Leadership styles and outcome patterns for the nursing workforce and work environment: A systematic review

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ABSTRACT

Background: Leadership is critical in building quality work environments, implementing new models of care, and bringing health and wellbeing to a strained nursing workforce. However, the nature of leadership style, how leadership should be enacted, and its associated outcomes requires further research and understanding. We aimed to examine the relationships between various styles of leadership and outcomes for the nursing workforce and their work environments.
Methods: The search strategy of this systematic review included 10 electronic databases. Published, quantitative studies that examined the correlations between leadership behaviours and nursing outcomes were included. Quality assessments, data extractions and analysis were completed on all included studies by independent reviewers.
Results: A total of 50,941 titles and abstracts were screened resulting in 129 included studies. Using content analysis, 121 outcomes were grouped into six categories: 1) staff satisfaction with job factors, 2) staff relationships with work, 3) staff health & wellbeing, 4) relations among staff, 5) organizational environment factors and 6) productivity & effectiveness. Our analysis illuminated patterns between relational and task focused leadership styles and their outcomes for nurses and nursing work environments. For example, 52 studies reported that relational leadership styles were associated with higher nurse job satisfaction, whereas 16 studies found that task-focused leadership styles were associated with lower nurse job satisfaction. Similar trends were found for each category of outcomes.
Conclusions: The findings of this systematic review provide strong support for the employment of relational leadership styles to promote positive nursing workforce outcomes and related organizational outcomes. Leadership focused solely on task completion is insufficient to achieve optimum outcomes for the nursing workforce. Relational leadership practices need to be encouraged and supported by individuals and organizations to enhance nursing job satisfaction, retention, work environment factors and individual productivity within healthcare settings.

What is already known about the topic?

- Leadership has been shown to influence nursing workforce outcomes, such as job satisfaction and burnout.
- A substantial amount of literature exists examining relationships between specific leadership styles and nursing workforce outcomes.

What this paper adds

- This review provides robust evidence that relational leadership styles, such as transformational and authentic leadership styles, are

associated with significantly improved outcomes for the nursing workforce and their work environments.
- Task focused leadership styles, particularly passive or dissonant leadership styles, were generally associated with negative nursing health and workforce outcomes. Transactional leadership was unique in that it was linked to improved job satisfaction and some outcomes related to relations among staff. However, this style was also associated with significantly poorer nursing workforce outcomes in areas such as empowerment, staff health, and wellbeing.

1. Introduction

As healthcare systems across the globe continue to experience relentless and turbulent change, the appeals and opportunities for healthcare professionals, especially nurses, to provide effective and visionary leadership to address the challenges and consequences of system reform have never been greater (Duncan et al., 2014; Institute of Medicine (IOM), 2011). Economic constraints that trigger demands for new models of care with skill mix changes in hospital care in order to reduce costs (Aiken et al., 2017) are significant in many countries and contribute to a climate of increased managerialism that promotes efficiencies at the expense of positive transformative changes in care quality (Duncan et al., 2014; Gilbert, 2005; Wong, 2015). Ongoing concerns about nurse and leader shortages (Titzer et al., 2014) along with complaints of overloaded and disenchanted nursing workforces point to the importance of healthy and productive work environments in sustaining the health and well-being of nurses (McHugh et al., 2011; Shirey, 2017; Van Bogaert and Clarke, 2018). Despite the widely recognized importance of leadership in creating healthy work environments, there is much debate in the literature as to what constitutes effective leadership in a context of these dynamic workplace challenges (Albert, 2016; Sherman and Pross, 2010). Effective leadership practices to address these challenges must be informed by current empirical findings of the effects of nursing leadership styles on nurse outcomes.

Leadership is studied within numerous fields including psychology and education, military, management, healthcare and specifically, nursing. Conceptualizations of leadership are typically defined by four central elements: 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 (Hunt, 2004; Northouse, 2007; Shaw, 2007; Shortell and Kaluzny, 2006). Frequently used leadership theories including transformational leadership, emotionally intelligent leadership, and authentic leadership have guided nursing leadership research and interventions, likely based on their emphasis on relationships for effecting positive change or outcomes (Gardner et al., 2005a,b; Hibberd et al., 2006).

We used Northouse's definition of leadership – "a process whereby an individual influences a group of individuals to achieve a common goal" (Northouse, 2007). Leadership styles can be generally categorized as focusing on human relationships or task completion. *Relationally focused leadership* focuses on people and relationships, such as *transformational leadership* which maximizes the potential of followers through encouragement of innovation, creativity and intellectual stimulation (Bass and Avolio, 1994), *resonant leadership* which focused on understanding the needs of individuals (Boyatzis and McKee, 2005; Goleman et al., 2002) and *authentic leadership* which emphasizes leader insight, transparency, and congruence in their actions and personal or expressed beliefs (Gardner et al., 2005a,b; Walumbwa et al., 2008). *Task focused leadership* styles are primarily *transactional leadership*, in which leaders make a transaction with followers by providing rewards in exchange for tasks completed (Bass and Avolio, 1994), *dissonant leadership* styles, whereby leaders employ commanding and pace-setting behaviours to achieve results (Goleman et al., 2002), and *instrumental leadership* that focuses on bridging motivational vision with strategic and task-mediated accomplishment (Avolio et al., 1999). Leaders using an *active management-by-exception* style address potential problems before they jeopardize performance, while *laissez-faire* leaders step in only when performance levels have already fallen (Avolio et al., 1999).

The purpose of the review reported here was to systematically review the literature examining the relationships between leadership styles and outcomes for the nursing workforce and their work environments. The following research questions guided the full systematic literature review and analysis.

1. Do nursing leadership styles influence outcomes for nurses, nursing environments, and the nursing workforce?

2. If so, how do these leadership styles impact the specific outcomes?

2. Methods

This is an update of a review originally published under the same title (Cummings et al., 2010a).

2.1. Search strategy, data sources, and screening

The search strategy included 10 electronic databases CINAHL, Medline, PsychInfo, ABI, ERIC, Sociological Abstracts, Embase, Cochrane, Health Star and Academic Search Premier. Searches included the following keywords – *leadership*; *research*; *evaluation*; *measurement*; *and nurs** – to locate studies published between 1985 and August 2017 that examined the outcomes of various styles of nursing leadership. Searches were originally undertaken in 2009 and updated in 2017 to locate studies published between 1985 and August 2017.

2.2. Inclusion criteria

Articles were included if they met the following inclusion criteria: 1) peer reviewed research; 2) studies measuring leadership by nurses; 3) studies measuring one or more outcomes of nursing leadership; and 4) studies examining the relationship between leadership and outcomes for the nursing workforce or nursing work environments. Qualitative studies and grey literature were not included.

2.3. Screening

Abstracts and manuscripts were independently reviewed by two of five research team members (SM, TP, GEC, SL, KT) based on pre-determined inclusion and exclusion criteria discussed by the research team (SM, TP, GEC, SL, KT, GGC). Articles in which leadership style was not clearly defined or articulated were further reviewed for inclusion by the principal investigator (GGC). 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.

2.4. Data extraction

Data extraction elements included: author, journal, country, research purpose and questions, theoretical framework, design, setting, subjects, sampling method, measurement instruments, reliability and validity, analysis, leadership measures, outcomes of leadership, significant and non-significant results. Data from each article were extracted independently by one of five reviewers and verified by another reviewer (SM, TP, GEC, SL, KT).

2.5. Quality review

Included articles were each reviewed independently twice for methodological quality by two of five research team members using an adapted quality assessment tool used in previously published systematic reviews (Lee and Cummings, 2008; Cummings and Estabrooks, 2003; Estabrooks et al., 2003, 2001; Wong and Cummings, 2007; Cummings et al., 2008a). The adapted tool (Box 1) was used to assess four areas of each study: research design, sampling, measurement and statistical analysis. Twelve items were scored as zero (=not met) or one (=met), and one item related to the measurement of leadership was scored as two (=objective observation), or one (=self-report) or zero (=not met). Studies were evaluated on sampling, statistical analysis, research design, and measurement, and scored as low (0–4), medium (5–9), or high quality (10–14).

Box 1
Quality assessment and validity tool for correlational studies*.

<table>
<tr><td colspan="3">The Outcomes of Leadership: A systematic review
Quality Assessment and Validity Tool for Correlational studies</td></tr>
<tr><td colspan="3">Study:_____ First Author: _____</td></tr>
<tr><td colspan="3">Publication Information: Date: _____ Journal: _____</td></tr>
<tr><td>Design:</td><td>NO</td><td>YES</td></tr>
<tr><td>1. Was the study prospective?</td><td>☐</td><td>☐</td></tr>
<tr><td>2. Was probability sampling used?</td><td>☐</td><td>☐</td></tr>
<tr><td>Sample:</td><td></td><td></td></tr>
<tr><td>1. Was sample size justified?</td><td>☐</td><td>☐</td></tr>
<tr><td>2. Was sample drawn from more than one site?</td><td>☐</td><td>☐</td></tr>
<tr><td>3. Was anonymity protected?</td><td>☐</td><td>☐</td></tr>
<tr><td>4. Response rate more than 60%</td><td>☐</td><td>☐</td></tr>
<tr><td>Measurement:
■ Leadership (IV) [assess for IVs correlated with DVs only]</td><td></td><td></td></tr>
<tr><td>1. Was Leadership measured reliably?</td><td>☐</td><td>☐</td></tr>
<tr><td>2. Was Leadership measured using a valid instrument?</td><td>☐</td><td>☐</td></tr>
<tr><td>■ Influence on the measure of leadership (DV)</td><td></td><td></td></tr>
<tr><td>1. Was the outcome of leadership observed rather than self-reported?</td><td>☐</td><td>☐</td></tr>
<tr><td>2. If scale was used for measuring outcomes, was internal consistency $\geq$ .70?</td><td>☐</td><td>☐</td></tr>
<tr><td>3. Was a theoretical model/framework used for guidance?</td><td>☐</td><td>☐</td></tr>
<tr><td>Statistical Analysis:</td><td></td><td></td></tr>
<tr><td>1. If multiple outcomes were studied, were correlations analyzed?</td><td>☐</td><td>☐</td></tr>
<tr><td>2. Were outliers managed?</td><td>☐</td><td>☐</td></tr>
<tr><td>Overall Study Validity Rating (circle one
(key: 0-4=LO; 5-9=MED; 10-14=HI)</td><td colspan="2">TOTAL: _____
LO MED HI</td></tr>
</table>

*Adapted from Cummings et al. (2008a).

2.6. Analysis

Outcomes from the included leadership studies were categorized in two ways using content analysis. First, we sorted outcomes into categories based on their common characteristics. Second, we identified the pattern of relationship between both relational and task focused styles of leadership with changes in specific outcomes. We then analyzed the reported relationships between specific leadership styles or practices and the outcomes by category and significance.

3. Results

3.1. Search results

The electronic database search yielded a total of 50,941 titles and abstracts, with 16,277 titles and abstracts resulting from the search update. Following removal of duplicates in the updated search, 5898 titles and abstracts were screened using the inclusion criteria and 351 manuscripts were retrieved for full-text screening. After final selection using the inclusion criteria for this review, 76 studies (reported in 84 papers) were added to the 53 studies included in the original review

(1985–2009). In cases where multiple manuscripts were published from a single study, we counted them as one study in our analysis. Therefore, 129 studies (53 original and 76 updated) were included. All studies were quantitative in design. See Table 1 for search results.

Of the 129 included studies, published between 1985 and 2017, 74 were conducted in North America (43 in the United States, 29 in Canada, 1 in Canada and the United States, and 1 in Canada and Australia), 24 in Europe, 11 in Asia, 8 in the Middle East, 4 in Australasia, 2 in Africa, and 6 had no stated country. See Table 2 for all characteristics of included studies.

3.2. Summary of quality review

Weaknesses in the 129 quantitative study designs related to sampling, design, and analysis (see Table 3). All 129 studies used correlational, non-experimental, or cross-sectional designs and were rated as moderate (scores = 5–9) or high quality (scores $\geq$ 10). However, these correlational designs limit interpretations of causality. Only 33 of the 129 included studies used probability sampling, partially due to the difficulty in using random sampling methods to study leadership in specific individuals or units. Many studies used correlational and

Table 1
Search strategy.

Database 1985–2017	Search terms	Original 2010 Review	Search Update	Total # titles & abstracts
ABI Inform	leadership AND • research (Subject) • evaluation (Subject) • measurement (Subject)	352	139	491
Academic Search Premier	leadership AND • research (KW) • evaluation (KW) • measurement (KW)	278	46	324
CINAHL (limited to research)	leadership AND exp research	3303	2439	5742
Sociological Abstracts	leadership AND • research (KW) • evaluation (KW) • measurement (KW)	906	223	1129
Cochrane Library (CDSR, ACP Journal Club, DARE, CCTR)	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	139	403	542
EMBASE	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	2617	4257	6874
ERIC	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	7828	105	7933
HealthSTAR/Ovid Healthstar	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	4515	3242	7757
Ovid MEDLINE	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	5587	4101	9688
PsychINFO	leadership AND • research (MP) • evaluate$ (MP) • measure$ (MP)	9139	1322	10461
Total abstracts and titles reviewed		34,664	16,277	50,941
Total abstracts and titles minus duplicates		18,963	5, 898	24,861
First selection		127	351	478
Final selection of research manuscripts/ studies		63/53	84/76	137/129

Note: For the updated search (2007–2017) the term nurs* was added as a search heading for each database in order to return only nursing relevant studies.

regression analyses and 100 studies did not report the management of outliers. Only 65 studies addressed appropriateness of sample size and 95 of 129 addressed anonymity of respondents. Ninety-six of 129 studies used samples from more than one site. Effects or outcomes of leadership were most often self-reported (n = 110), rather than observed.

A strength of included studies was the pervasive use of theory to guide research (113 of 129 studies), with some authors integrating several established theories to guide their research. These leadership theories and frameworks most often applied included Bass (and Avolio)'s *Transformational and Transactional Leadership* (33 studies), and *Full Range Leadership Model* (4 studies), Avolio and Gardner's Authentic Leadership (11 studies), Kanter's *Organizational Empowerment Theory (10 studies),* Kouzes and Posner's *Leadership Practices* (6 studies), Hersey and Blanchard's *Situational Leadership Model* (2 studies), *Path Goal Theory* (2 studies), *Magnet Hospital Model* (2 studies), and *Consideration and Initiation* (2 studies). *Promoting Action on Research Implementation in*

Health Services (PARIHS) was used to frame the research design in 2 studies. All remaining leadership theories were used in single studies.

Twenty studies in this review employed higher level multivariate statistical procedures, such as hierarchical regression, and 22 studies specifically applied structural equation modeling. Of those using structural equation modeling, 18 studies were published within the last 10 years.

3.3. The outcomes of leadership

A total of 121 identified outcomes were grouped into six categories, 1) *staff satisfaction with job factors,* 2) *staff relationships with work,* 3)*staff health & wellbeing,* 4) *relations among staff,* 5) *organizational environment factors* and 6) *productivity & effectiveness.* See Table 4 for all outcomes sorted by category, relational leadership style (shaded), task-focused leadership (non-shaded), frequency, and significance of outcomes or effects. In studies examining multiple relational and/or task-focused leadership styles, outcomes are accounted for in each category in which they were reported in Table 4. For the following results section, we present categories, most frequently cited outcomes, and difference in outcomes. In text citation numbers for each outcome refers to study numbers in Table 2.

Staff Satisfaction with work, job and their Leaders. Sixty-five studies reported 18 outcomes influenced by leadership style related to *staff satisfaction with work, job and their leaders*, which also included satisfaction with roles, policies and rewards. The most frequently examined outcome of leadership in this review was nursing *job satisfaction* (n = 57). Fifty-two of 57 studies reported highest job satisfaction associated with a variety of *relational focused* leadership styles, such as socio-emotional, consideration, authentic, inspirational, resonant and transformational leadership (4, 5, 7–10, 14, 19, 21, 22, 24, 25, 28, 31, 32, 34, 35, 36, 38–40, 46, 47, 50, 54, 55, 58, 62, 63, 66, 68, 69, 73, 77, 80, 83–85, 90, 92, 98, 105, 107, 109, 111, 112, 115, 117, 118, 122, 124, 126). In 4 studies, the *task-focused* style *transactional leadership* was associated with increased job satisfaction (54, 98, 105, 111). Sixteen studies reported that job satisfaction was significantly lower with task-focused forms of leadership, such as management by exception, instrumental, and laissez faire leadership (5, 7, 8, 10, 21, 25, 28, 32, 40, 47, 50, 54, 58, 105, 108, 117). Relational leadership styles were not significantly associated with job satisfaction in two studies (37, 42).

