

Knowledge Translation and the Clinical Nurse Educator: An Integrative Literature Review

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Abstract

Despite the increase in evidence based research, the application of knowledge to frontline nurses remains a challenge. Knowledge translation (KT) is a process that can address this challenge through transferring evidence into tangible knowledge relevant to nursing practice and direct patient care. The purpose of this literature review is to review the role of the clinical nurse educator (CNE) in the area of KT. Clinical nurse educators have an important role as facilitators of KT. In the literature reviewed for this project it was evident that clinical nurse educators have a low level comfort with knowledge translation, and that their level of education and experience has an impact on their level of comfort. As well, in this literature review, it was revealed that several personal and organizational barriers impact the effectiveness of knowledge translation for the clinical nurse educator and the frontline nurse. Additional education, a research-centered attitude, and research application skills are required to strengthen nurse educators' competency and confidence with translating nursing knowledge within a dynamic nursing culture.

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Knowledge translation (KT) is a catch phrase in health care and nursing education. The Canadian Institute of Health Research defines knowledge translation as a “dynamic and iterative process that includes synthesis, dissemination, exchange, and ethically-sound application of knowledge to improve the health of Canadians” (<http://www.cihr.gc.ca>). Understanding the elements of knowledge translation and the value of its application into the clinical setting does not follow a clear path. The process of KT may be a challenge for clinical nurse educators (CNE) and nurses.

Introduction and Context

Although KT is an emerging field in healthcare, the concept is not new (Wallin, 2008). The current literature reveals that many clinical nurse educators have a low comfort level with knowledge translation and are not confident in the application of research to practice (Milner, Estabrooks, & Humphrey, 2005). The World Health Organization stresses that “stronger emphasis should be placed on translating knowledge into action...bridging the gap of what is known and what is actually done” (as cited in Wallin, 2008). Since CNE’s provide staff education, integrating knowledge into nursing practice, they can influence frontline nurses to improve knowledge translation within the health care system.

Clinical nurse educators have a key role in being facilitators of knowledge translation. Although dispersed among specialty areas, CNE’s share the primary responsibility for envisioning, planning, and implementing professional development initiatives in clinical practice areas for frontline nurses. Milner, Estabrooks, and Humphrey (2005) described educator responsibilities as “promoting best practice by mentoring others, acting as an information source,

and assisting in the development of policies and procedures based on available research evidence” (p. 900). Knowledge translation is an integral component in the clinical nurse educator’s role. Matthew-Maich, Ploeg, Jack, and Dobbins (2010) suggest that nurses may require unlearning of current nursing practices; recognizing and addressing strong emotions, attitudes, and beliefs that impede change are necessary to help facilitate and sustain change through KT. Additional knowledge and educational support is required for nurses to understand research methodologies and the purpose of research. This additional support leads to effective application of KT in the clinical setting.

Purpose and Significance

The focus of my major paper is to review the role of the CNE in the area of KT through an integrative literature review. The following questions will guide this review: What are the responsibilities of the clinical nurse educator in order to be a facilitator of knowledge translation and what barriers prevent implementation of knowledge from being successful: what knowledge, skills, and attitude do clinical nurse educators need to have to facilitate knowledge translation in health care settings?

In this integrative literature review I will review relevant research articles for validity and applicability. I will also explore what the research says regarding the responsibilities of the CNE in relation to their role as a facilitator of KT for frontline nurses. Through this process I will review the role of education in preparing the clinical nurse educator to be a facilitator of KT. I will also review the role of organizational structure and culture on knowledge translation processes.

My current experience as a masters student has provided me with an appreciation for research and the need for knowledge to be integrated into clinical nursing practice. Through the engagement of methodology, theoretical, and statistical courses my experience and skill have developed in the areas of recognizing and understanding the components of research and the significance of interpretation. I have had the opportunity to explore components of research and develop skills of interpretation and application. Modeling the application of a knowledge translation lens to support decision making and influence changes has been instrumental in my quest to open dialogue and critical thinking with clinical practice with nursing staff.

The anticipated significance of this integrative literature review will include the identification of gaps in knowledge translation processes currently being utilized by clinical nurse educators. When clinical nurse educators understand the gaps and barriers that prevent knowledge translation, they can apply strategies to their practice to address these areas of concern. Through my involvement as a master's student with the Educator Pathway Project I developed an interest in the competency development of clinical nurse educators. I plan to disseminate the results of this literature review to the Professional Practice team in Fraser Health, supplementary to the work that they are currently doing with the CNE competencies. I would also like to work with the Professional Practice team to develop methods for providing further education and mentorship support for clinical nurse educators in the area of knowledge translation. The Professional Practice team provides support across the entire health authority in the areas of nursing practice and standardization of guidelines and protocols. The team also works in collaboration with clinical nurse educators to develop their competencies and support them in their practice.

Historical Development

Nursing research and the influence of knowledge translation on research has gained popularity in the past several years. Mensik (2011) describes research as “the generation, or creation, of new knowledge” (p. 174). The goal of nursing research is to obtain evidence that can be implemented by frontline nurses to benefit patients and clients. Since evidence obtained from research can be overwhelming and broad, synthesis is necessary to translate evidence into applicable knowledge. This process is known as knowledge translation. There are several similar terms that have been used to describe this process including research utilization, knowledge transfer, knowledge exchanged, knowledge-to-action, evidence -based practice, implementation, dissemination, and diffusion (Graham et al., 2006; Tetroe, 2007).

Definition

This integrative literature review applies the CIHR definition of knowledge translation throughout:

The exchange, synthesis and ethically-sound application of knowledge – within a complex system of interactions among researchers and users – to accelerate the capture of the benefits of research for Canadians through improved health, more effective services and products, and a strengthened health care system (<http://www.cihr-irsc.gc.ca>, p. 15).

McWilliams (2007) emphasizes that KT can only be effective through human relationships that work together creating a shared understanding of the knowledge, and that consideration of both the research evidence and the culture it’s being applied into. Knowledge translation creates a bridge between research and nursing practice, allowing the two worlds to share in the new knowledge collectively. Graham et al. (2006) describe KT as a transfer of knowledge synthesis from research evidence to implementation of this knowledge directly into health care improving both outcomes and efficiencies within the system.

Theoretical Perspective

Transformative learning theory is the theoretical lens of this review. Application of transformative theory provides a perspective of learning that focuses on how knowledge is gained as opposed to knowledge as content. Transformative theory applied to knowledge translation encourages ongoing critique and clear understanding of knowledge in relation to nursing practice. This theory provides structure to identifying the beliefs and values of the CNE and the frontline nurse. Matthew-Maich, Ploeg, Jack, and Dobbins (2010) emphasize that the “primary purpose of adult learning is transformative learning that leads to growth and empowerment” (p. 27). Clinical nurse educators can develop strategies appropriate to the current culture that they are working in to facilitate effective knowledge translation.

Transformative theory was developed by Jack Mezirow in 1978 and has continued to evolve over the past thirty years (Matthew-Maich et al., 2009). The theory is based on constructivist foundations with a focus on understanding the structure, elements, and processes of adult learning (Mezirow, 1994). As a learning theory this approach provides the educator with an environment that is constructive and transformative, enabling effective knowledge translation through engagement and participation. Transformative theory emphasizes the importance of approaching learning through a collaborative lens that encourages dialogue and critical thinking. It also facilitates an equal learning platform where power is shared between the educator and learner.

Applying transformative theory to this integrative literature review assists in the synthesis and understanding of the research. Transformative theory enables an understanding of the

perspectives of clinical nurse educators and frontline nurses and how their beliefs and values impact the effectiveness of knowledge translation in the clinical setting.

