HEALTH POLICY AND SYSTEMS

Critical Thinking of Nurse Managers Related to Staff RNs' Perceptions of the Practice Environment

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Abstract

Background Information and Significance: Critical thinking (CT) skills and the inclination to engage in critical thinking are essential for nurse managers to function as transformational leaders capable of influencing staff to align with organizational goals. In an extensive literature review, numerous studies were found examining the concept of CT in students and no studies were found exploring CT in nurse managers. Identifying the attributes, such as CT, that lead to success in the nurse manager role is useful when preparing nurse managers to lead effectively in the current healthcare climate.

Research Question: Is there a difference between nurse managers' CT dispositions and their respective staff nurses' perceptions of the practice environment?

Design: A convenience sample of 12 nurse managers and a random sample of 132 of their respective staff registered nurses (RNs) participated in this descriptive study. CT in nurse managers was measured by the California Critical Thinking Disposition Inventory (CCTDI). Staff RNs' perceptions of the practice environment were measured by the Practice Environment Scale (PES). The research question was answered using a *t* test.

Findings: Significant ($p < .001$) differences were found between specific nurse managers' CCTDI scores for open-mindedness, analyticity, and critical thinking confidence, and significant differences ($p < .01$) were found for systematicity when compared with their respective staff RNs' mean subscale and overall PES scores.

Conclusions: Results of the study support the positive relationship between strength in critical thinking dispositions of nurse managers and their respective staff RNs' perceptions of the practice environment. Nurse managers with stronger CT dispositions may be better able to create positive practice environments that are conducive to job satisfaction and thus the retention of staff RNs. Inclusion of strategies to support the development and use of CT in nurse managers is recommended. CT and other leadership attributes and skills including emotional and social intelligence and management of change through an appreciative inquiry process may provide opportunities to improve leadership effectiveness in nurse managers.

Clinical Relevance: Enhancing critical thinking skills and dispositions of nurse managers may help to create positive work environments for staff RNs. Staff RNs who work in an environment perceived to be positive may be in a better position to deliver high quality, safe patient care.

Globally, there is an increasing shortage of registered nurses (RNs). The World Health Organization estimates that an additional 2.4 million healthcare professionals, including physicians, nurses, and midwives, are needed to provide coverage for the world's basic healthcare needs (World Health Organization [WHO], 2006). The deficit in the number of RNs needed in the United States is expected to reach 285,000 by 2020 and 500,000 by 2025 (Donelan, Buerhaus, DesRoches, Dittus, & Dutwin, 2008). Similar shortages are predicted in Australia (Drury, Francis, & Chapman, 2009) and Canada (Wilson, Squires, Widger, Cranley, & Tourangeau, 2008). Healthcare enterprises in many countries face a challenge caused by a growing shortage of healthcare workers. This projected sustained shortage is due to multiple factors, including changing demographics (i.e., lengthening life span), insufficient nursing education programs, and, in the case of the United States, insufficient numbers of nursing faculty, as well as healthcare worker dissatisfaction with the work environment (American Hospital Association [AHA], 2002; American Nurses Association [ANA], 2002; Sherman, 2005).

Identifying factors that lead to satisfaction of the RN staff nurse role is important to attract and keep nurses in the workforce to mitigate the worsening nursing shortage. The practice environment in which nurses work has been shown to influence staff nurse job satisfaction and the subsequent retention of nurses (Mark, Salyer, & Wan, 2003; Scott, Gleason, Sochalski, & Aiken, 1999; Sleutel, 2000). Attributes of the professional practice environment found to significantly influence staff nurse satisfaction are nurse participation in hospital affairs, staffing and resource adequacy, nursing foundations for quality care, nurse manager ability and support, and collegial nurse-physician collaboration (Aiken, Havens, & Sloane, 2000; Andrews & Dziegielewski, 2005; Anthony et al., 2005; Friese, 2005; Lake & Friese, 2006; Wong & Cummings, 2007; Zangaro & Soeken, 2007).

