

Nurse turnover: A literature review

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Abstract

Ongoing instability in the nursing workforce is raising questions globally about the issue of nurse turnover. A comprehensive literature review was undertaken to examine the current state of knowledge about the scope of the nurse turnover problem, definitions of turnover, factors considered to be determinants of nurse turnover, turnover costs and the impact of turnover on patient, and nurse and system outcomes. Much of the research to date has focused on turnover determinants, and recent studies have provided cost estimations at the organizational level. Further research is needed to examine the impact of turnover on health system cost, and how nurse turnover influences patient and nurse outcomes.

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1. Introduction

High nurse turnover can impact negatively on an organization's capacity to meet patient needs and provide quality care (Gray and Phillips, 1996; Tai et al., 1998; Shields and Ward, 2001). At the nursing unit level, high turnover affects the morale of nurses and the productivity of those who remain to provide care while new staff members are hired and orientated (Cavanagh and Coffin, 1992; Sofer, 1995). Ongoing workforce

instability in many countries is raising questions about the impact of nurse turnover on the well-being of nurses, quality of patient care and system costs. Stated reasons for leaving that were common to nurses in the USA, Canada, England, Scotland and Germany include emotional exhaustion and problems in work design (Aiken et al., 2001). While numerous studies from several disciplines have been undertaken to better understand turnover behavior, further research is needed to address how turnover within the skilled nursing workforce impacts the capacity of health organizations to respond to demands for health care.

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The past literature reviews and meta-analytic studies have been conducted to review factors associated with nurse turnover. Irvine and Evans's (1995) meta-analysis revealed a strong positive relationship between behavioral intentions and turnover, a strong negative relationship between job satisfaction and behavioral intentions, and a small negative relationship between job satisfaction and turnover. Turnover predictors were identified in a literature review by Tai et al. (1998) as age, tenure, job satisfaction, organizational commitment, perceived job possibilities and supervisor's behavior. Similarly, Yin and Yang's (2002) analysis revealed that internal environmental factors such as stress resulting from staffing shortages, leadership style, supervisory relations, advancement opportunities and inflexible administrative policies were significantly related to turnover. For this paper, a comprehensive literature review was undertaken to examine the current state of knowledge about the scope of the nurse turnover problem, definitions of turnover, factors considered to be determinants of nurse turnover, turnover costs and of most importance to the authors, the impact of turnover on patient, nurse and system outcomes. This review focuses on the recent research, also identifying methodological challenges and implications for further study.

2. Methodological approach

Following the method for systematic review outlined by Cooper (1998), the following electronic databases were broadly scanned prior to more refined searches: Health Sciences and Health Administration (CINAHL, MEDLINE, PubMed, EMBASE, HealthSTAR), Economics (EconLit), Psychology (PsycInfo, PsycARTICLES) and Sociology (ASSIA, FRANCIS). Keywords to search the literature included nurse turnover, nurse retention, staffing shortage, job satisfaction, nurse vacancy, job stress, nursing leadership, nurse staffing and patient outcomes. As some publications might not be covered by electronic searches or studies may have been indexed inaccurately (Droogan and Song, 1996), reference lists of articles were scanned for additional items and new releases of key journals were individually reviewed for recently published studies. Internet searches of professional organization and government www-sites were conducted, producing unpublished research studies, discussion papers, media releases and action reports relating to nurse staffing issues.

Almost 200 documents were reviewed, of which 130 were used in this report. The selection was restricted primarily to the following studies: (1) published in the late-1990s or afterward with the exception of the early theoretical models; (2) those written in English; and (3) examining turnover or turnover intention in employee populations of registered or practical/enrolled nurses

working in the hospital, long-term or community care areas. The primary intent of the review was to examine the research in terms of how the evidence has advanced the knowledge in this area. Using predominant studies that had undergone peer-review assured a high level of quality, thereby promoting validity of the overall findings and conclusions.

From the body of research used in this report, a sample of 37 studies reporting measures of turnover (or turnover intent) as a variable are highlighted in tables provided in the Appendices. The research objective(s), samples selection, data collection and analysis methods, and key findings are outlined. Wherever possible, the research instrument and its author(s) were stated (refer to the respective articles for reference listings of these authors). Appendix A provides information about 32 studies that examine determinants of nurse turnover, and Appendix B provides information about 5 studies that examine turnover consequences. The publication years are between 1991 and 2004, the majority being in the past 5 years. The tables were developed in order to show the progression of research methodologies and the knowledge advancement, in particular, that the body of research represented in Appendix A (turnover determinants) is more developed than that represented in Appendix B (turnover consequences). This paper is organized by definitions of turnover found in the literature, theoretical models of turnover found in the literature, review of evidence on determinant of nurse turnover, review of evidence on consequences of nurse turnover, and a discussion of the methodological challenges in this body of evidence.

3. Turnover definition

Methodological challenges have plagued researchers when attempting to measure and compare turnover across diverse health care systems. Even at the local level, the lack of consistency in how records of turnover are maintained presents difficulties, as the reliability of turnover determinations varies according to record-keeping methods (Tai et al., 1998). The definitions of turnover and accuracy of the reason for turnover are often inconsistent, making it difficult to compare or generalize across studies (Tai et al., 1998 provide a summary table of turnover definitions and measures). Jones (1990a, b) defined nursing turnover as the process whereby nursing staff leave or transfer within the hospital environment. This definition encompasses voluntary and involuntary, as well as internal and external turnovers. Voluntary and involuntary turnovers are not always differentiated in studies because costs are incurred regardless of whether staff resign or are requested to leave. Some studies define turnover as any job move while others consider nurse turnover as leaving

the organization or even from the nursing profession. Mano-Negrin and Kirschenbaum (1999) suggest that turnover reflects the effect of the balance between organizational benefits (pull factors) and a careeristic attitude to work (push factors). Turnover behavior may be counteracted by career aspiration if expectations for advancement kept them in organization, added to by fear of unemployment.

When considering the definition of turnover, it is important to acknowledge that some renewal of nursing personnel can be viewed as beneficial to an organization. Nurse turnover offers opportunity for cost reduction with decreased salaries, benefit costs and vacation pay for new employees (Jones, 1990a). Productivity could increase by providing better matches as employees move to jobs where their performance will be greatest, contributing to an efficient labor market (Gray et al., 1996). Potential gains difficult to quantify are due to infusion of knowledge and ideas by replacements, the stimulation of policy changes and the decreased exhibition of withdrawal behaviors (Jones, 1990a). However, as turnover reaches 50%, its net effect on productivity is probably negative (Price and Mueller, 1981a, b) as employees that the organization prefers to retain are lost.

4. Theoretical models of nurse turnover

Past theoretical models have synthesized turnover research and specified relationships among determinants of turnover (Price and Mueller, 1981a, b; Mobley, 1982; Hinshaw and Atwood, 1983; Abelson, 1986; Parasuraman, 1989). Price and Mueller (1981a, b) view turnover as a product of job satisfaction and commitment, which in turn are influenced by organizational factors, demographics, and environmental factors such as alternative job opportunity outside the organization. In Hinshaw and Atwood's (1983) model, anticipated and actual turnovers amongst nurses are determined by two types of job satisfaction: organizational, relating to group cohesion, job stress, and control over decisions; and professional, the nurse's perception of the quality of care, time to do one's job, and enjoyment derived from it. Parasuraman (1989) also assessed the role of time lag in determining relationships between variables found consistently to explain and predict turnover across studies, confirming that intention to leave was the most immediate determinant of actual turnover. Personal and organizational variables were related to the intention to leave and actual turnover only indirectly through their effects on felt stress, job satisfaction, and organizational commitment. Furthermore, as hypothesized, the strength of the intention-turnover relationship decreased as the time interval between expressed intentions and turnover behavior increased. While the

early models provided a well-developed body of research from which to further examine the issue of turnover (Hinshaw and Atwood, 1983), limitations included inadequate sample sizes, lack of generalizability, not controlling simultaneously for the influence of multiple variables, cross-sectional nature of the data and the need to employ time series analysis, and the focus on individuals' data (Alexander, 1988; Cavanagh, 1989).