Methods

This integrative literature review draws on qualitative and quantitative research studies found in the literature from 2002 through to 2012. The review follows the guidelines outlined by Torracco (2005) in *Writing Integrative Literature Reviews: Guidelines and Examples*, and the critique guidelines for quantitative and qualitative research provided in *Nursing Research in Canada Methods and Critical Appraisal for Evidence-Based Practice* (Lobiondo-Wood & Haber, 2009). These studies were drawn from the CINHALL and MEDLINE (OVID) databases using the following key words: “knowledge translation,” “nursing research,” and “clinical nurse educator.” In addition, the key words “research utilization” and “advanced practice nurse” were also applied as they were found to be used interchangeably in the literature. To ensure a comprehensive review “times cited in database” and “cited reference” were also referenced. These studies met the following six inclusion criteria: each study had to be qualitative or quantitative in design; had to be original research; the purpose of each study had to focus on knowledge translation or research utilization; the participants had to be either CNE’s or nursing healthcare professionals; and studies had to be completed in English (see Appendix A). The review includes the literature search, evaluation of the data, and analysis of the data findings (see Appendix B and C).

Following is a review of the eight articles that most appropriately meet the criteria for the integrative literature review. Three of the articles are quantitative research studies and five are qualitative research studies. I analyzed these articles separately beginning with a brief summary

of the study and following with a critique analysis. The analysis reviews how knowledge translation or research utilization is conceptualized in the study, what assumptions are made, and the implications of the findings for nursing practice and the clinical nurse educator.

Results

The studies are classified into quantitative and qualitative categories. Each study is summarized to include details on the elements of the study, their findings, and relation to the research questions for this literature review. A synthesis of the data findings is included for each study.

Quantitative Studies

There are three quantitative studies that meet the criteria for this integrative literature review: *Clinical Nurse Educators' Perceptions of Research Utilization* (Strickland & O'Leary-Kelley, 2009), *Factors Influencing the Contribution of Advanced Practice Nurses to Promoting Evidence-based Practice Among Front-line Nurses: Findings From a Cross-sectional Survey* (Gerrish et al., 2011), and *Factors Affecting Evidence Translation for General Practice Nurses* (Mills, Field, & Cant, 2011).

1. Strickland and O'Leary-Kelley (2009) explored the role of clinical nurse educators as facilitators of research utilization (RU). Their research questions included: What are the elements perceived by the clinical nurse educator to be barriers to RU? What are the elements perceived by the clinical nurse educator to be facilitators of RU? and What is the relationship between the clinical nurse educator characteristics and perceptions of barriers to and facilitators of RU when compared with findings from staff nurse, administrator, and academic educators as depicted in previous studies? (Strickland & O'Leary-Kelley, 2009). Their descriptive study applied the BARRIERS Research Utilization Scale questionnaire to identify perceived barriers of research utilization by the CNE's. The BARRIERS scale was a 35 question tool that had been previously verified for validity and reliability. The questionnaire contained questions using the

Likert scale, and factor analysis was completed through one-way analysis of variance and *t* tests. The study included a convenience sample of hospital-based CNE's in California and received a 41% response rate ($n = 122$).

Strickland and O'Leary-Kelley (2009) findings revealed that the setting was the greatest barrier to research utilization although this varied according to the types of facilities and level of education. Their results showed that "educators with advanced degrees perceived the setting as less of a barrier than did those with undergraduate degrees" (Strickland & O'Leary-Kelley, p. 168). This study emphasized the value of advanced education in preparing the CNE for facilitation of RU. The findings also identified administrative support, resources and funding, lack of education and research knowledge, and nurses lack of motivation, interest and/or incentive as additional barriers preventing research utilization within a clinical setting (Strickland & O'Leary-Kelley, 2009).

This study contributes to this integrative literature review as it described the importance of the clinical nurse educator in the hospital setting and the value of additional education support specifically to evidence and research utilization. The researchers reviewed several factors that impact CNE's within their role and explore barriers to successful research utilization. Although the sample size and convenience sampling limit the results of the study, the author's use of the BARRIERS questionnaire provide strong validity to the results. Another limitation is the self-report surveys which have potential for bias as the responses may have primarily been from CNE's with an increased interest in research utilization (Strickland & O'Leary-Kelley, 2009). More detail in correlating the findings with results from other studies to compare the perspectives of frontline nurses, administrators, and academic educators would have helped when addressing their third research question.

According to Strickland and O'Leary-Kelley (2009), the hospital-based clinical nurse educator is critical in the application of research utilization and evidence-based practice. Although there is diversity in the CNE role, level of education also has an impact on effectiveness of the CNE with RU. There are also personal and organizational barriers that have an impact on the effectiveness of RU in the clinical setting. The influence and education level of the CNE has a direct impact on these barriers. Strickland and O'Leary-Kelley's results showed that clinical nurse educators with advanced degrees had a decrease in their perception of setting barriers. This supports the value of graduate education in equipping CNE's with the skills and knowledge to provide effective research utilization and knowledge translation.

2. Gerrish et al. (2011) completed a cross-sectional survey of advanced practice nurses (APN) working in hospitals and primary care settings across seven health authorities in England. The purpose of the study was to identify factors that influence the contributions of APN's in the promotion of evidence-based practice in frontline nurses. Gerrish et al. designed a questionnaire through the use of two APN focus groups and integration of sections of the Developing Evidence-Based Practice questionnaire (DEPQ). The questionnaire was piloted by a separate group prior to implementation to establish stability and a 5-point ordinal scale was used for each question. Additional measures to establish reliability and validity are not included in the study report. The response rate of participants was 28% ($n = 855$). The authors defined an advanced practice nurse as "any nurse working in the area of adult nursing whose role involved an element of clinical practice requiring expert knowledge and skill" (Gerrish et al., 2011, p. 1081). Clinical nurse educators and clinical nurse specialists were included in this definition, making up over fifty percent of the study participants.

The study found that in the majority of instances APN's relied on evidence that had already been synthesized instead of on primary published research reports (Gerrish et al., 2011). Interactions and research application with frontline nurses were primarily reactive problem-solving strategies or poor practice observations requiring corrective action to improve standards of care. Advanced practice nurses with master's qualifications ranked higher than those with bachelor qualifications when it came to confidence and competence in the area of research and skills.

Gerrish et al. (2011) explored different strategies that are used by CNE's and APN's to access evidence through various sources and methods for engaging frontline nurses in the process. This study contributes to this review through supporting the role of the CNE with evidence-based practice and identifying processes which can contribute to successful transfer of knowledge to the frontline nurses. The questionnaires were returned anonymously to support the validity and reliability of the results. Limitations of this study include the reliability and validity of a new questionnaire which impacted the unreliability of the response rate. Questionnaires were delivered to APN's directly at 25 of the participating organizations, but the other 62 organizations self-administered the questionnaire impacting the reliability of the response rate. There was a low response rate resulting in poor external validity as these findings cannot be extended to a wider population of APN's. There may also be a bias from the responding participants as having a positive view of evidence-based practice.

The findings of this study support that the advanced practice nurse has an important and valuable role in the areas of advancing nursing practice, service development, and education. Gerrish et al. (2011) described them as a "largely experienced, mature workforce but one which is not necessarily well-qualified academically" (p. 1086). They also showed that APN's focused

on disseminating information to frontline nurses using formal and informal sources of knowledge, and the majority of their time was spent assisting nurses with solving clinical problems (Gerrish et al., 2011). Advanced practice nurses relied heavily on evidence that had already been processed and policies and guidelines already developed either nationally or locally (Gerrish et al., 2011). This study suggests that advanced practice nurses know how to find knowledge to support KT but require further skill development in the areas leadership development, change management, competency and comfort with technology, and policy development.

3. Mills, Field, and Cant's (2011) study involved a cross-sectional survey of general practice nurses in Victoria, Australia using the Developing Evidence-Based Practice (DEPQ) questionnaire. Construct validity of the DEPQ was previously established through reliability testing and factor analysis. The questionnaire contained 49 main questions that have a 5-point response scale and a Cronbach alpha coefficient of 0.87. The subscales also were tested for reliability and had an alpha coefficient greater than 0.7. Construct validity for the study was also completed through reliability testing ($\alpha = 0.91$) and factorability of scales for reliable correlation coefficients using Kaiser's criteria, factor loading of 0.3, and parallel analysis. The response rate of participants was 33% ($n = 590$) and was above the 95% confidence level.