The nurse manager, defined as the manager with 24-hour responsibility for the operation of a patient care unit, is in a key position to create an environment that influences staff nurses' job satisfaction. Staff satisfaction is highly correlated to patient satisfaction (Harter, Schmidt, & Hayes, 2002). High levels of staff and patient satisfaction are goals that must be reached on the patient care unit level. These goals are integral to achieving quality clinical care outcomes and patient loyalty. Patient-expressed loyalty can influence decisions of care providers to choose among hospital enterprises to admit patients for care. The employees' relationship to their manager has been shown to positively correlate with staff satisfaction (Harter et al.). Specific to nurses' job satisfaction, relationships with their manager and a per-

ceived positive professional practice environment have been found to significantly impact RN job satisfaction (Wong & Cummings, 2007; Zangaro & Soeken, 2007).

Nurse managers are recognized as leaders with attributes that could enable the patient care unit and enterprise to achieve organizational goals. Five key leadership attributes necessary to influence organizational success were identified by Lemire (2001) in a large descriptive study. These attributes include being a visionary, expert achiever, communicator, mentor, and critical thinker. Both critical thinking skills (interpretation, analysis, evaluation, inference, explanation, and self-regulation) and dispositions of critical thinking (truth-seeking, open-mindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and critical thinking maturity) have been described as important competencies for nurse leaders (Facione & Facione, 1996; Lemire). Nurse managers' critical thinking skills and inclination to use those skills influence their decision-making and problem-solving abilities. Ways in which nurse managers engage in decision making and problem solving influence the establishment of work flow and structure for patient care delivery on a unit. The nurse manager's ability to creatively problem solve and develop relationships with staff can positively influence the practice environment and nurses' job satisfaction. Exploring relationships between nurse managers' critical thinking abilities and RN perceptions of the practice environment is an important consideration when seeking to enhance the professional practice environment to attract and retain nurses. Professional development and educational programs for nurse managers might include critical thinking strategies to support the creation of a more positive practice environment for nursing staff.

Purpose

The purpose of this study was to explore the differences between nurse managers' dispositions to use critical thinking skills and their respective staff RNs' perceptions of the practice environment.

Design

In this descriptive study nurse managers were categorized as weak or strong in critical thinking dispositions based on scores achieved on the California Critical Thinking Disposition Inventory (CCTDI). Then, staff RNs from the units of participating nurse managers completed the Practice Environment Scale (PES). Staff nurses' PES results were dichotomized based on the critical thinking disposition scores of their nurse managers. A two-tailed,

independent sample *t* test was conducted to determine if there were significant differences in the PES mean overall and subscale scores of the two groups of staff RNs.

Setting

The study was conducted at a 490-bed voluntary, non-profit, tertiary care hospital located in the northeastern United States.

Tools

Nurse managers' critical thinking dispositions were assessed by the CCTDI, a tool developed to measure the disposition or attitudes toward critical thinking. A good critical thinker has the skills as well as the mind-set to value and use critical thinking. Critical thinking skills and the dispositions of the ideal critical thinker were identified in the American Philosophical Association's (APA) Delphi study (Facione, Facione, & Sanchez, 1994). This study included 46 experts on critical thinking from a variety of disciplines who defined critical thinking skills as interpretation, analysis, evaluation, inference, explanation, and self-regulation and the dispositions of critical thinking as truth-seeking, open-mindedness, analyticity, systematicity, critical thinking self-confidence, inquisitiveness, and critical thinking maturity (Facione & Facione, 1996). Based on the APA Delphi study definition of critical thinking dispositions, a total of 225 items, scored on a 6-point Likert scale, were created. After review by expert critical thinking educators, the number of items was reduced to 150 and then underwent factor analysis, resulting in retention of 75 items grouped into seven subscales: truth-seeking (appraises new information based on evidence), open-mindedness (welcomes divergent views while being aware of one's own biases), analyticity (uses reason and evidence to solve problems), systematicity (is organized and focused in inquiry), critical thinking self-confidence (trusts in one's own reasoning and judgment), inquisitiveness (has desire for learning), and critical thinking maturity (is prudent in making decisions; Facione & Facione, 2007; Facione et al.).

