NURSING STUDENTS' USE OF GUIDELINES FOR PAIN MANAGEMENT IN CLINICAL PRACTICE - CONTEXT AND INFLUENCING FACTORS

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Dedicated to JP, Eliane and Louis.

I sustain myself with the love of family – Maya Angelou

Preface

The following research was approved by the University of Ottawa Research Ethics Board (HS05-14-21) and the Ottawa Health Science Network Research Ethics Board (20140089-01H). Valerie Fiset, the named doctoral candidate of this dissertation, participated in all aspects of the study conceptualization and design and is responsible for the integrity of the data and its interpretation. Valerie Fiset was the lead for all aspects of the dissertation, including data collection and analysis and drafting each manuscript.

Dissertation Abstract

Purpose

To understand the factors that influence nursing students' use of evidence-based pain management guidelines in their clinical placements.

Methods/Design

Guided by educational and knowledge translation theory, multiple approaches were used:

1. A scoping review of the literature to identify and describe educational strategies to promote evidence-based practice (EBP) by nursing students in the clinical setting, along with associated barriers and facilitators from the literature.
2. A process to develop indicators of the use of pain guidelines in clinical practice.
3. A descriptive case study to determine the gap between evidence-based guideline recommendations and actual practice and to understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guidelines.

Findings

The scoping review identified 37 papers in total, 14 descriptive and 23 evaluation studies. Commonly identified barriers were lack of EBP knowledge and skills and lack of support in the clinical setting. EBP projects were the most frequently evaluated educational interventions, alone, or in combination with workshops or journal clubs.

During the indicator development process, eleven guidelines were reviewed for quality, resulting in three quality guidelines. From these three guidelines, 12 recommendations were extracted. Quality indicators were then identified by a consensus process, resulting in 24 discrete indicators for the chart audit.

For the descriptive case study, fifty-four charts were audited, and interviews were conducted with nine students, seven nurses, one professor, and one clinical instructor. Multiple documents were reviewed, and a site visit was conducted. There are gaps between pain guideline recommendations and practice in the clinical setting. Examples of barriers include the perception that guidelines are not applicable for the clinical setting, lack of knowledge regarding guidelines and an emphasis on task completion in the clinical setting. Facilitators included access to resources, curriculum changes, and the integration of guidelines in policies and procedures.

These findings can inform the development, implementation and evaluation of evidence based educational strategies that take into account the multiple actors that impact nursing students' experience, namely, in-class professors, clinical instructors, and staff nurses. Future education and research approaches should be rooted in knowledge translation and education theory.

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My doctoral studies started with an email from Dr. Dawn Stacey, suggesting I take a course in knowledge translation as a special student. That year, the course was taught by Ian Graham and Barbara Davies and my passion for knowledge translation was ignited. I was excited about the possibilities of this area of research for nursing education, and I am grateful to them for taking me on as my co-supervisors. Even as I come to the end of this process, I believe in my research, and I am thankful for their guidance and wisdom through the process. Their incredible knowledge of this area of research is humbling. Dr. Wendy Gifford, I am indebted to you for taking over as co-supervisor when Barb retired in the spring of 2017. I know that coming in to this process at the point of analysis and write-up was far from easy, yet you supported me with grace and compassion.

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List of Abbreviations

AACN	American Association of Colleges of Nursing
AGREE	Appraisal of Guidelines for Research and Evaluation
APN	Advanced Practice Nurse
APS	American Pain Society
BPG	Best Practice Guideline
BPI	Brief Pain Inventory
BPSO	Best Practice Spotlight Organization
BScN	Bachelor of Science in Nursing
CCO	Cancer Care Ontario
CIHR	Canadian Institutes of Health Research
CINAHL	Cumulative Index to Nursing and Allied Health Research
CNO	College of Nurses of Ontario
CPG	Clinical Practice Guideline
CPS	Canadian Pain Society
EAU	European Association of Urology
EBP	Evidence-based Practice
EMBASE	Excerpta Medica dataBASE
ERIC	Educational Resources Information Center
ESAS	Edmonton Symptom Assessment System
ESMO	European Society of Medical Oncology
GAIN	Guidelines and audit implementation network
GIN	Guidelines International Network
GRADE	Grading of Recommendations, Assessment, Development and Evaluations
HCP	Health Care Provider
IASP	International Association for the Study of Pain
iKT	Integrated Knowledge Translation
IOM	Institute of Medicine
IP	Interprofessional
JBI	Joanna Briggs Institute

KT	Knowledge Translation
KTA	Knowledge to Action
MD	Medical Doctor (physician)
MeSH	Medical Subject Headings
NCCN	National Comprehensive Cancer Network
NGC	National Guideline Clearinghouse
NICE	National Institute for Health and Care Excellence
NLN	National League for Nursing
NQuIRE	Nursing Quality Indicators for Reporting and Evaluation
PACES	Practical Application of Clinical Evidence System
PDA	Personal Data Assistant
PI	Primary Investigator
PIPOH	Population, Intervention, Professionals/Patients, outcomes, health care settings
PRN	As needed
QI	Quality Indicator
RN	Registered Nurse
RNAO	Registered Nurses' Association of Ontario
SAGE	Standards and Guidelines Evidence
SIGN	Scottish Intercollegiate Guidelines Network
SPSS	Statistical Package for the Social Sciences
STTI	Sigma Theta Tau International
VA	Veteran's Affairs

Chapter 1: Introduction

The purpose of this dissertation is to describe the factors that influence nursing students' use of guidelines to inform their pain management practices as part of their clinical placements. This first chapter introduces the reader to the research problem, the study objectives and the structure of this manuscript-based dissertation.

1.1 Background

The need for health care providers to inform their practice with the best available evidence is now well-recognized as improved patient outcomes and care processes have been linked to evidence based practice (EBP) (Institute of Medicine [IOM], 2009; Joanna Briggs Institute [JBI], 2017; National Institute for Health and Care Excellence [NICE], 2018; Registered Nurses' Association of Ontario [RNAO], N.D.; Scottish Intercollegiate Guidelines Network [SIGN], N.D. As has been the case in many jurisdictions, the government of Ontario, as part of the *Excellent Care for All Act*, legislated the requirement for health care providers to integrate evidence into patient care (2010). In addition, entry-to-practice competencies for Registered Nurses in the province of Ontario require that nurses "provide nursing care that is based on critical inquiry and evidence-informed decision making" (College of Nurses of Ontario [CNO], 2014). In order to meet these requirements, it is essential to educate future nurses to engage in EBP, defined as a: "Process of shared decision making between practitioner, patient and others significant to them based on research evidence, the patient's experience and preferences, clinical expertise or know-how, and other available robust sources of information" (Sigma Theta Tau International [STTI], 2008).

Teaching nurses and nursing students how to use research to improve nursing practice has been of concern in Canada for at least 25 years. For example, the book *Reading Research: A*

user-friendly guide for nurses and other health professionals by Barbara Davies and Jo Logan was published in 1993. This resource is now in its 6th edition (with a 7th edition planned for 2020), and remains a popular resource for entry-level nursing programs (Davies & Logan, 2017). As well, The Best Practice Guideline (BPG) program was launched in 1999 by the RNAO, in partnership with the Ontario Ministry of Health and Long-term Care, with an end to produce and disseminate BPGs to improve nursing's contribution to quality patient care (Grinspun, 2018).

