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Factors contributing to nursing leadership: a systematic review

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***Objectives*: Leadership practices of health care managers can positively or negatively influence outcomes for organizations, providers and, ultimately, patients. Understanding the factors that contribute to nursing leadership is fundamental to ensuring a future supply of nursing leaders who can positively influence outcomes for health care providers and patients. The purpose of this study was to systematically review the multidisciplinary literature to examine the factors that contribute to nursing leadership and the effectiveness of educational interventions in developing leadership behaviours among nurses.**

***Methods*: The search strategy began with 10 electronic databases (e.g. CINAHL, Medline). Published quantitative studies were included that examined the factors that contribute to leadership or the development of leadership behaviours in nurse leaders. Quality assessments, data extraction and analysis were completed on all included studies.**

***Results*: A total of 27,717 titles/abstracts were screened resulting in 26 included manuscripts reporting on 24 studies. Twenty leadership factors were examined and categorized into four groups – *behaviours and practices* of individual leaders, *traits and characteristics* of individual leaders, influences of *context and practice settings*, and *leader participation in educational activities*. Specific behaviours and practices of individual leaders, such as taking on or practising leadership styles, skills and roles, were reported as significantly influencing leadership in eight studies. Traits and characteristics of individual leaders were examined in six studies with previous leadership experience (three studies) and education levels (two of three studies) having positive effects on observed leadership. Context and practice settings had a moderate influence on leadership effectiveness (three of five studies). Nine studies that examined participation in leadership development programs all reported significant positive influences on observed leadership.**

***Conclusion*: These findings suggest that leadership can be developed through specific educational activities, and by modelling and practising leadership competencies. However, the relatively weak study designs provide limited evidence for specific factors that could increase the effectiveness of current nursing leadership or guide the identification of future nurse leaders. Robust theory and research on interventions to develop and promote viable nursing leadership for the future are needed to achieve the goal of developing healthy work environments for health care providers and optimizing care for patients.**

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Introduction

Leadership has been studied in a wide variety of areas including psychology, military, education, management, health care and, most recently, in nursing. Recent reports suggest that leadership practices of formal nurse leaders and managers contribute to positive outcomes for organizations, patients,[1] and health care providers;[2] and that findings of leadership research in nursing have not been systematically examined. Although leadership has been conceptualized in many ways in the literature, the following elements are central to the definition of leadership: leadership (a) is a process; (b) entails influence; (c) occurs within a group setting or context; and (d) involves achieving goals that reflect a common vision.[3–6] Commonly-used leadership theories that grew out of psychology, sociology and business literatures translate to nursing. Theories of transformational leadership and, more recently, emotional intelligent leadership have guided nursing leadership research and interventions,

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presumably due to their emphasis on relationships as the foundation for effecting positive change or outcomes.[7] For this review, we use Northouse's definition of leadership – 'a process whereby an individual influences a group of individuals to achieve a common goal'.[4]

Effective nursing leadership provides guidance for solving complex problems related to nursing care delivery.[8] Nurse leaders create structure, implement processes for nursing care and facilitate positive outcomes.[9] With a forthcoming shortage of nursing leaders compounded by the current shortage of nurses, it is increasingly important to find ways to develop and retain nursing leaders to ensure positive outcomes in the health care system.[10,11] Developing nursing leaders and recruiting and retaining staff nurses into leadership positions[12] are essential components of succession planning for future nursing leadership.[13] Health care organizations spend considerable resources every year on personnel and leadership development, so understanding the factors that contribute to nursing leadership is imperative. The purpose of this review was to describe the findings of a systematic review of studies that examine the factors that contribute to enhancing nursing leadership and to make recommendations for further study.

After completing an initial scoping review of the nursing leadership development literature, we found two main themes. A larger group of studies examined factors contributing to enhancing nursing leadership using predominantly correlational survey designs and a smaller number of studies examined the effectiveness of educational interventions to develop leadership behaviour using quasi-experimental pre/post designs. From that scoping review, two research questions were developed that guided the full systematic review:

(1) What factors contribute to leadership in nursing?
(2) How effective are educational interventions in developing leadership behaviours among nurses?

Methods

Search strategy, data sources and screening

The search strategy began with ten electronic databases: CINAHL, Medline, PsychInfo, ABI, ERIC, Sociological Abstracts, Embase, Cochrane, Health Star and Academic Search Premier. Keywords used included 'leadership', 'research', 'evaluation' and 'measurement', to find studies published between 1985 and December 2006 that examined factors contributing to nursing leadership. See Appendix 3 (www.jhsrp.rsmjournals.com/cgi/content/full/13/4/240/DC1) for search strategy.

Inclusion criteria

Titles, abstracts and manuscripts were included if they met all inclusion criteria: (1) peer-reviewed research; (2) studies that measured leadership by nurses; (3) studies that measured one or more factors contributing to nursing leadership; and (4) studies that examined the relationship between these factors and nursing leadership. This excluded qualitative studies and grey literature.

Screening

Each abstract was reviewed twice for inclusion. Studies meeting inclusion criteria were categorized into nursing, other professions (such as medicine, teachers, etc.) and other settings (such as business, military or education). Due to the large volume of abstracts and only English language proficiency in our research team, we focused only on nursing studies published in English. All nursing studies were sorted into those that examined: (a) factors contributing to nursing leadership; (b) outcomes associated with nursing leadership; and (c) the measurement of leadership in nursing. The latter studies comprise two additional systematic reviews (submitted for publication).

Data extraction

The following data were extracted from included studies: author, journal, country, research purpose/questions, theoretical framework, design, setting, subjects, sampling method, measurement instruments and their reported reliability and validity, analysis, leadership measures, factors contributing to nursing leadership and significant/non-significant results. Two research team members completed and checked each data extraction.

Quality review

Each published article was reviewed twice for methodological quality by two team members using a quality assessment tool was adapted from several previously published systematic reviews.[1,14–16] The adapted tool (Appendix 1, see www.jhsrp.rsmjournals.com/cgi/content/full/13/4/240/DC1) was used to assess four areas of each study: research design, sampling, measurement and statistical analysis for a total of 14 possible points assigned from 13 criteria. Twelve items were scored as 0 (=not met) or 1 (=met) and one item related to the measurement of leadership was scored as 2 (=objective observation), 1 (=self-report) and 0 (= not met). Based on assessed points, each study fell into one of three categories: high (10–14), medium (5–9) and low (0–4).

Studies that reported on implementation of an educational intervention to develop leadership skills were assessed using a pre/post quality assessment tool adapted from another published systematic review.[15,17] The adapted tool (Appendix 2, www.jhsrp.rsmjournals.com/cgi/content/full/13/4/240/DC1) was used to assess six areas of each study: sampling, design, control of confounders, data collection and outcome measurement, statistical analysis and study dropouts. Thirteen items comprised the tool for a total of 16 points.

The primary author reviewed and approved all quality assessments, data extractions and analyses.