Reliability testing of the final 75 items was conducted on an initial sample of 160 college students and a subsequent study of 1,019 college students. Cronbach alpha scores for the seven subscales in the initial study ranged from .71 to .80, and the overall score for critical thinking disposition was .91. The Cronbach alpha reliabilities for the subsequent studies ranged from .60 to .78 on the subscales and .90 on the overall score. The CCTDI is therefore considered a reliable tool to measure critical thinking dispositions (Facione et al., 1994).

Each of the 75 items on the CCTDI targets one of the seven critical thinking dispositions and is scored using a continuous 6-point Likert scale from 1 (*disagree strongly*) to 6 (*agree strongly*); a lower score of 1, 2, or 3 indicates weakness, while a higher score of 4, 5, or 6 indicates strength in the targeted disposition. The specific disposition subscale score is a sum of the total points across all the items on the particular subscale, and the subscales are summed to yield an overall scale score. Possible subscale scores range from 10 to 60, and the possible total overall score ranges from 70 to 420. Subscale scores of 40 and above indicate strength in the disposition, and scores of 39 and below indicate weakness in the disposition. The CCTDI uses a forced-choice Likert scale that requires the respondent to agree with the item scoring a 4, 5, or 6 or disagree with the item scoring a 1, 2, or 3, and thus allows for use of a cutoff score of 40; scores above 40 indicate strength in the disposition and scores of 39 and below indicate weakness in the disposition (Facione & Facione, 2007; N. Facione, personal communication, March 2, 2009).

The practice environment was measured by the Practice Environment Scale (PES), a tool designed to examine nurses' job satisfaction (Lake, 2002; Mark et al., 2003). The PES was developed from the Nursing Work Index (NWI) and was originally composed of 65 items that described organizational structures identified in the original magnet studies as necessary to support professional nursing practice. The survey data used to develop the 65 items were derived from two different samples of nurses. The first sample of 2,336 nurses was from 16 magnet and 8 nonmagnet hospitals. The second sample of nurses included 80,500 nurses randomly sampled from all nurses in Pennsylvania (Lake, 2002).

The original 65 items of the NWI were reviewed by experts in nurse job satisfaction and a practicing staff nurse to determine if the item met the definition of a professional practice environment. Based on this review, the 65 items were reduced to 48 items, and then to 31 items grouped into five subscales: nurse participation in hospital affairs, nursing foundations for quality of care, nurse manager ability, leadership and support of nurses, staffing and resource adequacy, and collegial nurse-physician relations (Lake, 2002).

Reliability testing of the final 31 items was conducted on both individual nurse scores and on the aggregate of subscale scores. Individual nurse subscale scores (*n* = 1,610) were analyzed using Cronbach's α, with $\alpha > .80$ for all subscales except the collegial nurse-physician relations ($\alpha = .71$). The nurse manager ability, leadership, and support of nurses subscale scored the highest α at .84 (Lake, 2002). The PES is considered a robust tool that has

been endorsed by the National Quality Forum and is used by the ANA as part of the National Database of Nursing Quality Indicators to measure staff nurse job satisfaction (Lake, 2007).

The items on the PES are scored on a 4-point Likert scale of 4 (*strongly agree*), 3 (*agree*), 2 (*disagree*), and 1 (*strongly disagree*). Subscale mean scores of 2.5 and above indicate agreement with the item. Subscale mean scores of 2.4 and below indicate disagreement with the item. The individual nurse subscale scores are calculated as a mean score for the items included in the subscale. The composite, overall score is a mean calculated from the five subscale scores (Lake, 2007). The Cronbach alpha scores for the Practice Environment Subscales for my study are: (a) nurse participation in hospital affairs (a = .83); (b) nursing foundations for quality of care (a = .77); (c) nurse manager ability, leadership, and support (a = .91); (d) staffing and resource adequacy (a = .84); and (e) collegial nurse-physician relations (a = .83).