Significantly higher *satisfaction with their leader* was reported in 9 studies when leadership styles were authentic, charismatic, resonant, or transformational (6, 10, 11, 19, 43, 49, 78, 117, 126). Two studies examining consideration and initiating structures found equivocal results (19, 43). Management by exception (6), transactional and laissez faire (11, 58, 59, 117), and dissonant (10) leadership styles were associated with significantly lower satisfaction with their leader in 6 studies. The next most frequently examined outcomes included satisfaction with *organizational work, work itself,* and *power,* which were reported significantly higher with authentic, resonant, empowering, initiating structure and consideration styles of leadership (10). Results for remaining outcomes were equivocal or reported in a small number of studies.

3.3.1. Staff relationships with work

In this category about how staff engaged with or felt about their work and job, 72 studies reported 41 outcomes. Outcomes most frequently examined were staff reports of *organizational commitment, empowerment, intent to stay or leave*, and *retention*. Outcomes most frequently examined in this category include staff reports of *organizational commitment, empowerment, intent to stay or leave*, and *retention*.

Seventeen studies reported significantly increased *organizational commitment* with transformational leadership (2, 9, 35–37, 45, 80, 89, 90), supportive leadership (21, 76), consideration (28), charismatic leadership (6, 33), empowerment based leadership (64, 85) and resonant leadership (122). Six studies reported significantly lower

Table 2
Characteristics of included studies.

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
1	Al-Hussammi (2008), Euro J Sci Res, USA	n = 55 RNs/ LPNs	- Minnesota Satisfaction Questionnaire (Weiss et al., 1967)	20 items, 5 pt scale	α = 0.91	NR	Pearson product-moment correlation coefficients
		RR = 92%	- Organizational Commitment Questionnaire (Meyer et al., 1993)	23 items, 7 pt scale	α = 0.85	NR	Multiple regression
		4 long term care facilities	- Survey of Perceived Organizational Support (Eisenberger et al., 1986)	16 items, 7 pt scale	α = 0.75	NR	
			- Multifactor Leadership Questionnaire, Form 6S (Bass and Avolio, 1992)	18 items, 5 pt scale	Mean score	NR	
2	Avolio et al. (2004), J Org Behav, Singapore	n = 502 nurses	- Modified Multifactor Leadership Questionnaire, Form 5X (Bass and Avolio, 1997)	20 items, 5 pt scale	α = 0.87 & 0.82	NR	Aggregation
		RR = 80%	- Organizational Commitment (Cook and Wall, 1980)	9 items, 5 pt scale	α = 0.87	NR	HLM
		1 hospital	- Psychological Empowerment (adapted from Jones' self–efficacy scale, 1986, Ashforth's Helplessness Scale 1989, Tymon, 1988, Hackman & Oldham's autonomy scale, 1980).	2 items, 7 pt scale	α = 0.75 & 0.84	NR	
3	Boström et al. (2007), J Eval in Clin Practice, Sweden	N = 132 NAs, ENs, RNs, & rehab professionals,	- Research Utilization Questionnaire (Champion and Leach, 1989; Pettengill et al., 1994; Humphris et al., 1999 NR) 5 subscales	5 pt scale	α = 0.89	NR	Chi-square, *t*-test, Fischer's exact test
		RR = 67%	- Creative Climate Questionnaire: (author NR)	50 items, 4 pt scale	α = 0.77 & 0.91	NR	Spearman's test Multiple
		7 elderly care units					logistic regression
4	Boumans and Landeweerd (1993, 1994), J Adv Nurs & Heart Lung, Netherlands	305 ICU nurses	- Leadership (Leadership Behavior Description Questionnaire (Stogdill, 1963)	20 items, 5 pt scale	α = 0.90 & 0.82	NR	ANOVA
		256 general nurses	- Job Satisfaction (Algera, 1981; Boumans, 1990)	42 items	α = 0.80	NR	ANCoVA
		16 hospitals	- Health Complaints (Organizational Stress Questionnaire (Reiche and Van Dijkhuizen, 1979; Reichert and Smeltzer, 1999; Algera, 1981)	28 items	α = 0.75	NR	Fisher's Z
			- Absenteeism (self report)	Frequency	r = 0.75	Piloted	
			- Job Significance (no title, Hackman and Oldham, 1975)	11 items, sum	α = 0.56	NR	
5	Boyle et al. (1999), Am J Crit Care, Country NR	255 nurses	- Leadership (no title: (Kruse and Stogdill, 1973)	Range 10–50, 12–60	α = 0.83 & 0.92	NR	Pearson r Multiple regression
		14 ICU's	- Job Satisfaction (no title, (Hinshaw et al., 1987; Price and Mueller, 1981)	Range 11–66, 6–36	α = 0.85 & 0.78	NR	
			- Intent to Stay (no title: (Price and Mueller, 1986))	Range: 4–20	α = 0.87	NR	
6	Bycio et al. (1995), J Appl Psychol, Country NR	1376 RNs	- Multifactor Leadership Questionnaire-1 (MLQ-1, Bass, 1985)	40 items, 5 pt scale	α = 0.71–0.97	No measures were reported	Factor Analysis Regression
		Multiple hospitals	- Extra Effort, Satisfaction with Leader, Leader Effectiveness (MLQ -1 (Bass, 1985))	9 items	α = 0.79–0.91		
		RR = 57%	- Intent to Quit/Leave Profession (no title & author)	3 items	α = 0.87		

(continued on next page)

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Organizational Commitment (Affective, Continuance, & Normative: (Allen and Meyer, 1990))	24 items	α = 0.73–0.86		
7	Casida and Pinto-Zipp (2008), Casida et al. (2012), Casida and Parker (2011), Nurs Econ, Res Theory Nurs Pract, J Nurs Manag, USA & Nurs Econ, USA	37 NMs	- Multifactor Leadership Questionnaire, form 5X-short (Avolio and Bass, 2004)	36 items, 5 pt scale	α = > 0.90	CFI = 0.91, Goodness of Fit = 0.92	Correlational
		278 staff nurses	- Nursing unit organizational culture (Denison's Organizational Culture Survey (Denison, 2007))	60 items, 5 pt scale	α = 0.87–0.92	CFI = 0.91, Goodness of Fit = 0.99	
		RR = 70% 4 hospitals					
8	Chen et al. (2005), Chen and Baron (2006), J Nurs Schol & J Nurs Educ, Taiwan	286 nursing faculty members	Multifactor Leadership Questionnaire 5X Chinese Version: (Shieh et al., 2001) 9 subscales	36 items, 5 pt scale	α = 0.64–0.88	NR	Hierarchical multiple regression, *t*-test, one-way ANOVA bivariate correlations
		RR = 73%	- Job Satisfaction (Minnesota Satisfaction questionnaire Chinese Version: (Lin, 2016))	20 items, 5 pt scale	α = 0.80–0.91	NR	
9	Chiok Foong Loke (2001), J Nurs Manage, Singapore	20 managers	- Leadership Practices Inventory: self & observer (Kouzes and Posner, 1995)	30 items × 2, 5 pt scale	α = 0.81–0.91	NR	ANOVA
		RR = 100%	- Job-In-General scale (Smith et al., 1989)	18 items, yes/no/ ?	α = 0.91–0.95	Convergent	
		97 RNs	- Productivity (Productivity scale (McNeese-Smith, 1995)	15 items, 5 pt scale	α = 0.90–0.93	NR	Regression
		RR = 97%	- Organizational Commitment scale (Porter et al., 1974)	15 items, 7 pt scale	α = 0.82–0.93	NR	
10	Cummings (2004), Cummings et al. (2005), Can J Nurs Leadership & Nurs Res, Canada	6526 RNs	- Resonant Leadership (Emotional Intelligence (Goleman et al., 2002)	13 items	NR	NR	Structural Equation Modeling (SEM)
			- Hospital Restructuring (Alberta RN Survey (Giovannetti et al., 2002); also included Revised Nursing Work Index: (Aiken and Patrician, 2000) & Maslach Burnout Inventory (Maslach et al., 1996))	139 items; NWI-R 4 pt scale, MBI – 6 pt	NR	NR	
		All AB acute care hospitals	- Emotional Exhaustion (NWI-R) (Aiken and Patrician, 2000)	Not reported			
			- Emotional Health (MBI (Maslach et al., 1996)	6 pt scale			
			- Workgroup collaboration (NWI-R) (Aiken and Patrician, 2000)	4 pt scale			
			- Job satisfaction (Alberta RN Survey (Giovannetti et al., 2002)	4 pt scale			
				4 pt scale			
11	Dunham-Taylor (2000), J Nurs Admin, USA	396 Nurse Executives (NE), & 1115 staff reporting to 360 NE	- Multifactor Leadership Questionnaire, Form 5X: (Bass, 1994)	87 items	α = 0.82–0.94	Construct	Pair-wise correlation
			- Profile of Organizational Characteristics: (Likert, 1994)	2 × 18 items, 8 pt scale	α = 0.90–0.96	NR	
			- Staff Satisfaction, Work Group effectiveness, Extra Effort (no title & author)	NR	NR	NR	

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
12	Ferris (1985), J Appl Psychology, USA	68 RNs & their supervisors	- Turnover (Leader-Member Exchange (LMX): (Graen, et al., 1982)	5 items, 5 pt scale	α = 0.83	All measures NR	Correlation Within & Between Group Correlations
			- Average Leadership Style (ALS) (Graen et al., 1982)	Average MLX score	NR		
13	Gardulf et al. (2008), Nilsson Kajermo et al. (2008), Scand J Caring Sci & J Nurs Manage, Sweden	n = 833 RNs & RNMs	- Work satisfaction: (Quality Work Competence Questionnaire (Arnetz et al., 1995)	11 enhancement areas, 5 pt scale	α = 0.70–0.94	NR	Stepwise multiple linear regression
		RR = 51%	- Professional issues: (Huddinge University Hospital Model Questionnaire (author & year NR)	34 items, only 21 used	NR	NR	Multiple, stepwise, linear & logistic regression analysis
		1 University hospital	- Barriers to research implementation: Barriers Scale (Funk et al., 1991) 4 subscales	29 items, 4 pt scale	α = 0.69–0.83	NR	
			- Organizational & staff well-being: Quality Work Competence Scale (Arnetz and Arnetz, 1996; Arnetz, 1997, 2001; Thomsen et al., 1998)	11 enhancement areas, 3–6 multipoint items	α = 0.70–0.94	NR	
			- Professional issues: (Huddinge University Hospital Model Questionnaire (Author, year NR)	34 items, fixed response & 4 pt scale	NR	NR	
14	Garrett (1991), J New York State Nurs Assoc, USA	188 RNs	- Leader Behaviour Description Questionnaire-Form XII & Ideal Leader Behaviour Description Questionnaire-Form (author NR)	Mean score	NR	NR	Multiple regression
		RR = 62%	- Job Satisfaction (Job Descriptive Index: author NR)	Mean score	NR	NR	ANOVA
15	Gil et al. (2005), J Managerial Psych, Spain	318 healthcare professionals in 67 healthcare teams	- Leadership (Managerial Practices Survey (Yukl et al., 2002) 3 subscales	Aggregate score, 5pt	α = 0.66–0.96	NR	Descriptive Stats
		RR = 68.4%	- Team Satisfaction (Gladstein, 1984)	3 items, 5 pt scale	α = 0.85	NR	Hierarchical Regressional
			- Team Performance (Ancona and Caldwell, 1992)	5 items, 5pt scale	α = 0.83	NR	
16	Ginsburg et al. (2005), Health Serv Res, Canada	n = 244 nurses in clinical leadership roles baseline & follow up questionnaires	- Leadership (Soberman Ginsburg, 2003)	9 items, 7 pt scale	α = 0.84	NR	EFA, ANOVA
			- Patient Safety Culture (Singer et al., 2003) 3 sections same for pre & post test	32 items, 5 pt scale	α = 0.66–0.86	NR	t-test, Hierarchical regression
17	Hendel et al. (2005), J Nurs Manage, Israel	54 Head Nurses from 5 hospitals	- Multifactor Leadership Questionnaire, Form 5X Short (Bass and Avolio, 1995b)	36 items, 5 pt scale	α = NR	NR	Descriptives, Wilcoxon Rank Test, MANOVA
		RR = 90%	- Conflict Management (Conflict Mode Instrument (Thomas and Kilmann, 1974) 5 subscales	Forced Choice pairs	α = 0.61–0.68	PV	Regression
18	Hernandez et al. (1988), Public Health Nurs, USA	20 nursing work groups	- Social Psychological Processes -Organizational Climate, Supervisory & Peer Leadership & Group Processes (Survey of Organization (Likert, 1961) 4 indices	All measures together totalled 36 items, 5 pt scales	α = 0.66–92	All measures NR	Correlational
		Health Departments					

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
19	Holdnak et al. (1993), Healthc Manage Rev, USA	256 nurses	- Leader Behavior Description Questionnaire, XII (Stogdill, 1963)	5 pt scale	α = 0.75–0.87	NR	ANOVA
		3 hospitals	- Job Satisfaction (Job Description Index (Smith et al., 1969)	NR	α = 0.58–0.82	NR	Hierarchical moderator regression
20	Houser (2003), Capuano et al. (2005), J Nurs Admin & Healthc Manage Rev, USA	n = 1142 RNs	- Leadership Practices Inventory: (Kouzes and Posner, 1987)	NR	α = 0.69–0.85	Construct & Discriminant	SEM
		n = 55 Nurse Managers	- Turnover (Raw turnover rate, accession rate & vacancy rate)	Math equation	NR	NR	
		6 Hospitals & 3 LTC Centers	- Staff expertise (RN's rated according to Benner's criteria by their manager (Benner et al., 1996))	Math equation	NR	NR	
21	Howell and Dorfman (1986), J Applied Behav Sci, USA	140 professionals	- Leadership (modified form of path-goal theory (Schriesheim, 1978)	Mean	α = 0.69–0.90	NR	*T*-test
		108 non-prof	- Organizational Commitment Questionnaire (Porter and Smith, 1970)	Mean	α = 0.92	NR	Multiple linear regression
		Several hospitals	- Job Satisfaction (Minnesota Satisfaction Questionnaire (Weiss et al., 1967)	Mean	α = 0.88	NR	
22	Kennerly (1989), J Nurs Admin, USA	23 deans/ chairs	- Leader Behavior Description Questionnaire-Form XII (Stogdill, 1963)	10 items, 5 pt scale	α = 0.90 & 0.78	NR	Regression, Pearson product correlation coefficients
		181 nurse faculty	- Index of Job Satisfaction (Brayfield and Rothe, 1951)	18 items, 5 pt scale	α = 0.85	NR	
23	Klakovich (1996), J Nurs Admin, USA	113 RNs	- Leadership Achieving Styles Inventory-13 (Lipman-Bluman, 1991)	45 items, 7 pt scale	α = 0.81–0.91	Construct	Stepwise regression
		1 hospital	- Reciprocal Empowerment Instrument: (Klakovich, 1995)	24 items, 5 pt scale	α = 0.77–0.89	Pilot Study	Power analysis
			- Organizational Culture Inventory (Cooke and Lafferty, 1987)	120 items, 5 pt scale	α = 0.74–0.92		
24	Krogstad et al. (2006), Human Resources for Health, Norway	n = 1066 nurses	- Work Experiences (Work Research & Quality Improvement Questionnaire (Krogstad et al., 2002))	5 items, 5 pt scale	α = 0.85	1998 pilot study	Linear regression
		n = 358 doctors	- Local Leadership	4 items, 4 pt scale	α = 0.76		
		n = 390 auxillaries	- Top management	3 items, 10 pt scale	α = 0.77		
			- Competence	3 items, 10 pt scale	α = 0.82		
			- Work Organization	2 items, 5 pt scale	α = 0.74		
			- Professional Development				
25	Larrabee et al. (2003), J Nurs Admin, USA	90 RNs	- Multifactor Leadership Questionnaire-5X (Bass and Avolio, 1995b)	45 items, 5 pt scale	α = 0.63–0.95	Construct	ANOVA
		1 hospital	- Intent to Leave (Price and Mueller, 1981, 1986)	1 items, 5 pt scale	NR	NR	Multivariate regression
			- Job Satisfaction (Work Quality Index (Whitley and Putzier, 1994))	38 items, 7 pt scale	α = 0.76–0.90	Construct	
			- Empowerment (Spreitzer, 1995)	12 items, 7 pt scale	α = 0.86–0.96	Construct	
26	Laschinger et al. (1999), J Nurs Admin, Canada	537 RNs	- Leader Empowering Behavior Scale (Conger and Kanungo, 1988)	27 items, 7 pt scale	α = 0.77–0.95	All measures NR	SEM
		2 hospitals	- Empowerment (Conditions of Work Effectiveness Questionnaire (Kanter, 1977))	37 items, 7 pt scale	α = 0.80–0.88		
			- Formal Power (Job Activities Scale (Kanter 1977, 1993))	12 items, 5 pt scale	α = 0.69		