1.2 **Research Problem**

In an appeal for radical transformation in nursing education, Patricia Benner and colleagues (2010) recommended important changes in nursing education, notably: "From a focus on covering decontextualized knowledge to an emphasis on teaching for a sense of salience...and action in particular clinical situations" and "from a sharp separation of classroom and clinical teaching to integrative teaching in all settings" (p.89). This book was a wake-up call for educators, and after reading it, I became passionate about how to shift my teaching practice to accomplish these goals. A number of other authors have discussed the challenges of integrating EBP in clinical nursing education and have called for a better integration of what is taught in the classroom with the clinical setting (Ciliska, 2005; Melnyk, 2013; MacMillan, 2013). In an early review by Coomarasamy and Khan (2004) the authors concluded that it is not sufficient for EBP to be addressed in the classroom, and that it is necessary to integrate teaching around EBP in clinical practice settings to support improvements in students' knowledge, skills, attitudes, and behaviour. Greenlaugh, Howick, and Maskrey (2014) assert that it is necessary for educators to combine the application of evidence with reflection and case discussion, and to rigorously evaluate such shifts in clinically-integrated EBP education strategies.

Strategies to promote EBP in nursing clinical education have been described in the literature. Examples include: workshops for clinical instructors and/or students to promote critical appraisal and the use of BPGs and evidence in clinical education (Higuchi, Cragg, Diem, Molnar & O'Donohue, 2006; Mohide and Matthew Maich, 2007); journal clubs (Laaksonen, Paltta, vonShantz; & Ylonene, 2013; Mattila & Eriksson, 2007; Matilla, Rekola, Koponen & Erikssonn, 2013); and having the students conduct evidence-based projects during their clinical rotations (Foss, Kvigne, Larsson & Athlin, 2014; Helms & Pruitt-Walker, 2015; Smith- Strøm, Oterhals, Rustad, & Larsen, 2012). While many of the interventions described are innovative and interesting, most evaluations have been in small, non-generalizable studies, and have not been developed based on an appreciation of the factors that affect students' use of research evidence in clinical practice (see scoping review in Chapter 3 for a summary of related literature) (Fiset, Graham, & Davies, 2017).

A number of authors have discussed the theory-practice gap as it relates to the education of nursing students. The gap metaphor is conceptualized as the condition of separation between what learning activities typically happen in the classroom, at the academic institution, and the learning activities that occur in the clinical setting (Gallagher, 2004; Ousey & Gallagher, 2007). Factors contributing to the gap on the clinical side include: increasing complexity of care; shorter lengths of stay, nurse-to-nurse hostility; registered nurse (RN) turnover; and inadequate preparation of preceptors (Slaikeu, 2011). On the academic side, curriculums may not specifically address the use of evidence in clinical education (Balakas & Sparks, 2010; Ciliska, 2005; Lada, 2006; Moch, Cronje & Branson, 2010; Rolloff, 2010). Most authors of papers addressing the theory-practice gap in nursing education call for collaboration between academic

and clinical agencies to address these many concerns (Grealish & Smale, 2011; Harwood, 2010; Malloch & Porter-O'Grady, 2011; Scully, 2011; Slaikeu, 2011).

In summary, educators, through both curricular and teaching/learning innovations, need to challenge and support students to inform their practice with the best available evidence. Educators must strive for greater connection between the classroom and the clinical reality. To foster these connections, classroom teachers should incorporate quality evidence related to clinical care in their teaching. Student nurses, clinical instructors and health care team members, when presented with a challenging clinical situation, should turn to the evidence. Educators and managers in clinical agencies should create and update policies and procedures based on the best available evidence.

1.3 **Purpose and objectives of the dissertation**

The overall purpose of this study was to understand the factors that influence nursing students' use of evidence-based pain management guidelines in their clinical placements. More specifically, this multi-methods research dissertation aimed to address the following objectives:

Objective 1. Identify and describe educational strategies to promote EBP by nursing students in the clinical setting, along with associated barriers and facilitators from the literature.

Objective 2. Develop indicators of the use of pain guidelines in clinical practice.

Objective 3. Determine the gap between evidence-based guideline recommendations and actual practice.

Objective 4. Understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guidelines.

While the definition of EBP includes a broader perspective than the integration of guideline recommendations in practice decisions, this study focuses on the use of guidelines.

Guidelines are "statements that include recommendations, intended to optimize patient care, that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options" (IOM, 2011, para. 1.). The RNAO toolkit for the implementation of BPGs indicates that their use is to:

> *"deliver effective care based on current evidence; resolve a problem in the clinical setting; achieve excellence in care delivery by meeting or exceeding quality assurance standards; introduce an innovation; eliminate use of interventions not recognized as best practice; and create work environments that enable clinical excellence" (2012, p. 7).*

Quality guidelines can be particularly useful for nursing students as they are a summarized source of evidence appraised by guideline developers. For the purposes of this study, the researcher used practice guidelines and guideline recommendations as a sole source of evidence. Other elements of evidence-based practice, notably clinical expertise, patient preferences and other available information are not examined (STTI, 2008). Throughout the dissertation (with the exception of the theoretical framework chapter and the scoping review chapter), use of guidelines is the terminology that characterizes students' use of research evidence and EBP.

1.4 **Research context**

1.4.1 Clinical practice education.

Clinical practice education refers to learning activities conducted outside the classroom or laboratory settings and takes place in a variety of health care environments (RNAO, 2016). In these practice settings, nursing students build on theoretical knowledge and laboratory skills education as they develop clinical competence. Over the course of baccalaureate nursing education, students have placements in a wide variety of settings. How nurses and other interprofessional team members practice has an influence on nursing students in the clinical

setting. A variety of delivery models for clinical placements exist (Budgen & Gamroth, 2008). Most commonly a faculty member from the educational institution, often referred to as a clinical instructor, supervises students in clinical areas. The expert panel of developers of the RNAO best practice guideline, *Practice Education in Nursing* (2016), emphasized the importance of academic clinical educators being prepared to "contribute to a positive, high quality learning environment" (p. 9).

The clinical practice environment needs to be part of the equation for nursing students to develop skills in EBP, with relevant curriculum being integrated across years in both the academic and clinical settings (Ciliska, 2005). Khan and Coomarasamy propose one model that may provide guidance in making changes in the approach to education (2006). They suggest a hierarchy of teaching methods for the effective education of health care professionals related to EBP. At the highest level of this hierarchy, the authors advocate for "clinically-integrated-interactive" approaches to teaching that are based on the learners' needs and the clinical context (p.6). Activities that fall under this include journal clubs, clinical rounds, case discussions, and EBP projects. In addition to the teaching and learning activities in the clinical environment, practicing nurses also play a key role in supporting nursing students.

1.4.2 EBP - practicing nurses.

In 2011, Squires and colleagues published a systematic review of literature (up until early 2008) related to the extent that nurses used evidence in clinical practice. They found that nurses' reported use of research during that time was moderate-high, but they cautioned that the results may be falsely positive, noting many methodological issues with the included studies. A later integrative review by Saunders and Vehvilainen-Julkunen, that included studies from 2004 to early 2015, found that nurses were familiar with EBP and had positive attitudes toward EBP

(2016). Despite these positive attitudes, the nurses indicated that they did not have the knowledge and skills necessary to undertake EBP and did not use evidence in practice.

The authors of a number of original studies report on nurses' research use. Wangensteen, Johansson, Bjorkstrom and Nordstrom reported on a study that included 148 newly graduated nurses in Norway (2011). Similar to the Saunders review, the respondents to their survey using the Research Utilization Questionnaire had positive attitudes toward research, but only 24% self-identified as using research. In a large Swedish longitudinal study, looking at participants' instrumental, conceptual and persuasive knowledge use, authors found that instrumental use of research was most frequently reported, with conceptual use being the next most frequent (Wallin, Gustavsson, Erenberg & Rudman, 2012). Instrumental knowledge use increased over time in practice, with new graduate nurses averaging a score of 2.8/5, and nurses 5 years after graduation averaging 3.5/5. Conceptual research use scores averaged 2.6/5 for new graduates and 3.6/5 at year 5. Lastly, persuasive knowledge use was overall rated low, with 1.7/5 in new graduates, increasing to 2.0/5 in the participants at 5 years of practice.