Sample

Following internal review board approval, 38 nurse managers who met the inclusion criteria of at least 6 months' experience in their current position and the ability to read and write English were invited to participate in the study. A total of 16 nurse managers completed the survey, 4 surveys were submitted but had missing information and could not be used, and 22 nurse managers did not submit completed surveys within the 2-week data collection time frame. The final sample contained 12 CCTDI surveys for a return rate of 31.6%. The 12 nurse manager participants were responsible for 13 patient care units that included medical-surgical, critical care, emergency, postanesthesia care (PACU), labor and delivery, postpartum, and nursery. Procedure areas such as cardiac catheterization and electrophysiology laboratory, ambulatory renal hemodialysis, and ambulatory infusion and transfusion were also included.

Inclusion criteria for staff RNs were full- or part-time employment for at least 6 months on a patient care unit whose nurse manager had participated in the study and the ability to read and write English. Based on a review of the literature relevant to perceptions of the practice environment measured by the PES, a sample size of at least 128 staff RNs was required derived from a stat power analysis using G Power 3 with a parameter of a two-tailed *t* test of independent groups, with medium effect size of .50, an α of .05, and a power of .80 (Faul, Erdfelder, Lang, & Buchner, 2007; Lake, 2002, 2007).

Based on an anticipated response rate similar to that of the nurse managers of approximately 30%, a random sample of 327 (70%) of the 467 eligible staff RNs were invited to participate in the study to ensure the required number of surveys was obtained for analysis. The names of all staff RNs from participating units were placed into a paper bag and drawn until 327 names were obtained. Individually addressed packets containing the invitation to participate, demographic and PES surveys, and a sealable return envelope were delivered to each participating unit for distribution to the selected staff RNs. This sampling methodology was used to control for the bias that completely voluntary participation might have created. The completed surveys were returned to secured ballot boxes placed throughout the hospital for a 2-week period.

Results

A total of 12 (31.6%) nurse managers were included in the final sample. The nurse managers in the study were predominantly female (91.7%), caucasian (83.3%), and highest degree held was a bachelor of science in nursing (BSN) degree (59%). The age of the nurse managers ranged from 28 to 60 years, with a mean of 47.33 years. Total time of RN experience ranged from 5 to 42 years, with a mean of 23.3 years. Total time of nurse manager experience ranged from 1 to 27 years, with a mean of 11.3 years. Time in the current nurse manager position ranged from 1 to 27 years, with a mean of 10.42 years. The types of patient care units for which the nurse managers were responsible were two (15%) medical-surgical; three (23%) critical care; one (8%) emergency department; one (8%) PACU; one (8%) labor and delivery; one (8%) postpartum-nursery; two (15%) cardiac procedures; and two (15%) ambulatory procedure areas, including chemotherapy and infusion, and dialysis.

The demographic profile of the staff RNs in the study was similar to that of the nurse managers in age, gender, and education. The staff RNs were predominantly women (95.5%), and held a BSN (61%). More of the staff RNs had an associate degree (26%) than did the nurse managers (8%). The average age of the staff nurse respondents was 41.39 years, with an average of 15.8 years of RN experience and an average of 8.05 years in their current position. The ethnicity of the staff nurses differed from that of the nurse managers: 60% of staff RNs and 84% of nurse managers were caucasian. This reflects that the staff nurses were more diverse in ethnicity than the nurse managers. The demographic data of the nurse managers and the staff nurses used in this study were similar to the overall population of nurses employed at this enterprise.

The descriptive statistics for the subscales and the composite score are displayed in **Table 1**. The critical thinking

Table 1. Nurse Manager California Critical Thinking Disposition Inventory (CCTDI) Score Distribution and Standard Deviation by Subscale

CCTDI Scale	n	Minimum score	Maximum score	Mean score	Median score	SD
Truth-seeking	12	30.00	50.83	42.08	42.91	5.19
Open-mindedness	12	35.00	51.67	43.33	43.75	5.29
Analyticity	12	36.36	52.73	45.37	46.36	5.41
Systematicity	12	34.55	53.64	44.54	44.54	5.14
CT confidence	12	38.89	58.89	47.82	47.22	6.00
Inquisitiveness	12	41.00	57.00	50.50	52.50	5.10
Cognitive maturity	12	41.00	51.00	46.75	47.00	2.98
Total	12	281.74	352.17	320.41	321.02	23.70