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Informal Power (Organizational Relationship Scale (Kanter, 1977, 1993))	20 items, 5 pt scale	α = 0.89		
			- Job Tension (Job Tension Index (Lyons, 1971))	9 items, 7 pt scale	α = 0.81		
27	Leiter and Laschinger (2006), Laschinger and Leiter (2006), J Nurs Admin & Nurs Res, Canada	8597 nurses	- Leadership (Practice Environment Scale of the Nursing Work Index (Lake, 2002)	28 items, 4 pt scale	α = 0.84	PV	SEM
		2 provinces, ON & AB	- Burnout (Maslach Burnout Inventory: Human Service Scale (Maslach et al., 2001) 3 subscales	22 items, 7 pt scale	α = 0.78–0.91	PV	
28	Lok and Crawford (2001), Lok et al. (2005), J Manage Psych & App Psych, Australia	251 nurses	- Leader Behaviour Description Questionnaire (Stogdill, 1974)	40 items, 5 pt scale	α = 0.78–0.82	NR	Correlation
		RR = 63%	- Organizational Culture Index (Wallach, 1983)	24 items, 4 pt scale	α = 0.71–0.87	NR	Multiple regression analysis
			- Organizational Commitment Questionnaire: (Mowday et al., 1979)	15 items, 7 pt scale	α = 0.84–0.94	NR	Descriptive stats
			- Job Satisfaction Survey (Mueller and McClosky, 1990)	31 items, 5 pt scale	α = 0.83	NR	
29	Manojlovich (2005a,b), J Nurs Admin, USA	308 medical-surgical nurses	- Nursing Leadership (Manager's Activities Scale (Laschinger, 2004))	11 items	α = 0.82–0.94	NR	t-test
		RR = 73%	- Conditions for Work Effectiveness Questionnaire II (Laschinger, 1996a,b) 4 subscales, (Job Activities Scale II), (Organizational Relationships Scale II, author & date NR)	12, 3, 4 items	α = 0.78–0.93	Content & construct	correlations path analysis
30	Marchionni and Ritchie (2008), J Nurs Manage, Canada	n = 20 nurses	- Organizational Learning Survey (Goh and Richards, 1997)	21 items, 7 pt scale	α = 0.63	NR	Fisher's exact test
		RR = 25%	- Multifactor Leadership Questionnaire (Avolio and Bass, 2004)	45 items, 4 pt scale	α = 0.65–0.92	NR	
		1–50 bed medical unit 1–15 bed surgical unit					
31	McDaniel and Wolf (1992), J Nurs Admin, USA	1 Nurse Executive	- Multifactor Leadership Questionnaire (Bass, 1987)	76 items, 5 pt scale	α = 0.92	PV	T-test
		9 Admin	- Job Satisfaction (Work Satisfaction Scale (Hinshaw et al., 1987)) 5 subscales	32 items, scale	α = 0.87	Construct	Paired scoring
		46 RNs					
32	McGillis Hall and Doran (2007), J Nurs Manage, Canada	n = 1116 nurses	- Nurse staffing: Information provided by NMs	NA	NA	NA	Correlational co-efficients
		77 acute care med/surg units	- Patient complexity: Hospital records	NA	NA	NA	ANOVA
		19 hospitals	- Care delivery models: Three variables used to describe type of care given	NA	NA	NA	Multilevel hierarchical linear modelling
			- Coordination of care (Shortell et al., 1991)	5 items	α = 0.80	NR	
			- Job satisfaction: Job description index (Ironson et al., 1989)	18 items	α = 0.88	NR	
			- Job stress: Stress in General Scale (Smith et al., 1992; Stanton et al., 2001)	15 items	α = 0.91–0.92	NR	

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Nursing role tension: Tension Index (Lyons, 1971)	9 items	α = NR	NR	
			- Quality of care (Shortell et al., 1991)	6 items	α = 0.76	NR	
			- Nursing leadership (Shortell et al., 1991)	5 items	α = 0.87	Factor Analysis	
33	McGuire and Kennerly (2006), Nurs Econ, USA	63 nurse managers	- Multifactor Leadership Questionnaire Form 5X, (Bass and Avolio, 2000) 12 subscales, 2 versions used leader & rater form	45 items, 5 pt scale	Previously established	PV	Pearson's product-moment correlation
		500 RN's	- Organizational Commitment (Organizational Commitment Questionnaire, (Mowday et al., 1979))	15 items, 7 pt scale	α = 0.82–0.93	Convergent, discriminant & predictive	
34	McIntosh (1990), Work Stress, USA	RR not stated 97 RNs & LPNs	- Supportive Leader Behavior (Caplan et al., 1975)	4-items 5-pt scale	α = 0.89	NR	Moderated Hierarchical Regression. Descriptive statistics
			- Job satisfaction (Minnesota Satisfaction Questionnaire (Aldag et al., 1981))	20 items	α = 0.85	NR	
			- Anxiety (State-Trait Personality Inventory, (Spielberger, 1980))	10 items	α = 79	NR	
35	McNeese-Smith (1995, 1996), Hosp & Health Serv Admin & J Nurs Admin, USA	Seattle sample only	- Leadership Practices Inventory: Self & Other (Posner and Kouzes, 1987, 1990)	30 items × 2, 5 pt scale	α = 0.58–0.94	Criterion	ANOVA
		41 managers (1/2 non nurses)	- Productivity scale (researcher developed)	15 items, 5 pt scale	α = 0.90	Face/ PilotedConvergent	Regression
		471 employees	- Job-in-General scale (Smith et al., 1989): subscale of JDI	18 items, yes/no/ ?	α = 0.88		
		2 hospitals	- Organizational Commitment (Porter et al., 1974)	15 items, 7 pt scale	α = 0.92	NR	
36	McNeese-Smith (1995, 1999), J of Org Beh & J Nurs Admin, USA	LA Sample only	- Leadership Practices Inventory: Self & Other (Posner and Kouzes, 1987, 1990)	30 items × 2, 5 pt scale	α = 0.58–0.94	Criterion	ANOVA
		19 managers & 221 nurses	- Productivity scale (researcher developed)	15 items, 5 pt scale	α = 0.90	Face/Piloted	Regression
		1 hospital	- Job-in-General scale (Smith et al., 1989): subscale of JDI	18 items, yes/no/ ?	α = 0.88	Convergent	
			- Organizational Commitment (Porter et al., 1974)	15 items, 7 pt scale	α = 0.92	NR	
			- Motivation (Job Choice Exercise (JCE), (Stahl, 1986; Stahl and Harrell, 1982)	30 items, scores regressed & equation	α = 0.59–0.89	Criterion/Construct	
37	McNeese-Smith & Yang (2000), Hong Kong Nursing J, Shanghai & USA	Shanghai sample only	- Leadership Practices Inventory: Self & Other: (Posner and Kouzes, 1987, 1990)	30 items × 2, 5 pt scale	α = 0.58–0.94	Criterion	ANOVA
		48 head nurses, 292 nurses	- Productivity scale (researcher developed)	15 items, 5 pt scale	α = 0.90	Face/Piloted	Regression
		8 hospitals	- Job-in-General scale (Smith et al., 1989) subscale of JDI)	18 items, yes/no/ ?	α = 0.88	Convergent	
			- Organizational Commitment (Porter et al., 1974)	15 items, 7 pt scale	α = 0.92	NR	
38	Medley and Larochelle (1995), Nurs Manage, USA	122 staff nurses	- Multifactor Leadership Questionnaire (Bass and Avolio, 1995b)	70 items, 4 pt scale	α = 0.80–0.86	Content	Correlation, factor analysis

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
		4 hospitals	- Index of Work Satisfaction (Slavitt et al., 1986)	44 items, 7 pt scale	α = 0.82	NR	
39	Meyer-Bratt et al. (2000), Am J Crit Care, USA & Canada	1973 RNs	- Leader Empowering Behaviours (Good and Nelson, 1973; Baggs et al., 1992)	27 items, 7 pt scale	α = 0.96	NR	ANOVA
		65 peds acute care facilities	- Work Satisfaction Scale & Nursing Job Satisfaction Scale (Hinshaw and Atwood, 1985)	32 + 23 items, 5 pt scale	α = 0.83 & 0.86		Multiple regression
40	Morrison et al. (1997), J Nurs Admin, Country NR	275 nurses (licensed & unlicensed)	- Multifactor Leadership Questionnaire Form 5X (Bass and Avolio, 1995a) 4 subscales	5pt scale	α = 0.67–0.93	All measures NR	ANOVA
		RR = 64%	- Psychological Empowerment (Spreitzer, 1995)	4 items, 5pt scale	α = 0.72		Hierarchical Multiple Regression
			- Job Satisfaction (title NR: (Warr et al., 1979)	Likert type	α = 0.90 & 0.78		
41	Mosser and Walls (2002), South Online J Nurs Res, USA	253 nursing faculty	- Leadership Orientations Instrument, Other (Boleman and Deal, 1991)	32 items, 5 pt scale	α = 0.91–0.93	Varimax rotation	Pearson Correlation
		60 schools	- Organizational Climate Description Questionnaire-Higher Education (Borrevik, 1972)	42 items, 5 pt scale	α = 0.68–0.93		ANOVA
		RR = 42%					Tukey's HSD test (post hoc)
42	Nielsen et al. (2008), J of Adv Nurs, Denmark	n = 447 staff	- Global Transformational Leadership Scale (Carless et al., 2000)	7 items, 5 pt scale	NR	NR	Independent sample t-tests
		RR = 81%	- Influence, meaningful work, involvement, job satisfaction, & well-being - Copenhagen Psychosocial Questionnaire (Kristensen et al., 2002, 2006)	NR except for job satisfaction (5 items, 4 pt scale)	NR	NR	SEM
43	Peiro et al. (1996), Work Stress, Country NR	155 nurses	- Leadership: Supervisory Behaviour Questionnaire (Fleishman, 1957, 1953)	6 items, 5 pt scale	α = 0.64–0.72	PV	Within & Between Group Analysis Correlation
		127 physicians	- Job Satisfaction Questionnaire for PHCT Professionals (Peiro et al., 1990)	7 pt scale	α = 0.76–0.95	NR	
		28 Primary Healthcare Teams	- Workteam Climate (de Witte and de Cock, 1985)	4 pt scale	α = 0.77–92	NR	
			- Role Stress: Role Conflict (Rizzo et al., 1970)	6 items, 7 pt scale	α = 0.77–0.75	Construct	
			- Role Clarity (Rizzo et al., 1970)	7 items, 7 pt scale	α = 0.90–0.92	NR	
			- Job Related Tension (Rizzo et al., 1970)	6 items, 5 pt scale	α = 0.67–0.87		
44	Prenkert and Ehnfors (1997), J Nurs Manage, Sweden	23 head nurses & assistant head nurses	- Modified Multi-Leadership Questionnaire (Bass, 1985) 2 items removed & 3 items added renamed Leadership Nursing Effectiveness Questionnaire)	84 items, 5 pt scale	NR	NR	Correlations
		1 hospital	- Organizational Effectiveness = Nursing Recipients × Quality of Nursing Care	Equation			
			- Resources Used		NR	NR	
45	Searle-Leach (2005), J Nurs Admin, USA	Nurse Executives n = 102, nurse managers n = 148	- Transformational Leadership Profile (Sashkin et al., 1992)	50 items, 5 pt scale	α = 0.63–0.88	NR	Spearman's rank order correlation coefficients
		RNs = 651	- Organizational Commitment Scale (Penley and Gould, 1988)	15 items, 6 pt scale Sum & average score	α = 0.78–0.82	NR	Descriptive stats
46	Sellgren et al. (2008), J Nurs Manage, Sweden	77 Nurse managers	- Leadership behavior ('Change, production, employee' tool (Ekvall and Arvonen, 1991, 1994))	30 items, 6 pt scale	α = 0.86–0.94	NR	Correlations

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Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
		n = 426 staff	- Job Satisfaction Questionnaire (Ekvall, no year)	20 items	α = 0.74–0.92	NR	Duncan's post-hoc test
		RR = 55%	- Work climate (Creative Climate Questionnaire, (Ekvall and Arvonen, 1996))	50 items, 4 pt scale	α = 0.66–0.90	NR	Analysis of variance
		1 university hospital					
47	Shieh et al. (2001), J Nurs Educ, Taiwan	233 nurse faculty	- Multifactor Leadership Questionnaire 5–45 (Bass and Avolio, 1995b)	38-items, 5 pt scale	α = 0.71–0.94	Content & Construct	Hierarchical Multiple Regression
		21 nursing programs	- Nursing Faculty Satisfaction Questionnaire modified (Martin, 1991) - * Note: all measures translated into Chinese	40 items, 5 pt scale	NR	Concurrent	Chi-square
48	Stordeur et al. (2001), J Adv Nurs, Belgium	625 RNs	- Multifactor Leadership Questionnaire Form-5X: (Bass and Avolio, 1991)	70 items, 5 pt scale	α = 0.68–0.90	All measures NR	Multiple Regression
		1 hospital	- Work Stressors (Nursing Stress Scale: (Gray-Toft and Anderson, 1985; Gray-Toft and Anderson, 1981a,b))	34 items, 4 pt scale	α = 0.47–0.77		
			- Role Conflict (House and Rizzo, 1972)	3 items, 4 pt scale	α = 0.82		
			- Role Ambiguity (House and Rizzo, 1972)	3 items, 4 pt scale	α = 0.95		
			- Emotional Exhaustion (Maslach Burnout Inventory: (Maslach and Jackson, 1981))	9 items, 7 pt scale	α = 0.87		
49	Stordeur et al. (2000), Nurs Res, Belgium	464 - nurses, head nurses & associate directors	- Multifactor Leadership Questionnaire-5X (Bass and Avolio, 1991)	70 items, 5 pt scale	α = 0.68–090	All measures NR	ANOVA
		8 hospitals	- Perceived Unit Effectiveness (Shortell et al., 1989)	10 items, 5 pt scale	α = 0.84		Regression
			- Extra Effort (MLQ (Bass and Avolio, 1991)	3 items, 5 pt scale	α = 0.86		
			- Satisfaction with Leader (MLQ (Bass and Avolio, 1991) - * Note: all measures translated into French	2 items, 5 pt scale	α = 0.91		
50	Taunton et al. (1997), West J Nurs Res, USA	95 Nurse managers & 248 RNs	- Ohio State University Leader Behaviour Description Questionnaire (Kruse and Stogdill, 1973) + 2 questions (Camman et al., 1983)	NR	α = 0.61–0.94 (all measures)	All measures NR	Multiple Regression
		(124 leavers & 124 stayers)	- Retention (3 indicators: turnover [resignation], unit separation [transfer] & retention)	Proportion remaining > 6 m			Path Coefficients
		4 hospitals	- Stress (Hinshaw and Atwood, 1983,1985 adapted from Bailey and Claus, 1978; Claus and Bailey, 1977)	NR			
			- Job satisfaction (2 of 8 scales from Hinshaw & Atwood's job satisfaction questionnaire (Hinshaw and Atwood, 1985))	NR			
			- Group cohesion (Hinshaw and Atwood, 1985)	NR			
51	Taunton et al. (1989a,b), J Nurs Admin, USA	59 RNs	- Leadership Style (Michigan Organizational Questionnaire, no date)	NR	α = 0.70–93 across all study measures	Factor analysis	Correlations
		12 dieticians & social workers	- Retention – percentage of study period that participant remained on the job	%		Experience with measures	ANOVA