Results

Search results

The electronic database search yielded over 27,717 titles and abstracts. Following removal of duplicates, 18,963 titles and abstracts were screened using the inclusion criteria and 1278 manuscripts were retrieved. Of these, 141 were specific to nursing. Following quality assessment, 23 low quality correlational and exploratory/pilot studies were removed, leaving 118 nursing leadership studies. After final selection using the inclusion criteria for this review, 26 manuscripts (reporting 24 studies) were identified as examining the factors contributing to nursing leadership. Cunningham *et al.*[18,19] and Tourangeau[11,20] each had two included papers that reported on one study. The final 24 included quantitative studies and their characteristics are presented in Appendix 4 (see www.jhsrp.rsmjournals.com/cgi/content/full/13/4/240/DC1).

Sixteen of the 24 studies were conducted in the United States, two in Canada, one study in England and two had no country stated. For these two studies, the USA was assumed to be country of origin as their authors were located here.

Summary of quality review

The most common weaknesses in the 24 quantitative study designs related to sampling, design and analysis (Tables 1 and 2). Fifteen of the final 24 studies using correlational, non-experimental, cross-sectional or exploratory designs were rated as moderate or high (scores ≥ 5). However, these correlational designs limit interpretations of causality. The remaining nine studies used pre/post implementation (quasi-experimental) designs and were rated as low quality (scores < 0.60). None of these studies used a control group for comparison. Comparisons were made only within each sample before and after the educational intervention to assess for a change in leadership behaviours. Despite the low ratings, this group of studies contained valuable information on the development of nursing leadership and were retained. Only seven of the 24 included studies used probability sampling, partially due to the difficulty in using random sampling methods to study leadership in specific individuals or units. As these studies must target leaders and their followers, convenience sampling may be used more frequently. Most studies used correlational and regression analyses and 16 studies failed to report the management of outliers. Only one study addressed appropriateness of sample size and three addressed anonymity of respondents. Seventeen studies used samples from more than one site.

The majority of studies (19 of 24) used a theoretical framework to guide the research. Five of the nine pre/post

Table 1 Summary of quality assessment – 15 included correlational studies

	Studies (*n*)	
Criteria	**YES**	**NO**
Design		
Prospective studies	15	0
Used probability sampling	6	9
Sample		
Appropriate/justified sample size	1	14
Sample drawn from more than one site	13	2
Anonymity protected	4	11
Response rate >60%	8	7
Measurement		
Reliable measure of leadership	12	3
Valid measure of leadership	8	7
Effects (outcomes) were observed rather than self-reported*	2	13
Internal consistency ≥70 when scale used	9	6
Theoretical model/framework used	12	3
Statistical analyses		
Correlations analysed when multiple effects studied	5	10
Management of outliers addressed	4	11

*This item scored 2 points. All others scored 1 point

Table 2 Summary of quality assessment – nine included pre/post intervention studies

	Studies (*n*)		
Criteria: Pre/post intervention design	**YES**	**NO**	**N/A**
Sampling			
Was probability sampling used?	0	9	
Was sample size justified to obtain an appropriate power?	0	9	
Design			
One pre-test or baseline and several post-test measures*	3	6	
Simple before-and-after study	6	3	
Control of confounders			
Does the study employ a comparison strategy?	0	9	
Attempt to create or assess equivalence of the groups at baseline by:			
a) Matching*	0	9	
b) Statistical	9	0	
c) None	0	9	
d) The group comparisons were the same for all occasions (Pre, baseline and post evaluations)*			
Data collection and outcome measurement			
Was the dependent variable directly measured by an assessor?	4	5	
Were dependent variables either:			
a) directly measured*	4	5	
b) self-reported	5	4	
Were dependent variables measured reliably (with reliability indices previously or for this study)?	6	3	
Were dependent variables measured validly (with validity assessments previously or for this study)?	4	5	
Statistical analyses and conclusions			
Was (were) the statistical test(s) used appropriate for the main outcome and at least the 80% of the others?	9	0	
Were *P* values and confidence intervals reported properly?	9	0	
If multiple outcomes were studied, were correlations analysed?	1	0	8
Were missing data managed appropriately?	0	9	
Drop-outs			
Is attrition rate <30%	6	3	

*This item scored 2 points. All others scored 1 point

studies used a theoretical framework to test leadership development interventions. Ten of the 15 exploratory, correlational designs also used a theoretical framework to guide studies that examined whether particular traits, characteristics and behaviours were associated with the report of leadership (five self- and four observer-reported). These frameworks used a variety of leadership theories including Hersey and Blanchard's Situational Leadership Model, Kouzes and Posner's Leadership Challenge, Burns' Transformational Leadership, Bass and Avolio's Transformational and Transactional Leadership, and McLelland's Theory of Leadership Motivation.

Factors contributing to nursing leadership

The 24 included studies investigated relationships between various factors (20 different factors in total) and nursing leadership, primarily in acute care settings. Using content analysis, we categorized these factors into four groups based on similar themes: *behaviours and practices* of individual leaders, *traits and characteristics* of individual leaders, influences of *context and practice settings*, and *leader participation in educational activities* to develop leadership (Table 3).

Behaviour and practices of individual leaders

This category included eight studies that described factors contributing to nursing leadership that our research team conceptualized as arising from the conscious, purposeful actions or decisions of leaders.[21–27] Jenkins and Ladewig[23] reported how demonstrating and practising leadership skills increased leadership behaviours in both leaders and nurses who worked for those leaders. Initiating structure and consideration,

Table 3 Factors contributing to nursing leadership

Leadership factor	Source	Significant findings	Leadership
A. Behaviours and practices of individual leaders			
Demonstrating and practising leadership	Jenkins & Ladewig[23]	+	Enactive mastery and ability to lead groups (leaders)
		+	Modelling and leadership behaviours
		+	Practising leadership behaviours and self-efficacy, skill acquisition
Modelling leadership behaviours	Jenkins & Ladewig[23]	+	Self-efficacy in nurses
Leadership style	Perkel[30]	+	Leadership style predominantly transformational
	Goldenberg[21]	+	Leadership style is dominant (low task, high relationship)
Structuring and consideration behaviours	Norris & Vecchio[27]	+	Use of situational leadership
	Lucas[25]	+	Expertise in initiating structure and consideration
Managerial competencies	Kondrat[24]	+	Human, leadership categories ranked highest versus technical
Length of time in present position	Irurita[22]	—	Length of time in position and effectiveness
Role-taking and effectiveness	Mansen[26]	+	
B. Traits and characteristics of individual leaders			
Previous leadership experience	Irurita[22]	+	Non-nursing experience and effectiveness
		+	Previous nursing management and effectiveness
	Jenkins & Ladewig[23]	+	
	Perkel[30]	NS	
Previous nursing education	Irurita[22]	+	Education level and effectiveness
	Perkel[30]	NS	
Personality traits	Hansen *et al.*[28]	+	Openness, extroversion and motivation to manage
		+	Nurses prefer leaders to use personal power
Leadership motivation	Henderson[29]	+	Power motive and effectiveness
		NS	Type of motivation and effectiveness
Age	Kondrat[24]	+	Being older and managerial competencies
Gender and sex role	Rozier[31]	NS	Gender, sex role and leadership style, supervisory style
Value congruence	Perkel[30]	NS	
C. Influence of context and practice settings on leadership			
Differentiated practice – accessibility and contact with formal leaders	Boumans *et al.*[33]	—	Social emotional leadership due to social distance
Implementation of Enhanced Professional Practice Model (EPPM)	Ingersoll *et al.*[34]	+	Facilitative Leadership Style (EPPM features) - Control over practice - Compensation and rewards - Continuity of care delivery - Continuing education - Collaborative practice
Overall organizational climate	Jones *et al.*[32]	+	Predicts leadership behaviour
Performance feedback	Wallin *et al.*[35]	+	Predicts improvement in leadership
Employee maturity	Norris and Vecchio[27]	NS	Situational leadership
Educational activities, formal and informal	Young[36]	+	High transformational leadership