The past decade has seen further modeling work on nurse turnover. Irvine and Evans (1995) presented a model based on Mueller and Price's (1990) theory that different disciplinary perspectives contribute to explaining nurse turnover: economists who emphasize individual choice and labor market variables; sociologists, who emphasize the structural characteristics of the work environment and work content; and psychologists, who emphasize individual variables and intra-psychic processes. Krausz et al. (1995) examined progressive withdrawal, testing the conceptualization that a nurse first decides to leave the ward, then the hospital and, finally, the profession. The researchers felt that previous studies were narrow in scope, ignoring within-organization turnover from one unit to another and, when relevant, turnover from the profession. Their hypothesized progression model was supported. Although the intention to leave the profession was better predicted than the intention to leave the ward or the hospital, the cumulative effects of the lower two levels of withdrawal intention were its major determinants. Alexander et al. (1998) theorized that work environment affects groups of nurses differently, conceptualizing turnover as a multistage process linking social and experiential orientations, attitudes toward the job, the decision to quit, and the behavior of actually quitting. As in other models, intention to quit was the strongest direct predictor of turnover.

5. Investigation of nurse turnover determinants

Considerable attention has been committed to understanding organizational, individual and economical factors that influence turnover behavior. Administrative strategies and organizational climate, in particular, have been investigated as to their effect on job satisfaction, intent to leave and actual turnover behavior.

5.1. Job satisfaction and nurse turnover

There is a vast body of the literature linking job satisfaction in nursing and turnover. Job satisfaction instruments have been developed, notably the scale by Mueller and McCloskey (1990) that includes eight satisfaction factors; extrinsic rewards, scheduling, family/work balance, co-workers, interaction, professional opportunities, praise/recognition, and control/

responsibility. Job dissatisfaction has been frequently identified as the reason why nurses leave their jobs (Lum et al., 1998; Tzeng, 2002). Using data from a national survey of National Health Service (NHS) nursing staff, Shields and Ward (2001) found job satisfaction to be more important than the attraction of outside opportunities. Low job satisfaction was concentrated in young, newly qualified and highly educated nurses, and associated with administration, promotional prospects, employment security and amount of time for clinical duties.

5.2. Moderators of nurse turnover

Some studies suggest that certain moderators apart from external, personal and work-related variables, influence job satisfaction, turnover intention and turnover behavior. Moore (2001) found that a sense of professionalism mediated intention to quit despite the impact of restructuring changes on hospital and nurse conditions, poor management and communication style, and burnout. Similarly, Angerami et al. (2000) determined that nurses' motives to remain in their jobs related to attachment to nursing, even though their work was not recognized and they were poorly paid. Career commitment might not, however, have the same mediating effect when nurses first start working. Based on findings of a weak association between career commitment and turnover intention in new nurses from a longitudinal survey, Gardner (1992) suggested that career commitment is not a stable phenomenon in the first year, with greater susceptibility to organizational factors. As initial professional commitment is based partially on individual socialization into the profession (Blau and Lunz, 1998), more research examining the influence of nursing programs on career attitudes may provide insight into possible educational interventions that instill professional loyalty.

Professional commitment has been shown to be more effective in predicting intention to leave nursing than intention to leave the organization (Lu et al., 2002). Chang (1999) suggested in a non-nursing study that career commitment is distinct from organizational commitment, as individuals who are committed to both their career and their organization are even less willing to leave the company than those who are committed mainly to the organization. Likewise, Blau and Lunz, (1998) found in a longitudinal sample of medical technologists, that professional commitment accounts for significant additional variance in intent to leave the profession after controlling for external, personal and work-related variables. The findings support the position that career commitment is a more stable type of work commitment that can transcend situational and personal influences, thus supporting the role of continuing education and professional development opportu-

nities in nurse retention. In a recent study, Holtom and O'Neill (2004) examine a new construct, job embeddedness, which focuses on the accumulated reasons why a person stays in a job; being embedded in an organization is associated with reduced intent to leave and actual leaving. Based on data from a sample of 232 employees of US community-based hospital, job embeddedness assessed new variance in turnover in excess of that predicted by the variables in the major models of turnover.

Personal disposition has also been found to moderate the relationship between job satisfaction and voluntary turnover. Based on data collected from a sample of nurses and other workers in a medical clinic, Judge (1993) found that job satisfaction and voluntary turnover were more highly related for employees with positive dispositions than for employees with negative dispositions, suggesting that individuals in a positive frame of mind may take proactive steps such as quitting their jobs. Similarly, George and Jones (1996) determined that the relationship between job satisfaction and turnover intention was stronger when positive mood was high, consistent with research suggesting that people in positive moods tend to have higher levels of self-efficacy and are more optimistic and action-oriented than people who are not.

5.3. Organizational factors and nurse turnover

Much of the nurse turnover research explores how turnover behavior is influenced by organizational characteristics associated with workload, management style, empowerment and autonomy, promotional opportunities and work schedules. Although increasing recruitment of nurses and improved compensation may help offset nurse shortages in the short term, researchers suggest that administrative interventions to improve quality of work life are more effective long-term in reducing turnover (Bloom et al., 1992; Shields and Ward, 2001; Gifford et al., 2002). Measurement of organizational attributes that characterize professional nursing practice has been advanced with the use of the Revised Nursing Work Index (NWI-R) (Aiken and Patrician, 2000), although further work is needed to determine predictive capability and relevance to organizations across different nations (Estabrooks et al., 2002).

5.3.1. Workload, stress and burnout

A consistently heavy workload increases job tension and decreases job satisfactions, which in turn, increase the likelihood of turnover (Davidson et al., 1997; Tai et al., 1998; Hemingway and Smith, 1999; Strachota et al., 2003). Empirical evidence suggests that each additional patient per nurse is associated with a 23% increase in the odds of burnout and a 15% increase in the odds of job dissatisfaction (Aiken et al., 2002b). Workload

measurement has progressed over the past decade to reflect the variety of factors impacting a nurse's work day. O'Brien-Pallas (1988) had emphasized that workload measurement should focus on the complexity of the patient situation rather than on the actual tasks. Among variables relating to nurse, patient and work environment, the least studied are those involving scheduling and coordination of procedures, multiple and long procedures, and characteristics and composition of the caregiver team (O'Brien-Pallas et al., 1997). The practice environment impacts work content that in turn, determines intrinsic work motivation (Janssen et al., 1999). While findings show that work overload exists, a better understanding of the unpredictable nature of nurses' direct working environments, such as in the case of frequent unforeseen patient events, would promote a greater appreciation of why nurses are frustrated.

Some studies relating to work stress focus on a specific unit type. Barrett and Yates, (2002) using a convenience sample of oncology nurses, found nearly 40% were dealing with excessive workloads, 48% were dissatisfied regarding pay, 70% experienced emotional exhaustion and 48% of the sample could not commit to remaining in the specialty for a further 12 months. Based on interview data, Cartledge (2001) found work-related stress to be a major contributor to nurse turnover in critical care units. Cameron et al. (1994) conducted comparative analyses by unit type, concluding that RNs in psychiatric settings were least satisfied with their jobs, more likely to leave their positions and reported more burnout than did RNs in other settings. Other studies examine the effect of patient type on staff burnout (Evers et al., 2002; Molassiotis, and Haberman, 1996) and job satisfaction (Dougherty et al., 1992). In a study of burnout in staff caring for the elderly, Evers et al. (2002) used hierarchical regression analysis to determine that physical and psychological aggression and number of weekly working hours have a significant relationship with emotional exhaustion, and psychological aggression has a significant relationship with depersonalization. Perceived risk of assault also impacts turnover behavior, in one study predicting psychiatric nurses' intention to leave their current job (Ito et al., 2001).