Practicing hospital nurses (n=948) in Finland participated in a survey examining readiness for EBP (Saunders, Stevens, & Vehvilainen-Julkunen, 2016). The authors found that the nurses had low levels of self-efficacy and knowledge for EBP. In an American study of 163 magnet hospital nurses, Wonder and colleagues (2017) found that self-reported EBP knowledge/skills, attitudes and practice/use were not significantly correlated with objective scores on the EBP Knowledge Assessment in nursing test. The average overall score on the latter measure were 10.58/20. These authors concluded that moving forward, direct objective measurement is recommended over self-reported measures. Melnyk and colleagues conducted a national study of EBP competencies of RNs and Advanced Practice Nurses (APNs) (2018). In a

self-reported measure of EBP competency, with a maximum score of 96, their large (n=2,344) sample of participants averaged a score of 53.5 (SD=16.1). Their results differed from the Wallin study, in that younger age (and therefore assumed less time in practice) was significantly associated with higher EBP competency ratings, which the authors suggest may be related to changes in entry-level nursing curriculum and higher education levels. Finally, a recent study by Arumugam and colleagues (2018) compared the EBP knowledge, attitudes and self-reported behaviours of different health care providers involved in pain management. Nurses' (n=128) knowledge scores were high overall (mean=86.8%) but other scores were lower: attitudes 58.8%; behaviour 46.5%; outcome/decision 72%; and overall total score 64% (p. 5).

Studies included in this section range from systematic and integrative reviews to large longitudinal and cross-sectional descriptive studies. Though the systematic reviews both commented on the reduced quality of included studies, more recent descriptive work has been conducted more rigorously with large sample sizes. Researchers conducting the studies summarized above have shown that nurses' use of research and evidence-based practice competencies are not consistently high. It remains imperative that nurse educators strive to prepare students for the realities of EBP in the practice world.

1.4.3 EBP - nursing students.

An integrative review of the literature by Ryan was published in 2016, describing the extent to which nursing students were involved in research and EBP. Included studies reflected, despite a positive attitude and intention to use research and EBP, that nursing students did not actively participate in EBP. The authors of included studies (from the US, Jordan, UK, Sweden (3 studies), and Australia (3 studies), related this to a lack of support in the clinical environment, the focus on the completion of tasks in clinical practice education, and the theory-practice gap.

In an American cross-sectional study, Brown, Kim, Stichler and Fields (2010) looked at the sources of evidence that baccalaureate nursing students used, as well as their self-reported EBP Knowledge, Attitudes and Behaviors. Sources of knowledge most commonly used by students included (in descending order): textbooks (84.4%); the internet – Google (77.0%); and other people – faculty, RNs and physicians (MDs) (50.6%) (p.523). Students' self-rated EBP knowledge, attitudes and future use of EBP were above the middle of the response range (3/6) for all levels of students, however those scores for EBP use were below the middle of the response range (2.1/5) for all years of students (p. 524). Forsman and colleagues studied 1319 graduating nursing students in Sweden, to describe their intention to use research, and to link that to their actual practice one year later (2012). Many students (44.4%) indicated that their intention to use research was low. Twenty percent of students indicated that they did not know how much they intended to use research results in practice. Those students that indicated intent to use research were more likely to use research as part of their clinical practice one year later (p. 1160).

A similar US study in 174 graduating nursing students was published by Llasus, Angosta and Clark in 2014. These authors looked at students' EBP Knowledge, Readiness and their extent of EBP Implementation, and the relationship between the former two concepts with the latter. Mean scores for the outcomes were as follows: EBP Knowledge 7.62 (possible score 0-15); EBP Readiness 83.45 (possible score 20-120); and Implementation 17.61 (possible score 0-72). EBP readiness was found to mediate both EBP knowledge and implementation, and so the authors have called for educational strategies that increase nursing students' confidence in their EBP skills and promote EBP in clinical education. Kim and colleagues (2018) looked at senior Korean nursing students' EBP practice, attitudes and knowledge, correlating these results with

critical thinking disposition. Average scores were: 4.71/7 on the knowledge subscale; 4.71 on the practice of EBP subscale; and 4.58/7 on the attitudes toward EBP subscale.

Spurlock and Wonder, in a 2015 US study, tested the psychometric properties of the EBP Knowledge Assessment in Nursing, in a population of 200 undergraduate nursing students. The majority of participants had completed 50% of their program, with equal portions having completed 25% and 75% of the program. Students' scores ranged from 5-16/20, with a mean of 10.4/20. Students with higher scores were more likely to have already taken an EBP course or a statistics course. In another study, that described the psychometric properties of another EBP evaluation tool (the Student EBP Questionnaire), Upton, Scurlock-Evans and Upton undertook a study with 244 undergraduate nursing students in the 1st, 2nd and 3rd years at a UK University (2016). These authors provided average scores for the subscales as part of the results: practice subscale was 5.07/7; attitude subscale was 5.64/7; retrieving and applying evidence was 4.60/7; and sharing and applying EBP was 5.2/7. In looking at trends based on the year of program, the results demonstrated higher scores for students in later years of the program.

The studies described above include one integrative review, two reports of instrument development and cross-sectional and prospective correlational studies. All studies reported on either subjective ratings of either intent to use or actual use of EBP, with low to moderate results. The cross-sectional and prospective studies were carried out using reliable and valid tools, and all studies had adequate sample sizes. One critique of the studies reviewed relates to both nurses' and nursing students' EBP is they rely on self-reports of intent to engage in or actual use of EBP, versus actual observation or outcomes of EBP. In addition, none of the studies reflect the Canadian context, which may pose a limitation in relating them to populations of Canadian nurses and nursing students.

As with practicing nurses, researchers have shown that student nurses' use of EBP and their EBP knowledge and skills are not optimal, and clinical practice education is likely the ideal setting to promote the development of EBP competencies in student nurses.

1.5 Clinical context: Pain assessment and management

One clinical situation that is amenable to an EBP approach is that of the care of patients experiencing cancer-related pain. While a professor teaching in the classroom about pain and symptom management to undergraduate nursing students, I also heard from clinical instructors that nursing students did not have the requisite knowledge to support and care for patients experiencing these problems. The lack of knowledge related to pain management is supported by a recent research study by Hroch and colleagues (2019), where they found that the majority of nursing students in their cross-sectional descriptive study (n=336) did not achieve a passing score on the Knowledge and Attitudes Survey Regarding Pain.

1.5.1 Pain prevalence.

Authors of a systematic review of under-treatment of cancer pain reported that the pain of one in three cancer patients goes under-treated (Greco et al., 2014). It is essential that nurses address pain in cancer patients as pain is known to have negative effects on quality of life, function, and emotional state (Lemay et al., 2011; Kim, Dodd, Aouizerat, Jahan & Miaskowski, 2009; Nersesyan & Slavin, 2007). Pain is a leading cause of emergency department visits and hospital admissions for cancer patients (Barbera, Taylor & Dudgeon, 2010; Numico et al., 2017; Pannattoni, 2017; Vandyk, Harrison, Macartney, Ross-White & Stacey, 2012).

There appears to be strong evidence that pain is still a common symptom in cancer patients. Three systematic reviews, one large retrospective and one large prospective study were reviewed. A summary of prevalence rates is provided in Table 1.1. The authors of a systematic

review and meta-analysis (that included one Canadian study) found that cancer pain is a common issue among cancer patients and is a concern for their families, despite increased efforts to improve pain assessment and management (van den Beuken-van, Hoschstenbach, Joosten, Tjan-Heijnen & Janssen, 2016). They found that the pooled pain prevalence rates of patients undergoing cancer treatment was 55.0% (29 studies), and for those with advanced or end-stage disease it was 66.4% (24 studies). Fifty-two studies described pain severity, with 38% of patients in the combined results experiencing moderate to severe pain, defined as pain ratings ≥5 out of 10. Despite efforts to increase the uptake of evidence-informed pain assessment and management, cancer pain prevalence rates remain high when the Canadian Pain Society (CPS) has indicated that: "almost all acute and cancer pain can be relieved" (2010, CPS Position Statement).