as well as role-taking (often linked to cognitive empathy) were also significantly related to leadership effectiveness[26,27] and the use of situational leadership.[27] Relationship-based competencies were reported as more important than financial and technical competencies for leadership effectiveness.[25,28] This was supported by Goldenberg's work[21] where most leaders used a low task and high relationship style.

Traits and characteristics

Seven studies reported on relationships between specific traits and characteristics of nurse leaders and their reported leadership practices.[22–24,28–31] Previous leadership experience was related to higher reports of a leader's skills and practices in three studies,[22,23,30] although length of time in the present position was negatively correlated with leadership effectiveness.[22] More effective leaders also had personality traits of openness, extroversion and motivation to manage.[28] Significant positive relationships were reported between the leaders' motivation and their leadership behaviours.[29,32] While motivation was significant, no particular style of motivation (such as socialized power or personalized power) led to increased leadership effectiveness. Age was positively related to leadership skills.[24] These studies reported that older and more experienced nurses were more effective leaders. Value congruence between the leader and the organization was also not a significant predictor of leadership behaviour.[30] Only one included study examined the influence of sex roles or gender as other studies in this area were removed due to low quality. That study found no significant relationship between sex role behaviour, gender and leadership style or effectiveness.[31]

Context and practice settings

This category consisted of six studies that examined the influence of context and differentiated practice settings on the behaviours of nursing leaders (Table 4).[27,32–36] The results in this category were predicated on contact between leaders and employees as factors contributing to enhancing nursing leadership. One study explored changes in the practice setting which increased the distance between supervisor and caregivers.[33] When staff had less contact with the leader, reported leader effectiveness decreased due to removing the influence of social emotional leadership. Nurses also reported greater self-efficacy in leadership behaviours when given the opportunity to observe, model and practice leadership behaviours.[23] Ingersoll and colleagues[34] found that when nurses reported more autonomy and control, their leaders used a facilitative leadership style whereas a structured leadership style was used with staff that required more direction. Young[36] explored the types of educational opportunities available in the practice setting finding that individuals who ranked high on transformational leadership participated in more formal and informal leadership education.

Leader participation in educational activities

Educational activities (e.g. leadership development programs) were most frequently examined and the most significant factor contributing to increased leadership practices (nine studies).[11,18–20,23,37–42] All nine studies using pre/post measures of leadership skills and competencies reported an increase in leadership skills and competencies when rated by either self or observers. Tourangeau and colleagues reported both significant development of leadership practices observed by others and no significant change in self-reported leadership practices after participation in a weekend leadership training course.[20] Three studies measured the results of leadership development after one post-intervention measurement.[23,38,40] Two of these three studies reported that increased leadership skills remained three months after participating in the leadership development program and the third study reported positive results both six and 12 months after the program.[38]

The leadership development programs varied widely in programming, length and delivery. They ranged in length of time from three days to 18 months, and from being offered in all-day workshop format, structured self-directed learning, to a five-day residency

Table 4 Results of educational interventions to develop leadership behaviours

Leadership factor	Source	Significant findings	Leadership
Leader participation in educational activities			
Leadership development training/ program	Cleary *et al.*[37]	+	Self-reported leadership behaviour
	Cunningham and Kitson[18,19]	+	Self-rated leadership ability
	George[38]	+	Self-reported, observed leadership behaviours
	Jenkins and Ladewig[23]	+	Self-efficacy, shared governance behaviour
	Wessel-Krejeci and Malin[40]	+	Managerial competencies
	Krugman and Smith[39]	+	Self-reported leadership behaviour
	Tourangeau *et al.*[11,20]	+	Observed leadership behaviour
		NS	Self-reported leadership practices
	Werrett *et al.*[41]	+	Self-reported leadership behaviour
	Wolf[42]	+	Leadership adaptability
		+	Two-way communication in leadership style

program with follow-up three months later. Three of the nine studies had very similar interventions focused on leadership development over a period of three or four days.[11,40,42] Two studies extended their program with one four-day program being delivered over a period of two months and another program spanning 18 months with a variety of activities ranging from learning plans to observation.[38] However, the specific contents of the leadership development programs were not reported in detail.

Discussion

The integrated findings from the 24 included studies in this review provide limited evidence, but a foundation for discussion of the investment in leadership development and mentorship programs, the recruitment and selection of nursing leaders, and future research.

Interventions to develop leadership

All studies that examined the influence of a leadership development program reported significantly increased leadership behaviours post intervention. However, given the propensity for published work to report positive results, these positive results should be viewed with cautious optimism. Our review may potentially be missing data about leadership development programs that did not significantly influence the development of leadership skills and were not published. With no control groups in these studies, the positive results stem primarily from observer or self-report methods without comparison to groups not receiving an intervention. Experimenter effects on self-report methods may also inflate the reporting of improvements. However, the use of observed measures of leaders' styles and behaviours by others strengthens the validity of these leadership study results. Leadership measures by followers are free of social desirability response bias often associated with leaders' self-report measures.[43,44]

Most of the leadership development programs in this review were conducted in workshop format with or without opportunities to receive coaching and mentoring from senior skilled leaders. The majority of studies based their interventions on pre-existing leadership development programs while two programs were developed in-house. Three studies reported that effects of training remained three months or longer. While the positive results were not differentiated across these different types of programs, leadership development programs could be structured in ways that are even more effective or particularly influential in developing specific leadership skills than those represented in the studies reviewed. Longitudinal research examining a variety of leadership development interventions, with data collection extending beyond 18 months and using both control and intervention groups, would help to determine the longer-term effects of educational interventions on leadership behavior.[45] Such research would also identify whether the length or type of program influences the duration or magnitude of enhanced leadership behaviour.