5.3.2. *Management style*

Research has demonstrated the importance of nursing leadership to job satisfaction. Bratt et al. (2000) explored the effect of nurse attributes, unit characteristics and work environment on job satisfaction of nurses in paediatric critical care units, finding job stress and nursing leadership to be most influential. Leadership that values staff contribution promotes retention, evidenced by consistent themes in the literature relating to autonomy, good working relationships and a management style that facilitates rather than directs. Magnet hospital research in the USA has contributed to

a better understanding of nursing practice within healthcare organizations (Scott et al., 1999). Support has been shown for the positive effects of a decentralized organizational structure, a commitment to flexible working hours, an emphasis on professional autonomy, and communication between management and staff, resulting in lower nurse turnover and higher levels of job satisfaction than other hospitals (Aiken et al., 1994; Buchan, 1994).

Some studies refer to a participative management style as enhancing job satisfaction (Jones et al., 1993; Nakata and Saylor, 1994; Moss and Rowles, 1997; Yeatts and Seward, 2000). Song et al. (1997) found greater satisfaction with supervisory dimensions in a nurse-managed special care unit (SCU) with shared governance and minimal technology than a traditional intensive-care unit (ICU) characterized as being bureaucratic and high-tech; nurses working in both the SCU and the ICUs preferred the SCU practice model over the ICU model. Boyle et al. (1999) examined the effects of nurse managers' characteristics of power, influence and leadership style, finding managers' position power and influence over work coordination to have a direct link to intent to stay in employment. Instrumental communication, autonomy and group cohesion decreased job stress and increased job satisfaction, which in turn, were directly linked with intent to stay. Likewise, Leveck and Jones (1996) found that management style, group cohesion, job stress, organizational and professional job satisfaction influenced staff nurse retention and quality of care. In support of previous studies are findings of a recently published study showing that reward-based climates, high levels of communication openness and accuracy explained lower turnover in nursing homes (Anderson et al., 2004).

5.3.3. *Empowerment and autonomy*

Structural empowerment is the perception of the presence or absence of empowering conditions in the workplace, psychological empowerment is the employees' psychological interpretation or reaction to these conditions (Laschinger et al., 2004). Although studies have demonstrated that empowerment is associated with job satisfaction, a direct link with nurse turnover was not determined. Larrabee et al. (2003) concluded that the major predictor of intent to leave was job dissatisfaction and the major predictor of job satisfaction was psychological empowerment. Laschinger et al. (2004) used a longitudinal predictive design to test a model linking changes in structural empowerment (opportunity, information, support, resources, formal power, and informal power) and psychological empowerment (meaningful work, competence, autonomy, and impact) to changes in job satisfaction. Changes in perceived structural empowerment had direct effects on changes in psychological empowerment and job

satisfaction. Changes in psychological empowerment did not explain additional variance in job satisfaction beyond that explained by structural empowerment. The results suggest that fostering environments that enhance perceptions of empowerment can have enduring positive effects on employees.

Kramer and Schmalenberg (2003) quantified nurse autonomy and determined a strong relationship between degree of autonomy and rankings of job satisfaction and quality of care. Rafferty et al. (2001) found autonomy, control over resources, relationships with doctors, emotional exhaustion and decision-making to be correlated with one another as well as having a relationship with nurse-assessed quality of care and nurse satisfaction. These findings are consistent with those of Laschinger et al. (2001) whose survey of hospital staff nurses suggested that perceived autonomy, control and physician relationships influence the trust, job satisfaction, and perceived quality of patient care.

5.3.4. Promotional opportunities

Career development and life-long learning activities in nursing promote job satisfaction, increased retention of nurses and enable continued provision of high-quality care (Yoder, 1995; Kennington, 1999; Donner and Wheeler, 2001; Davidson et al., 1997; Collins et al., 2000). Dissatisfaction with promotion and training opportunities has been shown to have a stronger impact on nurse turnover than workload or pay (Shields and Ward, 2001). Multivariate analysis of data collected by Davidson et al. (1997) in a longitudinal survey of nurses in one hospital indicated that predictors of intent to leave were the perception of little promotional opportunity, high routinization, low decision latitude and poor communication. Perceived interest in one's career development and feelings of being valued influence nurses' intent to stay (Yoder, 1995). Similarly, Szigeti et al. (1991) used correlational analysis to investigate the potential factors that relate to the desire of registered nurses (RNs) and licensed practical nurses (LPNs) to continue practicing in rural hospitals. Overall job satisfaction and performance constraints were the only variables to make significant contributions to the prediction of turnover intention for both RNs and LPNs. Satisfaction with promotion was the only work-related variable to make a significant contribution to the prediction of turnover intention for RNs. Performance constraints, role ambiguity and shift work were the only work-related variables contributing to the prediction of turnover for LPNs.

5.3.5. Work schedules

To promote balance between work and home, potential benefits of self-scheduling strategies have been documented, especially for nurses who have home responsibilities such as young children (Kane and

Kartha, 1992; Teahan, 1998; Kane, 1999; Hung, 2002). Long shifts, overtime, weekends, nights, holidays and weekend overtime were found to be predictors of anticipated turnover (Shader et al., 2001; Strachota et al., 2003). Vetter et al. (2001) described a process of self-scheduling that met the needs of staff, promoted high job satisfaction and maintained staffing standards on the unit. Using cross-tabulations when comparing well-being in nurses with young children at home, nurses employed full-time, casual part-time, or those with job-sharing positions, Kane and Kartha (1992) found that job-sharing nurses had the highest ratings for job satisfaction and physical health status. Kane (1999) used analysis of variance to determine that job sharing has a positive impact on job satisfaction and retention when comparing differences among full-time, part-time or job-sharing nurses in a large Canadian teaching hospital. These findings were supported in a qualitative study by Durand and Randhawa (2002) in which flexible working practices, increased salaries and demonstrating value to staff impacted career-break nurses' decisions whether they would return to practice in the NHS.

Generally, to summarize the literature relating to the impact of organizational factors on nurse turnover, to date there appears to be substantial evidence to inform decision-makers of the type of management style and workload factors that promote job satisfaction in nurses, as findings have been relatively consistent across various specialty unit types and jurisdictions. However, less well known is the impact of environmental complexities on nurses' well-being and overall unit functioning, as well as the impact of unit, patient and nurse characteristics on their work environments. More evidence to determine the interdependence of these relationships would help decision-makers better understand how intervention directed to one component of the patient care system has an impact on the system as whole.

5.4. Individual factors and turnover

Certain socio-demographic characteristics of nurses predispose to turnover, but are not usually considered explanatory variables in turnover behavior (Tai et al., 1998). An inverse relationship between age and turnover has been demonstrated for many years (Lowery and Jacobsen, 1984; Parasuraman, 1989; Gray and Phillips, 1994; Kiyak et al., 1997). McNeese-Smith and van Servellen (2000) suggest that mature nurses have greater job satisfaction, productivity and organizational commitment. Shader et al. (2001) found anticipated turnover for younger nurses to be associated with job satisfaction and stress, but no significant predictors of turnover or stress in nurses over 50, possibly due to their proximity to retirement, their marketability related to experience, and the fact that only those who are satisfied remain

working in a particular nursing environment. Contrary to other studies, Chan and Morrison (2000) found no statistically significant difference in the proportion of stayers and leavers on several demographic factors including age.

In terms of work experience, less experienced nurses tend to be younger, participate less in decision-making and have fewer home responsibilities (Price and Mueller, 1981a, b), while those with more experience are more satisfied with pay and less likely to leave (Lum et al., 1998). What remains unclear is whether it is work experience that it is related to turnover, or that age, work experience and tenure are inextricably linked (McCarthy et al., 2002). The relationship between length of service (tenure) and turnover compared to that between experience and turnover is said to be more complex. Gray and Phillips (1994) indicate that turnover rates tend to be high in the first year of service and remain high, or even rise during the second year of service before declining. Fewer years of employment was related to termination (Davidson et al., 1997; Kiyak et al., 1997) and RNs with more years of work experience reported higher job satisfaction, lowest levels of burnout and were less likely to leave their positions (Cameron et al., 1994). Lane et al. (1990) suggested that tenure as a correlate of turnover is inappropriate for certain groups of nurses. While part-time unmarried nurses were more likely to leave their hospitals than full-time unmarried nurses, tenure was not found to be a significant predictor of turnover for married nurses.