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Job Satisfaction Index, (Price & Mueller, no date)	NR			-Duncan test (post hoc)
			- Intent-to-Stay (Intent to Stay Index, (Price & Mueller, no date))	NR			
52	Wakefield-Fisher (1987), J Prof Nurs, USA	215 Faculty	- Leader Behaviour Description Questionnaire-XII: (House, 1971): 2 subscales	NR	α = 0.88	Content, Construct	Regression
		21 doctoral programs participated	- Scholarly Productivity (Scholarly Productivity Index: researcher developed) 3 sub-scales (publication activities, prepublication & research activity & editorial activities)	NR	α = 0.75	Factor Analysis	
53	Womack (1996), J Prof Nurs, USA	106 Nursing Department Chairs	- Leadership Effectiveness & Adaptability Description-Self Instrument (Hersey and Blanchard, 1988)	12 items, 4 pt scale	NR	NR	Chi-square
		104 schools	- Scholarly Productivity Index: (Wakefield-Fisher, 1987), Researchers used the corrected version, now called SPIC (SPI Corrected)	3 dimensions (see above)	NR	NR	T-tests
	Updated Review Articles						
54	Abdelhafiz et al. (2016), J Nurs Manage, Jordan	n = 200 RNs	- The Multifactor Leadership Questionnaire, (Bass and Avolio, 1995)	45 items, 5 pt scale	NR	PV	ANOVA; t-test; Pearson's correlation coefficient
		88.8% RR	- Job Satisfaction Questionnaire –author developed	7 items, 3 pt scale	α = 0.819–0.871	NR	
55	AbuAlRub and Alghamdi (2012), J Nurs Manage, Saudi Arabia	n = 308 RNs	- Multifactor Leadership Questionnaire	35 items, 5 pt scale	α = 0.87	PV	Pearson's regression; hierarchical regression analysis
		51.3% RR	- Bass and Avolio (2004)	36 items, 6 pt scale	α = 0.73	PV	
			- Job Satisfaction Survey (Spector, 1985)	5 items, 5 pt scale	α = 0.80	PV	
			- McCain's Intent to Stay Scale (McCloskey and McCain, 1987)				
56	Allen-Gilliam et al. (2016), J Nurs Admin, USA	n = 15 SCNs	- Yukl's Managerial Practices Survey (Yukl et al., 2002, 2009)	48 items, 5 pt scale	α = 0.75–0.93	PV	Cronbach's alpha, aggregation indices
		82 RNs	- Safety Assessment Scale (Agnew et al., 2013; 2014)	10 items, 5 pt scale	"satisfactory reliability"	NR	
		79% SCN response rate					
57	Allen-Gilliam et al. (2016), JONA, USA	N = 218 RNs/LPNs	- Nursing Work Index-Revised (NWI-R) (Aiken and Patrician, 2000)	57 items, 4 pt scale	α = 0.96	Content, Criterion and Construct	A correlation matrix; Multiple linear regressions
		RR = 24% to 65% (varied over the 5 years)	- Shared Governance Survey (Frith and Montgomery, 2006)	39 items, 4 pt scale	α = 0.95	Content, Construct	
			- Index of Work Satisfaction (IWS)-1997 Revision (Stamps, 2007)	44 items, 7 pt scale	α = 0.91	NR	
			- Work Practice Breakdown Survey (Kenward and Zhong, 2004)	16 items, 0, 1 or > 1	NR	Content, Construct	
			- Developing Evidence-Based Practice (Gerris et al., 2008)	49 items, 5 pt scale	α = 0.87		
58	Alshahrani and Baig (2016), Coll Physicians Surg Pak	N = 94 licensed nurses	- Multifactor leadership questionnaire (Bass and Avolio, 2004)	45 items, 5 pt scale	α = 0.96	Pilot tested	ANOVA with Post Hoc-Tukey HSD
		RR = 59%	- Job satisfaction survey (JSS) (Spector, 1985)	39 items, 6 pt scale	α = 0.81	Pilot tested	Multiple linear regression analysis

Table 2 (continued)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
59	Andrews et al. (2012), Int J Nurs Stud, USA	N = 16 supervisors and n = 179 RNs	- Multifactor Leadership Questionnaire (Form 5X) (Bass and Avolio, 2004)	45 items, 5 pt scale	α = 0.74–0.96	PV	Parametric statistics; Multivariate analysis of variance with Bonferroni post hoc testing; four-step hierarchical regression
60	Asiri et al. (2016), DMC Nursing, Saudi Arabia	n = 332 nurses	- The Multifactor Leadership Questionnaire (MLQ), (Bass and Avolio, 2004)	44 items, 5 pt scale,	α = 0.94	PV	Pearson correlation, stepwise regression; ANOVA, post-hoc analysis
		RR = 95%	- Psychological Empowerment Scale (Spreitzer, 1995)	12 items, 6 pt scale	α = 0.94	NR	
			- Three-Component Model of Employee Commitment (Meyer and Allen, 1997)	18 items, 7 pt scale	α = 0.79	NR	
61	Cheng et al. (2016), Pers Rev, Australia	N = 201 registered nurses	- The Multifactor leadership questionnaire (MLQ, Form 5X-short) (Bass and Avolio, 1995b)	20 items, 5pt scale	α = 0.83 idealised influence (attributed), α = 0.75 idealised influence (behavior), α = 0.85 inspirational motivation, α = 0.80 intellectual stimulation, α = 0.76 individual consideration	PV	SEM
		RR = 28.4 %	- Team climate inventory (Anderson and West, 1998)	38 items, 7pt scale	α = 0.95 team vision, α = 0.88 task orientation, α = 0.92 participation safety, α = 0.91 support innovation, α = 0.89 interaction frequency, α = 0.75 and 0.77	PV	
			- Oldenburg burnout inventory (Demerouti et al., 2010)	8 items, 5pts	α = 0.75 disengagement, α = 0.77 exhaustion	PV	
			- modified version of the patient satisfaction scale as adapted from (Bartram et al., 2012)	**1 scale, 2 subscales,** Technical 4 items, 5 pt scale, Social 5 items, 5pt scale	α = 0.79 social, α = 0.61 technical	PV	
			- The Michigan Organizational Assessment Questionnaire (Cammann et al., 1979)	3 items, 7pt scale	α = 0.90	PV	
62	Choi et al. (2016), Human Resources for Health, Malaysia	n = 200 RNs	- Author developed survey including items adapted from:	17 items, 5 pt scale	NR	Content and Face validity	Descriptive Statistics; Partial least squares SEM
		57.14% RR	- Multifactor Leadership Questionnaire (Bass and Avolio, 2000)	8 items	α = 0.89		
			- Empowerment (Matthews et al., 2003)	5 items	α = 0.88		
			- Job Satisfaction (Warr et al., 1979)	4 items	α = 0.80		
63	Cummings et al. (2008b, 2013), J Nurs Manag, Can Oncol Nurs J, Canada	N = 515	- Subset of 14 items from the Nursing Work Index-Revised (NWI-R) (Aiken and Patrician, 2000)	14 items, 4 pt scale	NR	PV	Pearsons chi-square test stepwise logistic regression; SEM
		RR = 31%	- Job features questions		NR	Pilot-tested	
64	Dahinten et al. (2014), J Nurs Manag, Canada	N = 1067 nurses	- Conditions of Work Effectiveness (II) Scale (CWEQII) (Laschinger et al., 2001)	19 items, 5 pt scale	α = 0.88 intervention (i)	PV	Multiple regression analysis, Pearsons correlations, Descriptive statistics
		RR = 11%			α = 0.90 comparison (c)		
		= 23%			α = 0.85 (i)		

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Psychological Empowerment Scale (PES) (Spreitzer, 1995)	5 pt scale	α = 0.85 (c)	PV	
			- Leader Empowering Behaviors Scale (LEBS) (Hui, 1994)	7 pt scale	α = 0.98 (both)	PV	
			- Perceived Organisational Support Scale (POSS) (Rhoades and Eisenberg, 2002)	8 items, 7 pt scale	α = 0.90 (both)	PV	
			- Organisational Commitment Questionnaire (OCQ) affective commitment subscale (Meyer and Allen, 1991; Meyer et al., 1993).	8 items, 7 pt scale	α = 0.84 (i) α = 0.82 (c)	PV	
65	Dirik and Intepeler (2017), J Nurs Manag, Turkey	N = 350 nurses from three hospitals	- The Authentic Leadership Questionnaire (ALQ) (Avolio et al., 2007)	16 items, 5 pt scale	α = 0.95	Translated and Pilot-tested	Descriptive statistic, hierarchical regression,
			- Safety Climate Survey (Sexton et al., 2003)	19 items, 5 pt scale	α = 0.84	Translated and Pilot-tested	Analysis and percentage of problematic responses (PPR)
66	Duffield et al. (2009, 2011), Collegian; J Clin Nurs, Australia	n = 2141 nurses from 91 wards in 21 hospitals	- Nursing Work Index-Revised (Aiken and Patrician, 2000)	49 items, 4 pt scale	α = 0.74 autonomy α = 0.77 control over practice α = 0.83 nurse-physician relations α = 0.80 leadership α = 0.80 resource adequacy	PV	Regression analyses using hierarchical linear modelling (HLM); Beta weights calculated
		RR = 80.9%	- Nurse Survey (adapted from (Aiken et al., 2001; O'Brien-Pallas et al., 2004)	29 items, 4 pt scale	NR		
67	Ebrahimzade et al. (2015), Shiraz E Medical Journal, Iran	N = 207 nurses	- Maslach Burnout Inventory (MBI) (subscales: emotional exhaustion, deal with depersonalization, and reduced personal accomplishment within the profession) (Maslach et al., 1996)	22 items, 7 pt scale	α = 0.73, 0.81, 0.70	PV	Independent *t*-tests; 1-way ANOVA, Pearson's correlation analysis; Stepwise multiple regression analysis using beta coefficients.
		RR = 90%	- Multifactor leadership questionnaire (MLQ) (subscales: transformational, transactional, and laissez faire leadership styles) (Bass and Avolio, 1997)	36 items, 5 pt scale	α = 0.80, 0.76, and 0.95	PV	
68	Failla and Stichler (2008), J Nurs Admin, USA	N = 92 (15 nurse managers and their direct report nursing staff)	- Multifactor Leadership Questionnaire (Form 5X) (Bass and Avolio, 1995)	45 items, 5 pt scale	α = 0.39–0.84	Confirmatory factor analysis Construct validity	Descriptive statistics; Pearson product-moment correlation coefficients; 1-way ANOVA
		RR = 59%	- Leader form - Rater form		α = 0.61–0.84		
			- Index of Work Satisfaction Questionnaire-Part B (IWS-B) (Stamps, 2007)	44 items, 7 pt scale	α = 0.56–0.88		
69	Fallatah and Laschinger (2016), J Res Nurs, Canada	N = 93 RNs	- Authentic Leadership Questionnaire (ALQ) (Avolio et al., 2007)	16 items, 5 pt scale	α = 0.92	PV	Descriptive statistics; mediation analysis (Baron and Kenny, 1986)
		RR =	- Revised Nursing Worklife Index (NWI-R) (Aiken and Patrician, 2000)	6 items, 4 pt scale	α = 0.79	PV	
			- North Carolina Center for Nursing – Survey of Newly Licensed Nurses (Scott et al., 2008).	4 items, 5 pt scale	α = 0.79	PV	
70	Farag and Anthony (2015), J PeriAnesthesia Nurs, USA	n = 40 RNs	- Multifactor Leadership Questionnaire (Bass and Avolio, 2004)	36 items, 5 pt scale	α = 0.62–0.95	PV	Regression analysis; correlation analysis

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
		59.7% RR	- Patient Safety Climate in Health care Organizations tool (Nieva and Sorra, 2003)	20 items, 5 pt scale	α = 0.62–0.94	NR	
71	Friese and Himes-Ferris (2013), J Nurs Admin, USA	n = 402 oncology nurses	- Revised Practice Environment Scale of the Nursing Work Index (Lake, 2002; Friese, 2005)	23 items, 5 pt scale	α = 0.87	PV	Student's *t*-test; chi-square logistic regression; CFI, RMSEA
72	Garbee and Killacky (2008), Int J Nurs Educ Scholars, USA	30%RR 782 nursing faculty: (RR = 40.4%; 316 responses)	- Index of Job Satisfaction (Brayfield and Rothe, 1951)	18 items, 5 pt scale	α = 0.87	NR	Pearson correlation; Multiple regression (stepwise)
			- Mentoring Scale (Dreher and Ash, 1990)	18 items, NR	α = 0.95	PV	
			- Organizational Commitment Questionnaire (Mowday et al., 1979)	9 items, 7 pt scale	α = 0.82–0.93	PV	
			- Leadership Behavior Description Questionnaire (Stogdill, 1963)	20 items, NR	α = 0.76–0.80	PV	
			- Intent to Stay (combined Price and Mueller, 1981; Yoder, 1995; Kosmoski and Calkin, 1986)	6 items, NR	α = 0.89	NR	
73	Giallonardo et al. (2010) J Nurs Manag, Canada	N = 170 RNs	- The Authentic Leadership Questionnaire (ALQ) (Avolio et al., 2007)	16 items, 5 pt scale	α = 0.70–0.90	PV	Descriptive statistics; Pearson's correlations; hierarchical multiple regression and mediation analysis (Baron and Kenny, 1986)
		RR = 39%	- The Utrecht Work Engagement Scale (UWES) (Schaufeli and Bakker, 2003)	17 items, 7 pt scale	"the alphas were acceptable except for the absorption subscale which was 0.60"		
			- Part B of the Index of Work Satisfaction scale (IWS) (Stamps, 2007)	44 items, 7 pt scale	α = 0.89		
74	Gillet et al. (2013), Int J Nurs Stud, France	N = 343 nurses and auxiliary nurses	- Global Transformational Leadership scale (Carless et al., 2000)	7 items, 7 pt scale	Satisfactory reliability	Convergent and Discriminant	SEM; chi-square value (x2), the
		RR = 68.6%	- Organizational Justice Scale (Niehoff and Moorman, 1993)	14 items, 7 pt scale	adequate factorial structure and internal consistency	Validity	normed chi-square (x2/df), the Non-Normed Fit Index
			- Quality of Work Life (QWL) Questionnaire (Elizur and Shye, 1990; Delmas et al., 2001)	16 items, 7 pt scale		PV	(NNFI), CFI, IFI, RMSEA,
			- Modified Utrecht Work Engagement Scale (UWES-9, Schaufeli et al., 2006a,b)	9 items, 7 pt scale	high internal reliability of the scale	Confirmatory factor analyses	SRMR
75	Hayati et al. (2014), Springerplus, Iran	n = 240 nurses	- Multifactor Leadership Questionnaire (Bass and Avolio, 1997)	20 items NR	α = 0.81–0.94	"validity results were significant and satisfactory"	Descriptive statistics; inferential statistics
		(RR = NR)	- Work Engagement Scale (Schaufeli et al., 2002)	17 items, 6 pt scale	α = 0.73		
76	Hunt (2014), J Nurs Manag, USA	n = 92 RNs	- Satisfaction in Nursing Scale (Lynn et al., 2009)	55 items, 5 pt scale	α = 0.81–0.93	PV	Pearson's Product Moment Correlation analysis; multiple regression; Spearman's Rank Correlation
		21 NMs	- Leadership Practices inventory (Kouzes and Posner, 2008, 2012)	30 items	α = 0.73–0.92	PV	
			- Anticipated Turnover Scale (Hinshaw et al., 1987)	12 items	NR	PV	
			- Value of Patient Outcomes Scale (Hunt, 2012)	8 items, 4 pt scale	NR	PV	
77	Jenkins and Stewart (2010), Healthc Manage Rev, USA	n = 210 nurses	- Commitment to Serve (Barbuto and Wheeler, 2006)	23 items, 5 pt scale	α = 0.80	PV	Multivariate regression
		(RR = 73%)	- Role Inversion Behavior (Sherman, 2002)	3 items, 5 pt scale	α = 0.72	NR	