The results of this review also point to the importance of leaders' role in modelling, demonstrating and practising leadership skills during the course of their work. As leaders develop and learn new skills, they should demonstrate, model and use these skills in the practice setting since study results suggest that leaders will continue to develop and improve by using their abilities as well as by teaching others. By wanting to learn and choosing to make an intentional behavioural change, people can change their performance on a complex set of competencies that distinguish outstanding managers.[46] With the considerable financial resources that health care organizations invest in leadership development annually,[47] the results of these studies suggest that investments in educational programs to develop leadership competencies are well placed.

Recruitment and selection of leaders

Studies examining traits and characteristics of nursing leaders found that higher levels of education and experience led to increased leadership effectiveness, with the exception of one study[20] in which leaders with more experience were rated as exhibiting less effective leadership. These results suggest that the relationship between length of time in a leadership role and leadership practices can promote the development of leadership competence, as well as the development of burnout, job stress and apathy when leaders remain in their positions for lengthy periods.

Rozier[31] found a balance between sex role characteristics, suggesting that an effective leader utilizes a blend of both masculine and feminine traits. The demographic results from the lone study on sex role indicated that leadership style tended to be high task and high relationship which also points to emotional intelligence, a theme consistent with studies from other leadership literature.[2,48]

Further research should explore the relationship between traits and characteristics, such as levels of education, experience, sex/gender roles and leadership in greater detail as the studies in this review provided no clear indication on how much education and expertise leads to greater leadership effectiveness. Additional research should also explore the sex role behaviour of male leaders in nursing to add diversity and contrast to the findings since nursing is a female dominated profession. This would provide additional insight into the characteristics and differences between female and male leaders in nursing.

Context and practice setting characteristics

Contact between the leader and staff is important as it provides opportunities for both staff nurses and leaders to use and develop their leadership skills. The

reported reduction in leadership effectiveness resulting from increased distance between leader and staff may arise from leaders having fewer opportunities to use their leadership skills or staff not observing them.[33] This suggests a need for health care organizations to understand the most effective way to use and implement leadership within the organization as visible and accessible leadership also increases job satisfaction and retention of staff.[34]

The influence of organizational climate in predicting leadership behaviour[32] is consistent with the current interest in the relationship between context, culture and leadership.[49] Leadership behaviours may also have a reciprocal relationship with organizational culture. The dynamic interplay between leadership and culture can be further explored as culture plays a strong role in many factors ranging from job satisfaction to staff retention. This knowledge could lead to more effective strategies on how health care organizations can support and implement leadership roles. Jones *et al*. suggested that behaviours involved in decision-making, information dissemination and developing interpersonal relationships within an organization can facilitate leadership development. Role taking in the transformational leadership perspective involves leader–follower exchange where the leader attempts to understand follower needs and the follower provides the leader with their perception of leadership effectiveness. This suggests that the process of role taking involves a relationship-based style of leadership and a need for leaders with high emotional intelligence. Employee maturity and situational leadership should also be explored further. Norris and Vecchio[27] suggested that their non-significant results may arise from instrumentation, or employee maturity being rated as subjective and dynamic.

Last, the availability of educational opportunities including activities, ranging from formal lectures/in-services to informal staff mentorship in the practice setting, increased leadership behaviour. This suggests that providing opportunities to learn may strengthen leadership development.

Design and analysis

There was a notable lack of random sampling in the reviewed studies due in part to the nature of studying leadership because the specific populations of leaders are most easily accessed by convenience sampling. However, to further strengthen study design, future research using probability sampling and quasi-experimental designs with matched or random allocation to control and intervention groups, is needed.[47] The application of higher level multivariate statistical procedures like HLM and SEM can be used to test models and theories of leadership, specifically causal relationships of the influence of factors or interventions on the development of leadership. Models can include multiple factors contributing to nursing leadership and other variables influenced by leadership such as job satisfaction and retention. Finally, qualitative approaches examining the factors contributing to enhanced nursing leadership should be encouraged to generate themes and theoretical connections for future study.

One strength of this review was that the majority of studies were guided by a framework. Use of theoretical frameworks strengthen the validity of the study as theory provides a basis from which relationships between ideas and variables are constructed in order to be tested empirically, and to guide the choice of intervention design. However, we did not find a theoretical approach specific to leadership development in nursing, which is therefore an area for future development.

Measurement of leadership

A variety of tools were used to measure leadership in this systematic review. The most frequently used were the *Leadership Practices Inventory* (three studies), *Multifactor Leadership Questionnaire* (two studies), *Leader Behaviour Descriptive Questionnaire* (three studies) and the *Leadership Effectiveness and Adaptability Description* (two studies). The remaining studies used other instruments including those developed by the study's researcher. While many studies had similar leadership goals, the researchers may have had different conceptualizations of leadership that encompassed a broad range of areas, styles and principles applied differently in a variety of settings. A variety of tools were used to measure leadership, therefore each may have measured a different conceptualization of leadership suggesting no consensus on the definition of leadership. Thus, leadership to nurses may vary from what leadership means to those in business or the military. The lack of reporting of leadership measurement tool validity (only 10 of 24 studies reported) limits the external validity of their findings. This is a topic that could be addressed by further qualitative inquiry to add greater depth to the conceptualization of leadership in nursing. Finally, only 11 of the 24 studies reported internal consistency greater than 0.70. While studies may have actually had appropriate validity and internal consistency, insufficient details may have been reported in the final study.

This review was limited by a potential reporting bias since published work tends to over report positive and significant findings. Variability in the conceptualizations and measurement of leadership may limit the validity and generalizability of the findings. No randomized control trials (RCTs) were found and there was limited control for extraneous variables. The exclusion of non-English studies may have resulted in overlooking additional evidence of specific culturally influenced factors that enhance or develop leadership in nursing. Finally, qualitative studies were not included due to the volume of quantitative studies selected which may reduce the comprehensiveness of results.

Conclusion

As health care faces a looming shortage of nursing leaders and nurses, understanding the factors that contribute to enhancing nursing leadership can help organizations create strategies to develop leaders and enhance succession planning and staff retention. The findings of this systematic review suggest that leadership qualities can be developed through specific and dedicated educational activities. Characteristics such as transformational, high relationship styles and previous leadership experience are identified as contributing to leadership qualities. However, the relatively weak study designs provide limited evidence for specific factors that could increase the effectiveness of current nursing leadership or guide the identification of future nurse leaders. Robust theory and research on interventions to develop and promote viable nursing leadership for the future are needed to achieve the goal of developing healthy work environments for health care providers and optimizing quality care for patients.