Kinship responsibilities involve home obligations. Children, spouses and aging parents affect the work and turnover habits of nurses, possibly requiring a change in work environment (Price and Mueller, 1981a, b; Cavanagh, 1989). Bloom et al. (1992) point out that nurse turnover in the USA during the 1960s was attributed primarily to women leaving during child-bearing years. Tzeng (2002) found that age of youngest child was a significant predictor of nurses' intention to quit. Strachota et al. (2003) surveyed 84 nurses who had voluntarily terminated or changed their employment status, 19 of whom indicated the reason as family, having to stay at home with children or elderly parents. In a study of public health nurses serving rural and small urban areas, Henderson Betkus and MacLeod (2004) found that factors such as age, retirement, family needs and the economy affected intent to stay or leave, rather than job satisfaction or community satisfaction.

Educational level is believed to impact turnover in that more highly educated individuals are more likely to quit in order to seek career advancement, especially if there are limited opportunities in their current organization (Tai et al., 1998; Yin and Yang, 2002). Several studies suggest a relationship between educational attainment, specifically the possession of a degree, and turnover (Krausz et al., 1995; Cavanagh and Coffin,

1992). A higher level of nursing education may also imply more varied placements during their preparation and development of a sense of loyalty to their profession rather than a particular health care service (Lane et al., 1990). Given the recent requirement of a degree to practice nursing in many countries, further research should examine the effects of a more highly educated nursing workforce on turnover rates. Aiken et al. (2004, p.70) suggest that "sustained underinvestment in nursing education is a theme across countries that are now turning to aggressive international recruitment" thus increasing nursing migration. This research highlights that increased investment in nursing education is key to countries reducing their reliance on overseas nursing expertise, particularly from developing countries.

5.5. *Economic factors and nurse turnover*

Studies that include remuneration as one component of job satisfaction are inconsistent in their findings. For example pay does not have as strong an impact as work environment (Irvine and Evans, 1995), pay is not a high priority (Frisina et al., 1988) and pay is not associated with turnover (Michaels and Spector, 1982; Mobley et al., 1979; Borda and Norman, 1997). Shields and Ward (2001) found that dissatisfaction with promotion had a stronger impact than pay on intention to quit the NHS, therefore improved pay would only have limited success unless accompanied by improved opportunities. Other research suggests that pay can have both a direct and indirect effect on turnover intent (Lum et al., 1998; Chan and Morrison, 2000; Tzeng, 2002; Yin and Yang, 2002; Strachota et al., 2003). Lum et al. (1998) found that pay satisfaction correlated strongly with reduced turnover intent, but also had a weaker correlation mediated through job satisfaction. Lu et al. (2002) presented a matrix of correlation coefficients between variables that indicated a significant negative correlation between turnover intent and wage, as well as a positive correlation between wage and professional commitment.

There is scant and inconsistent evidence to inform us whether alternative employment opportunity is a determinant of nurse turnover. Price and Mueller (1981a, b) asserted that when jobs are plentiful, turnover is high and when jobs are scarce, turnover is low. Krausz et al. (1995) found that even where many alternative job opportunities exist, many nurses prefer an internal move. Bloom et al. (1992) claimed that turnover is related to alternative employment opportunities only in higher population areas. Yet in a study by Strachota et al. (2003), of 84 nurses who had voluntarily terminated or changed their employment status, 31 indicated better job opportunity for more money and better hours as reasons for leaving. A recent study by Duffield et al. (2004) of nurses who already left the profession found that many moved to management outside health

industry with most taking additional study after leaving. Further research would provide insight into the nature of circumstances that lead to alternative employment, whether in or outside nursing.

5.6. Summary of factors associated with nurse turnover

In summarizing the factors associated with nurse turnover, job dissatisfaction and expressed intent to leave are most consistently reported as impacting turnover. Job satisfaction, turnover intention and turnover behavior appear also to be influenced by certain moderators including professional commitment and personal disposition. Organizational characteristics associated with workload, management style, empowerment and autonomy, promotional opportunities and work schedules are believed to contribute to turnover, and therefore researchers suggest that administrative interventions to improve quality of work life are imperative for long-term resolution. These findings are reflected in the studies described in Appendix A.

While socio-demographic characteristics are not usually considered explanatory in turnover behavior, and related findings have been somewhat inconsistent, factors such as younger age, inexperience and fewer years of the job, higher educational level, and kinship responsibilities are claimed to predispose nurses to turnover. In terms of economic factors, findings relating to the impact of remuneration on turnover are varied, and there is little evidence as to whether alternative employment opportunity is a determinant of nurse turnover.

6. Consequences of nurse turnover

6.1. Economic impact

Inconsistent turnover definitions and measures have impeded a clear understanding of associated financial costs, as replacement cost estimations vary according to location and components included in the measure. Direct costs are those incurred during the hiring process, such as advertising, recruiting, agency nurses and hiring. Indirect costs are due to RN termination, orientation and training, and decreased RN productivity. Jones (1990a,b) is supported by others (Gray et al., 1996; Johnson and Buelow, 2003) in pointing out that indirect costs of nursing turnover could be significant because of the decreased initial productivity of new employees and the decrease in staff morale and group productivity that nursing turnover imposes. The health care providers who switch employers or leave health care entirely also suffer, as professional disillusionment is a major and accelerating problem (Waldman et al., 2004).

Jones (1990b) acknowledges that high nurse turnover adversely impacts the nursing department, hospital environment and healthcare system; however, no studies were found that considered both incremental staffing costs and health care system costs. Previous researchers have attempted to determine financial costs of replacing individual nurses. Estimations range from \$10,000 to \$60,000 per RN, depending on the nurse specialty (Jones, 1990b; Johnson and Buelow, 2003 citing Curran, 1991). Likewise, Strachota et al. (2003) cited estimates (from The Advisory Board Company, 2000) of \$42,000 to replace a medical-surgical nurse and \$64,000 for a specialty nurse. These figures included the cost of recruitment, orientation, precepting and lost productivity, the latter claimed to be nearly 80% of the total turnover cost. While it has been recognized that the cost associated with lower productivity of new hires is a significant component of turnover, Waldman et al. (2004) state that this cost has not been quantified before and therefore has not appeared as a recognized budget expense. They indicate that turnover cost models have typically omitted this measure, which requires calculations using learning curve algorithms and retention methodologies. In their application of rigorous accounting methodology to six groups of health care workers, including nurses, the largest cost driver was the loss and necessary replacement of nurses. The total cost for a newly hired nurse averaged \$15,825 and the cost of reduced productivity ranged from \$5,245 to \$16,102 (Waldman et al., 2004).

The economic impact at a country level of this turnover and ultimately nurse migration is now a topic of global discussion but little research and publications to date have occurred. In 1998 the United Nations Conference for Trade and development estimated that every professional, from ages 25 to 35, who migrated from South Africa represented an annual loss of \$184,000 for that country (United Nations Conference on Trade and Development, 1998). Interestingly, factors that are now found in regards to health professionals' decisions to emigrate are very similar to those of turnover. A study of five African countries found the main factors causing health professionals to emigrate to be lack of further training opportunities, and poor remuneration, working environment and health management systems (International Organisation for Migration, 2002 (IOM), 2002). The 2003 *World Health Report* describes how the African countries' ability to respond against HIV is undermined primarily by lack of skilled workforce. The secretariat paper to the 2004 World Health Assembly in Geneva describes how the turnover of health professionals and ultimate migration, increases not only the workload of those who remain but ultimately the capacity of country health services to respond. "Migration flow of health professionals

(largely nurses) account for 65% of economically active migrants” (WHO, 2004 p.1).