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Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Job Satisfaction from Work Climate Survey (Jackson Group Inc., 2007)	2 items, 5 pt scale	α = NR	NR	
78	Kanste et al. (2009), Scand J Caring Sci, Finland	n = 660 nurses, public health nurses, head nurses (RR = 73%)	- Adapted Multifactor Leadership Questionnaire (transformational) (Bass and Avolio, 1995; Kanste et al., 2007a,b)	23 items, 5 pt scale	α = 0.96	Construct validity	Descriptive statistics; chi-square, NFI, IFI, RMSEA, standardized regression, squared multiple correlations
			- Willingness to exert extra effort	3 items, 5 pt scale	α = 0.92	NR	
			- Satisfaction with the leader	2 items, 5 pt scale	α = 0.92	NR	
79	Kanste et al. (2007a,b), J Nurs Manag, Finland	n = 601 nurses and nurse managers (RR = NR)	- Multifactor Leadership Questionnaire (Bass and Avolio, 1995)	78 items, 5 pt scale	above α = 0.70 for all measures	PV	Descriptive statistics, Pearson product moment correlation coefficient, LMR analysis, two-way ANOVA and *t*-test
			- Maslach Burnout Inventory-Human Services Survey (Maslach et al., 1996)	22 items, 7 pt scale		NR	
80	Kodama et al. (2016), J Nurs Manag, Japan	N = 396	- Multifactor Leadership Questionnaire Form 5X–Short (MLQ; Avolio and Bass, 2004).	36 items	α = 0.80	Face validity (all measures)	Two-tailed significance tests; Logistic regression analysis; a chi square (v2) test multiple logistic
		RR = 53.8 nurses	- Transformational	5 components with 20 items	α = 0.73–0.87		
			- Transactional	3 components, 12 items	α = 072–0.85		
			- Laissez-faire	1 component, 4 items	α = 83		
			- Affective Commitment Scale (Meyer and Allen, 1991)	8 items, 3 pt scale	α = 0.77		
			- Organisational Justice Questionnaire (Shibaoka et al., 2010)	26 items. 4 pt scale	α = 0.70–0.95		
81	Laschinger and Fida (2015), J Nurs Admin, Canada	n = 723 RNs	- Authentic Leadership Questionnaire (Walumbwa et al., 2008)	16 items, 5 pt scale	α = 0.97	PV	Comparative fit index; incremental fit index; standardized root mean residual
			- Conditions of Work Effectiveness-II (Kanter, 1977)	12 items, 5 pt scale	α = 0.79 to 0.82	Construct validity	
			- Items from Nursing Work Index Revised (Aiken and Patrician, 2000)	6 items, 5 pt scale	α = 0.80	NR	
			- Camman's measure of job satisfaction (Camman et al., 1983)	3 items, 5 pt scale	α = 0.77	NR	
82	Laschinger et al. (2015), Inter J Nurs Studies, Canada	N = 1009 New grad nurses	- The Authentic Leadership Questionnaire (Walumbwa et al., 2008)	16 items, 5 pts	α = 0.96	PV	Descriptive statistics and scale reliabilities;
		RR = 27%	- Areas of Worklife Scale (Leiter and Maslach, 2011)	18 items, 5pts	α = 0.81	PV	Little's MCAR test
			- Occupational Coping Self-Efficacy scale (Pisanti et al., 2008)	9 items, 5pts	α = 0.83	PV	hybrid SEM approach;
			- The Maslach Burnout Inventory-General Survey: emotional exhaustion and cynicism subscales (Maslach et al., 1996)	10 items, 6 pt scale	α = 0.82	PV	Chi-square (x2), Chi-square ratio (x2/df), CFI, IFI, RMSEA
			- Interpersonal strain at work (Borgogni et al., 2012)	6 items, 6pts	α = 0.92 / α = 0.92	PV	
			- General Health Questionnaire (Goldberg and Williams, 1988)	12 items, 4 pts	α = 0.85	PV	
83	Laschinger et al. (2014), Nursing Economics, Canada	N = 1241 Nurses	- Resonant Leadership Scale (Cummings, 2006)	10 item, 5 pts	α = 0.95	PV	Descriptive, inferential, and reliability analyses; SEM
		RR = 35%	- Global Empowerment Scale (Laschinger, 1996a,b)	2 items, 5 pts	a = 0.84–0.88	PV	

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Workplace Incivility Scale (Cortina et al., 2001)	7 items, 6pts	a = 0.89	PV	
			- The Maslach Burnout Inventory-General Survey (Schaufeli et al., 1996)	7 items, 6pts	a = 0.82–0.94	PV	
			- Four-item global measure of work satisfaction (Laschinger et al., 2001)	4 items, 5pt scale	a = 0.78–0.84)	PV	
84	Laschinger et al. (2013, 2012a,b), J Nurs Admin; J Nurs Manage; Inter J Nurs Stud, Canada	N = 615 RNs total	- The Conditions of Work Effectiveness Questionnaire-II (CWEQ-II) – measure structural empowerment (Laschinger et al., 2001)	12 items, 5 pt scale	NN, EN α = 0.84, 0.83	PV	Multi- group path analysis using SEM; Means, standard deviations, range, Cronbach's alpha and correlation coefficients
		342 New graduates (NN) RR = 37.7, and 273 Experienced nurses (EN)	- The Authentic Leadership Questionnaire (ALQ) (Avolio et al., 2007)	16 items, 5 pt scale	α = 0.97, 0.95	PV	
		RR = 48%	- The Maslach Burnout Inventory–General Survey (Schaufeli et al., 1996)	10 items, 7 pt scale	no overall provided	PV	
			- Cynicism		α = 0.89, 0.85		
			- Emotional exhaustion		α = 0.93, 0.92		
			- Negative Acts Questionnaire-Revised (Einarsen and Hoel, 2001)	22 items, 5pt scale	α = 0.77–0.92	NR	
			- Job satisfaction scale (Hackman and Oldham, 1975)	4 items, 5pt scale	α = 0.82	NR	
			- Turnover Intentions Scale (Kelloway et al., 1999)	3 items, 5pt scale	α = 0.92	NR	
85	Laschinger et al. (2009), Laschinger and Finegan (2011), J Nurs Admin; Nurs Res, Canada	N = 3156 Staff nurses	- Leader-Member Exchange Multidimensional Measure (LMX-MDM) (Liden and Maslyn, 1998)	12 item, 7pt scale	a = 0.94	Exploratory and confirmatory factor analysis	Multilevel SEM; covariance, CFI, Tucker-Lewis Index, RMSEA, descriptive, inferential (Wilcoxon, Student *t*, and one-way ANOVA tests)
		RR = 40%	- Conditions for Work Effectiveness Questionnaire-II (Laschinger et al., 2001)	19 items, 6pt scale	a = 0.87	NR	
			- Core self-evaluation scale (Judge et al., 2003)	12items, 7pt scale	a = 0.69	PV	
			- Psychological Empowerment Scale (Spreitzer, 1995)	12 item, 5pt scale	a = 0.70–0.90	PV	
			- Affective Commitment Scale (Meyer and Allen, 1993)	6 items, 7pt scale	a = 0.79	PV	
			- Emotional Exhaustion and Cynicism subscales of the Maslach Burnout Inventory General Survey (Schaufeli et al., 1996)	10 items, 7 pt scale	α = 0.93 emotional exhaustion, α = 0.94 cynicism		
			- Global measure of work satisfaction (Laschinger et al., 2001)	4 items, 5 pt scale	α = 0.82		
86	Laschinger et al. (2012a,b), J Nurs Manag, Canada	N = 231 MMs	- Leadership Practices Inventory (LPI; Posner and Kouzes, 1988)	30 items, 10pt scale	α = 0.72–0.85	PV	path analysis within the AMOS SEM
		RR = 60.2% response rate	- Structural empowerment was measured using The Conditions of Work Effectiveness Questionnaire II (CWEQ-II; Laschinger et al., 2001)	19 items, 5pts	α = 0.79–0.82	PV	
		N = 788 FLMs	- Shorter eight-item version of the original 36-item Survey of Perceived Organizational Support (SPOS; Rhoades and Eisenberg, 2002)	8 items, 6 pts	α = 0.74–0.95	Full scale PV	

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
		RR = 53.9%	- Two items from the International Survey of Hospital Staffing and Organization of Patient Outcomes (Aiken et al., 2002)				
			- Perceived quality of nursing care	1 item, 4 pt scale	NR	NR	
			- Turnover intention	1 item, 3 pt scale	NR	NR	
87	Lavoie-Tremblay et al. (2016), J Adv Nurs, Canada	N = 541	- Global Transformational Leadership scale (GTL; Carless et al., 2000)	7 items, 5 pt scale	a = 0.94	NR	linear regression
		RR = 20.8 Nurses	- Abusive leadership scale (Tepper, 2000)	15 items, 5 pt scale	a = 0.88	NR	
			- Quality of care scale (Aiken et al., 2002)	4 items, 4 pt scale	a = 0.84	NR	
			- Turnover intention- measured using single item adapted from (O'Driscoll and Beehr, 1994)	2 items, 7 pt scale	NR	NR	
88	Lewis and Cunningham (2016), Nurs Res, USA	n = 120 nurses (RR = NR)	- Transformational leadership (Rafferty and Griffin, 2004, 2006)	18 items, 7 pt scale	α = 0.97	Internal, convergent, and discriminant validities (all measures)	PROCESS analysis tool, descriptive statistics, multiple mediator analyses, and bivariate correlations
			- Areas of Worklife Scale (Leiter and Maslach, 2002, 2003)	29 items, 7 pt scale			
			- Maslach Burnout Inventory (Schaufeli et al., 1996)	16 items, 7 pt scale	α = 0.89		
			- Utrecht Work Engagement Scale (Schaufeli and Bakker, 2003; Schaufeli et al., 2006a,b)	17 items, 7 pt scale	α = 0.88		
89	Liang et al. (2016), J of Adv Nursing, Taiwan	N = 414 nurses	- Multifactor Leadership Questionnaire (MLQ) (Bass and Avolio, 1997) – Chinese version (Lee and Hong, 2008)	20 items, 5 pt scale	α = 0.96	PV	Descriptive Statistics; SD
		2 hospitals	- Safety Attitudes Questionnaire (SAQ) (Sexton et al. 2006) – Chinese Version (Lee et al., 2010)	26 items, 5 pt scale	α = 0.89	PV	Confirmatory factor analysis
		(RR = 91.6%)	- Emotional Labour Questionnaire (ELQ) (Wu, 2003)	26 items, 6 pt scale	α = 0.89	NR	SEM: x^2, RMSEA, goodness of fit index, CFI, NFI and SRMSR
			- Intention to Stay Scale (Wang et al., 2006)	4 items, 5 pt scale	α = 0.84	NR	
90	Lin et al. (2015), BMC Nursing, Taiwan	N = 651	- Multifactor Leadership Questionnaire (Bass and Avolio, 1994)	4 pt scale	α = 0.975	Convergent Validity	Pearson correlations
		RR = 80.7	- Job Content Questionnaire (JCQ) (Karasek et al., 1998)	22 items, 4 pt scale	α = 0.721	Convergent Validity	Analysis of variance
			- Job satisfaction scale from Occupational Stress Indicator (OSI) (Cooper et al., 1988)	12 items, 6 pt scale	α = 0.939	Convergent Validity	exploratory factor analysis (EFA)
			- Organisational Commitment Questionnaire (Mowday et al., 1979)	15 items, 7 pt scale	α = 0.878	NR	
			- General Health Questionnaire (Chinese Version) (Goldberg and Williams, 1988)	12 items, 4 pt scale	α = 0.81	PV	
91	Lucas et al. (2008), J Nurs Manag, Canada	N = 203 nurses (unspecified)	- Emotional Competence Inventory, Version 2 (ECI 2.0) (HayGroup, 2006)	72 items, 5 pt scale	α = 0.48–0.97	NR	Descriptive statistics, correlational analyses, moderated regression analysis
		(RR = 68%)	- The Conditions of Work Effectiveness-II (Laschinger et al., 2001)	19 items, 5 pt scale	α = 0.86	PV	

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
92	Ma et al. (2015), J Nurs Admin, USA	N = 29742 RN	- Supportive nursing management scale adapted from the Practice Environment Scales of Nursing Work Index (PES-NWI) (Lake, 2002)	5 items, 6 pt scale	α = 0.79–0.88	NR	Descriptive statistics
		200 hospitals (41 states) (RR – at least 50%)	- Intent to leave and job satisfaction	2 items, 6 pt scale	NR	NR	ANOVA
							Three-level HLM models
93	Malik et al. (2016), Inter J Nurs Stud, India	N = 405 nurses + 81 supervisors	- Authentic Leadership (Walumbwa et al., 2008)	16 items, 5 pt scale	α = 0.973	Convergent validity	Path analysis
		43 hospitals	- Knowledge sharing behaviour (Lu et al., 2006)	8 items, 5 pt scale	α = 0.960	Discriminant validity	Confirmatory factor analysis
		(RR = 65%)	- Use of information technology (Saga and Zmud, 1993)	7 items, 5 pt scale	α = 0.934		Fit indices
			- Employee creativity (Oldham and Cummings, 1996)	3 items, 5 pt scale	α = 0.838		
94	Malik and Dhar (2017) Pers Rev, India	N = 520 nurses + 163 supervisors	- Authentic Leadership Questionnaire (Avolio and Chan, 2008)	16 items, 5 pt scale	α = 0.987	Convergent validity	Path analysis; confirmatory factor analysis; conventional fit indices
		42 facilities	- Psychological Capital (Luthans et al., 2007)	24 items, 5 pt scale	α = 0.989		
		(RR = 58%)	- Autonomy (Park and Searcy, 2012)	4 items, 5 pt scale	α = 0.948		
			- Extra Role Behaviour (Eisenberger et al., 2010)	8 items, 5 pt scale	α = 0.974		
95	Malloy and Penprase (2010), J Nurs Manag, Country NR	N = 122 RN	- Multifactor Leadership Questionnaire (MLQ) Form 5· (Bass and Avolio, 2004)	45 items, 5 pt scale	α = 0.90	PV	Pearsons correlation coefficient,
		(RR = 30.5%)	- Copenhagen Psychosocial Work Environment Questionnaire (COSOQ) (Kristensen and Borg, 2000)	144 items	α = 0.59–0.87	PV	Statistical ANOVA post hoc Tukey
96	Manning (2016), J Nurs Admin, USA	N = 441 RN 3 hospitals (RR = 31%)	- Multifactor Leadership Questionnaire 5X Short Form (Bass and Avolio, 1995)	45 items, 5 pt scale	α = 0.76	PV	Descriptive
			- Utrecht Work Engagement Scale (UWES) (Schaufeli and Bakker, 2003)	17 items, 7 pt scale	α = 0.71	PV	Multivariate analysis (multiple regression)
97	Mauno et al. (2016), J Adv Nurs, Finland	N = 3466 nurses	- Emotional Leadership (Zapf et al., 1999)	3 items, 5 pt scale	α = 0.61	PV (all measures)	Pearson's correlations
		(RR = 21%)	- Utrecht Work Engagement Scale (Schaufeli et al., 2002)	6 items, 7 pt scale	α = 0.93		Hierarchical regression analysis
			- Public Service Motivation (Kim et al., 2013)	4 items, 5 pt scale	α = 0.87		Explanation rates
			- Global Transformational Leadership scale (Carless et al., 2000)	7 items, 5 pt scale	α = 0.94		
			- Work ethic feasibility	1 item, 5 pt scale			
98	McCutcheon et al. (2009), Nurs Leaders, Canada	n = 717 RNs/RPNs	- Multifactor Leadership Questionnaire (Bass and Avolio, 2000)	36 items, 5 pt scale	α = 0.94	PV	HLM; multiple regression analysis
		n = 680 patients n = 41 managers (RR = 99%)	Transformational Transactional Management by exception Laissez-faire	20 items 4 items 8 items 4 items	α = 0.95 NR α = 0.57 NR		
			- McCloskey-Mueller Satisfaction Scale (Mueller and McClosky, 1990)	31 items, 5 pt scale	α = 0.92	NR	
99	McGilton et al. (2013), J Nurs Manag, Canada	n = 155 regulated nurses	- Nurse Manager Ability, Leadership, and Support of Nurses subscale of the Revised Nursing Work Index (NWI-R) (Lake, 2002)	4 items, 5 pt scale	α = 0.84	Face/content validity	Two-level, mixed-effects linear regression analysis
		(RR = 20–55%)		1 item, 5 pt scale	NR		
			- Intent to stay	2 subscales	NR		