Note. CT = critical thinking.

disposition subscales of the nurse managers were examined, and five subscales (truth-seeking, open-mindedness, analyticity, systematicity, and critical thinking confidence) had scores that could be dichotomized as strength (subscale score of 40 and above) or weakness (subscale score of 39 and below) in the particular critical thinking disposition, but the scores on two subscales, inquisitiveness and cognitive maturity, were all in the "strength" range and thus were not dichotomized.

The dependent variable, staff RNs' perceptions of the practice environment, was derived from the overall and subscale scores of the PES. RN staff nurse scores were categorized according to their nurse managers' strength or weakness on the five subscales of the CCTDI. The group means, standard deviations, *t* test results, and level of significance are displayed in **Table 2**. As this table indicates, there are significant differences in PES scores when they were compared based on their nurse managers' strength or weakness on the CCTDI subscales of analyticity, systematicity, open-mindedness, and critical thinking confidence.

As **Table 2** indicates, there were significant differences in staff RNs' PES subscale and overall scores for five dimensions of the practice environment (participation in hospital affairs, staffing and resource adequacy, nursing foundations for quality care, nurse manager ability and support, and collegial nurse-physician collaboration) with regard to nurse managers' scores on four subscales (analyticity, systematicity, open-mindedness, and critical thinking confidence) of the CCTDI. The staff RNs' PES scores were consistently higher when the nurse managers showed a positive disposition in these four critical thinking domains. The only significant difference between nurses working for managers with strength versus weakness on the truth-seeking subscale was with the nurse-physician relationship. Based on these findings, there was a statistically significant positive relationship between nurse managers' critical thinking dispositions of analyticity, systematicity, open-mindedness, and critical

thinking confidence and their respective staff RNs' perceptions of the practice environment as measured by PES scores.

Discussion

The staff RNs' PES subscale and overall scores were consistently higher when the nurse managers' CCTDI subscale scores for analyticity, systematicity, open-mindedness, truth-seeking, and critical thinking confidence were 40 and above, indicating a strong disposition toward critical thinking. The analyticity subscale addresses being alert to problems, using evidence to solve problems, anticipating consequences, and intervening promptly when a problem is evolving (Facione et al., 1994). The nurse manager is the person on whom staff RNs depend for guidance in solving a myriad of problems that arise on a daily basis. Nurse managers strong in analyticity may be better able to effectively and promptly help solve clinical, interpersonal, knowledge deficit, or process-related problems. Nurse managers who are able to provide guidance for addressing issues and problems in a credible manner may create a feeling of trust and safety in staff RNs and a subsequent perception of support from their nurse manager. Those nurse managers with strength in analyticity are more likely to use evidence to solve problems that may foster staff RNs' perceptions of delivering high-quality, evidence-based care to patients.

Systematicity focuses on organized, orderly, diligent inquiry that engages reflective thought processes and carefully considered solutions (Facione & Facione, 2007). Nurse managers strong in systematicity may be better able to structure complex work processes on the unit such as time scheduling and work distribution that may be perceived by staff RNs as fair. Staff RNs require staffing adequacy in order to fulfill their work responsibilities. Therefore, an organized staffing system run by the nurse

Table 2. RN Staff Nurses' Practice Environment Scale scores by Nurse Managers' Critical Thinking (CT) Dispositions