The researchers explored the factors that affect the way nurses engage in translating evidence-based knowledge into practice. The results of the questionnaire identified nine key components which were bundled into a model detailing five key domains that influence general practice nurses' ability to effect knowledge translation (Mills, Field, & Cant, 2011). The model's first domain is skills in finding, reviewing, and using evidence. Domain two, addresses barriers to finding and reviewing evidence. Domain three deals with knowledge from published

sources, while domain four reviews knowledge from other sources. The final fifth domain deals with both barriers and facilitators to change. The authors emphasize that “both internal (personal) factors such as nurses’ skills and knowledge and also external (organizational) factors are perceived as influential in the successful translation of knowledge into clinical practice” (Mills, Field, & Cant, 2011, p. 458).

Mills, Field, and Cant (2011) identified areas of influence that have a direct impact on nurses’ ability to successfully translate knowledge into clinical practice. Although there is no mention of clinical nurse educators or the role of influence that they contribute to knowledge translation, this study provides insight into the internal and external factors that influence successful KT for nurses in clinical practice. This study had strong validity in the application of the DEPQ questionnaire. Their response rate was low, but within the acceptable confidence level to support their findings. Their method of distribution was dependent on 30 divisional programme officers to distribute to practice nurses which may have had an impact on the accuracy of the response rate. The findings of this study are limited to primary care general practice nurses in Australia and cannot be generalized to all nurses internationally.

Frontline nurses seek out several different sources to gain information and apply evidence into their practice. Mills, Field, and Cant (2011) identified personal and organization barriers that impact application of knowledge translation. Personal barriers highlight the low level of skill in accessing and applying evidence into practice, and using more tacit knowledge than theoretical when implementing changes to practice (Mills, Field, & Cant, 2011). Provision of nursing work time and inter-professional staff support were organizational factors identified in the findings. Nursing leadership and mentorship is necessary to help general nurses be

successful with integrating evidence into practice and clinical nurse educators have a role in providing leadership through knowledge translation and evidence-based practice.

Qualitative Studies

Five qualitative studies met the criteria for the integrative literature review: *Uptake of Critical Knowledge in Nursing Practice: Lessons Learned from a Knowledge Translation Study* (Anderson et al., 2010), *Strategies to Increase Research-based Practice* (Pepler et al., 2006), *An Exploration of Factors Which Constrain Nurses From Research Participation* (Roxburgh, 2006), *A Context of Uncertainty: How Context Shapes Nurses' Research Utilization Behaviors* (Scott, Estabrooks, Allen & Pollock, 2008), and *The Role of Nursing Unit Culture in Shaping Research Utilization Behaviors* (Scott & Pollock, 2008).

1. A study by Anderson et al. (2010) applied a case study approach in four inpatient units in one hospital to observe how knowledge is synthesized and applied into practice by frontline nurses. Two doctoral nursing students immersed themselves on the unit for 8-10 hours per week, one over a 12 month period and the other over an 18 month period. They used the collaborative knowledge translation model developed during previous research and focused on the help-seeking and hospitalization experiences of ethno-culturally diverse patients. Their goals were to translate knowledge into practice through the application of collaborative relationships built on accountability, reciprocity, and respect; develop a specific project directed at transitioning patients from hospital to home; and engage in responsive dialogue to encourage reflective practice (Anderson et al., 2010).

Through two years of observation and focus groups their data were categorized into three themes. The first theme identifies the importance of the historical context of people's lives and

how that influences their individual experiences of health, illness, and help-seeking. The second theme highlighted racializing and marginalizing practices based on assumptions and social discourses with nurses and different groups of patients. The final theme explored the health-care delivery system through the lens of critical inquiry. This theme focused on the importance of congruence between research-derived critical knowledge and translation methodologies, and the importance of reflection to the integration of critical knowledge.

This study applies a collaborative knowledge translation model with the focus on relationship development between doctoral nursing student research assistants, unit-specific nursing leaders, and point-of-care nursing staff. The research assistants and nursing leaders are described as experienced nurse clinicians (Anderson et al., 2010). The duration of the observations and reflective discussions with clinicians, administrators, and researchers in this study provides strength and credibility. The authors draw on previously published and unpublished work to support their findings, and do not provide specific details on the number of participants involved in the observations and focus groups. This study was completed in one hospital and findings cannot be generalized to all hospital settings resulting in an external validity limitation.

Anderson et al.'s (2010) findings suggest that nurse clinicians are instrumental in facilitating knowledge translation and critical inquiry and reflection with frontline nurses specific to cultural issues in practice. The findings also revealed that KT is not a linear process, but is dynamic in nature that is interconnected with clinical partners and context of nursing practice. Critical knowledge does not function in isolation, but needs to be “an integral part of integrated knowledge for competent, effective, and hence efficient nursing practice” (Anderson et al., 2010, p. 117). Identifying cultural assumptions and addressing marginalization of patients can have a

direct impact on patient care and the patient's hospitalization experience. The researchers suggest that clinical nurse educators need to be engaged in the process from both a clinical and academic perspective for effective integration of KT (Anderson et al., 2010).

2. Pepler et al. (2006) applied a multiple-case study approach with clinical nurse specialists and Master's degree-prepared nurse educators on 8 units in 4 sites of a university hospital. Their study included 8 clinical nurse educator and clinical nurse specialists (CNS) who had 10 to 30 years of nursing experience and had been in their current position for 6 months to 10 years. Their research question asked "How and why do nurses in an acute care setting build or not build their practice on research?" (Pepler et al., 2006, p. 24). Further, the study explored strategies used by clinical nurse educators and clinical nurse specialists (CNS) to increase research-based practice and research utilization. The findings of the study included seven themes of unit culture that impact research utilization: harmony in research perspectives, motivation to learn, goal orientation, creativity, critical inquiry, mutual respect, and maximizing resources (Pepler et al., 2006). The authors found that the CNE's and CNS's used several strategies to support research utilization, but the strategies were found to be more effective on some units more than others. Their findings highlighted that unit culture had a significant impact on the effectiveness of research utilization.

Pepler et al.'s (2006) study emphasized the role of the clinical nurse educators and specialists in supporting research utilization in the clinical setting. They explored strategies utilized by the CNE's and CNS's to improve research utilization and reviewed the impact of culture as critical to success. Limitations to Pepler et al.'s (2006) study include generalizability of their findings as the study was completed in one specific hospital, in the specialty areas of oncology and neurology.

Given the findings of this study, Pepler et al. (2006) suggests that the nursing unit culture has a significant impact on the effectiveness of RU despite the CNE's and CNS's range of skills and processes. Clinical nurse educators and CNE's level of education also influences the competency required to promote the application of evidence into practice. Application strategies for motivating frontline staff and engaging them in the RU process can help to engage frontline staff. Pepler et al. (2006) provided the example of CNE's and CNS's facilitating opportunities for frontline staff to take turns attending conferences with the expectation that they would bring back the information and present new information and learning to their peers.

3. The study completed by Roxburgh (2005) applied an exploratory approach through two focus groups followed by individual interviews with practicing nurses. Purposeful sampling of registered nurses at a local District General Hospital was used, including the areas of specialist services; and elective, emergency, and ambulatory services. Convenience sampling was then utilized within the purposeful sampling to obtain participants. Out of the 268 nurses invited to participate there were 35 yes respondents. These participants were divided into two focus groups ($n = 7$) and single interviews ($n = 7$). Clinical nurse specialists and educators were excluded from the study because of their higher level of research education. The author explored practicing nurses' perspectives on factors that constrain them from participating in, and applying, research findings into their practice.

The study revealed six emerging themes: the level of support required by nurses to be research active, nurses' attitudes to undertaking and participating in research, the extent of nurses' knowledge about research, activities identified by nurses as research activity, skills to undertake research, and levels of educational preparation (Roxburgh 2005). From these themes, the author concluded that additional managerial and educational support would have a significant

impact on frontline nurses and their processes of research utilization. Roxburgh (2005) also emphasized that “nurses should be rewarded for additional roles/tasks which they undertake” (p. 544).

Roxburgh’s (2008) focus is on the comfort level of frontline nurses with research utilization. Although this study excludes CNE’s the information gained is applicable to assisting in understanding the culture of nurses relative to their attitude, beliefs, feelings, and experiences with research participation. Through understanding the barriers to RU, the CNE can be more equipped in facilitating research and knowledge translation. This study identified several barriers that impact RU in practice, it did not explore the current resources or potential resources that could impact or change the themes. This study also has limitations for generalization due to the small sample size and use of one location.