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- McCloskey-Mueller Satisfaction Scale (Mueller and McClosky, 1990)				
			- Emotional exhaustion subscale of the Maslach Burnout Inventory (MBI) (Maslach and Jackson, 1981)	9 items, 7 pt scale	"acceptable"	Construct validity	
100	Merrill (2015), J Nurs Admin, USA	n = 466	- Hospital Unit Safety Climate survey (Blegen et al., 2005)	33 items, 5 pt scale	NR	PV	Multiple regression
		RR = 29.5%	- Multifactorial Leadership Questionnaire (Avolio and Bass, 2004)	45 items, 4 pt scale	NR	PV	Multiple regression
		9 hospitals					
101	Meyer et al. (2011), J Nurs Manag, Canada	N = 558 nurse + 31 managers, 4 hospitals, (RR = 33.6%)	- Leadership Practices Inventory (Posner and Kouzes, 1988)	30 items, 10 pt scale	α = 0.98	PV	Descriptive statistics; ANOVA; Coefficient regression HLM
102	Meyer et al. (2014), Nurs Res, Canada	N = 754 teamwork (73,7% nurses) + 30 nurse managers − 35%	- Leadership Practices Inventory (Posner and Kouzes, 1993)	30 items, 10 pt scale	α = 0.98	PV	Descriptive statistics; HLM
			- Relational Coordination Survey for General Health Care Settings (Gittell, 2004)	7 items, 5 pt scale	α = 0.89		
103	Mills et al. (2017), J Res Nurs, Australia	N = 161 RNs	- Nurse Self-Concept Questionnaire (NSCQ) (Cowin, 2001, 2002; Cowin and Hengstberger-Sims, 2006; Cowin et al., 2008)	36 items, 8 pt scale	α = 0.79 to 0.91	NR	One-way ANOVA and Tukey's post-hoc tests
		RR = 44%	- Practice Environment Scale of the Nursing Work Index (PES-NWI) (Lake, 2002; Parker et al., 2010)	30 items, 4 pt scale	α = 0.80 to 0.89	PV	
			- Connor–Davidson Resilience Scale (CD-RISC 10) (Campbell-Sills and Stein, 2007; Connor and Davidson, 2003)	10 items, 5 pt scale	NR	PV	
			- Nurse Retention Index (NRI) (Cowin, 2001, 2002)	6 items, 8 pt scale	α = 0.93	NR	
104	Moneke and Umeh (2015), J Nurs Adm, USA	N = 112 RN	- Leadership Practices Inventory (LPI) (Kouzes and Posner, 2002)	30 items, 10 pt scale	α = 0.91	PV	Pearson product-moment correlation
		(RR = 81.7%)	- Organizational Commitment Questionnaire (OQC) (Mowday et al., 1979)	18 items, 7 pt scale	α = 0.86	PV	Multiple regression techniques and analysis of variance (ANOVA)
			- Job in General (JIG) questionnaire	18 items, Y/N/U scale	α = 0.87	NR	
105	Negussie and Demissie (2013), Ethiop J Health Sci., Ethiopia	N = 186	- Minnesota Satisfaction Questionnaire (MSQ) (Weiss et al., 1967)	18 items, 5 pt scale	α = 0.96	Face validity, pilot tested (all measures)	Descriptive statistics; principal Component Analysis, Pearson Product-Moment Coefficient and Multiple Regression
		(RR = 94%)	- Multifactor Leadership Questionnaire (MLQ) (Bass and Avolio, 2002)	45 items, 5 pt scale	α = 0.74		
106	Nelson et al. (2014), Burnout Research, Canada	N = 406	- Authentic Leadership Questionnaire (French adapted version) (Walumbwa et al., 2008)	8 items, 5 pt scale	α = 0.95	Temporal separation between measures	Least squares path analysis
		(RR = 10.7%–71.8%)	- Work Climate Scale (Roy, 1989)	17 items, 6 pt scale	α = 0.97		Regression analyzes
			- Psychological well-being at work (Gilbert et al., 2011, 2006)	25 items, 5 pt scale	α = 0.95		Structural equations and the bootstrap approach
107	Neubert et al. (2016), Leaders Quart, USA	N = 1485 nurses + 105 nurse managers	- Servant Leadership (Ehrhart, 2004)	14 items, 5 pt scale	α = 0.96	PV (all measures)	Multiple regression
		(RR = 38%)	- Helping behaviour (Van Dyne and LePine, 1998)	4 items, 5 pt scale	α = 0.77		SAS Proc Mixed
			- Creative behaviour (Scott and Bruce, 1994)	3 items, 5 pt scale	α = 0.82		Ordinary Least Squares (OLS)

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Organizational structure (Covin and Slevin, 1989)	7 items, 5 pt scale	α = 0.63		PROCESS macro
			- Items from Work Satisfaction Index (Stamps, 2007)	1 item, 5 pt scale	NR		
			- Patient Satisfaction (Press-Ganey, 2018)	9 items, 5 pt scale	α = 0.91		
108	Pyc et al. (2017), Int J Stress Manage, USA	N = 232 nurses + n = 24 supervisors (RR = NR)	- Abusive Supervision Scale (Tepper, 2000)	15 items, 5 pt scale	α = 0.95	Convergent and predictive validity	Descriptives, internal reliability coefficients, intercorrelations
			- Authoritarian leadership style (Cheng et al., 2004)	9 items, 5 pt scale	α = 0.86		
			- Anxiety - subscale of the Emotional Strain Scale (Caplan et al., 1975).	4 items, 4 pt scale	α = 0.69		
			- Depression - subscale of the Emotional Strain Scale (Caplan et al., 1975)	5 items, 4 pt scale	α = 0.78		
			- Exhaustion- Maslach Burnout Inventory (Maslach and Jackson, 1981)	5 items, 7 pt scale	α = 0.90		
			- Physical Symptoms Inventory (Spector and Jex, 1998)	18 items, 3 pt scale	α = 0.88		
			- Job satisfaction (Cammann et al., 1979)	3 items, 6 pt scale	α = 0.80		
			- Intention to quit (Spector et al., 1988)	1 item, 5 pt scale	NR		
			- In-Role Job Performance Scale was used (Williams and Anderson, 1991)	5 items, 7 pt scale	α = 0.93		
109	Read and Laschinger (2015), J Adv Nurs, Canada	Time 1: n = 342 RNs	- Authentic Leadership Questionnaire (Walumbwa et al., 2008)	16 items, 5 pt scale	α = 0.95	PV (all measures)	Chi-square test
		Time 2: n = 191 matched usable RN returns (RR = 48.2%; 55.8%)	- Conditions of Work Effectiveness II (CWEQ-II) (Laschinger et al., 2001)	12 items, 5 pt scale	α = 0.80		Structural equation modelling
			- Areas of Worklife Scale, Community Subscale (Leiter and Maslach, 2003)	3 items, 5 pt scale	α = 0.81		Fit statistics
			- The Mental Health Inventory (Ware and Kosinski, 2000)	5 items, 6 pt scale	α = 0.86		
			- Job Satisfaction (Shaver and Lacey, 2003)	4 items, 5 pt scale	α = 0.82		
110	Regan et al. (2016), J Nurs Manag, Canada	n = 220 RNs	- Conditions of Work Effectiveness Questionnaire – II (Laschinger et al., 2001)	14 items, 5 pt scale	All scales demonstrated acceptable reliability (Cronbach's α > 0.80).	PV	Hierarchical multiple regression analysis
		13% RR	- Authentic Leadership Questionnaire (Avolio et al., 2012)	16 items, 5 pt scale		PV	
			- Nursing Work Index Revised (Aiken and Patrician, 2000)	6 items, 5 pt scale			
			- Interprofessional Collaboration Scale (Laschinger and Smith, 2013)	4 items, 5 pt scale			
111	Roberts-Turner et al. (2014), Pediatri Nurs, USA	N = 935	- 3 subscales of the Healthcare Environment Survey (HES) – (Nelson, 2007; Persky and Bakkan, 2008):				SEM; RMSEA, The Mardia multivariate skewness, kurtosis tests were applied to examine multivariate non-normality of data before analysis
		RR = 76.5%	- Distributive justice scale (from the Job Satisfaction Scale of (Price and Mueller, 1986))	8 items, 7 pt scale	α = 0.95–0.96	NR	SEM

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Autonomy scale from Index of Work Satisfaction (IWS) survey (Stamps and Piedmonte, 1986)	8 items, 7 pt scale	α = 0.74–0.84	NR	
			- Job satisfaction (three items from Hackman and Lawler (1971) and two from Brayfield and Rothe (1951))	5 items, 7 pt scale	α = 0.84	NR	
112	Roche et al. (2015), J Nurs Stud, Canada and Australia	n = 4811 RNs	- Practice Environment Scale of the Nursing Work Index (Lake, 2002)	31 items, 7 pt scale	α > 0.7	PV	
113	Savic et al. (2007), Healthc Manage Rev, Slovenia	40% RR n = 558 nurses (RR = 52%)	- Leadership Practices Inventory deriving prevalence of transformational leadership (TF) style, transactional leadership (TA) style and laissez-faire (LF) leadership (Kouzes and Posner, 2003)	11 items, 5 pt scale	TF α = 0.92	PV	Descriptive statistics; reliability analysis, factor analysis, one-way ANOVA, paired samples test, bivariate correlations, and linear regression analysis
		n = 106 physicians (RR = 26%)			TA α = 0.66		
		n = 70 non-healthcare professional (RR = 26%)			LF α = 0.80	NR	
114	Shi et al. (2015), Inter J Nurs Pract, China	N = 378	- "Personal Involvement" - General Regulatory Focus Measure (GRFM) (Lockwood et al., 2002; Jia et al., 2012)	4 items, 5 pt scale 18 items, 9 pt scale	α = 0.78 α = 0.79 and 0.87	PV	Pearson's correlations, chi-square statistic (χ2), χ2/df, RMSEA, CFI, SRMR
		RR = 61%	- Validated Chinese version of the Transformational Leadership Inventory (TLI) (Podsakoff et al., 1990)	22 items, 5 pt scale	α = 0.89	test–retest reliability, internal consistency reliability and construct validity	
			- Chinese version of the Maslach Burnout Inventory—General Survey (MBI-GS) (Qiao and Schaufeli, 2011)	9 items, 7 pt scale	α = 0.84	PV	
115	Sili et al. (2014), Medicina del Lavoro, Italy	n = 110 nurses (RR = 57%)	- Positive Leadership-Nursing Organizational Health Questionnaire (Sili et al., 2010)	5 items, 4 pt scale	α = 0.79	PV (all measures)	Pearson's R correlations;
			- Work Satisfaction: Nursing Organizational Health (Sili et al., 2010)	10 items, 4 pt scale	α = 0.86		SEM: Chi square
			- Maslach Burnout Inventory – General Survey (Maslach et al., 1996)				(χ2) and incremental indexing; CFI; RMSEA,
			- Cynicism (detached) - Emotional Exhaustion	5 items, 7 pt scale 5 items, 7 pt scale	α = 0.76 α = 0.90		SRMR
116	Simon et al. (2010), J Adv Nurs, Germany	n = 2119 RNs	- Leadership Quality	4 items, 5 pt scale	α = 0.91	PV (all measures)	Generalized linear mixed model approach; highest posterior density intervals, pseudo-R^2 odds ratio.
		(RR = 38%–83% across 16 hospitals)	- Intent to leave profession	1 item, dichotomized (potential leavers/ potential stayers)	Reported as: 'high consistency'		
			- Intent to leave organization	5 items, dichotomized (potential leavers/ potential stayers)			
117	Sojane et al. (2016), Curationis, South Africa	n = 204 RNs	- Practice Environment Scale of the Nurse Work Index (Lake, 2002):	4 items, 4 pt scale	α = 0.71	PV (all measures)	Spearman's rank order correlation,
		RR = 33.3%	- leadership scale				t-test, Cronbach's alpha and statistical significance
		9 hospitals	- job satisfaction	1 item, 4 pt scale	α = 0.7–0.8		

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- intent to leave	1 item, 2 pt scale (y/n)	NR		
			- Maslach Burnout Inventory (Maslach et al., 1996)	9 items, 4 pt scale	NR		
118	Suliman (2009), Nurs Admin Quart, Saudi Arabia	N = 31 nurse managers and to 118 staff nurses	Multifactor Leadership Questionnaire (MLQ) (Bass and Avolio, 1995)	47 items, 5 pt scale	α = 0.67–0.84	Content validity established by principal component analysis.	Descriptive statistics and inferential statistical methods (ANOVA, MANOVA, and *t*-test independent sample)
		RR = 79.4% and 30.2%	Dichotomous question measuring the intention to continue at work	1 item, yes/no	NR		
119	Tourangeau et al. (2014) Nurs Educ Today, Canada	1328 nurse faculty: RNs RPNs or NPs	- Psychological Empowerment Scale – self-determination subscale (Spreitzer, 1995)	3 items, 7 pt scale	α = 0.92	Confirmatory factor analysis (all measures)	Simultaneous and stepwise multiple regression
		(RR = 49%; 650 responses)	- Job Routinization and Formalization scale – routinization subscale (Bacharach et al., 1990)	3 items, 7 pt scale	α = 0.80		
			- Resonant Leadership Scale (Cummings et al., 2005)	10 items,5 pt scale	α = 0.96		
			- Perceived Organizational Support Scale (Eisenberger et al., 1986)	9 items, 7 pt scale	α = 0.93		
			- Conditions for Work Effectiveness Questionnaire — global empowerment subscale (Laschinger et al., 2001)	2 items, 5 pt scale	α = 0.83		
			- Physical Work Environment Scale (Developed by authors)	7 items, 7 pt scale	α = 0.82		
			- Work Group Relationships Scale (Riordan and Weatherly, 1999)	11 items, 7 pt scale	α = 0.97		
			- McCloskey/Mueller Satisfaction Scale — salary and benefits subscale (Mueller and McClosky, 1990)	3 items, 5 pt scale	α = 0.78		
120	Van der Heijden et al. (2017), Medicine, Belgium, Germany, Finland, France, Italy, the Netherlands, Poland, and Slovakia	n = 39,894	- Quality of leadership: The Copenhagen Psychosocial Questionnaire (COPSOQ) (Kristensen and Borg, 2000)	4 items, 5 pt scale	α = 0.87–0.92	PV (all measures)	SEM: Chi square, RMSEA; CFI/Tucker
		(RR = 51%)	- Nurse Well Being, manifested through: Job Satisfaction: (COPSOQ)	4 items, 4 pt scale	α = 0.69–0.82		Lewis Index TLI, and SRMR]
			Positive affectivity: Positive & Negative Affect Schedule (PANAS) (Watson et al., 1988)	10 items, 5 pt scale	α = 0.68–0.077		
			Satisfaction with salary	3 items, 5 pt scale	α = 0.70–0.84		
			- Psychological distress, manifested through: Personal Burnout: COPSOQ	6 items, 5 pt scale	α = 0.84–0.91		
			Negative affectivity: PANAS	10 items, 5 pt scale	α = 0.79–0.91		
121	Wade et al. (2002), J Adv Nurs, USA	n = 731 RNs	- Practice Environment Scale (Lake, 2002)	31 items, 4 pt scale	NR	PV	Descriptive statistics, regression analysis, frequencies
		(RR = 34%)	- Caring attributes of managers: Nyberg's Caring Assesement Scale (Nyberg, 1990)	20 items, 4 pt scale	α = 0.97	PV	