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Appendix 1 Quality assessment and validity tool for correlational studies*

Factors contributing to enhanced Nursing Leadership: A Systematic Review (2005)
Quality Assessment and Validity Tool for Correlational Studies

Study: _____
First Author: _____
Publication Date: _____
Journal: _____

	NO	YES
Design:		
1. Was the study prospective?	0	1
2. Was probability sampling used?	0	1
Sample:		
1. Was sample size justified?	0	1
2. Was sample drawn from more than one site?	0	1
3. Was anonymity protected?	0	1
4. Response rate more than 60%	0	1
Measurement:		
■ **Factors contributing to enhanced nursing leadership (IV) [assess for IVs correlated with DVs only]**		
1. Are factors contributing to enhanced nursing leadership measured reliably?	0	1
2. Were factors contributing to enhanced nursing leadership measured using a valid instrument?	0	1
■ **Effects on leadership (DV)**		
1. Is leadership observed rather than self-reported?	0	1 or 2
2. If scale was used for measuring effects, is internal consistency ≥ .70?	0	1
3. Was a theoretical model/framework used for guidance?	0	1
Statistical Analysis:		
1. If multiple effects studied, are correlations analyzed?	0	1
2. Are outliers managed?	0	1
Overall Study Validity Rating (circle one)..... (key: 0–4 = LO; 5–9 = MED; 10–14 = HI)	**TOTAL: _____** **LO MED HI**	

*Adapted from Cummings & Estabrooks[14] and Estabrooks *et al.*[16]

Definitions for correlational tool

Design

(1) **Was the study prospective?**
Most studies are probably retrospective but prospective studies would be preferable.

(2) **Was probability sampling used?**
A random sample of some form or a systematic sample with a random start is acceptable. Most researchers probably used a convenience sample, i.e. studying all the patients available to them in one or more setting(s) that agreed to participate which is scored 0.

Sample

(1) **Was sample size justified?**
Sample size is justified if it is based on appropriate power calculations (power = 80), or follows other rules of thumb such as an N of at least 10 per IV studied. Even if researchers try to justify lower standards, a 0 is cored if these cut-offs are not met. This assessment is a judgment based on available information. Two rules of thumb will apply:

- If using a multivariate approach 10 cases per IV are required;
- If using several correlations or t-tests, a sample of 80 or more reflects adequate power

Sample sizes that suggest very high power, e.g. because it is so large, will also be noted.

(2) **Was sample drawn from more than one site?**
This refers to physical location – multiple groups belonging to the same system count as multisite. Several units within the same hospital do not count as multisite, but several hospitals within the same system or region do.

(3) **Was anonymity protected?**
If the researcher studied nurses in his/her own facility, the researcher may be able to determine the identity of responders. Subjects who think their responses are identifiable tend to give more politically correct or socially desirable responses.

(4) **Response rate more than 60%?**
Operationally defined as the number of people who participated divided by the number of people who were sampled (e.g. given or sent or offered a questionnaire). If not reported, information that allows calculation will be sought and the same rule applied.

Measurement

Leadership (IV) [assess for IVs correlated with DV only]

(1) **Are factors contributing to enhanced nursing leadership measured reliably according to one of the following categories?**
- Any factors contributing to enhanced nursing leadership affecting leadership are measured

(2) **Were factors contributing to enhanced nursing leadership measured using a valid instrument?**
Did researchers make the link between the extent the factors contributed to enhanced nursing leadership and effects on leadership? If so, 1 is scored. A zero is scored if important factors contributing to enhanced nursing leadership were missing. Only those IVs that were correlated with the DV were of interest.

Effects on leadership (DVs)

(1) **Are the effects of leadership observed rather than self-reported?**
1 is scored for patients self-report of the effects of leadership. 2 is scored for the self-report of nursing leaders in addition to some independent measure or observation of leadership.

(2) **If a scale was used for outcomes, is internal consistency $\geq$0.70?**
The coefficient needs to be for the sample studied in order to score as 1.

Statistical analysis

(1) **If multiple factors contributing to enhanced nursing leadership are studied, are correlations analysed?**
If more than one factor contributing to enhanced nursing leadership was studied, study scored 0 if results reported using numerous bivariate statistics (e.g. reports multiple t's, r's, etc.) only. 1 is scored if there was an attempt to explore relationships among factors contributing to enhanced nursing leadership, i.e. correlations are reported, multiple regression is used or interactions are reported (the discussion noted that specific predictors were or were not highly correlated with each other).

(2) Are outliers managed?
If not, relationship could be spurious. If one of the following was reported to decrease the disproportionate effect of outliers, I is scored:
- Outliers removed;
- A technique used to moderate their effect (e.g. winsorizing, jack-knifing);
- Non-parametric statistics used (Spearman's rho or MWU, etc.).

Omitting any discussion of outliers or mentioning-but-not-managing was scored as 0.

Adapted from an instrument provided by Dr Greta Cummings and Dr Carole Estabrooks.

Appendix 2 Quality Assessment Pre/Post Intervention Design*

Reviewer _____ Date: _____

Leadership Systematic Review (2006)
Pre/Post Intervention – Design Quality Assessment Tool

Study: _____
First Author: _____
Publication Information: Date: _____
Journal: _____

A. Sampling	Yes	No	N/A
1. Was probability sampling used?	1	0	
2. Was sample size justified to obtain an appropriate power?	1	0	
B. Design:			
a) One pre-test or baseline and several post-test measures	2	0	
b) Simple before-and-after study	1	0	
Subtotal (out of 2)			
C. Control of Confounders			
Does the study employ a comparison strategy? An attempt to create or assess equivalence of groups at baseline by:			
a) Matching group participants	2	0	
b) Statistical control	1	0	
c) None	0	0	
The group comparisons were the same for all occasions (Pre, baseline and post evaluations)	2	0	
Subtotal (out of 2)			
D. Data Collection and Outcome Measurement			
Measurement: 1. Was the DV was directly measured by an assessor? 2. Were dependent variables either: a. directly measured b. self-reported 3. Were dependent variables measured reliably (with reliability indices previously or for this study)? 4. Were dependent variables measured validly (with validity assessments previously or for this study)?	 1 2 1 1 1	 0 0 0 0 0	
Subtotal (out of 5)			
E. Statistical Analysis and Conclusions			
1. Was (were) the statistical test (s) used appropriate for the main outcome and at least the 80% of the others 2. Were p values and confidence intervals reported properly 3. If multiple outcomes were studied, were correlations analysed? 4. Were missing data managed appropriately?	1 1 1 1	0 0 0 0	N/A
Subtotal (out of 4)			
F. Drop-outs			
Is attrition rate <30% (if no attrition code 1)	1	0	
Subtotal			
Total: Total number of points (out of 16 total points)			

Overall Validity Rating:

$$\frac{\text{Total number of points obtained}}{\text{Total Nº of points – N/A}}$$

Key: <0.60 = LO; 0.61–0.79 = MED; 0.8–1.0 = HI

TOTAL: _____
LO MED HI

*Adapted from an instrument provided by Estabrooks *et al.*[17]