Table 1.1 Cancer pain prevalence

Author	Population	n	Pain Prevalence
Kim, 2009 Multiple countries – 3 Canadian SR[a]	Cancer patients/active treatment	484	40%
Kirkova, 2011 US	Advanced cancer patients	796	83%
Miller-Reilly, 2013 Multiple countries 1 Canadian SR[a]	Cancer patients/active treatment	3,914	48.03%
Spichiger, 2011 Switzerland	Advanced cancer/hospital admission	103	71.3%
Van den Beuken-van, 2016 Multiple countries 1 Canadian SR[a]	Group 1 After curative treatment	18,832	39.3%
	Group 2 During anti-cancer treatment	6,904	66.4%
	Group 3 Advanced, metastatic, terminal cancer	9,653	66.4%
	Group 4 All cancer stages	17,682	50.7%

[a] SR – systematic review

1.5.2 Pain management guideline implementation

High-quality, evidence-based, pain management guidelines exist to support clinicians in their practice. However, as Fallon and colleagues assert, the use of these evidence-based guidelines has not been sufficiently widespread to inform practice decisions for cancer or palliative care patients admitted to inpatient units for complications of their disease or treatment, or end-of-life care (2018). These authors reported on their large cluster randomized control trial in the UK, where they compared cancer centres using the Edinburgh Pain Assessment and Management Tool with those maintaining usual care. The centres that adopted the tool had improved pain outcomes for patients with moderate to severe pain (p. 5). In an earlier Korean

study, Choi and colleagues implemented evidence-based pain recommendations from the SIGN and the American Pain Society (APS), with a focus on audit and feedback; changing documentation practices; and staff education (2013). They found improvements in patient assessment, opioid side effect assessment and management, and patient and family education. Herr and colleagues reported on a large cluster randomized intervention study in sixteen US community based hospices (2012). The interventions to improve the adoption of guideline recommendations included: engagement and training of local opinion leaders, champions and senior leaders; conducting a gap assessment and presenting results; providing BPGs to the hospices; and providing on-site academic detailing. Overall, providers in the hospices that participated in the intervention did not have significant increases in evidence-based pain management practices. Nursing practices that did improve included using a pain scale to assess pain, completing a primary assessment that included pain characteristics and administering appropriate analgesic based on the type of pain (p. 1010). There was not a significant difference in overall pain scores between intervention and control hospices.

Results of the reviewed studies are mixed. Of the two large, cluster randomized control trials, one conducted in UK cancer centres found improvements in cancer pain outcomes; the other carried out in US hospices resulted in non-significant improvements in cancer pain scores at the experimental sites (Fallon et al., 2014; Herr et al., 2012). Choi and colleagues' single-centre study of an audit and feedback approach to pain practice improvements (2014) is of limited generalizability because of its quasi-experimental approach and site-specific context.

In Ontario, the Ontario Cancer Symptom Management Collaborative was conceived in 2008 to promote: "… earlier identification, documentation and communication of patient symptoms." (Cancer Care Ontario [CCO], n.d.) One initiative of this group was to ensure that

70% of cancer patients presenting to outpatient cancer clinics complete the Edmonton Symptom Assessment System (ESAS) a pain and symptom screening tool (McMaster Health Forum, 2015). In a 2014 study, authors demonstrated that this 70% threshold was not being achieved in many cancer centres (Periera, et al., 2014). For those situations where symptom screening did occur, clinicians did not routinely use the screening information to address patients' symptoms in a manner that reflected best practice (Bainbridge et al., 2011).

Barriers to the use of guidelines in Ontario Cancer Centres include:

1) A lack of agreement among professionals about the need for the screening tool;

2) A lack of knowledge about the guidelines and available supports for dealing with patients who are distressed;

3) A lack of time and resources to act on the results of screening and incorporate pain and symptom management guidelines into practice; and

4) Resistance to change among some health professionals (Dudgeon et al., 2012).

In order to address some of these barriers, professionals can employ Knowledge Translation (KT) strategies. A high quality systematic review by Cummings and colleagues evaluated studies to determine whether KT interventions improved cancer pain outcomes (2011). They concluded that trials that used higher intensity interventions (two or more hours of education in one setting or a total of four or more teaching sessions) were significantly more likely to lead to positive pain outcomes such as decreased pain severity.

Of note, the aforementioned literature reflects guideline implementation approaches focused on clinicians, and not nursing students. In order for patients to have effective pain management, nurses and nursing students need to apply evidence-based recommendations in the clinical setting. Regrettably, cancer pain prevalence remains high, despite the fact that guidelines

exist as resources for clinicians and students for the assessment and management of pain, and some implementation strategies have been successful in promoting evidence-based pain management. A large number of nursing students have clinical placements on oncology inpatient units. These clinical areas are an excellent context for studying the factors that influence nursing students' use of an evidence-based approach to pain management, including the factors that affect their ability to use guidelines as part of their practice.

1.6 **Positioning the PhD Candidate**

As a professor teaching in a collaborative Bachelor of Science in Nursing (BScN) program, a clinical coordinator overseeing clinical placements in the 3rd and 4th years of the program, and as an academic administrator, I have observed first-hand how undergraduate nursing students are equipped to engage in EBP. I saw that the integration of guideline recommendations happens to some extent in the classroom, but is limited in the clinical setting, leading to my interest and passion for this research. During the initial conception of the study, I was a professor and clinical coordinator; at the time of data collection, I was a professor in a BScN program, and at the time of the data analysis, I was an academic program administrator. I have once again returned to the professor role (all roles on a site different from that used for data collection).

In approaching this study, it is important to note my position as a researcher, and situate myself epistemically. I see pragmatism as being a fit based on my own personal worldview and that of the research I engage in. Creswell (2009) provides a description of how pragmatism can be an appropriate worldview to guide research, in particular mixed-methods research. He relates: 1) that "Pragmatism is not committed to any one system of philosophy or reality" (p.10); 2) that "Individual researchers have freedom of choice" in terms of methods, techniques and

procedures (p.11); and 3) that "Truth is what works at the time…not based in a duality between reality independent of the mind or within the mind" (p.11). It is evident through these characteristics that Creswell is advocating for mixed-methods research, encompassing a variety of methodologies (p.11). My experiences with professional plurality (multiple roles in clinical practice, education, research and administration) led me to relate to a paradigm that supports pluralism. Throughout my career, I have lived a pragmatic approach as I attempted to solve complex problems, to implement solutions based in a variety of sources that resulted in the most positive outcomes. My pragmatic approach supports the use of both qualitative and quantitative approaches.

The long-term goal of this program of research is to inform the development and evaluation of teaching/learning strategies appropriate for the clinical setting, improving nursing students' EBP knowledge, skills and attitudes. I believe that it is essential to seek the perspective of the 'subjects' of these teaching/learning strategies, namely nursing students, faculty and clinical nurses. McCready has proposed that knowledge development in nursing proceed through a lens of Jamesian pragmatism, to "guide the achievement of an engaged, unified and pluralistic community of nursing researchers" (2010, p. 195). They state that "Involving practice in research will improve both practice and research, and add practical value to what that is co-generated" (2010, p.201), reflecting the integrated Knowledge Translation (iKT) approach of this study (Canadian Institutes of Health Research [CIHR], 2012).