6.2. Nurse outcomes

While there is increasing attention on the impact of inadequate nurse staffing and poor work environments on nurse health and safety outcomes, few studies focus specifically on turnover to determine its effect on nurse outcomes. Inadequate staffing levels and work overload have been studied (Baumann et al., 2001; O'Brien-Pallas et al., 2001; Shamian and O'Brien-Pallas, 2001) and associated negative effects on nurses' well-being demonstrated. O'Brien-Pallas et al. (2001) examined trends in earned hours and complexity of inpatient hospital cases for the years 1994/95 through 1998/99, finding increased patient acuity and demand accompanied by decreased numbers of nurses working in hospitals. Findings suggested that as hours of care per patient day increased, so did the overtime nurses were asked to work and the incidence of missed shifts due to illness. These findings are consistent with Zboril-Benson's (2000) study in which higher rates of absenteeism were found to be associated with lower job satisfaction, longer shifts, working in acute care and working full-time. In an Ontario study, more than one-third of nurses experienced high emotional exhaustion, had higher overall and musculo-skeletal claim rates compared to non-nurses, and musculo-skeletal claims comprised the majority of nursing claims (Shamian and O'Brien-Pallas, 2001). Clarke et al. (2002) found poor organizational climate and high workloads to be associated with 50% to 2-fold increases in the likelihood of needlestick injuries and near-misses (with a needle or sharp) to nurses.

6.3. Patient outcomes

While studies are beginning to emerge that correlate nurse staffing with patient outcomes, more data are needed to support the claim that patient safety depends on the ability to recruit and retain sufficient numbers of qualified nurses and shape a supportive practice environment (Clarke and Aiken, 2003). A few studies were found that linked nurse turnover with quality of patient care (Shortell et al., 1994; Leiter et al., 1998) but no studies were found that substantiated the effect of nurse turnover on quality of care delivery. Leiter et al. (1998) examined data from 605 patients and 711 nurses to find that patients on units where nurses found their work meaningful were more satisfied with all aspects of their hospital stay, and patients who stayed on units where nursing staff felt more exhausted or more frequently expressed the intention to quit were less satisfied with the various components of their care. In a study looking at how nursing home care affects resident infection and hospitalization for infection, Zimmerman

et al. (2002) found that RN turnover was significantly related to both outcomes; with each proportionate loss of an RN the risk of infection increases almost 30% and the risk of hospitalization increases more than 80%.

Recent studies have linked nurse staffing levels with the length of stay (Lichtig et al., 1999; Needleman et al., 2002); complication rates (Blegen et al., 1998; Robertson and Hassan, 1999; Dimick et al., 2001; Whitman et al., 2002; Unruh, 2003); patient mortality and 'failure to rescue' (Blegen et al., 1998; Tourangeau et al., 2002) and patient incidents that comprise a threat to patient safety and well-being (Blegen et al., 1998; Whitman et al., 2002). Large sample sizes and sophisticated statistical analysis substantiate the claim that better nurse staffing levels in terms of skill mix (Blegen et al., 1998; Lichtig et al., 1999; Needleman et al., 2002; Tourangeau et al., 2002; Unruh, 2003); patient-to-nurse ratio (Dimick et al., 2001; Aiken et al., 2002b); years of related experience (Tourangeau et al., 2002) and hours of nursing care (Blegen et al., 1998) result in more desirable outcomes for patients. Aiken et al. (2001) claim that increases in patient acuity and nurses' responsibilities have increased workload in ways that, when coupled with a deteriorating practice environment, adversely affect patient outcomes.

Whitman et al. (2002) examined relationships between nursing staffing and specific nurse-sensitive outcomes across cardiac and non-cardiac intensive care and intermediate care units, and medical-surgical units. Significant inverse relationships were present between staffing and falls in cardiac intensive care, medication errors in both cardiac and non-cardiac intensive care units, and restraint rates in the medical-surgical units. Blegen et al. (1998) found that as the RN proportion increased, rates of adverse outcomes decreased up to 87.5%. The higher the RN skill mix, the lower the incidence of adverse occurrences on inpatient care units. Lichtig et al. (1999) used nursing intensity weights to acuity-adjust the patient data and found that both higher nurse staffing and higher proportion of RNs were significantly related to shorter lengths of stay.

The importance of good management in promoting quality of patient care has been supported. Shortell et al. (1994) determined that management ability of intensive care units was significantly associated with lower risk-adjusted length of stay, lower nurse turnover, higher evaluated technical quality of care and greater evaluated ability to meet family member needs. Similarly, according to multivariate results in an international study managerial support for nursing had a pronounced effect on nurse dissatisfaction and burnout (Aiken et al., 2002a). Also, organizational support for nursing and nurse staffing were related to nurse-assessed quality of care. Qualitative research supports these findings: themes relating to workload, human resources, nursing shortage, restructuring and physical environment were

seen as an increasing risk in patient care (Nicklin and McVeety, 2002).

6.4. Summary of turnover consequences

There is overall consensus that undesirable nurse turnover is costly as well as detrimental to nurse and patient outcomes. Researchers agree that adverse impacts relate to decreased initial productivity of new employees and decreased staff morale and productivity. Financial costs of replacing individual nurses are being estimated, however, studies have yet to produce evidence in terms of incremental staffing costs and health care system costs. Studies that examine the effect of inadequate nurse staffing and poor work environments on nurse health and safety outcomes often do not include variables explicit to nurse turnover. Similarly, few studies have produced findings that link nurse turnover to measurable patient outcomes. The scant evidence that does exist suggests that patients do suffer more physically and emotionally in health care environments experiencing high nurse turnover. As suggested in the study findings in Appendix B, there is clearly a need for research committed to better understanding nurse turnover and its consequences.

7. Methodological challenges

Methodological challenges have been identified by researchers attempting to study turnover. Cavanagh (1989) concluded that simple bivariate investigations to examine why nursing staff leave their jobs produced conflicting results and underscored the complexity of the turnover problem. A variety of study populations, methodologies and inconsistent definitions and measurements made comparison of turnover studies difficult, due to confusion over the precise meaning of turnover and who is included in the analysis (Cavanagh, 1989; Tai et al., 1998). Irvine and Evans (1992) pointed out that different operational definitions of concepts could account for inconsistent findings and that concept clarification is needed to define the relationships among the various concepts. Due to the complexity of defining and measuring multifaceted predictors and outcome constructs as well as differences among work contexts, study results are often inconsistent with each other (Mor Barak et al., 2001).

Irvine and Evans (1992) indicate that studies have not always specified whether the focus is voluntary turnover or involuntary turnover. Where studies distinguish between voluntary and involuntary turnover, there is still a lack of clarity due to inaccuracy of organizational data. Institutional records cannot be trusted blindly, since “face-saving” reasons may have been used to document employee withdrawal, altering the distinction

between voluntary and involuntary termination (Campion, 1991). Also, as identified by Waldman et al. (2004), a practical reason for refining turnover cost measures relates to the required adaptation of accounting concepts in health care as corporate practices are applied to clinical settings.

Much of the turnover research is characterized by small sample sizes at the unit and organization levels. Mor Barak et al. (2001) state that gaps in existing knowledge include the examination of macrolevel variables such as organization size, setting, structure, funding status and other economic factors, as well as specific job conditions and employee characteristics, thereby limiting usefulness of findings for policy formation. As samples often do not include different subgroups within an organization’s workforce, such as the study of differential turnover rates between managers and subordinates within the same unit (Cavanagh, 1989), the evidence is less beneficial than it could be in addressing high nurse turnover.

In terms of data collection, many studies have used questionnaires as the sole means (Cavanagh, 1989) as was the case in the most of the studies used in this review. While this approach is most advantageous in large-scale investigation, more opportunity to comment on relevant aspects of turnover behavior could enrich the overall findings. Fottler et al. (1995), however, cautions against the use of exit interviews of terminating nurses, since they are likely to identify non-job-related factors as reasons for leaving, due to reluctance to criticize the organization for fear of alienating the interviewer and jeopardizing future job references.

