such as excessively long workdays, high workloads, and insufficient resources to accomplish the job (Ahola, Honkonen, Virtanen, Kivimäki, Isometsä, Aromaa, & Lonnqvist, 2007; Maslach, 2003). Over time, such work demands become overwhelming, depleting individuals' emotional and physical resources. Consequently, burnout is characterized by feelings of emotional exhaustion, detachment from others, and diminished perceptions of personal accomplishment (Maslach & Leiter, 1997, 2008). Although it can occur among workers in any job category, burnout has been found to be particularly prevalent among the "caring-giving" professionals, such as physicians, nurses, and social workers—professionals who appear particularly invested in attempting to meet the needs of their clients despite high workloads and limited resources (Maslach, Schaufeli, & Leiter, 2001).

This is alarming in that occupational burnout can result in negative consequences for the workplace and the worker. In hospitals, Lake (1998) found that burnout was directly related to RNs' intentions to leave their jobs and that intent-to-leave was a significant predictor of actual attrition. For the worker, burnout has been associated with the development of serious health problems including depression, myocardial infarction, hypertension, cardiovascular disease, Type II diabetes, insomnia, and a host of somatic complaints (Ericson-Lidman & Standberg, 2007; Melamed, Shirom, Toker, Berliner, & Shapira, 2006; Melamed, Shirom, Toker, & Shapira, 2006; Murphy, Duxbury, & Higgins, 2006; Saleh & Shapiro, 2008; Schuitemaker, Dinart, Van der Pol, & Appeels, 2004). Furthermore, studies indicate that the negative consequences of burnout can extend to the worker's family, resulting in increased family stress and impaired marital relationships (Burke & Greenglass, 2001; Figley, 1998).

Derived from sociological theories of organizations and professions (Flood, 1994; Shortell & Kaluzny, 1988), the Nursing Organization and Outcomes Model (Aiken, Clarke, & Sloane, 2002), as depicted in Figure 1, proposes that organizational factors including nurse staffing levels/workloads, practice environments, and care processes not only affect patient outcomes but affect nurse outcomes, such as burnout, as well. According to the model, better staffing, lower workloads, and more supportive practice environments free nurses to concentrate on their patients, facilitate high-quality care processes, and enhance positive nurse outcomes. Findings from nurse outcome studies provide support for the model in that higher workloads, usually measured by patient-to-nurse ratios, and less supportive practice environments were significantly associated with nurse burnout and intentions to leave their jobs (Aiken, Clarke, & Sloane, 2002; Aiken, Clarke, Sloane, Lake, & Cheney, 2008; Flynn, 2007a; Leiter & Laschinger, 2006; Rafferty et al., 2007). There have been no studies, however, that have investigated the relationship between impaired care processes, such as uncompleted patient care activities, and nurse burnout. Moreover, almost all of these studies have been conducted among hospital-based nurses, and little is known regarding the relationships between organizational factors, care processes, and burnout in nurses working in dialysis settings.

Purpose

Given the rising need for chronic hemodialysis services within the aging population, as well as growing concerns over nurse recruitment and retention in this increasingly crucial setting, it is important to implement evidence-based strategies to prevent burnout and attrition in

chronic hemodialysis facilities. Therefore, recruiting a nationwide sample of U.S. nurses practicing in chronic hemodialysis facilities, the aim of this study was to explore the following research questions:

1. What is the prevalence of occupational burnout among RNs practicing in chronic hemodialysis facilities?
2. What are the unadjusted and adjusted effects of RN staffing and workloads, practice environments, and impaired nursing care processes on the likelihood of occupational burnout?
3. What is the effect of occupational burnout on the likelihood of nurses' intentions to leave their jobs?

Method

To ensure the protection of participants, this study, employing a cross-sectional, correlational design, was approved by Rutgers University's institutional review board prior to data collection. Because nurses are reliable informants regarding organizational features of their workplaces, the use of nurse survey data has become a key methodological approach in nursing outcome studies (Aiken et al., 2008). Consequently, 2,000 RNs who identified themselves as staff nurses in hemodialysis settings were randomly selected from the American Nephrology Association's membership list to receive survey packets mailed to their homes. In accordance with a Dillman (2007) survey method, follow-up reminders were mailed at scheduled intervals.