1.7 **Organization of the dissertation**

This dissertation is manuscript-based, and the content and structure is described in Table 1.2. Chapter 1 provides a rationale for the research, as well as the study purpose and objectives. In Chapter 2, I provide an overview of the theoretical underpinnings of the study. Next in

Chapter 3, the first published manuscript, the factors that influence nursing students' evidenced based practice and the clinically-based educational strategies that have been evaluated are described in a scoping review (Objective 1). Quality indicators were created in preparation for the case study research, this process is described in Chapter 4, and is the second published manuscript (Objective 2). In the final manuscript, I describe a mixed-methods case study, that was carried out to describe the gap between recommended and actual pain management practices as well as the factors that influence nursing students' use of guidelines in the clinical setting (Chapter 5, Objectives 4 and 5). Of note, the case study was initially proposed as a multiple case study examining both pain and dyspnea. Data from one site focusing on pain management forms the basis for the draft manuscript (Chapter 5) and the thesis. Chapter 6 presents an integrated discussion that summarizes the dissertation findings and addresses the implications for practice, education, theory and research. Given the manuscript-based format, readers will notice repetition of content across the dissertation chapters as the published articles stand-alone in journals. The articles have been formatted for the specific journals so readers will notice differences in the use of referencing systems across the articles.

Table 1.2 Manuscript-based dissertation content/structure

Chapter	Chapter Title	Objectives	Study design	Manuscript
1	Introduction	To describe the rationale for the research study, the study purpose and objectives.	-	-
2	Theoretical underpinnings	To describe the educational and KT[a] theories that underpin the study, as well as the iKT[b] approach.	-	-
3	Evidence-based practice in clinical nursing education: A scoping review	Identify and describe educational strategies to promote EBP[c] by nursing students in the clinical setting, along with associated barriers and facilitators from the literature.	Scoping review	**Published** Fiset, V., Graham, I.D., & Davies, B. (2017). Evidence-based practice in clinical nursing education: A scoping review. *Journal of Nursing Education, 56*(9), 534-541. doi: 10.3928/01484834-20170817-04
4	Developing guideline-based quality indicators: Assessing gaps in pain management practice.	Develop indicators of the use of pain guidelines in clinical practice.	Multiphase approach for quality indicator development.	**Published** Fiset, V.J., Davies, B., Graham, I.D., Gifford, W. & Woodend, K. (2019). Developing guideline-based quality indicators: Assessing gaps in pain management practice. *International Journal of Evidence-based Healthcare.* doi: 10.1097/XEB.0000000000000160
5	"We don't have time to do all those crazy steps": Nursing students' use of guidelines for pain	Determine the gap between evidence-based guideline recommendations and actual practice.	Descriptive case study	**Manuscript prepared for submission to: *BMC Medical Education***

	management in clinical practice – context and influencing factors	Understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guidelines.		
6	Integrated discussion	To summarize and integrate the dissertation findings and address the implications for practice, education, theory and research.	-	-
7	Contributions of collaborators	To describe the contributions of collaborators as members of the research team, co-authors of manuscripts and the research process.	-	-

[a]Knowledge Translation, [b]Integrated Knowledge Translation, [c]Evidence-based practice

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Chapter 2: Theoretical Underpinnings of the Research

In this chapter, I present the theoretical underpinnings for the study, linking both educational theory and knowledge translation theory. The dissertation research activities are mapped against the relevant aspects of the theories at the end of the chapter.

2.1 Introduction

Gaines (2014) calls for nurse educators to instill in nursing students the skills needed to actually "translate and implement" evidence (p. 487). Current approaches to teaching nursing students and nurses in the application of the steps of evidence-based practice (EBP) are insufficient to achieve this goal. Other factors, such as attitudes, beliefs, organizational factors and supports are not as responsive to educational interventions, thus educators may require different approaches to prepare nurses to use research evidence as part of their practice (Registered Nurses' Association of Ontario [RNAO], 2012). Nurse educators must heed Gaines' call – "Needed: A Knowledge Translation skill set" (2014, p. 487).

In order to heed this call, educators must consider familiar educational theory, as well as approaches from the Knowledge Translation (KT) literature – broadening the consideration of evidence based practice to include: "a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge…" (Canadian Institutes of Health Research [CIHR], 2012, Knowledge Translation Definition section).

In this chapter, I review selected educational theories as well as theory and concepts related to KT. The chapter by Hutchison and Estabrooks on educational theory in the book *Knowledge Translation in Health Care* (2013) and the book *Models and Frameworks for Implementing Evidence-Based Practice* (Rycroft-Malone & Bucknall, 2010) provided direction for the researcher's selection of theories and frameworks included in this review, which was not

intended to be exhaustive. The Knowledge to Action (KTA) Framework, a model for KT research and the application or use of research evidence in practice, by Graham and colleagues (2006) is described. The literature review includes an approach to knowledge generation known as integrated Knowledge Translation (iKT), and considers, from an educational theory perspective, constructivism, constructionism, social constructivism, social constructionism, and adult learning theory. Linkages are made between the KTA framework, the iKT approach and the educational theories described.

2.2 Educational Theory

Educational theory comes from behavioural, cognitive, humanist, social learning and constructivist paradigms (Hutchison & Estabrooks, 2013). In this study, the KTA framework links to the educational theories of constructivism and constructionism, particularly social constructivism, where learning builds on previous experience in a social context. In addition, the KTA framework has similarities to adult education, as learning is a developmental process based on identified needs. Constructionism and social constructionism relate to the iKT approach in the production of knowledge, supporting a model of education that decreases the separation between knowledge production, theory and practice.

2.2.1 Constructivist, Constructionist, Social Constructionist and Social Constructivist Theory

The origins of constructivist learning theory originate with the Swiss psychologist and philosopher Jean Piaget, who regarded learning as complex, non-linear, and rooted in the experiences of the student (von Glaserfield, 2005). From a constructivist point of view, learning "requires invention and self-organization on the part of the learner" (Fosnot & Perry, 2005, p. 33). These authors maintain that the ability to reflect on prior knowledge is the driving force

behind learning. Nursing educators have made a call for constructivist approaches, moving from a teacher-focused pedagogy to one that is active, student-focused, and puts the emphasis on building on current or past knowledge; the role of the teacher is that of facilitator and mentor rather than the traditional 'sage on the stage' (Brandon & All, 2010; Peters, 2000; Rolloff, 2010; Young & Maxwell, 2007). In making a specific call for the use of constructivist principles to educate nursing students around EBP, Rolloff (2010) parallels the goals of constructivism, including the development of critical thinking skills and promoting a sense of personal inquiry, with the goals of EBP.

Constructivism and constructionism both take the position that knowledge is constantly being created and re-created by learners (Ackermann, 2001). However, while constructivism emphasizes how individuals make or discover meaning in the context of the learning situation, constructionism highlights the intentional creation, or construction of knowledge (Coutas, 2009). In terms of implications for the education of nursing students and practicing nurses, Jha indicates: "…the constructionist would favour practices in which students work together with teachers and others to decide on issues of importance, and the kinds of activities that might best allow significant engagement" (2012, p. 175). In reaction to the focus of constructionism on individual learning, social constructionism moves toward a focus on relationships and how they can enrich the learning process (Jha, 2012). A social constructionist perspective represents knowledge as a product of both individual and social processes (Thomas et al., 2014).

Piaget's constructivism lacks focus on the important social aspect of learning. The social constructivist approach was highly influenced by L.S. Vygotsky, whose research demonstrated that development was mitigated by social interaction (Young & Maxwell, 2007). Social constructivist learning takes place within a constantly changing perspective that is both socially

and culturally influenced (Palinscar, 1998). Palinscar describes activities such as having students explain their ideas to each other; discussing conflicts; and working together to solve complex problems as rooted in social constructivist theory (1998). Young and Maxwell advocate for educators to capitalize on the classroom as a social milieu, permitting interaction in order to facilitate learning (2007). In the context of social constructivism, individual learning happens through social mechanisms; in social constructionism, social action and knowledge are inseparable. Both approaches promote EBP, as it occurs in an inherently social context. Other authors see social constructivism as a suitable worldview with which to explore EBP (Thomas, Saroyan & Dauphinee, 2011; Thomas et. al, 2014, p. 256). Table 2.1 provides a summary of the similarities and differences of the educational theories discussed.