Appendix 3 Search strategy

Database 1985–2006	Search terms	Titles and abstracts (*n*)
ABI Inform	leadership AND • research (Subject) • evaluation (Subject) • measurement (Subject)	338
Academic Search Premier	leadership AND • research (KW) • evaluation (KW) • measurement (KW)	26
CINAHL (limited to research)	leadership AND exp research	2958
Sociological Abstracts	leadership AND • research (KW) • evaluation (KW) • measurement (KW)	905
Cochrane Library (CDSR, ACP Journal Club, DARE, CCTR)	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	138
EMBASE	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	2149
ERIC	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	7277
HealthSTAR/Ovid Healthstar	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	3593
Ovid MEDLINE	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	4379
PsychINFO	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	5954
Total abstracts and titles reviewed		27,717
Total abstracts and titles minus duplicates		18,963
First selection of leadership studies		1278
Second selection (nursing leadership studies only)		118
Final selection of research manuscripts/studies		26/24

Appendix 4 Characteristics of included studies

A. Correlational Designs

Author(s) Journal, Country & Year	Theoretical framework	Sample	Measurement/instruments	Scoring	Reliability	Validity	Analysis	Quality assessment score (0–14)
Boumans *et al.*[33] Nordic College of Caring Sciences Country not stated 2004	Differentiated Practice (Prim, 1987; Baker, 1997; Parkin, 1995)	$n = 102$ All caregivers from various qualification levels $n = 4$ Care coordinators $n = 57$ RNs $n = 7$ Enrolled Nurses $n = 6$ Supervisors	Social Emotional Leadership (Boumans, 1990) 20 items, self-report Differentiated Practice (Boumans, 2004)	5 pt scale 0–45 points	$\alpha = 0.81$ $\alpha = 0.65$	Face Validity Differentiated practice measure piloted	Linear regression analysis Spearman rank order correlation	7
Goldenberg[21] Journal of Advanced Nursing Canada 1990	Baldridge's (1971) theory on effects of external constraints on leadership style and Hersey & Blanchard's 'structural leadership theory' (1977, 82)	$n = 35$ administrators of college (diploma) nursing programs 98% participation rate $n = 106$ senior faculty members	Leadership Style Analysis (LSA) self & other (Hersey, Blanchard & Hambleton, 1979), self-report Demographics	0–30 points	$\alpha = 0.76–0.79$	LSA has been empirically tested Additional questionnaire pilot tested and modified post-test Face validity	Measures of central tendency (mode) Chi-square	8
Hansen *et al.*[28] Nursing Administration Quarterly USA 1995	Taunton's nurse manager and nurse retention, 1989	$n = 99$ Nurse Managers provided info about their personal traits $n = 1035$ staff nurses provided info about perceptions of their nurse managers' leadership	NEO Personality Inventory (Costa & McCrae, 1985) Motivation to Manage Sentence Completion Multiple Choice scale (Miner, 1977) 40 items Consideration & Structuring Expectations scales (Kruse & Stogdill, 1973) 22 items, self-report Adapted form of French & Raven's (1959) 5 typology of power Moch, Cammann & Cook (1983) Influence Scales	5-point Likert-type scale Responses positive, neutral or negative Not Reported Agreement or disagreement Not reported	$\alpha = 0.80–0.92$ $\alpha = 0.72$ $\alpha = 0.83–0.92$ $\alpha = 0.90$ $\alpha = 0.86$	Not reported for all instruments	Factor analysis Descriptive statistics	7
Henderson[29] Journal of Nursing Administration USA 1995	McClellard's theory of leadership motivation	300 mailed surveys to Chief Nurse Officers $n = 92$ Chief Nurse $n = 59$ pairs Chief Executive & Chief Nurse	Leadership Effectiveness – constructed for study from previous research (Freund, 1985), self-report Power management Inventory for leadership motivation 3 scales (Hawker, 1981)	5-point Likert scale Weighted scoring system of 300 points	Not reported $\alpha = 0.67–0.77$	Not reported Validated in pilot study Validated in pilot study Not reported	Factor analysis Discriminate function analysis Spearman coefficients	9

Continued

Continued

Author(s) Journal, Country & Year	Theoretical framework	Sample	Measurement/instruments	Scoring	Reliability	Validity	Analysis	Quality assessment score (0–14)
			Index of Job Satisfaction – 18 items (Braefield & Rothe, 1951)	5-point Likert scale	$\alpha = 0.87–0.94$		Multiple regression	
			Index of Hospital Complexity - 8 Questions (Henderson, 1988)	Horizontal & vertical differentiation & spatial dispersion – 10-point scale	Not reported			
Ingersoll *et al.*[34] Journal of Nursing Administration USA 1996	Structural contingency theory (Charms, 1993)	Staff nurses RR 88.3% at baseline (79–98% for individual units) RR 84.3% during final data collection period (76–100%)	Leadership Opinion Questionnaire (Duxbury *et al.*) 40 items, self-report	Perception score subtracted from actual	$\alpha = 0.91$ consideration & $\alpha = 0.78$ structure	Not stated	ANOVA Correlations Least squares regression	8
			Enhanced Professional Practice Model (EPPM) (Milton, 1995)	0–8 Rating, Scores Summed for each model component	$\alpha = 0.77–0.82$			
			Perceived Group Attractiveness & Cohesion Scale (Good & Nelson, 1973)	Subscale scores summed into 2 scales	$\alpha = 0.82$			
			Index of Work Satisfaction (Stamps & Piedmonte, 1986)	Not reported	$\alpha = 0.82$			
			Job Satisfaction Scale (Price & Mueller, 1986)	Not reported	$\alpha = 0.87$			
Irurita[22] The Australian Journal of Advanced Nursing USA 1988	Hershey & Blanchard's Situational Leadership (Stogdill, 1974)	$n = 44$ Head Nurses 37 returned, (RR 84%) $n = 148$ Staff Nurse 82 returned, (RR 55.4%)	Leadership Effectiveness & Adaptability Description (LEAD-other), Hersey & Blanchard, 1982, observer reported Education, Career background & Demographics	LEAD scoring guide	Not reported	Standardization tests conducted by authors of 264 managers in North America and by other studies.	Descriptive statistics Spearman rank-order correlation coefficients Multiple Regressions, Spearman's rho	10
Jones *et al.*[32] Journal of Professional Nursing USA 1990	Native View Paradigm of Organizational Culture (Gregory, 1983)	$n = 317$ Nurse Practitioners	37-item questionnaire measuring self-reported leadership behaviours in clinical practice.	1 to 5 scale 'always' to 'never' summed across dimensions	$\alpha = 0.57–0.72$	Not reported	Five multiple regression analyses were performed using the 9 climate dimension as predictors and each of the leadership dimensions as dependent variables	5
			Organizational Climate (Litwin & Stringer, 1968) 50 items Demographic Info	Likert scale 1–4	$\alpha = 0.20–0.86$	Not reported		