Sample

A survey response rate of 52% resulted in data from 1,015 nephrology RNs across the United States. Among these, 422 RNs, representing 47 of the 50 states, indicated they currently worked in chronic hemodialysis facilities and, therefore, composed the analytic sample for this study. The largest proportion, or 53.3%, of nurses in the sample practiced in corporate-owned, freestanding chronic hemodialysis facilities, 26.8% practiced in hospital-based chronic hemodialysis facilities, and 19.2% practiced in hospital-owned, freestanding chronic hemodialysis facilities. The demographics of the study sample are presented in Table 1.

Measures

Occupational burnout was measured by the Emotional Exhaustion subscale (EES) of the Maslach Burnout Inventory (Maslach & Jackson, 1986). The EES is the most frequently used measure of occupational burnout worldwide and consists of nine items rated on a scale ranging from 0 to 6. Scores can range from 0 to 54, with higher scores indicating higher emotional exhaustion and burnout. According to standardized norms, scores of 27 or higher are considered high for medical personnel and indicate a state of job-related burnout (Maslach & Jackson, 1986). In the current study, an internal consistency coefficient of .89 indicates acceptable reliability of the measure in this sample of chronic hemodialysis nurses.

Intent-to-leave the job was conceptualized and measured by two survey items developed to capture (a) nurses' intentions to leave their current position and (b) nurses' intentions to leave their current employer, respectively. Nurses planning to leave their positions were also asked to indicate the type of role they planned to assume in their new position.

RN staffing was measured as nurses' responses to several items developed and tested in previous research and used to calculate patient-to-RN ratios (Aiken, Clarke, & Sloane, 2002; Aiken et al., 2008). Recognizing that nurses' workloads are influenced by more than patient ratios, overall nurse workload was measured by the five-item Workload subscale of the Individual Workload Perception Scale (Cox, 2003). Acceptable psychometric properties of the

scale and subscales have been established in multiple samples of nurses (Cox et al., 2006). On a 4-point summated rating scale ranging from (1) *strongly disagree* to (4) *strongly agree*, nurses were asked to rate the extent to which they agreed that the statement reflected their workload conditions. Scores can range from 5 to 20, with higher scores indicating higher workloads. Sample items include “my workload will cause me to look for a new position” and “my workload has caused me to miss important changes in my patients’ conditions.” In the current study, an internal consistency coefficient of .78 compares favorably with a published alpha of .70 in a sample of hospital-based nurses (Lacey et al., 2007), indicating good reliability of the measure in this sample of chronic hemodialysis nurses.

The Practice Environment Scale (PES) of the Nursing Work Index–Revised (Lake, 2002) has been endorsed by the National Quality Foundation as a standard measure of the nursing practice environment. Consisting of 31 items, respondents indicate on a 4-point summated rating scale the extent to which they agree that the organizational attribute depicted in each item is present in their current job; higher scores indicate a more supportive practice environment. Items on the PES compose five subscales that reflect key domains of the nursing practice environment, including (a) Nurse Participation in Hospital Affairs; (b) Nursing Foundations for Quality of Care; (c) Nurse Manager Ability, Leadership, and Support; (d) Collegial Nurse-Physician Relations; and (e) Staffing and Resource Adequacy. Mean subscale scores are averaged to produce a composite score ranging from 1 to 4 (Lake, 2002). In the current study, an internal consistency coefficient of .94 on the composite measure indicates acceptable reliability of the measure in this sample of chronic hemodialysis nurses.

Impaired nursing care processes were measured using a series of innovative survey items developed and tested in previous studies to provide a metric of the adequacy of key processes of nursing care (Aiken et al., 2001; Sochalski, 2001). Slightly reworded to reflect a hemodialysis setting, nurses were asked to indicate from a list of seven key nursing care activities, which, if any, were necessary but left undone during their last full day of work because they did not have time to complete them. These key nursing care activities include nursing care processes such as surveillance and monitoring during dialysis treatments, coordination of care, patient teaching, documentation in the patient medical record, and supervision of staff. Total impaired processes scores were computed as a sum of all necessary care activities left undone and could range from 0 to 7. Construct validity of the nursing care processes measure has been demonstrated in that process scores have been found to be associated in the theoretically expected direction with RN staffing, quality of care, and frequency of adverse events in hospitals and hemodialysis facilities (Sochalski, 2001, 2004; Thomas-Hawkins et al., 2008).