Table 2.1 Comparison of constructivist and constructionist learning theories

Theories	Constructivism Social constructivism	Constructivism Constructionism	Constructionism Social constructionism	Social constructivism Social constructionism
Similarities	Active role of learner Focus on learner, not teacher Learning builds on experience of learner	Knowledge is constructed by people Learning doesn't happen simply through receipt of information	Focus is on the construction of knowledge	Context is crucial to learning
Differences	Social constructivism emphasizes social context of shared learning.	Constructivism emphasizes how the individual makes meaning from knowledge. Constructionism emphasizes how the individual produces knowledge.	In social constructionism, groups of people participate in the mutual creation of knowledge; and knowledge is dependent on social processes.	In social constructivism the person remains central to the process of meaning-making in a social context. In social constructionism the production of knowledge is shared in a social context.

2.2.2 Adult Learning Theory/Andragogy

Both adult learning theory, or andragogy, and constructivism emphasize the responsibility learners have for their own learning, learning through experience and taking a problem solving approach (Knowles, Holton & Swanson, 1998). Knowles and colleagues outline several assumptions that distinguish andragogy from a traditional pedagogical model. Notably, adult learning depends on understanding why they need to learn something. Adults have a sense of responsibility for self that engenders resentment if another attempts to impose their will on them; adults bring their experiences to the context of learning; readiness and motivation to learn is impacted by the perception that something is required by the learner's real-life situation and motivation for adult learners may be external, but is most commonly internal.

Knowles and colleagues (1998) outlined the steps of the adult learning planning process: 1) assess learning needs; 2) create strategies to address the learning needs; 3) implement those interventions; and 4) assess the outcomes of the learning process. Hutchison and Estabrooks (2013) indicate that the tenets of adult learning theory are helpful in the design of interventions to optimize KT in the clinical setting.

The educational theories discussed provide a relevant perspective to advance EBP in nursing students and nurses, with their emphasis on engagement and responsibility of the learner, learning in a social context, and processes for assessing learning needs and implementing approaches to meet those needs. Understanding the relationship between KT theory, an iKT approach and educational theory provides a foundation for the development of educational interventions for nursing students and practicing nurses.

2.3 **Knowledge Translation Theory**

Broadly speaking, KT is a process that guides a variety of knowledge users to implement evidence or knowledge in health care practice. The emphasis of KT is on its social nature: "This process takes place within a complex system of interactions between researchers and knowledge users which may vary in intensity, complexity and level of engagement depending on the nature of the research and the findings as well as the needs of the particular knowledge user" (CIHR, 2012, Knowledge Translation Definition section). KT differs from EBP, which is generally seen as a process that is carried out by individuals. Successful KT involves researchers engaging end-users of the knowledge generated and examining roadblocks to knowledge use, as well as considering a wide range of potential stakeholders (CIHR, 2009). By structuring educational and other interventions to promote KT, researchers address the determinants of research utilization, and can make improvements to the extent to which nursing students inform their practice with evidence.

Rycroft-Malone, in discussing the choice of theories to guide KT studies asserts "pragmatic yet informed decisions will need to be made" regarding the most appropriate theory or theories" (2007, p. S84). Indeed, she maintains that more debate is required to define the best approaches for the use and improvement of KT theory, exploring how different epistemological views can add to our comprehension of the complexities of KT, and how to design studies that take into account multiple viewpoints.

Multiple theories, models and approaches inform the integration of evidence in practice (Rycroft-Malone & Buknall, 2010). One such theoretical framework is the KTA framework (Graham & Tetroe, 2010), depicted in Figure 2.1. The KTA framework "make[s] sense of the black box known as 'knowledge translation' or 'implementation' by offering a holistic view of

the phenomenon by integrating the concepts of knowledge creation and action" (Graham & Tetroe, 2010, p.209). The framework combines the activities of those who generate knowledge with those who use knowledge, and promotes collaboration throughout the KT process. The knowledge creation portion of the framework consists of three phases: knowledge inquiry, knowledge synthesis and creation of knowledge tools and / or products (Graham & Tetroe, 2010). The action phases of the framework provide a structure for "what needs to be done, how, and what circumstances/conditions need to be addressed when implementing change" (Graham & Tetroe, 2010, p. 213). The action phase of the framework is rooted in planned change theory.

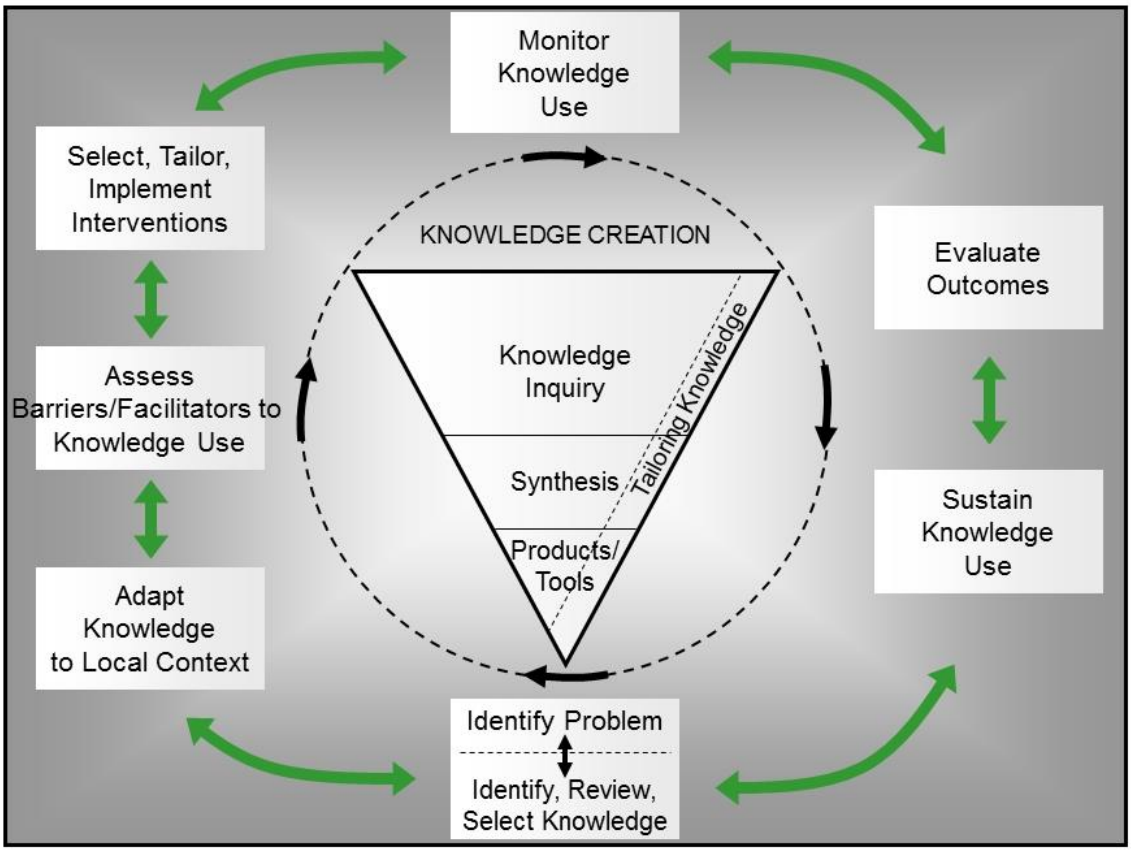

Figure 2.1 The knowledge to action framework

The authors of the KTA framework undertook an extensive synthesis of planned change theories and models to delineate the phases of the action component of the framework (Graham & Tetroe, 2010). As part of this synthesis, they subjected 31 planned action theories to analysis, elucidating the seven phases of the framework's action cycle. The authors explain that the action phases do not supplant the theories that formed the basis of the actual phase, and that theory from other areas i.e.: psychology, sociology, education, etc. may also be relevant.