Until very recently, many studies utilized cross-sectional designs, almost exclusively examining turnover from a fixed point in time and using a dichotomous (turnover or no turnover) dependent variable (Mor Barak et al., 2001). Authors from the past few decades argued that more longitudinal research designs would increase ability to predict who will leave and determine factors that moderate turnover behavior (Hinshaw and Atwood, 1983; Cavanagh, 1989). Earlier researchers had suggested that the study of nursing turnover is too complicated for simple correlation; that the lack of multivariate analysis resulted in a lack of clarity as to what extent the host of variables hypothesized to impact turnover were simple correlates or independent predictors. (Cavanagh, 1989; Irvine and Evans, 1992). Also, the relationship between intention to leave and actual turnover merits further examination, since intention to leave alone accounts for only a portion of actual turnover (Mor Barak et al., 2001). Current analysis procedures are including more advanced statistical methods such as multivariate analysis and structural equation modeling, suggesting that researchers are responsive to previous critiques. Future research to examine the strongest turnover predictors

simultaneously would help determine their relationships to one another and discover their mediating and moderating influences (Mor Barak et al., 2001).

8. Concluding comments

Concerns have been expressed nationwide and globally about the shortage of nurses and the issue of turnover, yet the data to support an evidence base to develop effective policies to deal with these problems are lacking. A comprehensive review of recent literature was conducted to examine the current state of knowledge relating to causes and consequences of nurse turnover. It was found that research has been hampered by methodological challenges, even in the inconsistent definition of turnover itself. Most of the investigation to date has concentrated on determinants of nurse turnover, highlighting factors including organizational, work, management, job, individual, and economic, as well as moderating factors. Theoretical modeling of turnover that seeks to demonstrate relationships among determinants has consistently shown a positive relationship between intent to leave and turnover. Very little research was found that focused on the impact of nurse

turnover, with economic impacts, nurse and patient outcomes attracting interest.

Decision-makers require more evidence relating to costs associated with turnover, how staffing decisions influence turnover, how nurse turnover affects the health team functioning, and how nurse turnover affects health system outcomes including nurse and patient outcomes. For such evidence to be useful and generalizable, however, the methodological limitations of research need to be reduced. Studies that reflect standardized definitions of turnover, agreed formulae for identification of costs, distinction between voluntary and involuntary turnover, involve samples that include multiple units and organizations, even countries, and the use of longitudinal research designs and multivariate analysis promise to produce more robust understanding of the complex phenomenon of nursing turnover. A skilled nursing workforce is required to strengthen the health systems of all nations. Policy solutions to nursing turnover and shortages risk being around “quick fixes”: the issue is complex and ultimately it is only through more research and detailed analysis of impact of turnover within health systems and at country level that viable and sustainable solutions become apparent.

Appendix A. Studies of nurse turnover determinants

Author(s)	Purpose	Sample/Setting	Method/Analysis	Key Findings
Szigeti et al. (1991)	Investigate factors relating to RNs' and LPNs' desire to keep practicing in rural hospitals	291 RNs and LPNs from hospitals with less than 100 beds	Questionnaire	Overall job satisfaction and performance constraints are a predictor of turnover intent for RNs and LPNs. Satisfaction with promotion the only work-related predictor of turnover intent for RNs. Performance constraints, role ambiguity, and shift work were the only work-related turnover predictors for LPNs
		59% response rate	Correlational analysis	
Bloom et al. (1992)	Examine thesis that social organization of work in hospitals is determinant of voluntary turnover rate	Administrative data from 435 hospitals from the Nursing Personnel Survey	Measures: voluntary turnover, skill and educational of nurses, working conditions, work patterns, career laddering, work	Ratio of RNs to total staff is related to turnover. Total, primary, and modular nursing organization had significant but marginal effect on turnover. Career ladder unrelated to

	among registered nurses		incentives, economic opportunity	turnover. Professional benefits related to higher rather than lower turnover. Hospitals with a larger proportion of longer tenured nurses had lower turnover. Economic opportunity had inconsistent effects on turnover
			Secondary data analysis Multiple regression	
Gardner (1992)	Measure career commitment and explore its relationship to turnover and work performance	320 newly employed registered nurses at one hospital	A longitudinal, repeated-measures descriptive survey to measure career commitment and explore relationship to turnover and work performance	Career commitment scores dropped over the first year. Although career commitment correlates with turnover, and there is a relationship with job performance, the direct association is weak. Career commitment in the first year in a new job is susceptible to organizational factors
Judge (1993)	Test hypothesis that there is interaction between affective disposition and job satisfaction	Medical clinic. Subjects ($N = 234$): RNs (56%), LPNs (15%), office assistants (15%), lab techs (14%)	Questionnaire Measures: affective disposition, job satisfaction, voluntary turnover. Regression analysis	Nurse data supported hypothesis. The more positive the disposition of the individual, the stronger the relationship between job dissatisfaction and turnover. Individuals dissatisfied with their jobs but positively disposed to life were the most likely to quit
Cameron et al. (1994)	Examine similarities and differences between job satisfaction, propensity to leave, and burnout of RNs and RNAs	623 RNs and 231 RNAs from three community hospitals	Questionnaire-Quality of worklife conditions, index of organizational reactions, burnout scale, propensity to leave	Both groups moderately satisfied with jobs, burnout or propensity to leave. RNs with more years of experience had highest job satisfaction, lowest burnout, and were less likely to leave. None of these variables were related to the length of time RNAs were employed. RNs in psychiatric settings least satisfied with jobs, more likely to leave, and reported more burnout than RNs in other settings
			Multivariate analysis	

Gray and Phillips (1994)	Examine turnover rates and relationship to age and length of service	342,000 employees from nine staff groups in NHS	Secondary data analysis	Annual turnover rate among all NHS staff 13.6%; higher turnover among full-time than part-time; turnover declines with age, are high in first year of service, remains high in second year before declining
Krausz et al. (1995)	Test withdrawal progression-relationship between predictor variables and withdrawal levels of ward, hospital and profession	Wave 1–390 nurses in large hospital. One year later same nurses completed similar questionnaire resulting in 146 matched pairs (37.4% of 390)	Questionnaire-Withdrawal intention, Job Scope (Hackman and Oldman), Burnout (Pines et al.)	Milder forms of withdrawal preceded more severe forms, culminating in intent to leave the profession. Job scope effected intent to leave the ward; burnout effected intent to leave the hospital. Although intention to leave the profession was better predicted than intention to leave the ward or the hospital, the cumulative effects of the two lower levels of withdrawal intention were the major determinants
			LISREL Goodness-of-fit measures	
Leveck and Jones (1996)	Examine effects of management, group cohesion, job stress, job satisfaction (organizational and professional) on retention and quality of care	Theoretical model was tested using data from 50 nursing units at four acute care hospitals in the southeast	Hinshaw and Atwood'S (1983) anticipated turnover model was modified and expanded to include relevant antecedent and outcome variables	The model explained 49% of the variance in staff nurse retention and 39% of the variance in process aspects of quality of nursing care. Experience on unit and professional job satisfaction were predictors of staff nurse retention; job stress and clinical service were predictors of quality of care. The variable contributing the most was management style
Davidson et al. (1997)	Examine effects of hospital change on job satisfaction and turnover	736 nurses from a hospital	Questionnaire-Satisfaction scales by Hinshaw and Atwood and Price and Mueller	Intent to leave predicted by perception of little promotion, high routinization, low decision latitude and poor communication. Predictors of turnover were fewer years on the job, expressed intent to leave, and lack of time to do job well