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
			- Job Enjoyment Subscale (JES) of the Nursing Job Satisfaction Scale (Atwood and Hinshaw, 1980; Hinshaw et al., 1987)	11 items, 5 pt scale	α = 0.89	PV	
122	Wagner et al. (2013), Can J Nurs Res, Canada	n = 148	- Modified Condition for Work Effectiveness Questionnaire II (Laschinger et al., 2001)	19 items, 5 pt scale	α = 0.78–0.81	Confirmatory factor analysis	SEM indices: Chi-square showed final model fit
		(RR = 31%)	- Psychological empowerment scale (Spreitzer, 1995)	12 items, 7 pt scale	α = 0.62–0.72	Convergent/diverged validity	
			- SAW questionnaire (Kinjerski and Skrypnek, 2006)	18 items, 6 pt scale	α = 0.93	Face/content validity	
			- Resonant Leadership (Estabrooks et al., 2009)	10 items, 6 pt scale	α = 0.95	Face/content validity (correlations between variables above 0.5)	
			- Job satisfaction (Quinn and Shepard, 1974)	4 items, 7 pt scale	α = 0.72	Face/content validity	
			- Organizational commitment (Meyer et al., 1993)	6 items, 7 pt scale	α = 0.74–0.85		
123	Walumbwa et al. (2012), Leaders Quart, USA	Time 1: n = 338 nurses (RR = 82%)	- Ethical leadership scale (Brown et al., 2005)	10 items, 5 pt scale	α = 0.94	PV	Chi-square (χ2), comparative fit index (CFI), root-mean-square residual (RMR), and root-mean-square error of approximation (RMSEA).
		Time 2: n = 316 nurses	- Group conscientiousness (Goldberg, 1992)	10 items, 5 pt scale	α = 0.88	PV	
		(RR = 93%)	- Group voice behavior (Van Dyne and LePine, 1998)	6 items, 5 pt scale	α = 0.81	NR	
		3rd survey: n = 83 supervisors	- Group in-role performance (Williams and Anderson, 1991)	7 items, 5 pt scale	α = 0.70	NR	
124	Wang et al. (2012), J Adv Nurs, China	N = 238	- The Chinese version of the Leadership Practice Inventory (LPI) (Chen and Baron, 2007)	30 items, 5 pt scale	α = 0.91	Content validity, pilot testing	Pearson's Product–Moment Correlation Coefficient
		RR = 95.2%	- The Nurse Job Satisfaction Scale (NJSS) (Cao, 2000)	62 item, 5 pt scale	α = 0.93	Content validity, pilot testing	
125	Weng et al. (2015), J Nurs Manag, Taiwan	n = 439 RNs	- Leadership assessment (Scandura and Williams, 2004; Sosik et al., 2004; Gowen et al., 2009)	19 items, 5 pt scale	α = 0.92–0.93	PV (all measures)	HLM model analysis
		97.55% RR	- Patient safety climate scale (Katz-Navon et al., 2005; Naveh et al., 2005)	28 items, 5 pt scale	α = 0.91–0.94		Kolmogorov–Smirnov test
			- Innovation climate (Sarros et al., 2008; Dackert, 2010; Wong and He, 2003)	9 items, 5 pt scale	α = 0.87		
			- Nurse innovation behaviour (Weng et al., 2012; Chang and Liu, 2008)	9 items, 5 pt scale	α = 0.95		
126	Wong et al. (2013, 2010), J Nurs Manag, J Adv Nurs, Canada	N = 280	- Authentic Leadership Questionnaire (ALQ) (Avolio et al., 2007)	16 items, 5 pts	α = 0.7–0.9	NR	reliability estimates and Pearson correlations
		RR = 48%	- Trust in Management Scale (Mayer and Gavin, 2005)	10 items, 5 pts	α = 0.76 to 0.82	NR	Sobel test
			- Areas of Worklife Scale (AWS) (Leiter and Maslach, 2003).	29 items, 5 pts	α = 0.70 to 0.82	NR	
			- Nursing Quality Indicators (American Nurses Association (ANA), 2000)	4 items, 4pts	α = 0.75	NR	
127	Wong et al., (2010), J of Nurs Manag, Canada	N = 280	- Authentic Leadership Questionnaire (ALQ) (Avolio et al., 2007)	16 items, 5 pt scale	α = 0.97	Confirmatory factor analysis	Descriptive statistics, reliability estimates and Pearsons correlations

Table 2 (*continued*)

Ref#	Author(s), Journal, Year & Country	Sample	Measurement/Instruments	Scoring	Reliability	Validity	Analysis
		Nurses	- Personal identification scale developed by (Kark, 2001)	10 items, 7pt scale	α = 0.96		
		RR = 48%	- The Trust in Management Scale (Mayer and Gavin, 2005)	10 items, 5 pt scale	α = 0.83		
		Grad Nurses	- Utrecht Work Engagement Scale (UWES) short version (Schaufeli and Bakker, 2003)	9 items, 6 pt scale	α = 0.90		
		N = 342	- Helping and Voice Behaviours Scale –voice subscale (Van Dyne and LePine, 1998)	6 items, 7 pt scale	α = 0.82–0.96		
		RR = 37.7%	- International Survey of Hospital Staffing and Organization of Patient Outcomes (Aiken et al., 2001)	1 items, 4 pt scale	NR		
128	Yokoyama et al. (2016), J Clin Nurs, Japan	n = 898 nurses	- Negative Acts Questionnaire-Revised (Tsuno et al., 2010)	22 items, 5 pt scale	a = 0.93	PV	multivariate logistic regression analysis
		78% RR	- Practice Environment Scale of Nursing Work Index (Ogata et al., 2008)	31 items, 4 pt scale	a = 0.73–0.84	PV	
129	Yoon et al. (2016), J Nurs Manag, Korea	n = 180 RNs	- Confidence and Intent to Delegate Scale (Parsons, 1999)	11 items, 10 pt scale	α = 0.83	PV	Kolmogorov–Smirnov, Shapiro–Wilk, Spearman's rho
		86% RR	- The Multifactor Leadership Questionnaire (MLQ), (Bass and Avolio, 1997)	25 items, 5 pt scale	α = 0.92		

PV = Previously Validated.

NR = Not Reported.

organizational commitment with transactional, management by exception and instrumental leadership styles (6, 21, 28, 33, 35 60). One study reported significantly lower organizational commitment with the leadership practice of inspiring a shared vision (35).

Significantly higher staff *empowerment* at work was reported for relational leadership styles in 16 studies; transformational leadership (2, 25, 40, 62, 86), authentic leadership (81, 84, 110, 126), resonant leadership (83), supportive leadership (76), and motivational or

Table 3

Summary of Quality Assessment – 129 included quantitative studies.

Criteria	No. of studies	
	YES	NO
Design:		
Prospective studies	45	84
Used probability sampling	33	96
Sample:		
Appropriate/justified sample size	65	64
Sample drawn from more than one site	95	34
Anonymity protected	97	32
Response rate > 60%	57	72
Measurement:		
Reliable measure of leadership	123	6
Valid measure of leadership	109	20
[a]Effects (outcomes) were observed rather than self-reported	19	110
Internal consistency > 70 when scale used	114	15
Theoretical model/framework used	112	17
Statistical Analyses:		
Correlations analyzed when multiple effects studied	109	20
Management of outliers addressed	29	100

[a] This items scored 2 points. All others scored 1 point.

empowering leadership (29, 64, 85). Passive management and transactional styles were related to nurses' reports significantly lower empowerment (40, 60).

Nurses' intent to stay was significantly higher with supportive and consideration leadership styles, and lower with decision decentralization (5, 71, 76, 112, 117). *Nurses' intent to leave* was significantly higher with management by exception leadership, abusive leadership, authoritarian leadership, or when nurses reported their leaders were not engaging in relational leadership (6, 87, 108, 117), and lower with transformational and charismatic leadership (6, 61, 66, 86, 87, 92, 117). Actual *retention* was significantly higher with consideration and supportive styles (50, 103, 112, 117), and better subordinate relations (51), while a decrease in turnover was found with leader-member exchange (12), and transformational leadership practices (20). *Retention* was significantly lower following decision decentralization (51). *Relational leadership styles* also were associated with increased *engagement* (73, 75, 88, 96, 97), *job autonomy* (43, 46, 68, 73, 110) and decreased reports of *personalization* (27, 67, 79, 115) and *turnover* (12, 20, 55). Results for remaining outcomes were equivocal or reported in a small number of studies.

3.3.2. Relations among staff

Twenty-three studies reported 23 outcomes associated with leadership style related to *relations among staff*, or how individuals or groups of staff interacted with each other. The most frequently examined outcomes included *teamwork between physicians and nurses, team innovation/creativity, work-team climate, conflict management* and *nursing work group collaboration. Teamwork between physicians and nurses* was reported to be better in association with authentic leadership (110) resonant leadership (10), greater nurse manager ability, supportive leaderships (27, 28, 112), and leader empowering behaviours (39). *Team innovation/creativity* increased significantly with authentic (94),

Table 4

Outcome differences between relationally focused (shaded) and task focused (non-shaded) leadership styles. Total: 121 outcomes in 129 studies.

Outcomes	Significantly Increased	Significantly Decreased	No change
A. Satisfaction with Work, Job and Leader. Satisfaction with...			
Job	4, 5,7, 8, 9, 10, 14, 19, 21, 22, 24, 25, 28, 31, 32, 34, 35, 36, 38, 39, 40 ,46, 47, 50, 54, 55, 58, 62, 63, 66,68,69, 73, 77, 80, 83, 84, 85, 90, 92, 98, 105,107,109, 111, 112, 115, 117, 118, 122, 124,126		37, 42
	54, 98, 105, 111	5, 7, 8, 10, 21, 25, 28, 32, 40 ,47, 50, 54, 58,105, 108, 117	4, 38
Leader	6, 10, 11, 19, 43, 49, 78, 117, 126		
		6, 10, 11, 58, 59, 117	78
Organizational Work	39, 68, 76, 126, 68		
Work Itself/Intrinsic	43, 55, 76, 85, 124		
Pay	124		73, 19, 117
Power	26, 81, 86		
Job Security	10, 117	10	
Workload	43, 124		
People	19		
Time with Patients	10	10	
Financial Rewards	10	10	
Organizational Policies			73
Supervision and Hospital Policies	124		
Job Significance	4		4
Promotion	19		117
Variation of work	95	95	95
Reward/Appreciation	95	95	95
Nursing	66		

Table 4 (*continued*)

Outcomes	Significantly Increased	Significantly Decreased	No change
B. Staff Relationships with Work			
Organizational Commitment	2, 6, 9, 21, 28, 33, 35, 36, 37, 64, 76, 80, 85, 89, 90, 122	35	
		6, 21 ,28, 33, 35, 60	
Empowerment	1, 7, 6, 23, 29, 42, 62, 64, 76, 81, 83, 84, 85 86, 110, 126		
		40, 60	
Intent-to-leave	116	6, 61, 66, 86, 87, 92, 117	25
	6, 87, 108, 117		
Intent-to stay	5, 71,76, 117,112,		89, 99
		5, 117	
Retention	50, 51, 103, 112, 117		
		51, 117	
Engagement	73, 75, 88, 96, 97		
		96	
Job Autonomy	43, 46, 68, 73, 110		
	4	68	
Depersonalization		27, 67, 79, 115	
		67	67, 79
Turnover		12, 20, 55	76
Role Conflict		95, 110	43, 95
		43	95
Role Clarity	43, 95, 129		95
			95
Personal Accomplishment	27		67
	67, 79		67
Individual/Professional Development Opportunity	95, 124		
			95
Professionalism	68,73		
		68	
Cynicism		84, 85	
Overcommitment		120	
Intent-to-leave profession			116
Absenteeism			4
Occupational Coping Self-Efficacy	82		
Quality of Work Life	74		
Job Mobility	10		
		10	
Job Insecurity			95
			95
Job Enjoyment	121		

Table 4 (*continued*)

Outcomes	Significantly Increased	Significantly Decreased	No change
Role Ambiguity	48	48	48
Balance of family and work	124		
Work-family conflict		95	95
		95	95
Contingent Rewards	95	95	
Personal Involvement	113		
	113		
Moral Ethical Behaviours	84		
Bullying		84	
Quantitative Work Demands			95
			95
Cognitive Demands			95
			95
Emotional Demands			95
			95
Hiding Emotional Demands			95
			95
Social Responsibility	95	95	95
Influence Over Work	95	95	
Meaning of Work	95	95	95
Self-Efficacy			95
			95
Willingness to Voice Concerns	127		
Predictability/Communication	95	95	
B. Inter-Staff Relations			
Nurse Physician/Teamwork	10, 27, 39, 110, 112	10	
Team Innovation/creativity	15, 94, 100,107		
Work-Team Climate	32, 43, 100, 110	87	
Conflict Management	17, 63, 128,	17	
Nursing Work Group Collaboration	10, 100, 107	10	
Group Process	18, 100, 110		
Group Cohesion	50, 39		
Interpersonal Relationships	124		
Teamwork (communications and			

Table 4 (*continued*)

Outcomes	Significantly Increased	Significantly Decreased	No change
relationships)	102		
Group Conscientiousness		123	
Group Voice		123	
Fostering Trust	127		
Nurse-Nurse Interaction	17		
Incivility		83	
Team Satisfaction	15		
Helping Behaviour	107		
Interpersonal Strain	82		
Social Support Colleagues	95		
			95
Vertical Trust	95		
		95	95
Horizontal Trust	95		95
		95	95
Relational Social Capital	109		
Social Support Relationship with Leader	95		
		95	
Knowledge Sharing	94		
C. Staff Health and Wellbeing			
Emotional Exhaustion		10, 26, 27, 48, 67, 79, 82, 83, 84,	
	10, 49, 108	67	67
Emotional Health	10, 106	115	50
		10	50
Job Stress		26, 32, 39, 126	43, 48
	48, 128		
Burnout		61, 88, 114	
Anxiety		34	
	108, 128		
Personal Stress		50, 120	
Health Complaints		4	
	4		
Mental Health Symptoms		109	
Psychological Distress		27	
Well-being	120		
Sleep trouble			95

Table 4 (*continued*)

Outcomes	Significantly Increased	Significantly Decreased	No change
			95
General Health			95
			95
Psychological Capital	93		
D. Organizational Environment Factors			
Organizational Climate	18, 41, 100,70, 125, 106		18, 41, 100,70, 125
		100	
Organizational Support	43, 56, 64, 76, 84, 86, 90, 100		
		100	
Staffing	27, 76, 81, 117,112		
Organizational Characteristics	1, 3, 11 13		
Respect for Rules	43, 56, 100		
		100	
Organizational Culture	16, 7, 100		
		7, 100	
Best Practice Guidelines	56, 100		30
Professional Practice Environment	57,69		
Policy Involvement	27, 63		
Goal Information	43, 7		
Nursing Model	27		
Social Community	95		
		95	95
Justice & Respect	95		
		95	95
E. Productivity & Effectiveness			
Extra effort	1, 6, 7, 42, 58, 118, 80, 78		
		7	78
Productivity	9, 18, 35, 36, 126, 76		37
		36	18, 37
Effectiveness	11, 26, 58, 7		
		11, 26, 7	
Leader Effectiveness	118, 7, 78	6	
	66		78
Organizational Effectiveness	7, 87	87	44
Research utilization	3, 13		
		13, 100	
Staff Expertise	20, 129		
Team Effectiveness	15, 60		
Perceived Unit Effectiveness	49		

Outcomes	Significantly Increased	Significantly Decreased	No change
Leader Scholarly Productivity			53
Work Ethic	97		
Leadership Quality	95		
		95	
Poor Performance		108	

Note: Numbers in each column = reference numbers of included studies from Table 2.
Shaded results = Relational leadership styles.
Non-shaded results = Task focused leadership styles.
Some studies examined multiple relational and/or task-focused styles with mixed results, and are accounted for in each category they were reported for.

servant (107) and transformational (100) leadership styles. *Work-team climate* was enhanced when leaders enacted authentic (110), consideration (43) and transformational (100) styles, or with leadership characterized by responsiveness and clear communication (32). *Conflict management* and *nursing workgroup collaboration* improved with relational leadership styles (63), such as authentic leadership (128), transformational (100) and servant leadership (107) styles, respectively, and was lower in association with transactional leadership (17) and dissonant leadership (10), respectively. Results for remaining outcomes were equivocal or reported in a small number of studies.