The KTA framework has a number of other relevant characteristics. The authors maintain that it is "iterative, dynamic and complex, both concerning knowledge creation and knowledge application, with the boundaries between the creation and action components and their ideal phases being fluid and permeable" (Graham & Tetroe, 2010 p. 209). They go on to emphasize that it is not simply research knowledge that is important to consider in KT, but that experiential and contextual knowledge are valued as well. Experiential knowledge is not empirically proven, it is gained through experience, such as learning how to provide comfort to patients with touch and conversation (Mental Health Commission of Canada, 2014). Contextual knowledge is again non-empirical, and is gained through interaction within a given setting. It is defined by Bountis (2009) as: "Knowledge in context, information, and/or skills that have particular meaning because of the conditions that form part of their description". In the previous example, not only might a practitioner learn how to provide comfort through experience, but they would also learn by observing the norms of practice in a given setting. Lastly, the authors indicate that the framework falls within a social constructivist paradigm and "privileges social interaction and adaptation of research evidence that takes local context and culture into account as key mechanisms for turning knowledge into action" (p. 209). They highlight the importance of the relationships amongst the players involved in KT processes and that the roles of those

involved (i.e.: implementers and adopters) would be “less distinct than usual” (p.210). These characteristics of the KTA framework relate specifically to the iKT approach used to guide collaborative research efforts and are beneficial to direct the development of educational interventions for KT.

2.3.1 iKT

The CIHR has differentiated between two types of KT, notably end-of-grant KT and iKT (2012). The former is a more traditional approach to the dissemination of research findings, whereby the researcher shares the results of a study through publications, conferences and possibly other mechanisms such as communication to the public and policy makers. Different from this classic approach, iKT involves integrating those who will use the research findings throughout the research process. CIHR (2012) indicated that by doing iKT: “researchers and research users work together to shape the research process by collaborating to determine the research questions, deciding on the methodology, being involved in data collection and tools development, interpreting the findings, and helping disseminate the research results” (Integrated KT section). Graham and Tetroe (2010) and CIHR (2012) have indicated that this approach is akin to collaborative research, participatory or action research, community based research, co-production of knowledge or Mode 2 knowledge production. Key to iKT is the collaboration and involvement of those conducting research ‘knowledge producers’, with those who will also produce and apply the research in practice or policy ‘knowledge users’. Parallels exist between the engagement in the application of knowledge (KT), the production of knowledge (iKT) and the engagement of learners to promote EBP. Educational theory is a first step to make that link.

2.4 **Linking Knowledge Translation to Education**

In a commentary on the role of KT in professional discourse, Cornelissen and colleagues (2011) make the case for the integration of KT in the preparation of undergraduate nursing students as well as in practitioner-driven continuing education. They advocate for a constructivist approach rooted in practical realities, reflecting not only empiric knowledge, but also the knowledge gained through storytelling, trial and error, and reflection. Moch, Cronje and Branson (2009) advocated for students to take a greater role in the promotion of EBP through partnerships in the clinical setting. They see the role of students as going beyond that of simply receiving education in EBP to that of stimulating the use of evidence in the settings where they are practicing clinically. Key to both of these arguments are the inherent concepts from the KTA framework and characteristics of iKT, notably those of participation, collaboration, involvement, and engagement.

In social constructionist learning environments, learners take an active role in their learning, acting not as mere recipients of knowledge but also creators of that knowledge. This parallels the role of the knowledge user in an iKT approach, where they are not passive recipients of researcher-produced knowledge, but instead build on previous knowledge to create results that are applicable and are readily applied in practice. It is apparent that with an iKT approach, knowledge users and researchers function in a social environment, and must foster positive relationships in order to realize successful knowledge creation and application. Nursing students' learning in the clinical setting is inherently social, and social relationships affect the nature of the learning. As power-sharing is promoted in the context of iKT, encouraging empowerment of knowledge users (Parry, Salsberg & Macaulay, 2009), so too is power shared between the student and the teacher in a constructivist learning approach (Peters, 2000).

Similar to the lack of control that any one individual may experience as part of the iKT approach, Knowles and colleagues (1998) recognize that in the context of organizational learning, learners may need to relinquish control across each component of the of adult learning planning process. For example, frequent medication errors in a clinical setting will require that education be provided to prevent them. However, nurses may not perceive that this education is necessary. Ideally, all learners would have insight into their personal learning needs however, joint planning of the assessment of learning needs may be required to meet both individual wants and system requirements. In addition to consulting with learners, ways of determining needs in health care settings may include collecting data related to certain clinical outcomes, or observing clinical practice. Several authors have emphasized the importance of needs assessment as part of continuing professional development to ensure learning is relevant for clinicians (Moore, Green & Gallis, 2009; Van Hoof & Meehan, 2011). These actions all relate to the "assessing barriers to knowledge use" phase of the KTA framework (Graham & Tetroe, 2010).

Adult learning theory also focuses on addressing identified learning needs. This step relates to the "select, tailor and implement interventions" phase of the KTA framework. Knowles and colleagues (1998) recognize there is minimal literature describing the learner's role in this phase of the process however they argue that learner involvement in this phase could result in higher motivation and higher satisfaction. In order to promote learner involvement in this phase, they could be offered choices in terms of learning strategies, for example online vs. in-class participation, or shifting of the teacher's role to that of facilitator or guide, encouraging engagement in the learning experience.

Lastly, learner involvement in the evaluation phase centres on the need for self-reflection and to identify what outcomes should be examined to determine if their personal, desired

changes took place (Knowles et al., 1998). Whereas previously there was a focus on participant satisfaction and demonstration of knowledge, authors now advocate for a focus on outcomes that directly affect patients (Moore et al., 2009; Kirkpatrick, 2007; Sargeant et al., 2011; Van Hoof & Meehan, 2011). This focus on evaluation is similar to the KTA framework, in the phase "monitoring of knowledge use and the evaluation of outcomes" (Graham & Tetroe, 2010) that emphasizes examining the effects of practice change on actual patient outcomes.

In addition to the parallels between the KTA framework and the adult learning planning process, there are other links between an iKT approach and adult learning theory. As the research question is shaped by involvement of the knowledge users in an iKT approach, so too are the learning objectives of learners in adult education theory. Another key similarity between iKT and adult education theory is that of the role of the leader. This quote by Knowles (1983) is illustrative of the characteristics of a leader: "Creative leaders…involve their clients, workers or students in every step of the planning process, assessing needs, formulating goals, designing lines of action, carrying out activities and evaluating results…"(p.205). This role is undertaken by the lead researcher in the iKT context, or by the educator in the context of education.

2.5 **Relationship of Theory to Research**

This research was rooted in an iKT approach, integrating those who will use the research findings throughout the research process, by engaging students, faculty, clinical instructors and inpatient clinicians as they participated on an advisory committee. Specifically, students, faculty and clinical instructors who were not eligible to participate in the research project could participate as members of the advisory committees. Past students, the clinical coordinator and clinical instructors from the program were invited to participate in the advisory committee along with clinicians representing nursing, and other health professionals. In Table 2.2, I outline how

advisory committee members were involved in different components of the research process. An advisory committee partnership agreement was used to delineate the roles, responsibilities and engagement of the members. In addition, the educational and KT theory described informed a number of elements of the project. These are summarized in Table 2.2.