From this study, Roxburgh (2006) proposes that reading literature and understanding evidence requires an attitude that is receptive to learning. Roxburgh (2006) stressed that the “key to nursing becoming a research-based profession is in its ability to understand how to read the literature” (p. 543). Barriers that prevent nurses from engaging in knowledge translation and research utilization are personal feelings of inadequacy and unfamiliarity. Roxburgh (2006) found that nurses did see research as being relevant to practice, but fear and lack of confidence were obstacles preventing more active involvement.

4. Scott, Estabrooks, Allen, and Pollock (2008) completed an ethnographic study on context and its influence on nurses’ research utilization behaviors. Through in depth observations and interviews the researchers explored the organizational context of one pediatric intensive care unit. Their participants included physicians ($n = 6$), residents, fellows, clinical

assistants, nurses ($n = 130-140$), a nurse practitioner, respiratory therapists, pharmacists, social workers, and a dietician. Data was collected from a seven month observation time and several themes were identified. The “concept of uncertainty” theme involved several components: the precarious condition of patients, inconsistency in management, inherent unpredictability of nurses’ work, and complexity of working with other disciplines. The second theme was the “nature and structure of nurses’ work”. This included location of work, technology-driven routinized work, and the complexity of working with other disciplines. The final theme was on the “nature of valued knowledge” which found that nurses rely on three types of knowledge: clinical experience or experiential knowledge, advanced practice knowledge, and research (Scott, Estabrooks, Allen, & Pollock, 2005). Within each of these themes frontline nurses’ perspectives influenced the effectiveness of research utilization. Scott, Estabrooks, Allen, and Pollock (2005) emphasize that “context is important because it determines aspects such as access to group membership, professional relationships and boundaries, and the influence of hierarchy” (p. 356). Frontline nurses in this study expressed hierarchical boundaries between professional competencies of team members and limited access to groups that have specialty knowledge.

The specific impact of CNE’s was not included in this study, although they were a group considered to have specialty knowledge. This study included the attitudes and perspectives of frontline nurses and impact of the application of KT. Further analysis on the clinical nurse educator’s role within this organizational context could have strengthened the findings of this study.

There are several barriers to nurse engagement with research utilization: low education level, lack of involvement in research activities, lack of attendance at conferences, and inability to understand research that impacts the integration of evidence into nursing practice (Scott,

Estabrooks, Allen, & Pollock, 2008). Nurses consider personal clinical experience to be valuable knowledge because it is “immediately accessible to them and does not require technology for retrieval as research knowledge does, thereby fitting with the nature and structure of nurses’ work” (Scott, Estabrooks, Allen, & Pollock, 2008, p. 353); seeking additional knowledge through other sources is viewed as unfamiliar and time consuming. There are also organizational barriers that impact RU application including perceived expectations of nurses from management to apply research into their practice and research being reflected in decision making by managers.

5. Scott and Pollock (2008) conducted a focused ethnography of pediatric critical care unit in a Canadian children’s hospital. The study explored the role of unit culture in shaping research utilization behaviors of nurses. Data collection involved observation of unit activities and behavior patterns, interviews with nurses, and interviews with management and other health care professionals including nurse practitioner, clinical educator, and pediatric intensivists. The researchers completed 120 hours of observation over a 12 month timeframe and interviewed a total of 29 unit staff members, inclusive of nurses, unit nursing managers, physicians, and other health care professionals. Four significant themes on unit culture emerged: structure of authority, nature of nurses’ work, workplace ethos, and valued knowledge forms. Within structure of authority, nurses expressed concern with the hierarchical structure and inconsistent leadership expectations. The nature of the nurses work involved location, expected level of activity, routinized work, and expected ways to get work done through the use of technology. The workplace ethos theme identified handling of ethical issues, response to errors, and receptiveness to innovation as areas of concern. Finally, valued forms of knowledge included clinical experience, specialized knowledge, and research knowledge.

Although the study by Scott and Pollock (2008) is limited to one specialized unit, the findings in regards to unit culture are similar to a previous study completed by Scott-Findlay and Golden-Biddle (2005). In Scott and Pollock it is unclear if the clinical nurse educator was included as a unit health care professional as there is no feedback from their perspective included in the article. The findings provide additional insight into the influence of culture and how that impacts the implementation of KT. This study has limited generalizability as it was localized to one specialized unit.

The findings by Scott and Pollock (2008) suggested that organizational barriers impacting research utilization include inconsistency in leadership and guidance from nurse unit managers and physicians. Nurses in the study emphasized that they felt disempowered by the levels of authority from the physicians and the unit managers (Scott & Pollock, 2008). The study concluded that the “top-down mentality encourages passivity among nurses and research use will not become an inherent part of their everyday nursing practice” (Scott & Pollock, 2008, p.306). Clinical nurse educators have an opportunity to collaborate with these levels of authority and advocate for practice changes that are evidence-based. They are also in a position to provide nurses with the skills and abilities to engage in the research utilization process.

The nature of the nurses’ work influenced how nurses prioritize their time. Integration of additional work related to RU into a routine and established schedule brings a change that increases the stress level of nurses and is not always viewed as a positive resource. Being responsive to new ideas and innovation, even from other frontline staff was not encouraged (Scott & Pollock, 2008). Nurses primarily value clinical knowledge above specialized and research knowledge and specialize and research knowledge is viewed as privileged forms of knowledge more applicable for clinical nurse educators and advanced practice nurses (Scott &

Pollock, 2008). These perspectives have a direct impact on CNE's and their ability to engage frontline nurses in evidence and knowledge translation.

Scott and Pollock's (2008) findings support the influence of culture within a nursing unit and its relationship to research utilization of health care professionals. Nurses' perceptions will directly impact the success of RU and their participation in the process. Clinical nurse educators' awareness and acknowledgement of local unit culture will assist them in developing strategies to work within specific cultures or shape the culture to be research focused.

Discussion

This integrative literature review revealed that there is very limited research in the area of knowledge translation involving clinical nurse educators. The research on knowledge translation inclusive of CNE's is intertwined with the concepts of evidence-based practice and research utilization. Underlying themes from the research include the value of the clinical nurse educator's role as a leader in facilitating KT and research utilization, the benefit of graduate education in preparing clinical nurse educators for KT, and the personal and organizational barriers to implementing research findings. The following is a summary of the themes identified from the review.

The Leadership Role of Clinical Nurse Educators

The clinical nurse educator role requires the provision of tools and practical application of knowledge through the development and implementation of clinical practice guidelines and standardization. Clinical nurse educators and advanced practice nurses are in a dynamic leadership position that enables them to introduce knowledge that has a direct impact on nursing practice (Anderson et al., 2010; Gerrish et al., 2011; Pepler et al., 2006; Strickland & O'Leary-Kelly, 2009). Within a clinical setting, this integration of knowledge can be disseminated to frontline nurses by clinical nurse educators in a manner that encourages critical inquiry and dialogue.

From the perspective of individual health authorities, structure and program specialty areas have an impact on the role and expectations of the clinical nurse educator. In British Columbia, the Professional Practice and Integration programs exist to provide support to clinical nurse educators and the integration of knowledge translation. These programs provide

leadership training and mentorship workshops to develop leadership skills and furthering education. An example is the Educator Pathways Program developed in collaboration by Fraser Health Authority, Vancouver Coastal Health Authority, University of Victoria, University of British Columbia, and the Nurses Bargaining Association. This program offers a four pathway education approach for CNE's with the goal of enhancing their educator competencies and furthering graduate education. Also through research focus groups and shared work teams, CNE's have an opportunity to be an integral component to a team focused on applying new knowledge into nursing practice and improving patient care delivery.

Graduate Education

Graduate education of clinical nurse educators is a valuable contributor to successful knowledge translation to frontline nurses (Gerrish et al., 2011; Pepler et al., 2006; Strickland and O'Leary-Kelley, 2009). Advanced education benefits the educator by enhancing analysis skills and confidence leading to improved application of KT with nurses. It further benefits the CNE through the development of time management and prioritization. Advanced education enables the clinical nurse educator to have increased knowledge and confidence within their role in the organization, as well as an increased awareness of potential challenges and strategies to address them (Anderson et al., 2010; Gerrish et al., 2011; Pepler et al., 2006; Strickland and O'Leary-Kelley, 2009).