	Weak CT Disposition NM score 39 and below		Strong CT Disposition NM score 40 and above				Significance level
	Mean	SD	Mean	SD	t	p	
Analyticity	(n = 28)		(n = 104)				
Participation	2.65	.43	2.98	.35	−4.196	.000	<.001
Quality of care	2.61	.41	2.96	.34	−4.692	.000	<.001
NM ability	2.65	.44	2.97	.39	−3.735	.000	<.001
Staffing	2.59	.43	2.91	.43	−3.521	.001	<.001
Nurse-physician relations	2.76	.34	2.95	.17	−4.049	.008	<.01
Overall score	2.65	.37	2.95	.31	−4.048	.000	<.001
Systematicity	(n = 30)		(n = 102)				
Participation	2.71	.45	2.96	.35	−3.108	.002	<.01
Quality of care	2.72	.44	2.93	.35	−2.183	.006	<.01
NM ability	2.70	.46	2.96	.40	−3.023	.003	<.01
Staffing	2.67	.46	2.89	.43	−2.454	.015	<.05
Nurse-physician relations	2.83	.15	2.93	.24	−2.802	.006	<.01
Overall score	2.73	.38	2.94	.32	−3.014	.003	<.01
Truth-seeking	(n = 29)		(n = 103)				
Participation	2.88	.27	2.91	.42	−.422	.674	NS
Quality of care	2.88	.26	2.89	.41	−.100	.921	NS
NM ability	2.87	.30	2.91	.45	−.464	.643	NS
Staffing	2.84	.32	2.84	.48	−.094	.925	NS
Nurse-physician relations	2.84	.14	2.93	.25	−2.419	.018	<.05
Overall score	2.86	.23	2.90	.37	−.492	.624	NS
Open-mindedness	(n = 47)		(n = 85)				
Participation	2.75	.44	2.99	.33	−3.469	.001	<.001
Quality of care	2.73	.42	2.97	.33	−3.524	.001	<.001
NM ability	2.74	.47	2.99	.37	−3.371	.001	<.001
Staffing	2.67	.47	2.94	.41	−3.341	.001	<.001
Nurse-physician relations	2.78	.26	2.98	.18	−4.780	.000	<.001
Overall score	2.74	.38	2.97	.29	−3.989	.000	<.001
CT confidence	(n = 7)		(n = 125)				
Participation	2.11	.41	2.95	.34	−6.350	.000	<.001
Quality of care	2.13	.41	2.93	.33	−6.161	.000	<.001
NM ability	2.08	.38	2.95	.38	−5.888	.000	<.001
Staffing	2.10	.40	2.88	.41	−4.905	.000	<.001
Nurse-physician relations	2.64	.11	2.93	.23	−3.360	.001	<.001
Overall score	2.21	.31	2.93	.30	−6.049	.000	<.001

Note. NM = nurse manager.

manager that ensures adequate daily staffing can be seen as supportive to nursing practice and the creation of a positive work environment and job satisfaction.

The open-mindedness scale addresses one's ability to be open and tolerant of divergent opinions and to respect the rights of others to hold different opinions (Facione & Facione, 2007). Open-mindedness is in concert with the nurse manager's ability to respect the varied opinions and needs of a diverse work force and solve problems in a flexible and creative way that demonstrates care and concern for staff. Staff RNs need to be heard and value the

opportunity to influence their nursing practice by participating collaboratively in the development of policy and procedures that govern the way practice is carried out on a patient care unit (Scott et al., 1999; Lake, 2002). Nurse managers strong in open-mindedness may be more comfortable with incorporating staff nurses' differing viewpoints and suggestions into structures and processes that govern unit practice, thus creating a collaborative work environment that is more satisfying to staff RNs.

The truth-seeking scale measures one's likelihood to be courageous in asking questions that may result in

information that does not support one's beliefs or opinions (Facione & Facione, 2007). The only significant difference found in the truth-seeking scale was nurse-physician relationships. Staff nurses depend on their manager to support them when there is a difference of opinion with physicians. Truth-seeking in the context of negotiating with physicians may be helpful in resolving conflict and building collaborative, mutually respectful relationships with physicians. However, strength in nurse managers' truth-seeking disposition did not have a statistically significant relationship to other dimensions and the overall score of the PES. It could be that staff RNs expect their nurse managers to be strong when questioning physicians but shy away from being asked difficult questions that may challenge their own perspective.