3.3.3. Staff health & wellbeing

Thirty studies reported 13 outcomes related to *staff health and wellbeing*. *Emotional exhaustion* and *job stress* were reported lower with transformational leadership (48, 67, 79), empowering leadership (26), resonant leadership (10, 83), authentic leadership (82, 84), transactional leadership (67), and nurse assessed nurse manager ability, leadership and support of nurses (27). Dissonant leadership (10) and management by exception (48) were associated with poorer *emotional health* and greater *emotional exhaustion*. Job tension or stress decreased when nurses had a positive perception of nursing leadership or when leaders embodied an authentic leadership style (26, 32, 39). *Transformational leadership* was also associated with decreased *burnout* (61, 88, 114). Results for remaining outcomes were equivocal or reported in a small number of studies.

3.3.4. Organizational environment factors

Twenty-eight studies reported 13 outcomes influenced by leadership style pertaining to *organizational environment factors*, specific to the organizational environment, culture, community and structures. Outcomes most commonly examined were *organizational climate or culture, organizational support* and *staffing*. Eight studies reported that *culture* and *climate* were better in association with authentic leadership, supportive leadership, transformational leadership, structural leadership, initiative structure, and change oriented leadership (15, 16, 18, 32, 41, 43, 70, 100, 106, 125). *Perceived support* was highest with relational leadership styles (56), specifically transformational leadership (43, 86, 90, 100), authentic (84), empowering (64), and support (76) styles. *Staffing* was perceived to be better or increased when leaders employed supportive (27, 76, 112, 117) or authentic (81) leadership styles. Results for remaining outcomes were reported in a small number of studies.

3.3.5. Productivity & effectiveness

Thirty-two studies reported 13 outcomes related to *productivity and effectiveness* outcomes influenced by leadership style in. Factors frequently examined were *extra effort by staff, productivity* and *effectiveness*. *Extra effort* by staff was significantly higher in association with transformational leadership styles in eight studies (1, 6, 7, 42, 58, 78, 80, 118). Outcomes reflecting individual, team and organizational *productivity* and *effectiveness* were significantly higher in 18 studies with charismatic, authentic, supportive, transformational, and change oriented leadership (1, 6, 7, 9, 11, 15, 18, 20, 26, 35, 36, 37, 49, 58, 87, 60, 118, 78). Leadership styles such as management by exception, transactional, laissez faire, and peer leadership were associated with reported significant decreases in effectiveness and productivity (6, 11, 18, 26, 36). Results for remaining outcomes were equivocal or reported in a small number of studies

4. Discussion

This comprehensive review provides robust findings to support that relationship focused leadership practices are linked to better outcomes for nurses related to their work environments, their perception of and performance in their workplace, and importantly, their personal health and well-being. Overwhelmingly, *relationally focused leadership* styles

frequently led to positive outcomes in comparison to *task focused leadership* styles. A recent realist review building on the work of Gilmartin and D'Aunno (2007), found results similar to our review such that in healthcare settings, transformational and collaborative approaches to leadership lead to more favourable outcomes for healthcare workers, including nurses (Lega et al., 2017). Not only were task-focused leadership styles less likely to produce improved outcomes, but many styles, such as dissonant leadership, abusive leadership, management by exception, transactional, instrumental and laissez faire approaches, led to significant negative outcomes. Due to the important and pervasive nursing workforce outcomes that leadership styles are linked to, it is imperative to distinguish between *relationally focused* and *task focused leadership* styles and the different theories behind the varying leadership styles. We discuss the implications of our findings for nurses in clinical practice, leadership theory, leadership research, as well as for knowledge translation into practice in healthcare settings.

4.1. Implications for the nursing workforce and work environment

Healthcare leaders who focus primarily on task completion and performance management, as with pacesetting and commanding styles (dissonant leadership), may not be spending critical thought, time and energy on developing or maintaining relationships with staff members who may require responsiveness to their own emotional needs when providing complex and often life altering care and treatments. Leader capacity to build and maintain meaningful relationships is crucial for cooperating and negotiating with staff. Empathic responses by leaders are also necessary to facilitate conflict resolution and to provide for an individual's need for respect and understanding (Tucker and Russell, 2004). This type of support and investment in staff is critical for the unified achievement of a common goal of provision of excellence in client care.

Leadership practices may not only have serious implications for nursing staff, but also for the clients whom nurses care for. Various leadership styles can impact patient outcomes through the positive and negative influences on nursing staff and their work environment (Wong and Cummings, 2007; Wong et al., 2013). Specific factors influencing nurses' job satisfaction are important to investigate, as decreased job satisfaction can be an indicator of quality care issues. Job satisfaction has important implications for nurses' intent to stay or intent to leave, along with actual retention, all things that can influence cost of care provision, staff safety, continuity in care, and client health outcomes, including increased patient mortality (Aiken et al., 2002; Russell et al., 2017). Retention and sufficient nurse staffing have been linked to poor health outcomes and sub-optimal continuity of care in particular for vulnerable populations in remote locations or persons requiring increased support or rehabilitation, such as in long term care or correctional facilities (Bostick et al., 2006; Biddle, 2013; Aaron, 2011). Although both overarching patterns of leadership practices have merit and utility in certain contexts, some findings suggest that clarifying leadership style versus using a mixed method of both types has greater potential to influence patient outcomes (Cummings et al., 2010a,b). Ultimately, mixed leadership styles in healthcare and their potential negative influence on staff, client and cost-related outcomes remains unclearly conceptualized and studied.

Relatively fewer studies used observation versus self-report to measure outcomes across all categories. Although this makes sense in some instances, such as with job satisfaction, few of the 32 studies reporting outcomes in the productivity and effectiveness category focused on specific and observed performance outcomes of individual nurses. The outcomes were examined primarily using nurse-assessed productivity, effectiveness, and engagement in activities of extra effort, which may also introduce a level of social desirability. Stronger research designs examining the influence of leadership styles with observed rather than self-report on actual performance outcomes for nurses and other healthcare practitioners is warranted.

In an examination of the relationship between specific leader traits and behaviours and outcomes, Derue et al. (2011) found that generally task-oriented leader behaviors lead to improvement in performance-related leadership outcomes while relational behaviors positively influence affective criteria such as follower satisfaction with leader. This is not in line with the results of this review, which highlights that relational leadership styles more positively influence the reported productivity and effectiveness outcomes. However, Derue et al. (2011) found that passive leadership styles and behaviours are associated with negative outcomes, which mirrors our findings.

4.2. Implications for leadership theory generally and in healthcare

An array of literature exists on leadership theory from various fields in health, psychology, sociology, military research as well as education and business. Theoretical frameworks provide guidance for the relational structure between identified concepts and the interpretation of empirical data. A total of 113 of 129 studies were guided by a theoretical framework, strengthening the validity of study findings, and highlighting the robust and well-established theory that exists in this area. Theory development can clarify and specify ideas and relationships, localizing how concepts interact with each other (Risjord, 2011). In healthcare, it is imperative to develop knowledge and theory to thoroughly and rigorously examine the potential influence of both relational and task focused influences of leadership on differential outcomes for nurses and work environments (Gilmartin and D'Aunno, 2007).

Meta-analysis conducted by Derue et al. (2011) on leadership theory, leader behaviour types and leader effectiveness highlighted that while there is a plethora of different leadership theory being utilized in current literature, oftentimes theory is developed without consideration of previous frameworks, resulting in overlaps and redundancies across current theory (Derue et al., 2011). The theoretical framework most often applied is Bass and Avolio's (1994) *Transformational and Transactional Leadership*. To address potential overlaps, a recent meta-analytic review of authentic versus transformational leadership showed that although authentic leadership was better linked to improved behavioral and attitudinal staff outcomes, more work is required to clarify the distinction between the two leadership styles and their antecedents (Banks et al., 2016).

Our categorization of leadership approaches is not to indicate that relationally focused leadership should be employed at the expense of work to be done. Theories around relationally focused leadership are typically founded on emotional intelligence as the basis for effective leadership, but are premised on leaders possessing management, organization and analytical skills, and intelligence (Bass et al., 2003; Goleman et al., 2002). Leadership approaches such as transformational leadership (Clements and Washbush, 1999; Goleman et al., 2002), resonant (Boyatzis and McKee, 2005) and authentic leadership (Walumbwa et al., 2008), suggest leaders embodying these styles make more emotionally intelligent and ethical decisions that lead to better outcomes (Banks et al., 2016; Wong and Giallonardo, 2013). Yet, Goleman et al. (2002) noted that there can be a discriminate use of dissonant leadership styles for specific situations, despite the excess use being detrimental to employees. A meta-analysis by Judge et al. (2004) showed that initiating structure by leaders was moderately positively associated with leadership outcomes and organization performance. West et al. (2002, 2006) have reported greater use of high performance human resource management practices such as clarity of staff roles and an effective performance management/appraisal system with lower patient mortality in England (West et al., 2002, 2006).

In our review, positive outcomes related to task-focused leadership styles, although few, were typically noted when employing transactional leadership styles, supporting the importance of managing effective processes between staff to achieve desired outcomes. Consideration and initiating structure leadership behaviours were reported to have important direct effects on numerous indicators of effective leadership (Judge et al., 2004). This further supports the importance of management skills and practices that may influence critical outcomes for nursing staff and clients.

4.3. Implications for leadership research

The strength of study designs employed to examine leadership style and nursing staff outcomes has improved over the last decade to more frequently include higher level multivariate statistical analyses. These designs are critical to specify casual structural relationships between leadership styles and multiple outcomes, and to test model fit with empirical data. However, specific mechanisms of action for specific leadership styles and their antecedents remain under-theorized and under-researched. Although studies employing structural equation modeling could address this, leadership was often an exogenous variable, or one of several, in the tested models with few mediating factors specified between leadership style and examined outcomes. Further work is warranted around specification mechanisms of action and when specific components of both relational and task-focused styles may be effective in certain contexts.

The majority of included studies did not use probability sampling and only 57 of 129 studies reported a response rate of over 60%, despite convenience sampling. Increasing response rates in future studies would enhance the general rigor of work in this area, albeit, recruiting for leadership populations can be challenging. The majority of studies had samples drawn from more than one site, which should continue with future research as the diversity of multiple settings will add to validity and generalizability of study findings. Future research can employ probability sampling, and a purposive unit of analysis where individual scores are linked to their leader and analyzed.

A variety of tools were used to measure leadership in the studies in this review. Some of the more common tools used were the *Multifactor Leadership Questionnaire* (39 studies), *Leadership Practices Inventory* (11 studies), *Leader Behaviour Descriptive Questionnaire* (8 studies), *Authentic Leadership Questionnaire* (6 studies), *Global Transformational Leadership Scale* (4 studies), *Leadership Effectiveness & Adaptability Description* (3 studies), and *Leader Empowering Behaviours* (3 studies). One hundred and three of the 129 studies reported whether their leadership measurement tool was tested for validity, and a total of 111 from 129 studies clearly reported internal consistency greater than 0.70. The varying theoretical frameworks and subsequent tools used to operationalize concepts of leadership, highlight that researchers in the included studies may have used different conceptualizations of leadership to link to a variety of staff outcomes. For our review, we accepted the definition of leadership described by the authors of each study. Not only does this suggest that definitions of leadership, particularly effective leadership, may differ across disciplines, but also between and among theorists, researchers and practitioners.

4.4. Implications for the translation of knowledge into practice for healthcare organizations

In a dynamic and complex healthcare system, effective leadership is needed to develop and retain nurses and nursing leaders to support a unified vision and progressive change for optimal nursing care delivery processes and outcomes (Laschinger et al., 2008; Smith et al., 2006; Tropello and DeFazio, 2014, Dunn and DeFazio, 2014). Yet, the current reality is such that many healthcare leaders are primarily task focused. Healthcare organizations must continue to recruit to leadership positions to fulfill their organizational mission and vision. Compounded by a forthcoming healthcare leadership shortage (Laschinger et al., 2008), improving existing leadership is key for future sustainability of the nursing workforce. Therefore, hiring leaders with relational skills, or providing training for existing leaders, should be a priority for chief executives and nursing administrators. However, issues around the lack

of clear conceptualization of emotional intelligence and effective relational leadership, as well as personal and cultural differences in interpretations of their expression make screening and assessing related competencies challenging (Matthews et al., 2002).

Another review conducted by some of the authors on this team, previously demonstrated the effectiveness of interventions to improve leadership in nursing, with significant increases in relational leadership practices noted in all 9 included studies (Cummings et al., 2008a). Continuing education on leadership has been shown in other studies to increase competency in leadership skills (Macphee et al., 2012; Patton et al., 2013). However, as some perspectives point out that leadership is developed through exercising it, the potential for training and education through virtual simulations has been proposed for leadership development opportunities (Guthrie et al., 2011).

An environmental scan conducted through the Canadian Foundation for Healthcare Improvement as part of the *QWQHC: Quality Worklife, Quality Health Care* (Hanson et al., 2007) initiative summarized recommendations for leading practices and improving quality of worklife in healthcare organizations. The environmental scan recognizes the challenges facing nursing leadership in the midst of increasingly complex care delivery. It emphasizes the principles of responsiveness of leaders, promoting a shared vision and values, and ethical decision-making in both organizational decisions and in supporting individuals (Hanson et al., 2007). These findings align with the results of this review supporting relational leadership practices in promoting positive work environments, and improving teamwork and effectiveness, all critical elements of healthy workplaces. This not-for-profit pan Canadian coalition works from different jurisdictions to translate evidence-informed solutions to improve such competencies in practice through tailored teaching programs and provision of resources and training across Canadian regions (CFHI, 2018).

4.5. Notable changes in review update

As evidenced by the large number of articles included in this updated review, the research on leadership styles has increased dramatically over the past decade. As of this update, a total of 121 outcomes in six categories are identified in 129 studies, compared to the original review yielding 64 outcomes identified in 53 studies. Notably, the number of studies from North America has doubled, and research from Asia and the Middle East has emerged. The care settings examined remained typically hospital settings.

The number of robust quantitative designs identified since the original review has increased exponentially. For example, 18 of 22 studies using structural equation modeling were published in 2008 or later. An increase in robust study designs and analyses, such as structural equation modelling and hierarchical linear modelling allows us to draw firmer conclusions regarding what type of leadership styles contribute to certain nursing outcomes and in what way. The current research is also strengthened by the pervasive use of established theory. Although the theoretical framework most often applied in the update remains Bass and Avolio's (1994) *Transformational and Transactional Leadership*, a notable change in theory direction is the increased application of the *Authentic Leadership Development Theory* (Gardner et al., 2005a,b). Recent studies, including a review by Alilyyani et al. (2018) aligns with our findings, demonstrating that all dimensions described in authentic leadership theory (self-awareness, relational transparency, internalized moral perspective and balanced processing) were associated with improved work attitudes and behaviours of healthcare workers (Wong and Laschinger, 2013). Although the substantive conclusions of this review remain the same, the dramatic increase in the number and strength of studies related to this topic allows us to strongly recommend that relational leadership styles need to be encouraged and employed in

health care settings.

4.5.1. Limitations

This review is limited by variability in the conceptualizations and measurement of leadership may limit the validity and generalizability of the findings. The potential of publication bias exists, which may result in missing reports of non-significant findings. Notable weaknesses in included studies were around sampling and self-report of most outcomes. Only quantitative designs were included based on the volume of quantitative studies identified and the scope of this review. However, a strength of this review is the large number of included robust quantitative designs using multivariate analysis guided by well-established theoretical frameworks, and the clear patterns of positive and negative relationships of outcomes differentiated by relational and task focused leadership styles should not be ignored.

5. Conclusion

Healthcare organizations are increasingly dependent on the nursing profession to provide effective leadership in a variety of dynamic and complex healthcare settings. The findings of this systematic review provide robust support that relational leadership versus task-focused leadership styles are linked to better nursing workforce outcomes and related organizational outcomes. Combined with knowledge from other reviews that relational and transformational leadership skills can be learned (Cummings et al., 2008a), these results present an important moral imperative to ensure that our healthcare organizations are led by individuals and teams who display relational skills, concern for their employees as persons, and who can work collaboratively to achieve a preferred future for themselves, their employees, their patients, and their organisation. Future work is warranted to explore if particular elements of leadership styles are better associated with certain types of workforce outcomes. The results of this review demonstrate the ability nurse leaders have to positively affect the health and well-being of their nurses through relational leadership practices, which has critical implications for healthcare organizations to support relational leadership practices for improved nursing staff outcomes and client care.

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