My personal experience with graduate education is influencing my perceptions on adult learning, and understanding the dynamics of the learning culture. This experience reinforces, for me, the foundational role of theory in nursing and education. Frontline nurses need to understand that knowledge translation is a process that integrates research findings and nursing

theory and creates tangible and applicable knowledge. This knowledge requires new learning for the nurse and a change in practice or perception that may have a direct impact on patient care.

Matthew-Maich et al. (2010) argued that evidence gained from research is not neutral or objective and unlearning may be required which could lead to emotional responses and resistance to change. Clinical nurse educators that have advanced education have the competence and confidence to mentor frontline nurses during the learning process and foster critical reflection through engagement and dialogue.

Personal Barriers

Clinical nurse educators and frontline nurses have differing beliefs and perceptions of research and the role of research on their nursing practice. This difference has an impact on the success of research application through knowledge translation. Personal attitudes and involvement in research activities have been correlated to successful application of evidence-based practice in nursing (Gerrish et al., 2011; Pepler et al., 2006; Roxburgh, 2006; Strickland & O'Leary-Kelley, 2009; Scott & Pollock, 2008).

Many nurses have a low level of competence in research and in applying research into their practice. Nurses naturally turn to personal and peer clinical experience for learning and answers to inquiry (Matthew-Maich, Ploeg, Jack, & Dobbins, 2010). Accessing literature and research is not their first instinct when looking for information. Many nurses also lack the skills to critically analyze and critique research articles. Three of the reviewed studies on research barriers concluded that lack of knowledge regarding statistical analysis and low comfort levels with critique of research created a disconnect between nurses and research (Mills, Field, Cant, 2011; Pepler et al., 2006; Roxburgh, 2006). With the current availability of online resources

nurses have access to current and relevant literature. Therefore it is important to focus on developing skills in both identifying valid sites and resources, as well as critiquing and understanding the literature. Online groups such as journal clubs, discussion forums, and social media groups can support nursing literature and encourage critical dialogue.

Personal motivation is also a barrier to engaging frontline nurses in research participation and knowledge translation. Clinical nurse educators have a role in influencing nurses' perceptions; understanding their uncertainties about research will give them confidence and empower them to pursue a research focused approach with patient care. Nurses need to have a willingness and desire to engage in the conversation of research and be active participants of KT. Recognizing personal attitudes and beliefs can assist with shifting these perceptions and redeveloping trust in the research. Components to developing this trust include participation and modeling from administration, advanced practice nurses, and the researchers.

Organizational Barriers

Organizational factors that create barriers to knowledge translation were also identified in the literature that was reviewed. Multiple studies have identified key barriers that impact KT: lack of work time, lack of knowledge of how to access research reports and protocols, infrastructure in relation to size and centralization of resources, capacity, leadership support, and inter-professional support from staff (Anderson et al., 2010; G.G. Cummings, Estabrooks, Midodzi, Wallin & Hayduk, 2007; C.A. Estabrooks, Kenny, Adewale, Cummings, & Mallidou, 2007; Gifford, Davies, Edwards, Griffen, & Lybanon, 2007; Majdzadeh, Sadighi, Nejat, Mahani, & Gholami, 2008; Mills, Field, & Cant, 2011; Roxburgh, 2006; S.D. Scott, Estabrooks, Allen & Pollock, 2008; S.D. Scott & Pollock, 2008).

Since knowledge translation is a complex process that can appear intimidating to the frontline nurse, providing mentorship through administrative leadership can help facilitate change. Hospitals that have a research focused approach with managerial support can be strengthened through reallocation of duties to create time for nurses to focus on research studies (Pepler et al., 2006; Roxburgh, 2006; S.D. Scott, Estabrooks, Allen, & Pollock, 2008; S.D. Scott & Pollock, 2007). This additional support needs to take into account issues related to workloads and staff schedules as well as encourage nurses to participate in research studies and in order to develop strategies for incorporating evidence into practice.

Organizational culture can also be a barrier to the effectiveness of clinical nurse educators in KT strategies. For example, in the studies completed by Pepler et al. (2006) and Gerrish et al. (2010) responses from nurses varied depending on the harmony and perception of each unit. If research is not seen as a component that is integrated throughout the organization, then the introduction of new knowledge will not be well received. Managers have a role in collaborating with CNE's to support the application of KT in practice. Changing the culture of an organization requires a team focused approach that is motivated to improve quality of nursing practice and patient care (S.D. Scott & Pollock, 2008; S.D. Scott, Estabrooks, Allen & Pollock, 2008). Administrators have a valuable role in being part of the collective team and exploring options to provide additional financial support both internally and externally.

The influence of the context of facilities has a significant impact on the culture of the leadership team and the staff members. S.D. Scott and Pollock (2008) and S.D. Scott, Estabrooks, Allen, and Pollock (2008) studies on organizational characteristics found that having a work environment focused on strong leadership, positive environment, and regular performance management resulted in an increase in research utilization, staff development, and

lower adverse events. Leadership that supports and validates the roles and responsibilities of each nurse creates a stable and accountable environment. This is a relationship that is built on collaboration, trust, and ownership. Having a strong leadership structure in place is especially important in the support of CNE and the role they have in being an active change agent with KT.

Areas for Further Development

Following this integrative literature review there are areas that can benefit from further development. Several articles reviewed suggested additional research was needed for understanding the processes of nursing culture that impact frontline nurses with evidence-based practice (Gerrish et al., 2011; Pepler et al., 2006; Roxburgh, 2006). Scott and Pollock (2008) recommended theoretical development with nursing culture and its influence on nurses' ability to apply research in clinical practice. Organizational context and culture has a significant impact on the clinical environment and impacts how nurses will respond to changes in practice and patient care delivery.

Further research is also needed to evaluate the effectiveness of current KT strategies in nursing practice. Several articles reviewed provided valuable suggestions for application including development of professional relationships through group membership and mentorship, management engagement and support, and decreasing workload demands (Gerrish et al., 2011; Mills, Field & Cant, 2011; Roxburgh, 2006; Strickland & O'Leary-Kelley, 2009). There is limited supporting evidence that these strategies can be successful. Anderson et al.'s (2010) study concluded the importance of considering how different kinds of knowledge impact KT, as well as the value of translation on all organizational levels academically and in clinical practice. Further development on the clinical nurse educators' role with research and KT would

supplement the literature and provide a venue for further exploration in improving outcomes strategies. Clinical nurse educator competencies are consistent with being an active participant and translator of nursing research and education, and additional literature to support these competencies would be beneficial.

Theory Application

Applying transformative theory to this integrative literature review provided a foundation for understanding knowledge translation through exploring the perspectives of both the clinical nurse educator and the frontline nurse. Mezirow's (1996) transformative theory of adult learning is based on an emancipatory paradigm, through the synthesis of objectivist and interpretative paradigms. Emancipatory knowledge provides self-awareness gained through critical reflection and self-reflection (Cranton, 2002). This theory makes the assumptions that the learning process is obtained through applying prior or revised interpretation of the meaning gained from one's experience, and learning occurs through existing meaning schemes or transforming meaning perspectives through reflection and discourse (Mezirow, 1996). Individual perceptions and beliefs contribute to the learning process which leads to application and action.

Mezirow's theory emphasizes that the facilitation of transformative learning occurs through critical reflection and critical discourse within a framework of trusting relationships (Matthew-Maich, Ploeg, Jack & Dobbins, 2009). Applying this process to the exploration of the role of the CNE with KT requires reflection on the learning experiences and discourse with other advanced practice nurses to foster further learning and application in clinical practice. The chosen articles enabled an exploration of the expressed beliefs and values in relation to research

and evidence-based practice including experiences of KT application, organizational context, and unit culture. Through this collaborative lens, themes were identified providing additional insight and strategies for integrating KT processes in clinical practice. Applying transformative learning encourages CNE's and frontline nurses to critique, reflect, and understand research evidence individually and collectively, as well as find personal and professional meaning in new learning through KT.