Data Analysis

To prepare data for analyses, burnout scores were dichotomized into two categories: (a) no occupational burnout as indicated by a score on the EES of 26 or less and (b) a state of occupational burnout indicated by a score on the EES of 27 or higher. To compare the effects of differing levels of predictor variables on burnout, scores for each predictor were collapsed into quartiles based on their distribution in the sample; approximately 25% of the sample composed each quartile. The four staffing quartiles were computed as (a) up to 4.61 patients per RN (lowest patient-to-RN ratio or “best” staffing), (b) 4.62 to 7.99 patients per RN, (c) 8 to 11.99 patients per RN, and (d) 12 or more patients per RN (highest patient-to-RN ratio or “worst” staffing). Likewise, composite PES scores were collapsed into quartiles that ranged from the lowest PES scores (2.36 or lower), indicating the least supportive environment, to the highest PES scores (3.14 or higher), indicating the most supportive environment. The reported numbers of necessary care activities left undone were also collapsed into quartiles, which ranged from no care activities left undone to three or more care activities left undone.

Results

Descriptive statistics were computed for all study variables. Scores on the EES ranged from 0 to 54 ($M = 21.3$, $SD = 11.1$). Burnout was prevalent in this sample in that a total of 31% ($n = 132$) of the 422 RNs in the sample of RNs had scores of 27 or higher on the EES. Patient-to-RN ratios ranged from 1 to 48 ($M = 9.6$, $SD = 7.1$), practice environment scores ranged from 1.1 to 4.0 ($M = 2.8$, $SD = 0.5$), and workload scores ranged from 5 to 20 ($M = 10.9$, $SD = 3.2$). A total of 23.3% of RNs reported that their workload will cause them to look for a new position, 11.1% reported they were planning to leave their current position within the next 12 months but remain with their current employer, and an additional 8.2% reported they were planning to leave their employing facility within the next 12 months. Among those planning to leave their position yet stay with their employer, 47.6% were planning to move to a non-patient-care role, 35.7% were planning to move to a direct patient care role outside of the dialysis center or unit, and 9.5% were planning to move to a position outside of nephrology nursing practice; only 7.1% of nurses who reported intentions to leave their position and stay with their employer were planning to assume a new role in the dialysis unit or center that included direct patient care. Last, there were no associations between demographic variables, including number of years of experience and number of years practicing in nephrology settings, and outcome variables of burnout and intentions to leave.

The results of logistic regression models are summarized in Table 2, indicating that the individual, or unadjusted, effects of (a) higher patient-to-RN ratios, (b) higher workloads, (c) least supportive practice environments, and (d) three or more care activities left undone were significantly associated with higher odds on nurse burnout. Among these significant predictor variables, workload had the largest unadjusted effect on burnout. Figure 2 graphically depicts the distribution of burned-out RNs across differing levels of workload, indicating that among the 132 RNs suffering from burnout, 59% had workload scores of 13 or higher.

As presented in Table 2, when estimating the adjusted effects, controlling for the effects of other predictor variables, respondents reporting the highest workloads were 5 times as likely to be burned out compared to RNs reporting lowest workloads. Respondents who rated their practice environments as least supportive were more than 4 times as likely to be burned out compared to RNs who rated their practice environment as most supportive. Moreover, respondents who reported leaving three or more necessary patient care activities undone during their most recent work shift were more than twice as likely to be burned out when compared to their colleagues who reported leaving no necessary patient care activities undone. The adjusted effects of higher patient-to-nurse ratios, however, were not significant. Recognizing a significant association ($r = .34$, $p = .00$) between the Staffing and Resource Adequacy subscale of the PES and patient-to-RN ratios in these data, the model was re-estimated after deleting the Staffing subscale from the composite PES measure in an effort to reduce collinearity among predictors. The results, however, were unchanged in that the adjusted effects of patient-to-nurse ratios remained insignificant. Therefore, the effects of the five subscale PES composite measure, which includes the Staffing and Resource Adequacy subscale are presented in Table 2.

Last, logistic regression was used to estimate the effects of burnout on the odds on (a) nurses' intentions to leave their current positions yet stay with their employer and on (b) nurses' intentions to leave their employer. Nurses who were burned out were 3 times as likely, compared to nurses who were not burned out, to be planning to stay with their employer but leave their current position, $OR = 3.0$ (1.7, 5.0), $p = .00$. Similarly, nurses who suffered from burnout were almost 3 times as likely to be planning to leave their employer, $OR = 2.70$ (1.59, 5.86), $p = .00$.