The CCTDI critical thinking confidence scale addresses trust in one's own reasoning. The person with strong critical thinking confidence demonstrates the ability to make sound decisions and believes that others rely on them to solve problems and decide what to do (Facione & Facione, 2007). Staff RNs may view nurse managers who are strong in critical thinking confidence as supporting their practice and thus creating a positive work environment. Overall, the sample of nurse managers had strong scores for critical thinking confidence. This may be attributed to the age and experience level of the nurse managers included in the study to be skilled in solving problems and making decisions.

Limitations

The ability to generalize findings of the study is limited in several ways. This study was conducted in a single tertiary medical center in the northeastern United States and may not be representative of the entire population of nurse managers and their respective staff nurses. Only those nurse managers who voluntarily chose to answer the CCTDI were included in the study. The limited nurse manager response, in turn, limited the inclusion of staff RNs to only those whose nurse manager chose to participate in the study. The random sample size for nurse managers (12/38 = 31.6%) and staff RNs (132/327 = 44%) limits the ability to generalize the findings to a broader population of nurse managers and their associated staff RNs.

Variables that may influence staff RNs' perceptions of the practice environment is the type of patient care unit worked on and full- or part-time work status and were not examined in this study. The small sample size limited the ability to address how the difference in type of unit may influence the staff RNs perceptions of the practice environment.

Conclusions

The nurse manager is in a pivotal role to influence the establishment of a professional practice environment for delivery of patient care that is conducive to staff RNs' job satisfaction. Identifying the attributes that lead to success in the nurse manager role is useful in preparing nurse managers to lead effectively in the current healthcare climate. Critical thinking skills and disposition to use those skills can be viewed as an antecedent to establishing work flows and creatively solving problems that support the establishment of a professional practice environment (Zori & Morrison, 2009). The findings from this research study support the relationship between nurse managers' critical thinking dispositions of open-mindedness, analyticity, systematicity, and critical thinking confidence and their respective staff RNs' perceptions of the practice environment. Both formal and informal educational strategies to encourage and support the development and use of critical thinking as well as other leadership skills such as emotional and social intelligence in nurse managers seem critical to the success of both individual leaders and their healthcare enterprises.

Chief nursing officers, directors of nursing, and nurse educators responsible for initial and ongoing maturation of nurse managers are challenged to find ways to encourage the development and use of critical thinking dispositions. Informal, ongoing interactions with nurse managers and formal leadership education programs could incorporate strategies to support the development of critical thinking skills and disposition to consistently apply these skills. Honing of emotional and social intelligence skills, inquiry-based learning, appreciative inquiry, critical incident analysis, concept mapping, case studies, role-play, and dialogue are useful techniques that may improve critical thinking (Facione & Facione, 2008; Raymond & Profetto-McGrath, 2005; Toofany, 2008; Zori & Morrison, 2009). Nurse managers may also improve critical thinking skills and dispositions by engaging in reflective journaling and participating in journal clubs to critique and analyze relevant leadership articles (Profetto-McGrath; Zori & Morrison).

Nurse managers skilled in the use of critical thinking may be better able to create positive practice environments that are conducive to job satisfaction and thus the retention of staff RNs. Increased retention of staff RNs can decrease turnover, and thus vacancy rates that are costly to healthcare enterprises. Therefore, investing in the development and support of critical thinking in nurse managers who, in turn, are able to create a more positive practice environment may help to improve the job satisfaction of staff RNs.

Replication of this study with a larger sample would be useful in further exploring the impact that nurse managers with strength in critical thinking may have on staff RNs' perceptions of the practice environment. It would also be interesting to explore how critical thinking strength of staff RNs may influence their perceptions of the practice environment. Strategies to strengthen critical thinking in nurse managers may likewise be used with staff RNs. Perhaps strengthening critical thinking skills in staff RNs might also improve their clinical practice and job satisfaction and provide a useful avenue for future research.

Clinical Resources

- American Hospital Association: http://www.aha.org
- American Organization of Nurse Executives: http://www.aone.org
- Insight Assessment: Measuring Critical Thinking Worldwide: http://www.insightassessment.com
- The Critical Thinking Community: Foundations for Critical Thinking: http://www.criticalthinking.org

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