Kiyak et al. (1997)	Examine employees' level of commitment, operationalized as intent to leave and subsequent termination of employment	73.5% response rate Staff of six nursing homes and 12 community facilities serving older adults (N = 308)	Multivariate analysis Questionnaire-Job Description Index (Smith et al., 1974), job satisfaction, intention to leave	Turnover predicted best by intent to leave, followed by length of employment (shorter), and age (younger). Intent to leave predicted by age (younger), length of employment (shorter), job dissatisfaction, and type of agency worked (community). Dissatisfaction is a factor in desire to leave and may lead to turnover or continued dissatisfaction
Song et al. (1997)	Compare job satisfaction, absenteeism, and turnover between nurse-managed special care unit (SCU) and in traditional ICU	143 nurses- 34 from SCU (90% response rate) and 109 from ICUs (69% response rate)	Multiple regression Discriminant function analysis Annual questionnaires 1991–1994- Job Diagnostic Survey (Hackman and Oldman), Staff perception and preference, nurse absenteeism and turnover ANCOVA	Was greater supervisory and payment satisfaction in SCU (shared governance and minimal technology) than ICU (bureaucratic and high tech). Percent absent hours for SCU nurses was lower than ICU. Turnover rates did not differ between the two units Nurses working in both the SCU and the ICUs preferred the SCU practice model over the ICU model
Lum et al. (1998)	Assess direct and indirect impact of pay policies on turnover intentions of pediatric nurses	361 RNs in neonatal and pediatric ICU	Questionnaire-Job Satisfaction Scale, Pay Satisfaction, Organizational commitment scale, Turnover Intention Chi-square Goodness-of-fit	Job satisfaction has indirect and organizational commitment has direct effect on intent to quit. Pay satisfaction had direct and indirect effect on turnover intent. Having children, a degree, and working 12-h shifts have direct and indirect influence on pay satisfaction and turnover intent
Boyle et al. (1999)	Examine effects of managers' power, influence,	77.5% response rate 255 staff nurses in intensive care	Questionnaire-Manager, organization and	Managers' position power and influence over work coordination had direct

	and leadership style on nurses' intent to stay	units at four urban hospitals	work characteristics; nurse characteristics of opportunity elsewhere; job stress, satisfaction, and commitment; and intent to stay Causal modeling and multiple regression path analysis	link to intent to stay. Instrumental communication, autonomy, and group cohesion decreased job stress and thus increased job satisfaction. Job satisfaction was directly linked with intent to stay
Hemingway and Smith (1999)	Examine model: organizational climate hypothesized to affect withdrawal and injuries through the mediating effects of occupational stressors	252 RNs from different wards and shifts within four hospitals	Questionnaire-Work Environment scale, Nursing Stress Scale, Injuries (reported, unreported, near), Injury composite, absenteeism, Turnover intention Multiple regression analysis Hierarchical multiple regression	Turnover intentions and injury measures related to organizational climate and occupational stressors. However, climate and stressors not significantly related to frequency of short-term absences. High work pressure was predictive of greater role conflict and role ambiguity, and of more stress from heavy workload. Poor supervisor support was significantly related to greater stress from heavy workload, and lack of autonomy was related to higher role ambiguity
Janssen et al. (1999)	Gain insight into the relationships between work characteristics and specific stress reactions	156 nurses from nine departments at a general hospital 89% response rate	Questionnaire- Quality of job, mental work overload, Social support, unmet career expectations, Intrinsic work motivation, Maslach Burnout Inventory Pearson correlations LISREL analysis	Emotional exhaustion was predicted by lack of social support from colleagues and work demands. Turnover intention was determined by unmet career expectations, such as a higher salary, more responsibility and to a lesser extent by quality of job content

Kane (1999)	Determine if are differences in job satisfaction, burnout, and desire to leave position, in nurses employed in full-time, part-time, or job sharing	Sample ($N = 269$) drawn from large Canadian teaching hospital. Three sample groups were developed, consisting of job sharing, full-time, and part-time	Quasi-experimental. Questionnaire to measure job satisfaction, propensity to leave, burnout and family stressors	Job-sharing nurses reported greater satisfaction than full-time nurses. No statistically relevant findings related to employment status and propensity to leave. Total burnout scale not significantly different by employment status but Depersonalization Subscale showed significant difference with job-sharing nurses faring better than the full-time or part-time groups. No significant relationship noted between family stressor and job satisfaction, burnout and propensity to leave
Mano-Negrin and Kirschenbaum (1999)	To understand impact of 'careerist' attitudes (push effects) and organizational benefits (pull) on turnover	707 health care workers of which 46% were nurses	Questionnaire-Voluntary turnover a dichotomous variable (stayed vs. left)	Nurses and physician turnover behavior is negatively affected by career aspiration-expectations for advancement kept them in organization, added to by fear of unemployment (nurses). Turnover reflects the effect of the balance between organizational benefits (pull factors) and a careerist attitude to work (push factors)
		29% response rate	Cross-sectional analysis ANOVA Logistics regression	
Chan and Morrison (2000)	Explore factors influencing turnover intention of RNs	114 nurses from various units in large hospital	Questionnaire-adapted from Battersby et al. (1990)	Leavers: Cert or diploma grads, work non-ICU, RNs 2–4 years. Stayers: Specialized qualification, work in ICU, had either <2 years or between 6-10 years experience. Work factors of job satisfaction, collegiality, use of skills,

				recognition, staffing and salary influenced if stay or leave
		95% response rate	Descriptive statistics	
Collins et al. (2000)	Examine views in innovative roles, on job satisfaction, career development, intention to leave and factors that hinder and enhance working	452 nurses and 162 professionals allied to medicine (PAMs)	Questionnaire	High level of job satisfaction in both groups (nurses and PAMs). Job satisfaction significantly related to feeling integrated within professional group and colleagues, feeling that new roles improved career prospects, adequately prepared and trained for the role. 68% ($n = 415$) felt the role enhanced career prospects but 27% ($n = 163$) said they would leave their profession if they could. Low job satisfaction was significantly related to intention to leave the profession
		78.5% response rate	Descriptive statistics Content analysis	
Cartledge (2001)	Explore factors influencing turnover	Intensive care nurses who left position	Content analysis of eleven interviews	Four themes emerged from content analysis: stress, professional development, recognition and respect of others, and implications of shift work
Ito et al. (2001)	Relate intent to leave to job satisfaction, perceived risk of assault, and supervisory support	1,494 nurses from 27 psychiatric hospitals	Questionnaire-National Institute for Occupational Safety and Health job stress	44% reported intention to leave their job, 89% of those perceived a risk of assault. Younger age, fewer previous job changes, less supervisory support, lower job satisfaction and more perceived risk of assault significant predictors of intention to leave
		76.5% response rate	Chi square, <i>t</i> test Kendall's tau b Logistic regression	
Moore (2001)	Examine impact of restructuring on conditions and nurses' well-being, nurses reaction to	201 nurses working in three hospitals	Internet questionnaire- Restructuring Initiative Index, Impact of Restructuring	Despite high conditions, nurses kept strong sense of professional efficacy. However, impact predicted nurse burnout. Management

	changes; and degree to which nurses felt they were consulted and supported		Index and Hospital Consultation Scale (Burke and Greenglass); Social Support (Tate, 1996); Deakin Coping Scale (Moore and Greenglass, 1999), burnout and self-efficacy items, Intention to Quit	communications proposed as a mediator against burnout but was not supported. Nurses considered management a top-down approach and this non-consultative communication also predicted nurse burnout. The restructuring changes, their impact, and poor communication style, and burnout also predicted nurses' intentions to quit; however, a sense of professionalism mediated this intent
			Asymptotic variance-covariance matrix structural equation modeling	
Shader et al. (2001)	Examine relationship between job satisfaction, age stress, cohesion, work schedule and turnover	241 nurses and nurse managers in 12 units in a 908-bed hospital	Questionnaire-Index of Work Satisfaction, Job Stress Scale, Byrne Group Cohesion Scale, Anticipated Turnover Scale	Job stress, work satisfaction, group cohesion and weekend overtime were predictors of anticipated turnover. There were differences in the factors predicting anticipated turnover for different age groups
			Unit demographic data from hospital databases Pearson's correlations	
Shields and Ward (2001)	Investigate determinants of job satisfaction, establish importance of job satisfaction in intent to quit	Data of 9625 nurses from 1994 national survey of nursing staff	Secondary data analysis job satisfaction scales for work aspects Turnover—Stayer vs. Quitter	Job satisfaction is most important determinant in intent to quit, more so than outside opportunities. Poor career advancement opportunities (largest quantitative affect), increased workload, pay and workplace relations important in quitting outcome. Work dissatisfaction is greater in young, male, ethnic minority and highly educated nurses
			Cross-tabulations <i>t</i> statistics	