Discussion

Findings from this study indicate that one in three dialysis nurses in the sample was suffering from occupational burnout. Although this proportion of burnout is consistent with that reported among hospital-based nurses (Aiken et al., 2001; Flynn, 2007b), it is, nonetheless, unacceptably high. As nurses' contributions to patient safety and outcomes are increasingly quantified, it becomes apparent that an adequate supply of experienced nurses in all areas of practice, including chronic hemodialysis facilities, is essential to ensuring quality patient care. Thus, in the interest of patients, it is imperative to recognize and to address the high rates of nurse burnout in practice settings. Moreover, given that burnout can result in serious health risks for nurses and their families, it must also be recognized as a significant occupational health problem warranting the attention of employers, unions, policy makers, and the community of occupational health professionals.

Evidence-based strategies must be implemented in health care organizations aimed at reducing the likelihood of nurse burnout. A high workload, independent of patient ratios, was the single greatest contributor to burnout in this sample, both before and after adjusting for the effects of other predictors. Based on the findings of this study, reductions in nurses' workloads will be a key initiative in preventing or reducing nurse burnout. In collaboration, managers and staff nurses in chronic hemodialysis facilities need to identify the array of tasks and activities in which dialysis RNs engage, identify activities that are best accomplished by an RN, and reassign remaining tasks to more appropriate personnel, freeing RNs to concentrate on patient care.

Consistent with findings from hospital-based studies (Aiken, Clarke, & Sloane, 2002; Aiken et al., 2008), another significant predictor of nurse burnout was a nonsupportive practice environment. Fortunately, the characteristics of practice environments are malleable and can be modified through administrative policy and actions. Supportive traits such as staff input into decisions and policies, supportive and competent managers, flexible schedules, continuing education offerings, and efficacious continuing quality improvement activities can and should be implemented in chronic hemodialysis facilities.

Findings from this study also indicate that impaired nursing care processes significantly contribute to nurse burnout independently of workload or practice environment. Nurses strive to provide quality patient care, desiring to work in organizations that support their quality efforts (Flynn, 2008; McClure & Hinshaw, 2002). Yet according to these findings, when nurses must leave important patient care activities undone because they did not have time to complete them, the likelihood of burnout significantly increases. Thus, impaired nursing care processes can be harmful to patients and nurses as well.

Overall, study findings support the relationships proposed by the Nursing Organization and Outcomes Model. High workloads, unsupportive practice environments, and impaired care processes were significantly associated with increased odds on nurse burnout. Importantly, nurses experiencing burnout were more likely to be planning to leave their jobs, whether their plans included leaving their position or leaving their employer. These findings have crucial implications for administrators of dialysis facilities concerned about retaining their nursing staff and adhering to new federal staffing requirements.

Nurse managers and administrators in chronic hemodialysis facilities who are interested in retaining direct care RNs should carefully examine the working conditions of their nurses. Findings from this study indicate that nurse burnout and, subsequently, intentions to leave can be reduced by ensuring reasonable workloads, creating a supportive work environment, and redesigning responsibilities so that nurses have time to complete important and necessary care

activities. By ensuring that nurses' workloads allow them time to provide quality care, hemodialysis providers will enhance the well-being of nurses and the patients they serve.