Limitations

There are limitations to this literature review in relation to the minimal number of research studies completed on the topic of KT specifically in relation to CNE's. Knowledge translation, although similar to research utilization and evidence-based practice, is more dynamic and complex. Additional research, specifically on KT in relation to the collaborative partnership with CNE's, frontline nurses and researchers is needed.

Conclusion

Nurses are consistently challenged with additional education and research opportunities which impact the profession and individual practice. Education is a component of maintaining and developing nursing skills and competencies. Regardless of the multitude of educational resources in healthcare, nurses prefer learning primarily from social interaction, dialogue and experiences (Matthew-Maich et al., 2009). Effective knowledge translation requires that CNE's change the culture of learning from peer interaction to opportunities within the KT framework. Applying knowledge translation strategies will enable CNE's to connect with nurses in a safe environment that brings together social interaction, ongoing dialogue and sharing of experiences.

Clinical nurse educators are important change agents within health care and have the opportunity to impact nursing practice and patient care through the integration of evidence-based knowledge.

Nursing research is a vital resource to clinical practice and knowledge development. The goal of knowledge translation is to validate the evidence obtained from research and translate that knowledge into nursing practice to directly benefit patient care. Through the integration of theory and knowledge there is an opportunity to change perspectives of both the researcher and the consumer. Melding these two worlds into a collaborative relationship creates an environment of shared learning and mutual goal setting that can have a significant impact on changing nursing practice and improving quality of health care delivery. There are many barriers that prevent effective KT and additional research is needed to support implementation. Knowledge translation provides an opportunity for nurses to transition from a world of routine to one of innovative change and growth.

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Appendix A: Criteria Template for Analysis of Articles

1. Is the qualitative or quantitative designs original research?
2. Is the concept knowledge translation (or research utilization) the focus of the study?
3. Are the participants in the study clinical nurse educators or health care professionals?
4. Are there suggested strategies for change?
5. Is the research study completed in English?

Appendix B: Relevancy Scale for Ranking Preliminary Literature Search

Article (APA)	Time frame (2003-2012)	Research	Original Research	Purpose: KT /RU	Model and/or Strategy	Participants: CNE/APN/ Clinical	English	Accepted Y/N
Anderson, J.M., Browne, A.J., Reimer-Kirkham, S., Lynam, M.J., Rodney, P., Varcoe, C., ...Brar, A. (2010). Uptake of critical knowledge in nursing practice: Lessons learned from a knowledge translation study. <i>CJNR</i> , 42(3), 106-122.	√	Qualitative Case Study	√	Knowledge translation and critical knowledge application	Collaborative Knowledge Translation Model	Nurse leaders and front-line nurses	√	Y
Barnsteiner, J.H., Reeder, V.C., Palma, W.H., Preston, A.M., Walton, M.K. (2010). Promoting evidence-based practice and translational research. <i>Nursing Administration Quarterly</i> , 34(3), 217-225.	√	Article	X	Translate research and evidence-based practice	N/A	Nurses	√	N
Baumbusch, J.L., Reimer-Kirkham, S., Basu-Khan, K., McDonald, H., Semeniuk, P., Tan, E., & Anderson, J.M. (2008). Pursuing common agendas: A collaborative model for knowledge translation between research and practice in clinical	√	Article	X	Knowledge translation	Collaborative Model of knowledge translation	Nurses	√	N

settings. <i>Research in Nursing and Health</i> , 31, 130-140. doi: 10.1002/nur.20242								
Brown, C.E., Ecoff, L., Kim, S.C., Wickline, M.A., Rose, B., Klimpel, K., & Glaser, D. (2010). Multi-institutional study of barriers to research utilization and evidence-based practice among hospital nurses. <i>Journal of Clinical Nursing</i> , 19, 1944-1951. doi: 10.1111/j.1365-2702.2009.03184.x	√	Quantitative Cross-sectional study	√	Research Utilization and Barriers to Evidence-based Practice	N/A	Frontline Nurses	√	N
Conway, J. & Elwin, C. (2007). Mistaken, misshapen and mythical images of nurse education: Creating a shared identity for clinical nurse educator practice. <i>Nurse Education in Practice</i> , 7, 187-194. doi: 10.1016/j.nepr.2006.08.005	√	Article	X	CNE Role	Conceptual Model	CNE's	√	N
Cummings, G.G., Estabrooks, C.A., Midodzi, W.K., Wallin, L., & Hayduk, L. (2007). Influence of organizational characteristics and context on research	√	Quantitative	√	Research Utilization and Org, characteristics and context	Theoretical Model	Registered Nurses	√	N

utilization. <i>Nursing Research</i> , 56(4S), S24-S39.								
Doane, G.H., & Varcoe, C. (2008). Knowledge translation in everyday nursing from evidence-based to inquiry-based practice. <i>Advances in Nursing Science</i> , 31(4), 283-295.	√	Article	X	Knowledge Translation	Theoretical	General nursing practice	√	N
Doran, D.M., & Sidani, S. (2007). Outcomes-focused knowledge translation: A framework for knowledge translation and patient outcome improvement. <i>Worldviews on Evidence-Based Nursing</i> , 4(1), 3-13.	√	Article	X	Knowledge translation	Outcomes-focused KT Intervention Framework	Nurses	√	N
Estabrooks, C.A., Kenny, D.J., Adewale, A.J., Cummings, G.G, & Mallidou, A.A. (2007). A comparison of research utilization among nurses working in Canadian civilian and United States army healthcare settings. <i>Research in Nursing & Health</i> , 30, 282-296. doi: 10.1002/nur.20218	√	Quantitative Secondary Analysis	X	Research Utilization and comparison between US and Canadian Nurses	Data from two studies	Registered Nurses	√	N
Estabrooks, C.A.,	√	Quantitative	X	Internet	N/A	Nurses,	√	N

O’Leary, K.A., Ricker, K.L., & Humphrey, C.K. (2003). The internet and access to evidence: how are nurse positioned? <i>Journal of Advanced Nursing</i> , 42(1), 73-81.				access and application of Nurses & comparison to the Public and Physicians		Physicians & General Public		
Fink, R., Thompson, C.J., & Bonnes, D. (2005). Overcoming barriers and promoting the use of research in practice. <i>JONA</i> , 35(3), 121-129	√	Quantitative	√	Research Utilization and Attitudes and Barriers	Rodgers Diffusion of Innovation Theory BARRIERS questionnaire	Registered Nurses	√	N
Gerrish, K., Guillaume, L., Kirshbaum, M., McDonnell, A., Tod, A., & Nolan, M. (2010). Factors influencing the contribution of advance practice nurses to promoting evidence-based practice among front-line nurses: findings from a cross-sectional survey. <i>Journal of Advanced Nursing</i> , 67(5), 1079-1090. Doi: 10.1111/j.1365-2648.2010.05560.x	√	Quantitative Cross-sectional study	√	Promotion of research use and evidence-based practice	N/A	Advance Practice Nurses	√	Y
Gilmore, J.A., Huntington, A., Broadbent, R., Strong, A., & Hawkins, M. (2011). Nurses’ use	√	Quantitative Non-experimental Cross-sectional survey	√	Online Health Information	Questionnaire	Medical Frontline Nurses	√	N

of online health information in medical wards. <i>Journal of Advance Nursing</i> , 68(6), 1349-1358. doi: 10.1111/j.136502648.2011.05845.x								
Graham, I.D., Logan, J., Harrison, M.B., Straus, S.E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? <i>Journal of Continuing Education in the Health Professions</i> , 26(1), 13-24. doi: 10.1002/chp.47	√	Article	X	Knowledge Translation	Knowledge to Action process model	General nursing	√	N
Henderson, A., Winch, S., Holzhauser, K., & De Vries, S. (2006). The motivation of health professionals to explore research evidence in the practice: an intervention study. <i>Journal of Clinical Nursing</i> , 15, 1559-1564. doi: 10.1111/j.1365-2702.2006.01637.x	√	Quantitative Quasi-experimental study	√	Application of research evidence into practice	N/A	Frontline nurses, physicians, & allied health staff	√	N
Kitson, A.L. (2008). The need for systems change: reflections on knowledge translation and organizational change. <i>Journal of Advanced Nursing</i> ,	√	Article	X	Knowledge translation	Theoretical	Nursing	√	N