Continued

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Author(s) Journal, Country & Year	Theoretical framework	Sample	Measurement/instruments	Scoring	Reliability	Validity	Analysis	Quality assessment score (0–14)
Kondrat[24] Association of Perioperative Registered Nurses Online USA 2001	Claimed conceptual framework for the study included 5 major categories: Technical, human conceptual, leadership and financial management	$n = 300$ Head Nurses and Nurse Managers 120 usable responses, (RR 40%).	Operating Room Nurse Manager Questionnaire (modified from nurse manager questionnaire) 53 items (Chase, 1994), self-report	4-point Likert scales	$\alpha = 0.95$ for subscale 1 & 0.96 for subscale 2	Not discussed	Descriptive statistics ANOVA	6
Lucas[25] Journal of Nursing Education USA 1986	Situational approach (McGregor 1976) [also discussed Baldridge *et al.*(1978), Hersey & Blanchard (1977) & Bass (1960)]	240 of 382 deans in the National League of Nursing (NLN) 170 (RR 78%) deans provided data on self-perceived Leadership behaviours	Leader Behaviour Descriptive Questionnaire (LBDQ) Hemphill & Coons, 1957 later refined by Halpin & Winer (1957) (self-report) 2 subgroups a) Consideration b) initiation of structure Institutional characteristics	5-point Likert scale	$\alpha = 0.83–0.92$	Consideration and concurrent validity. Pilot testing	Pearson's Correlation ANOVA Descriptives Factor analysis	9
Mansen[26] Journal of Professional Nursing USA 1993	Not reported	$n = 176$ (faculty members) (RR = 57%: $n = 208$) $n = 30$ (Nursing Education Administrators) 38% RR, $n = 46$)	Leader Behaviour Descriptive Questionnaire (LBDQ) XII (Stogdill, 1969: original Hemphill & Coons, 1957) 2 subscales out of 12, self-report	Not reported	$\alpha = 0.90$ consideration $\alpha = 0.77$ initiation of structure	Not reported Not reported Not reported Not reported	Correlation Multiple Regression Descriptives	9
			Role Taking (Davis, 1980): Interpersonal reactivity Index – 2 subscales	5-point Likert scale	$\alpha = 0.74$ perspective taking $\alpha = 0.70$ fantasy scale			
			Organizational Characteristics (Grigsby, 1988)	5-point Likert scale	Not reported			
			Job Satisfaction – Kahn's Job Satisfaction Inventory (Kahn *et al.*, 1964)	Not reported	Not reported			
Norris and Vecchio[27] Group & Organization Management USA 1992	Situational Leadership (Hersey & Blanchard, 1982/88)	$n = 91$ Full-time nursing staff members RR 87%. The nurses' supervisors (seven head nurses) completed confidential surveys describing their	Job Descriptive Index-Satisfaction with Supervisor Scale (Smith, Kendall & Hulin, 1969)	Not reported	Not reported	Not reported for all instruments used	Hierarchical regression	7
			Leader-Member Exchange (Liden & Graen, 1980)	Not reported	Not reported			
			LBDQ-12 self-report measures of consideration & initiating structure	Not reported	Not reported			
			Head nurses provided performance ratings for each nurse	4-point scale	Not reported			
			Psychological & Job Maturity - based on instrument proposed by Hambleton, Blanchard &	Not reported	Not reported			

Continued

Continued

Author(s) Journal, Country & Year	Theoretical framework	Sample	Measurement/instruments	Scoring	Reliability	Validity	Analysis	Quality assessment score (0–14)
		subordinates' behaviours	Hersey (1977) & previously used by Vecchio (1987).					
Perkel[30] Nursing Leadership Forum USA 2002	Transformational (Burns 1978, Bass 1985) Transactional & Laissez-faire (Bass & Avolio, 1995)	$n = 900$ nurse executives 414 questionnaires returned – 3 were unusable RR 45.6	Multifactor Leadership Questionnaire (5x-short) (Bass & Avolio, 1995) 45 items, self-report Full Range Leadership Model, 9-scales from MLQ Value Analysis Worksheet (VAW) 23 items (Harrington & Preziosi, 1998) Sociodemographics	5-point Likert 4-point Likert	Not reported $\alpha = 0.86–0.96$	Test–retest reliability for VAW was 0.86 ($p < 0.01$) Content validity established in tool development by panel of experts	Absolute differences calculated using Gordon's (1999) method Descriptives Correlations Multiple regression analysis	10
Rozier[31] Nursing Management USA 1996	None	Nurse executives Women ($n = 329/1500$) Men ($n = 49/1500$) RR 25%	Questionnaire modified from 'leadership study International Women's Forum' – (Rosener *et al.*, 1990), self-report	Six inventories summed for a total or aggregate score	$\alpha = 0.71–0.86$	Inventories separately developed & tested for reliability & validity by authors. Rosener, McAllister & Stephens (1990)	Factor analysis	5
Wallin *et al.*[35] Worldviews on Evidence-Based Nursing, Sweden 2006	None	Staff on 4 Swedish neonatal units Overall response rate for 2001 was 90.6% (164/181) and 87% for 2002 (167/192). 1 year timeframe to collect data 7 men and 127 women participated in the study	Quality of Work Competence (QWC) Karasek *et al.*, 1990; Cartwright *et al.*, 1997: 10 key areas with 41 individual items, self-report Commitment to Change – author not reported 4 items	Overall score from the QWC called the Dynamic Focus Score (DFS) Not reported	Stated as reliable by researcher α =0.78 included items	Stated as valid by researchers Not reported	Descriptive statistics, Chi-square, ANOVA, Multiple regression, Paired comparison used for 134 individuals who answered twice	7
Young[36] Nursing Administration Quarterly USA 1992	Transformational Leadership (Burns, 1978)	$n = 66$ Nurse leaders Based on LBQ scores, participants assigned to low, moderate and high TFL group;	Leadership Behaviour Questionnaire self-report (Sashkin, 1988) 50 items & 10 subscales Leadership Development Inventory – 4 scales (researcher developed)	Not reported Rank ordering of activities in addition to scales	$\alpha = 0.6–0.75$ (for 9 scales) 1 scale α=0.5 $\alpha = 0.79–0.98$	LDI – expert panel review (content validity) Discriminant & convergent validity established Factoral design used to validate a new instrument	LDI – Factoral design analysed these responses to validate a new scale Descriptives Qualitative & Quantitative	5