References

- Ahola K, Honkonen T, Virtanen M, Kivimäki M, Isometsä E, Aromaa A, et al. Interventions in relation to occupational burnout: The population-based health 2000 study. *Journal of Occupational and Environmental Medicine* 2007;49:943–952. [PubMed: 17848850]
- Aiken LH, Clarke SP, Sloane DM. Hospital staffing, organization, and quality of care: Cross-national findings. *International Journal for Quality in Health Care* 2002;14:5–13. [PubMed: 11871630]
- Aiken LH, Clarke SP, Sloane DM, Lake ET, Cheney T. Effects of hospital care environment on patient mortality and nurse outcomes. *The Journal of Nursing Administration* 2008;38(5):223–229. [PubMed: 18469615]
- Aiken LH, Clarke SP, Sloane DM, Sochalski JA, Busse R, Clarke H, et al. Nurses' reports on hospital care in five countries. *Health Affairs* 2001;20(3):43–53. [PubMed: 11585181]
- Burke RJ, Greenglass ER. Hospital restructuring, work-family conflict and psychological burnout among nursing staff. *Psychology and Health* 2001;16:83–94.
- Centers for Medicare and Medicaid Services. Draft interpretive guidelines for end stage renal disease. 2007 [Retrieved December 2, 2008]. from <http://www.cms.hhs.gov/SurveyCertificationGenInfo/downloads/SCLetter08-31.pdf>
- Cox, K. Individual workload perception scale user's manual. Kansas City, MO: Children's Mercy Hospitals and Clinics; 2003.
- Cox KS, Teasley SL, Zeller RA, Lacey SR, Parsons L, Carroll CA, et al. Know staff's intent to stay. *Nursing Management* 2006;37:13–15. [PubMed: 16395045]
- Dillman, D. Mail and internet surveys: The tailored design method. Vol. 2nd ed.. Hoboken, NJ: John Wiley and Sons, Inc.; 2007.
- Ericson-Lidman E, Standberg G. Burnout: Co-workers' perceptions of signs preceding workmates' burnout. *Journal of Advanced Nursing* 2007;60(2):199–208. [PubMed: 17877567]
- Figley, CR. Burnout in families: The systematic cost of caring. Boca Raton, FL: CRC Press; 1998.
- Flood AB. The impact of organizational and managerial factors on the quality of care in health care organizations. *Medical Care Review* 1994;51:381–428. [PubMed: 10139532]
- Flynn L. Extending work environment research into home health settings. *Western Journal of Nursing Research* 2007a;29(2):200–212. [PubMed: 17337622]
- Flynn, L. The state of the nursing workforce in New Jersey: Findings from a statewide survey of registered nurses. Newark: New Jersey Collaborating Center for Nursing; 2007b.
- Flynn, L. Workload, quality of care, and job satisfaction in home health nurses. In: Dickson, GL.; Flynn, L., editors. *Nursing policy research: Turning evidence-based research into health policy*. New York: Springer; 2008. p. 143-150.
- Flynn, L.; Thomas-Hawkins, C.; Bodin, S. Using research to influence federal policy: The nephrology nurses' experience. In: Dickson, GL.; Flynn, L., editors. *Nursing policy research: Turning evidence-based research into health policy*. New York: Springer; 2008. p. 81-84.
- Gardner JK, Thomas-Hawkins C, Fogg L, Latham CE. The relationship between nurses' perceptions of the hemodialysis unit work environment and nurse turnover, patient satisfaction, and hospitalizations. *Nephrology Nursing Journal* 2007;34(3):271–281. [PubMed: 17644871]
- Lacey SR, Cox KS, Lorring KC, Teasley SL, Carroll CA, Sexton K. Nursing support, workload, and intent to stay in magnet, magnet-aspiring, and non-magnet hospitals. *The Journal of Nursing Administration* 2007;37(4):199–205. [PubMed: 17415107]
- Lake ET. Advances in understanding and predicting nurse turnover. *Research in the Sociology of Health Care* 1998;15:147–171.
- Lake ET. Development of the practice environment scale of the nursing work index. *Research in Nursing & Health* 2002;25(3):176–188. [PubMed: 12015780]
- Leiter MP, Laschinger HK. Relationships of work and practice environment to professional burnout: Testing a causal model. *Nursing Research* 2006;55(2):137–146. [PubMed: 16601626]