65(1), 217-228. doi: 10.1111/j.1365-2648.2008.04864.x								
Logan, J., & Graham, I. (1998). Toward a comprehensive interdisciplinary model of health care research use. <i>Science Communication</i> , 20, 227-246. doi: 10.1177/1075547098020002004	X	Article	X	Research utilization	Ottawa Model	Health care professionals	√	N
Majdzadeh, R., Sadighi, J., Nejat, S., Mahani, A., & Gholami, J. (2008). Knowledge translation for research utilization: Design of a knowledge translation model at Tehran University of Medical Sciences. <i>Journal of Continuing Education in the Health Professions</i> , 28(4), 270-277. doi: 10.1002/chp.193	√	Qualitative Narrative review and focus group	√	Knowledge translation & research utilization	Theoretical Model for Knowledge Translation	Researchers & decision makers	√	N
McWilliam, C.L. (2007). Continuing education at the cutting edge: Promoting transformative knowledge translation. <i>Journal of Continuing Education in the Health Professions</i> , 27(2), 72-79. doi: 10.1002/chp.102	√	Article	X	Knowledge translation	Transformative Theory Framework	Nurse Clinicians	√	N

<p>Mills, J., Field, J., & Cant, R. (2011). Factors affective evidence translation for general practice nurses. <i>International Journal of Nursing Practice</i>, 17, 455-463. doi: 10.1111/j.1440-172X.2011.01962.x</p>	√	Quantitative Cross-sectional study	√	Evidence Translation	Developing Evidence-Base Practice Questionnaire	General Practice Nurses	√	Y
<p>Milner, F.M., Estabrooks, C.A., & Humphrey, C. (2005). Clinical nurse educators as agents for change: increasing research utilization. <i>International Journal of Nursing Studies</i>, 42, 899-914. doi: 10.1016/j.ijnurstu.2004.11.006</p>	√	Quantitative	X	Research Utilization & Clinical Nurse Educators	Rodgers Diffusion of Innovation Model	CNE's, CNS's, & APN's	√	N
<p>Nieminen, A., Mannevaara, B., Fagerstrom, L. (2011). Advanced practice nurses' scope of practice: a qualitative study of advanced clinical competencies. <i>Scandinavian Journal of Caring Science</i>, 25, 661-670. doi: 10.1111/j.1471-6712.2011.00876.x</p>	√	Qualitative Study Descriptive	√	Clinical competencies	Group Interviews	Advanced practice nurses	√	N
<p>Olade, R.A. (2004). Evidence-based practice and research utilization activities among</p>	√	Quantitative Non-experimental Descriptive study	√	Research Utilization	Questionnaire – open ended questions	Rural Frontline Nurses	√	N

rural nurses. <i>Journal of Nursing Scholarship, 36(3), 220-225.</i>								
O’Nan, C.L. (2011). The effect of a journal club on perceived barriers to the utilization of nursing research in a practice setting. <i>Journal for Nurses in Staff Development, 27(4), 160-164.</i> doi: 10.1097/NND.0b013e31822365f6	√	Quantitative Quasi-experimental	√	Research Utilization and Journal Clubs	BARRIER S Questionnaire	Registered Nurses	√	N
Palmer, D., & Kramlich, D. (2011). An introduction to the multisystem model of knowledge integration and translation. <i>Advances in Nursing Science, 34(1), 29-38.</i>	√	Article	X	Knowledge translation	Multisyste m Model of Knowledge Integration and Translation	Nurses	√	N
Peterson, J.C., Rogers, E.M., Cunningham-Sabo, L., & Davis, S.M. (2007). A framework for research utilization applied to seven case studies. <i>American Journal of Preventative Medicine, 33, S21-S34.</i> doi: 10.1016/j.amepre.2007.03.009	√	Case Study Design	Y	Research Utilization	Rogers Diffusion Theory and Green’s Theory	Communit y Professionals	√	N
Pepler, C.J., Edgar, L., Frisch, S., Rennick, J.,	√	Qualitative Multiple Case Study	√	Research Utilization & unit	X	CNE’s, CNS’s, nurses, &	√	Y

<p>Swidzinski, M., White, C., Brown, T., & Gross, J. (2006). Strategies to increase research-based practice. <i>Clinical Nurse Specialist</i>, 20(1), 23-31.</p>		<p>& focus group</p>		<p>culture</p>		<p>head nurses</p>		
<p>Reimer-Kirkham, S., Varcoe, C., Browne, A.J., Lynam, M.J., Khan, K.B., & McDonald, H. (2009). Critical inquiry and knowledge translation: exploring compatibilities and tensions. <i>Nursing Philosophy</i>, 10, 152-166.</p>	<p>√</p>	<p>Article</p>	<p>X</p>	<p>Knowledge translation</p>	<p>X</p>	<p>Nursing Professionals</p>	<p>√</p>	<p>N</p>
<p>Roxburgh, M. (2005). An exploration of factors which constrain nurses from research participation. <i>Journal of Clinical Nursing</i>, 15, 535-545.</p>	<p>√</p>	<p>Qualitative Focus groups & single interviews</p>	<p>√</p>	<p>Research participation of Nurses</p>	<p>X</p>	<p>Frontline Nurses</p>	<p>√</p>	<p>Y</p>
<p>Scott, S.D., Estabrooks, C.A., Allen, M., & Pollock, C. (2008). A context of uncertainty: How context shapes nurses' research utilization behaviors. <i>Qualitative Health Research</i>, 18, 347-357. doi:</p>	<p>√</p>	<p>Qualitative</p>	<p>√</p>	<p>Research Utilization and Organizational Context</p>	<p>X</p>	<p>Frontline nurses, managers, & other healthcare professionals</p>	<p>√</p>	<p>Y</p>

10.1177/1049732307313354								
Scott, S.D. & Pollock, C. (2008). The role of nursing unit culture in shaping research utilization behaviors. <i>Research in Nursing & Health, 31</i> , 298-309. doi: 10.1002/nur.20264	√	Qualitative Research Ethnography	√	Research Utilization & Organizational Culture	X	Nurses, unit managers, physicians, & health care prof.	√	Y
Strickland, R.J. & O’Leary-Kelley, C. (2009). Clinical nurse educators’ perceptions of research utilization. <i>Journal for Nurses in Staff Development, 25</i> (4), 164-171.	√	Quantitative Non-experimental Descriptive study	√	Research Utilization & Identification of Barriers	Rodgers Diffusion of Innovation Model & BARRIERS Scale Questionnaire	CNE’s, CNS’s, & Educator Directors	√	Y
Wallin, L. (2008). Knowledge translation and implementation research in nursing	√	Article	X	Knowledge translation	X	Nurses	√	N
Witzke, A.K., Bucher, L., Collins, M., Essex, M., Prata, J., Thomas, T., Waterhouse, J., & Wintersgill, W. (2008). Research needs assessment. <i>Journal for Nurses in Staff Development, 24</i> (1), 12-18.	√	Quantitative Non-experimental Survey Study	√	Research Utilization and Nurses knowledge and attitudes	Research KAP Survey	Registered Nurses	√	N