Lu et al. (2002)	Investigate relationships among turnover intent, professional commitment, and job satisfaction of RNs	Random sample of 2197 hospital nurses	Questionnaire—Professional Commitment scale (Lu, Chiou and Chang, 2000) Turnover Intention (Blau and Lunz, 1998) Job Satisfaction	Professional commitment was more effective in predicting intent to leave nursing profession than intent to leave organization. Professional commitment related to intent to leave profession was more strongly correlated than intent to leave the organization. Job satisfaction related to organizational leave intent was more strongly correlated than professional leave intention
		86.2% response rate	Descriptive statistics Correlation matrices Discriminant analysis	
Tzeng (2002)	Hypothesis: the higher the general job satisfaction and happiness, and satisfaction with role, the lower the intent to quit	648 hospital nurses 82% response rate	Questionnaire-Job satisfaction subscales, general perceptual factors ordinal logistics regression analyses	General job satisfaction, general job happiness, satisfaction with salary and promotion, institution, educational background, and age of nurses' youngest child were significant predictors of nurses' intention to quit
Larrabee et al. (2003)	Investigate the relative influence of attitudes and context of and structure of care on nurses' job satisfaction and intent to leave	90 RNs employed on two medical, two surgical, and three intensive care step-down units at a medical center	Questionnaire-Work Quality Index, Multifactor Leadership Questionnaire, Profession work environment subscale, Nurse Collaborative Practice Subscale, Group Cohesion Scale, Spreitzer's 12-item questionnaire, Personal Views Survey	Major predictor of intent to leave was job dissatisfaction, and the major predictor of job satisfaction was psychological empowerment. Predictors of psychological empowerment were hardiness, transformational leadership style, nurse/physician collaboration, and group cohesion
Strachota et al. (2003)	Investigate reasons nurses changed employment status	84 hospital nurses who changed employment status	Telephone interviews over 4 months	Reasons for change were: hours worked; better job opportunity; family; poor pay and benefits; poor staffing; unsupportive management; unacceptable

				work environment; work stress; no opportunity for advancement
		46% response rate	Data analyzed for themes and categories	
Anderson et al. (2004)	Tested effect of administrative climate, communication patterns, and interaction between the two on turnover	3449 employees in 164 randomly sampled nursing homes	Perceptions of administrative climate and communication linked to secondary data	Climate and communication affected turnover, but lower turnover dependent on interaction between the two. With reward-based climates, higher levels of communication openness and accuracy explained lower turnover, relative to nursing homes with an ambiguous climate. Adequate staffing and longer tenure of nursing director also important predictors of turnover
			Hierarchical regression	
Duffield et al. (2004)	Identify positions of RNs moved to when left nursing and explore perceptions about the skills gained from nursing	154 nurses no longer employed in nursing	Questionnaire-Current job, skills gained from nursing, reasons for becoming a nurse, reasons for leaving nursing (Duffield and Frank)	Many moved to management outside healthcare, most took added study. Few had difficulty in non-nursing employment, most agreed nursing skills assisted in attaining positions. Reasons for leaving related to work aspects, structural aspects, professional issues, team support, salary and prestige, employer care, and legal concerns
			Kruskal-Wallis test	
Henderson Betkus and MacLeod (2004)	Examine public health nurses' (PHNs) job and community satisfaction, and relate it to decision to stay	124 PHNs from 48 rural and small urban communities in British Columbia	Self-administered questionnaire Stramps and Piedmontes Work Satisfaction Index	PHNs most satisfied with professional status, interaction and autonomy, and friendliness of the community and their friends, and least satisfied with salary. Job satisfaction or community satisfaction did not influence retention. Age, retirement, family needs and the economy affected intent to stay or leave

Holtom and O'Neill (2004)	Examine job embeddedness in predicting retention and assess whether factors that influence nurse retention are different from other workers	76% response rate 232 employees, including nurses, from community hospital	Independent <i>t</i> -test Content coding Questionnaire 1 year later, hospital data regarding leavers	Job embeddedness predicted turnover beyond a combination of perceived desirability of movement measures (job satisfaction, organizational commitment) and perceived ease of movement measures (job alternatives, job search). Job embeddedness assessed new variance in turnover in excess of that predicted by major variables in major turnover models. Levers for influencing retention are substantially similar for nurses and other healthcare workers
		46.4% response rate	Alpha coefficient	

Appendix B. Studies of nurse turnover consequences

Author(s)	Purpose	Sample/Setting	Method/Analysis	Findings
Jones (1990b)	Develop a methodology to measure nurse turnover costs	Turnover and turnover cost data from four acute care hospitals grouped into direct and indirect costs	Total nursing turnover cost divided by the number of nurses reported as turning over at each of the hospitals	Mean turnover rate 26.8% Mean cost per RN turnover was \$10,198, ranging from \$6,886 to \$15,152
Shortell et al. (1994)	Examine factors associated with risk-adjusted mortality, risk-adjusted average length of stay, nurse turnover, technical quality of care, and ability to meet family member needs	17,440 patients across 42 ICUs	Apache III methodology for risk-adjustment	Technological availability significantly associated with lower risk-adjusted mortality (beta = -0.42); diagnostic diversity significantly associated with greater risk-adjusted mortality (beta = 0.46); and caregiver interaction comprising the culture, leadership, coordination, communication, and conflict management

Leiter et al. (1998)	Study relationship of nurse burnout, intent to quit, and meaningfulness of work with patient satisfaction with care, information provided and care coordination, and outcomes of the hospital stay	605 patients and 711 nurses from 16 inpatient units from two hospital sites	Staff survey: Maslach Burnout Inventory, meaningfulness of work, intention to quit,	abilities of the unit is significantly associated with lower risk-adjusted length of stay (beta = 0.34), lower nurse turnover (beta = -0.36), higher evaluated technical quality of care (beta = 0.81), and greater evaluated ability to meet family member needs (beta = 0.74) Patients where nurses found work meaningful were more satisfied with all aspects of hospital stay. Patients who stayed on units where nursing staff felt exhausted or expressed the intention to quit were less satisfied with the various components of their care. Although nurse cynicism was reflected in lower patient satisfaction, the correlations between cynicism and other aspects of care fell below statistical significance. No significant correlations were found between nurse professional efficacy and patient satisfaction
Zimmerman et al. (2002)	Determine relationship between structure and process elements of nursing home care and resident outcomes	Senior administrators	Patient survey: Satisfaction measures and outcomes Interviews for facility data	RN turnover significantly related to outcomes; with each proportionate loss of an RN the risk of infection increased almost 30% and the risk of hospitalization increased more than 80%. When other predictive process and structure variables are included, associations persist, implying that the relationships between turnover and infection & hospitalization cannot be explained by confounding with other processes and structure variables

		2015 new admissions aged 65 and older from a stratified random sample of 59 nursing homes	Baseline data of residents followed for 2 years. Outcome measures: infection and hospitalization for infection. Regression analysis	
Waldman et al. (2004)	Examine turnover and its costs in the health care environment	Multiple databases to measure costs of hiring, training, and termination, and to measure employee productivity	Prior work on costing turnover used for new accounting methodology. This model was applied to a large academic medical center	The total costs for a newly hired nurse averaged \$15,825. CoRPs for nurses ranged from \$5,245 to \$16,102 The training of nurses generated 59% of total training costs Turnover costs represent an expenditure of about 5% of the annual operating budget

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