- Levy R. CMS proposed revisions to conditions for participation: Part III: Administrative provisions. *Dialysis and Transplantation* 2006;35:304–312. 336–339.
- Maslach, C. *Burnout—The cost of caring*. Cambridge, MA: Malor Books; 2003.
- Maslach, C.; Jackson, SE. *Maslach burnout inventory*. Vol. 2nd ed.. Palo Alto, CA: Consulting Psychologists Press; 1986.
- Maslach, C.; Leiter, MP. *The truth about burnout*. San Francisco: Jossey-Bass; 1997.
- Maslach C, Leiter MP. Early predictors of job burnout and engagement. *Journal of Applied Psychology* 2008;93(3):498–512. [PubMed: 18457483]
- Maslach C, Schaufeli WB, Leiter MP. Job burnout. *Annual Review of Psychology* 2001;52:397–422.
- McClure, ML.; Hinshaw, AS. *Magnet hospitals revisited: Attraction and retention of professional nurses*. Washington, DC: American Nurses Publishing; 2002.
- Melamed S, Shirom A, Toker S, Berliner S, Shapira I. Burnout and risk of cardiovascular disease: Evidence, possible causal paths, and promising research directions. *Psychological Bulletin* 2006;32(3):327–353. [PubMed: 16719565]
- Melamed S, Shirom A, Toker S, Shapira I. Burnout and risk of type 2 diabetes: A prospective study of apparently healthy employed persons. *Psychosomatic Medicine* 2006;68:863–869. [PubMed: 17132837]
- Murphy SA, Duxbury L, Higgins C. The individual and organizational consequences of stress, anxiety, and depression in the workplace. *Canadian Journal of Community Mental Health* 2006;25(2):143–157.
- Rafferty AM, Clarke SP, Coles J, Ball J, James P, McKee M, et al. Outcomes of variation in hospital nurse staffing in English hospitals: Cross-sectional analysis of survey data and discharge records. *International Journal of Nursing Studies* 2007;44(2):175–182. [PubMed: 17064706]
- Saleh P, Shapiro C. Disturbed sleep and burnout: Implications for long-term health. *Psychosomatic Research* 2008;65:1–3.
- Saran R, Bragg-Gresham JL, Rayner HC, Goodkin DA, Keen ML, Van Dijk PC, et al. Nonadherence in hemodialysis: Associations with mortality, hospitalization, and practice patterns in DOPPS. *Kidney International* 2003;64:254–262. [PubMed: 12787417]
- Schuitemaker GE, Dinart MD, Van der Pol GA, Appels A. Assessment of vital exhaustion and identification of subjects at risk of myocardial infarction in general practice. *Psychosomatics* 2004;45(5):414–416. [PubMed: 15345786]
- Sehgal AR, Snow RJ, Singer ME, Amini SB, DeOreo PB, Sivler MR, et al. Barriers to adequate delivery of hemodialysis. *American Journal of Kidney Diseases* 1998;31(4):593–601. [PubMed: 9531174]
- Shortell, SM.; Kaluzny, AD., editors. *Health care management: A text in organizational theory and behavior*. New York: John Wiley & Sons; 1988.
- Sochalski J. Quality of care, nurse staffing, and patient outcomes. *Policy, Politics, & Nursing Practice* 2001;2(1):9–18.
- Sochalski J. Is more better? The relationship between nurse staffing and the quality of nursing care in hospitals. *Medical Care* 2004;42:67–73.
- Thomas-Hawkins C, Flynn L, Clarke SP. Relationships between registered nurse staffing, processes of nursing care, and nurse-reported patient outcomes in chronic hemodialysis units. *Nephrology Nursing Journal* 2008;35(2):123–131. [PubMed: 18472681]
- U.S. Renal Data System. *URSDS annual data report: ESRD incidence & prevalence*. 2007 [Retrieved August 31, 2008]. from: http://www.usrds.org/2007/pdf/02_incid_prev_07.pdf

Figure 1. Nursing Organization and Outcomes Model

Note: Aiken, Clarke, & Sloane, 2002, by permission of Oxford University Press.

Figure 2. Distribution of RNs With Emotional Exhaustion Scores ≥ 27 by Workload (n = 132)

Table 1
Demographic Characteristics of the Study Sample

Variable	<i>M</i>	<i>SD</i>
Age	48.6	8.1
Years in current position	7.8	6.8
Years working for current employer	10.4	9.2
Years in nephrology nursing	13.2	8.6
	<i>n</i>	%
Gender		
Female	394	93.4
Male	26	6.2
Not reported	2	0.5
Race		
African American/Black	29	6.9
Asian/Pacific Islander	31	7.4
Hispanic	8	1.9
White/Caucasian	346	82.0
Other	5	1.1
Not reported	3	0.7
Nursing education		
Diploma	76	18.0
Associate degree	153	36.3
Baccalaureate degree	173	41.0
Master's degree	11	2.6
Not reported	9	2.1

Table 2

Effects of Heaviest Patient-to-RN Ratios, Highest Levels of Workload and Care Activities Left Undone, and Least Supportive Work Environment on Odds of Nurse Burnout

	Estimated Separately (Gross Effect) OR (95% CI)	Estimated Jointly (Net Effect) OR (95% CI)
Patient-to-RN ratio (12 or more patients vs. 4.61 or less)	1.83 [*] (1.04, 3.22)	<i>ns</i>
Workload (Scores of 13 or higher vs. 8 or less)	12.37 ^{***} (5.86, 26.07)	5.23 ^{***} (2.18, 12.57)
Practice environment (Scores of 2.43 or lower vs. 3.21 or higher)	12.13 ^{***} (5.90, 24.93)	4.60 ^{**} (1.96, 10.78)
Care left undone (3 or more vs. none)	8.75 ^{***} (4.50, 17.01)	2.68 [*] (1.17, 6.14)

Note: OR = Odds Ratio; CI = Confidence Interval.

*
 $p < .05$.

**
 $p < .01$.

 $p < .001$.