B. Pre/Post Intervention Designs

Author(s) Journal Country & Year	Theoretical framework	Sample	Intervention	Measurement/ instruments	Scoring	Reliability	Validity	Analysis	Quality assessment score (0–1)
Cleary *et al.*[37] Issues in Mental Health Nursing Australia 2005	None	15 nurses from the Area Mental Health Service (hospital and community); 3 nurses withdrew during program leaving 12 nurses completing program	Leadership development program using self-directed learning with a workbook; based on transformational and transactional leadership	Nurses' Self-Concept Questionnaire NSCQ – self-report, Cowin, 2001 Completed pre and immediately post program; 36 items in dimension of Nurse Self-Concept, Caring, Staff Relations, Communication, Knowledge, Leadership	Pre/post test means 8-point Likert scale	Not reported	Not reported	Descriptive Statistics	0.4
Cunningham and Kitson[18,19] Nursing Standard England 2000 (2 papers – Parts I & II - reporting one study)	None	Senior nurses ($n = 4$) Wards sisters ($n = 24$) Senior nurse & clinical leaders Pre-test ($n = 176$) Returned ($n = 131$) Distributed post-test ($n = 231$) Returned ($n = 150$)	Leadership development program (18 months) Each clinical leader experienced observing care on the ward and having their area observed by expert facilitator Networking & mentoring opportunities and participation in workshops	Multifactor Leadership Questionnaire MLQ (Bass, 1990), self- and observer report Organisation of Care (Bowman & Thompson, 1995) Newcastle Satisfaction with Nursing Scale (McColl *et al.*, 1996) Interdisciplinary team questionnaire (Poulton and West, 93)	Pre/post means Pre/post means Pre/post means, patient evaluation of nurses Pre/post means	From previous study (Alimo-Metcalfe, 95) Not reported Not reported Not reported	From previous study (Alimo-Metcalfe, 95) Not reported Not reported	Paired t-test ANOVA Quantitative & Qualitative	0.46
George *et al.*[38] Nursing Admin Quarterly USA 2002	Shared Leadership Ford motivational systems theory Bandura's self-efficacy theory	Study 1: $n = 30$ who participated in SLCP in 1995 & 15 nurses from same hospital in control group Study 2: $n = 412$ nurses	The Shared Leadership Concepts Program (SLCP) 5 content areas arranged in 4–8 hour day modules & delivered over a 2-month period	Smola Assessment of Leadership Inventory (SALI) pre/post program (Smola, 1988) Leadership Practices Inventory – LPI-IC Individual Contributor Self or	Not reported Not reported	Not reported Not reported	Not reported Not reported	Descriptive statistics – comparison of means Paired t-test	0.53

Continued

Continued

Author(s) Journal Country & Year	Theoretical framework	Sample	Intervention	Measurement/ instruments	Scoring	Reliability	Validity	Analysis	Quality assessment score (0–1)
		RR 45% in final sample		Observer) (Kouzes and Posner, 1993) Nursing Activity Scale (Schutzenhofer, 1998)	Not reported	Not reported	Not reported		
Jenkins and Ladewig[23] Nursing Leadership Forum USA 1996	Self-efficacy theory (Bandura, 1977; 1986)	$n = 34$ RNs RR 85% baseline $n = 26$ at 1 month $n = 24$ at 6 months $n = 23$	The intervention was an all-day structured leadership development session	Efficacy Expectation Assessments (researcher developed) 15 items, self-report Activity self-reports of Behaviour Performance (based on Efficacy Expectation Assessments)	0 = not at all – 10 = totally 0 (never) – 10 (always) scale	$\alpha = 0.83–0.98$ from this study $\alpha = 0.90–0.97$ from this study	Indices of content validity ranged from 0.75–1.00 for items included in scales	Descriptive stats ANOVA Correlations	0.56
Krugman and Smith[39] Journal of Nursing Admin USA 2003	None	104 permanent charge nurses, University of Colorado Hospital, 4-year period from 1999	Implementation of a permanent charge nurse leadership role over a 4-year period	Leadership Practices Inventory – LPI self & observer, Kouzes and Posner, 1988; 30 item Job Satisfaction – McCloskey-Mueller Satisfaction Scale (Mueller and McCloskey, 1990); 31 items	5-point Likert scale Not reported	$\alpha = 0.70–0.85$ for self $\alpha = 0.81–0.92$ for other $\alpha = 0.89$	Stated as known validity Stated as known validity	Descriptive statistics t-tests ANOVA	0.47
Tourangeau[11] Journal of Nursing Admin Canada 2003	Kouzes and Posner's 5 fundamental leadership practices (1995)	$n = 67$ Nurses participated in evaluating the institute (30 established & 37 aspiring leaders)	The Leadership Institute (Dorothy Wylie) 5-day residency program with follow-up booster weekend 3 months later	Leadership Practices Inventory – LPI self & observer (Kouzes and Posner, 1988; 1993)	Mean scores	$\alpha = 0.46–0.89$ for self-reported and $\alpha = 0.75–0.92$ for observer-reported	Not reported	MANOVA	0.4
Tourangeau *et al.*[20] Canadian Journal of Nursing	Situational Leadership Model of Hersey &	Established leaders ($n = 30$) Aspiring leaders ($n = 37$)	The Leadership Institute (Dorothy Wylie) 5-day residency program with	Leadership Practice Inventory – LPI self & observer (Kouzes and Posner, 1995)	10-point scale from 1 to 10	$\alpha = 0.71–0.85$ for self-reported and 0.82–0.93 for observer-reported	Not reported Reported as well-validated by researchers	MANOVA	0.6

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Author(s) Journal Country & Year	Theoretical framework	Sample	Intervention	Measurement/ instruments	Scoring	Reliability	Validity	Analysis	Quality assessment score (0–1)
Leadership Canada 2003	Blanchard, 1988.		follow-up booster weekend 3 months later	30-items Maslach Burnout Inventory – 25 items (Maslach *et al.*, 1996)	7-point scale from 0 to 6	Not reported			
Werrett *et al.*[41] NT Research England 2002	None	550 nurses pre and 181 post surveys from West Midlands Region in UK during 2001–2002 from acute and primary care hospitals Sample size 1050/4000 RR 52.4% pre, 33% post	Three-day Leading an Empowered Organisation Programme with data gathered pre-and three months post course 35 courses were run during 2001 to 2002	Pre-test: 4 sections – self-report (1) demographics (2) aspects of leadership (3) importance-performance analysis, 33 items; Werrett *et al.*, 2001 (4) level of management and leadership; 4 questions Post-test: Similar format	Part 2: 6 Visual analogue scales Part 3: 5 point scale pre/ post-test Post-test Part 2: 7 additional visual analogue scales	α =0.97 comparing pre/ post data	Not reported	Descriptive statistics Factor Analysis	0.47
Wessel-Krejeci and Malin[40] Nursing Economics Country not stated 1997	None	$n = 80$ Nurse practice coordinators, Nurse managers, Staff educators, Team coordinators & Other RR 92%	Leadership development training workshops At the end of each 3-day session, participants completed Leadership Competency and Demographics	Leadership competency Instrument (developed by the researchers) 48 items, self-report Demographics Narrative evaluation guide for qualitative study	Scale of 1–5	$\alpha = .97$	Content – established through pilot study	t-test ANOVA Fisher's LSD	0.53
Wolf[42] Journal of Continuing Education in Nursing USA 1996	Situational Leadership Theory and learning theory (Hersey and Blanchard, 1988a)	$n = 144$ RNs who participated in a 4-day management institute	4-day management training program	Leadership Effectiveness & Adaptability Description, self-report (Hersey and Blanchard, 1988a; Hersey 1989)	12 management situations 0–36.	Based on previous study (Greene, 1980)	Face-based on review of items Content established (Greene, 1980)	T-tests for Paired samples	0.4

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