Appendix C: Quality Review of Literature Articles

Quantitative Studies

Article (APA)	Study Design Objective	Methods	Setting Sample	Findings	Notes on Quality
<p>Strickland, R.J. & O’Leary-Kelley, C. (2009). Clinical nurse educators’ perceptions of research utilization. <i>Journal for Nurses in Staff Development</i>, 25(4), 164-171.</p>	<p>Research questions: (a) What are the elements perceived by the CNE to be barriers to RU? (b) What are the elements perceived by the CNE to be facilitators of RU? (c) What is the relationship between the CNE characteristics and perceptions of barriers to and facilitators of RU when compared with finding from staff nurses, administrator, and academic educators?</p>	<p>Non-experimental Descriptive study BARRIERS scale Questionnaire and demographic survey mailed to distribution list.</p>	<p>Convenience sampling method – hospital-based clinical nurse educators in California (n = 122). Response rate: 41%</p>	<p>~ Themes of additional barriers included: lack of education/research knowledge, motivation/interest/incentive, support/resources/funding/technology, and time. ~ Setting was perceived as a greater barrier by educators with undergraduate education than educators with advanced degrees ~ Educators working with Magnet designation perceived the setting less of a barrier than those in non-Magnet facilities. ~ Educators with smaller-bed-capacity perceived the setting to be more of barrier than the large-bed subgroups.</p>	<p>~ Strengths: Strong validity with BARRIERS scale questionnaire. ~ Limitations: Convenience sample of self-selected nurse educators that may have increased bias in the results. External validity – setting and demographics limit the generalizability of the study. Majority of sample responders came from nonprofit facilities and increased response from profit/private institutions may have yielded different results. Sample response only 41%</p>
<p>Gerrish, K., Guillaume, L., Kirshbaum, M., McDonnell, A., Tod, A., & Nolan, M. (2010). Factors influencing the contribution of advance practice nurses to promoting</p>	<p>Identify factors influencing advanced practice nurses’ contribution to promoting evidence-based practice among front-line nurses</p>	<p>Cross-sectional study Questionnaire</p>	<p>Purposive sample of 7 of 28 Strategic Health Authorities. Advanced practice nurses (n=855) working in 87</p>	<p>~ APN’s relied heavily on evidence which had already been synthesized into guidance for practice rather than published research reports. ~ Actions by APN’s were focused on proactive or reactive problem-solving strategies with frontline</p>	<p>~ Strengths: Highlighted the value of APNs as clinical leaders to promote EBP among FLNs. Questionnaire was developed through focus groups and pilot study before being used in the research study.</p>

<p>evidence-based practice among front-line nurses: findings from a cross-sectional survey. <i>Journal of Advanced Nursing</i>, 67(5), 1079-1090. Doi: 10.1111/j.1365-2648.2010.05560.x</p>			<p>hospital/primary care settings in England.</p>	<p>nurses. ~ APN's who possessed Masters qualifications were more likely to view themselves as competent/expert in all the identified skills associated with evidence-based practice.</p>	<p>~ Limitations: Sample size was strong, but unable to confirm response rate at 67 organizations self-distributed the questionnaire. Potential for bias with respondents as may be strong supporters of evidence-based practice</p>
<p>Mills, J., Field, J., & Cant, R. (2011). Factors affecting evidence translation for general practice nurses. <i>International Journal of Nursing Practice</i>, 17, 455-463. Doi: 10.1111/j.1440-172X.2011.01962.x</p>	<p>Explore the domains of influence affecting practice nurses' ability to find, evaluate, and use clinical evidence.</p>	<p>Cross-sectional study</p>	<p>Developing Evidence-Based Practice Questionnaire to general practice nurses (n=590) in Victoria, Australia Response rate: 33%</p>	<p>~ Internal (personal) factors including nurses' skills and knowledge and external (organizational) factors are perceived as influential in the successful translation of knowledge into clinical practice. ~ Identified priority is skill development in finding, reviewing and using evidence with the aim of expanding the knowledge base of general practice nurses.</p>	<p>~ Strengths: Applied the DEPQ questionnaire to the study ensuring validity Results correlated with study conclusions. ~ Limitations: Low response rate</p>

Qualitative Studies

Article (APA)	Study Design Objective	Methods	Setting Sample	Findings	Notes on Quality
Anderson, J.M., Browne, A.J., Reimer-Kirkham, S., Lynam, M.J., Rodney, P., Varcoe, C., ...Brar, A. (2010). Uptake of critical knowledge in nursing practice: Lessons learned from a knowledge translation study. <i>CJNR</i> , 42(3), 106-122.	Translating critical knowledge into practice content through the application of the Collaborative Knowledge Translation Model Focused on help-seeking and hospitalization experiences of ethno-culturally diverse patients	Qualitative Case Study	Four inpatient units in one hospital over two years.	~ Three themes: 1. transitions and material context of people’s lives influence their experiences of health, illness, and help-seeking 2. Racializing and marginalizing practices and how they can be addressed 3. Health-care delivery systems through the lens of critical inquiry	~ secondary analysis of research data not completed, weakens validity and strength of the themes and findings ~ external validity – weak as unable to generalize to all hospitals
Pepler, C.J., Edgar, L., Frisch, S., Rennick, J., Swidzinski, M., White, C., Brown, T., & Gross, J. (2006). Strategies to increase research-based practice. <i>Clinical Nurse Specialist</i> , 20(1), 23-31.	Describe strategies used to facilitate research utilization by nurses in a practice setting	Multiple Case Study Included: open-ended focus groups, individual interviews, and observational sessions.	Nurses, head nurses (n=20) and CNS’s, CNE’s (n=8) on 8 units in 4 sites of a university hospital.	~ Themes of Unit Culture linked to research utilization: Harmony in research perspectives Motivation to learn Goal orientation Creativity Critical inquiry Mutual respect Maximizing resources ~ CNEs and CNSs strategies to support research utilization found on all units, but response to these strategies differed.	~ Strengths: Highlighted the importance of CNSs and CNEs in helping to create a unit culture to support research utilization. Emphasized the importance of the CNSs and CNEs having the competencies necessary to promote the use of evidence in daily practice. ~ Limitations: External validity – limited to one hospital, not generalizable to all nurses and hospitals.
Roxburgh, M. (2005). An	Explore practicing	Exploratory through two	Purposeful sampling and	~ Had six emerging themes:	~ Strengths: Identified themes

<p>exploration of factors which constrain nurses from research participation. <i>Journal of Clinical Nursing, 15, 535-545.</i></p>	<p>nurses' views on factors which they perceived constrained them from research participation</p>	<p>focus groups followed by single interviews</p>	<p>convenience sampling Focus groups: (n=7) and single interviews: (n=7) from one District General Hospital</p>	<p>Level of support nurses require to be research active. Nurses attitudes to undertaking/participating in research. The extent of nurses' knowledge about research. Activities identified by nurses as research activity. Skills to undertake research. Levels of educational preparation relating to research.</p>	<p>from the data create opportunities for the development of further studies. ~ Limitations: External validity: small sample size from one location</p>
<p>Scott, S.D., Estabrooks, C.A., Allen, M., & Pollock, C. (2008). A context of uncertainty: How context shapes nurses' research utilization behaviors. <i>Qualitative Health Research, 18, 347-357.</i> doi: 10.1177/1049732307313354</p>	<p>Explore the organizational context of a single nursing unit to understand the process by which context influenced nurses' research utilization behaviors.</p>	<p>In-depth observation and interviews with unit nurses, managers, and other healthcare professionals</p>	<p>Purposive sampling (n=29)</p>	<p>~ Emerging themes: Concept/sources of uncertainty Nature and structure of nurses' work. Nature of valued knowledge ~ Nurses were reluctant to take initiative based on the context of uncertainty. ~ Sources of uncertainty: precarious condition of seriously ill patients, inherent unpredictability of nurses' work, complexity of teamwork, and inconsistency in management.</p>	<p>~ Strengths: Strong sample size Highlighted themes related to organizational context that impact research utilization. These themes can be applied to other areas of nursing practice in further research development. ~ Limitations: External validity – study was completed on one specific unit and would be unable to generalize to other specialty areas and all nurses.</p>
<p>Scott, S.D. & Pollock, C. (2008). The role of nursing unit culture in shaping research utilization</p>	<p>Explore how the organizational culture of the nursing unit shaped nurses' research utilization</p>	<p>Ethnography</p>	<p>Observation over a 7-month period on a critical care unit in a Canadian children's hospital and</p>	<p>~ Four significant themes of unit culture: Structure of authority. Nature of nurses' work. Workplace ethos. Valued knowledge forms. ~</p>	<p>~ Strengths: These themes are a starting point for the development of assessment tools for research utilization. Identified the need for theoretical</p>

<p>behaviors. <i>Research in Nursing & Health</i>, 31, 298-309. doi: 10.1002/nur.20264</p>			<p>single interviews (n=29)</p>		<p>development on nursing unit culture. ~ Limitations: External validity – unable to generalize to all nurses and all units.</p>
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