Table 2.2 Research activities mapped on theory

Theory	Research Objectives	Specific Research Activities	Advisory committee involvement (iKT activities) ***Constructionism / Social Constructionism***
KTA: Select, tailor and implement interventions ***Adult Education***	1. Identify and describe educational strategies to promote EBP by nursing students in the clinical setting, along with associated barriers and facilitators from the literature.	**Scoping review of the literature**	Reviewed findings of literature review, provide input on relevance for current education settings.
KTA: Identify, review, select knowledge	2. Develop indicators of the use of pain BPGs in clinical practice.	**Indicator development** •Review relevant pain guidelines. •Assess the quality of guidelines. •Develop indicators from guideline recommendations.	Provided input into determination of fit with guidelines for practice setting, as well as which recommendations are suitable for the assessment of indicators.
KTA: Identify problem ***Constructivism / Social Constructivism*** ***Adult Education***	3. Determine the gap between evidence-based guideline recommendations and actual practice. 4. Understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guideline.	**Case study** •Chart audits to determine the extent to which nurses and nursing students' practice reflects recommendations from guidelines. •Document review for pain management practices and processes and use of guidelines. •Interviews with nurses and nursing students to describe their pain assessment and management practices and their understanding related to practice guideline use.	Reviewed and gave feedback refining audit tools and document extraction forms. Assisted with interpretation of findings of audit & document review. Assisted with refining and assessing content validity of interview guides and facilitate access to participants (for face validity).
KTA: Assess barrier/supports to knowledge use ***Constructivism / Social Constructivism*** ***Adult Education***	4. Understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guideline.	**Case study** •Interviews (Barriers & facilitators; context and influencing factors; use of guidelines as part of teaching/expectation of students, role of nurses in supporting students) •Documents (policies and procedures, documentation tools) •Site visit	Assisted with refinement of interview guides and facilitate access to participants. Assisted with interpretation of interview and observation findings.

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Chapter 3: Evidence-based practice in clinical nursing education: A scoping review

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Abstract

Background: Nursing students require education that integrates evidence-based practice (EBP) knowledge across classroom and clinical settings. This study was conducted to identify and examine the literature related to nursing students' use of evidence in clinical education and to identify associated research gaps. **Method:** Scoping review. **Results:** Included studies (n=37) describe the barriers and facilitators to nursing students' EBP, and describe the evaluation of strategies that support nursing students' engagement in EBP. Most commonly identified barriers are: lack of knowledge and skills for EBP; negative attitudes toward EBP in students, faculty and nurses; and lack of supports in the clinical setting. Strategies evaluated included educational sessions and evidence-based practice projects, either alone or in combination, as well as other stand-alone interventions. All but two of the intervention studies reported positive subjective or objective outcomes. **Conclusion:** Based on these results, educators can engage in combined educational strategies that focus on addressing described barriers.

Keywords: Clinical education, Evidence-based practice, Nursing, Undergraduate education

3.1 Background

Utilizing the best available evidence is a crucial competency for baccalaureate nursing students (Institute of Medicine [IOM], 2010). Most commonly, nursing programs have attempted to develop evidence-based practice (EBP) competencies through classroom learning, and not as part of clinical placements (Ciliska, 2005). However, in an appeal for radical transformation in nursing education, Patricia Benner and colleagues (2010) have recommended important changes to that model, notably moving "from a focus on covering decontextualized knowledge to an emphasis on teaching for a sense of salience...and action in particular clinical situations" and "from a sharp separation of classroom and clinical teaching to integrative teaching in all settings" (p.89). Currently, as Ciliska suggests, EBP is taught as decontextualized knowledge, and the relevance of this knowledge must be supported through its integration in clinical practice.

This call is further supported by the authors of a recent systematic review that examined pedagogical strategies to teach EBP to undergraduate nursing students (Aglen, 2016). The author concluded that the traditional focus in nursing education on information literacy is not sufficient and that "knowledge about how evidence relates to practice is the important pre-requisite for EBP" (p. 260). Another systematic review suggests that focusing on improving health professional students' attitudes toward EBP may result in greater improvements in EBP practices (Wong, McEvoy, Wiles & Lewis, 2013). Strategies described in both articles include "real-time" teaching of formulation of clinical questions and subsequent literature search based on actual care issues, "EBP" teaching rounds and workshops, case presentations, problem-based learning and journal clubs (Aglen, 2016; Wong et al., 2013). Ryan (2016), in a third integrative review described undergraduate nursing students' attitudes and use of research and EBP. Key

findings included the importance of students' capability beliefs and attitudes for EBP, and the ability of clinical units and preceptors to support EBP. None of the three recent reviews has focused specifically on undergraduate nursing students' engagement in EBP as part of their clinical practice education. Clinical practice education refers to learning activities conducted outside the classroom or laboratory settings, and takes place in a variety of health care environments.

We would suggest that ideally, students, through both curricular and teaching/learning strategies, would be challenged and supported to inform their practice with the best available evidence, whether that be in the form of research articles, systematic reviews, or practice guidelines. As a beginning point for understanding approaches to integrate EBP competencies in undergraduate clinical nursing education, the research evidence related to this topic was explored. To our knowledge, this is the first scoping review to focus on this area.

3.2 **Methods**

This review was conducted using the Arksey and O'Malley framework for scoping studies (2005), taking into consideration recommendations by Levac et al. (2010). In a review of the nursing literature related to scoping studies by Davis, Drey and Gould (2009), the authors indicate that "the main strengths of a scoping study lie in its ability to extract the essence of a diverse body of evidence and give meaning and significance to a topic that is both developmental and intellectually creative" (p. 1398). Arskey and O'Malley distinguish scoping reviews from systematic reviews in that the latter tend to focus on a well-defined question and research design whereas a scoping review will address a broader question and include studies reflecting wider designs (2005). Another key difference between systematic reviews and scoping reviews is that the scoping review generally does not include quality assessment of included studies.

The steps of the scoping review outlined by Arskey and O'Malley include: "1) identifying the research question; 2) identifying relevant studies; 3) study selection; 4) charting the data; 5) collating summarizing and reporting results; and 6) consultation" (2010, p.22). The specific research questions were: 1) What are the barriers, facilitators and other factors that affect nursing students' EBP in clinical education; and 2) what are the educational strategies described to promote EBP by nursing students in clinical education?

The next stage of the process was to identify relevant studies. As recommended by Levac et al. (2010), a team with content and methodological expertise was assembled, including researchers with expertise in nursing education, EBP, as well as nursing students and recent graduates. The purpose of this team was to provide guidance related to the search terms, as well as the article screening and data extraction process. A research librarian and library technician were also involved in developing and implementing the search strategy.

The databases searched include: CINAHL, Cochrane Database of Systematic Reviews, ERIC, PubMed, PsychInfo, ProQuest Nursing and Allied Health, Proquest Dissertations and Theses, Sage, and Medline, using a combination of keyword, ERIC thesaurus terms and mapped subject heading (MeSH) headings. Search terms used related to the concepts of nursing students (undergraduate nursing students), EBP (any educational strategy to support students using evidence in clinical education), and clinical nursing education (inpatient or community settings). The reference lists of retrieved articles were hand-searched. Tables of contents of key journals related to nursing education were also hand-searched. The literature was searched from January 1998 to July, 2015, in English and French. This timeframe was chosen to reflect the 1998 launch of the journal *Evidence Based Nursing*; the 1998 initiation of the *National Guideline* Clearinghouse; and one year prior to initiation of the Best Practice Guideline program at the

Registered Nurses Association of Ontario (RNAO). English and French papers were included as the primary investigator is fluent in both languages.

Following development and implementation of the search strategy, reviewers selected relevant studies for abstraction. Screening of potentially relevant studies for inclusion in the review was conducted by the first author (VF) and 2 trained research assistants. The inclusion and exclusion criteria were adapted by the authors from the PIPOH (population, intervention, professionals/patients, outcomes, health care setting) framework (Fervers et al., 2006). More specifically: the population included undergraduate nursing students; the intervention was any educational strategy to support students' use of evidence in clinical education; professionals were nursing faculty in clinical and academic settings; outcomes included students' use of research evidence in clinical placements or factors that influenced their engagement in EBP; and the setting was any clinical setting, excluding all in-class settings.

Included studies were research studies of any methodology focused on undergraduate nursing students' use of research evidence during their clinical placements. Following the removal of duplicate references, three reviewers independently reviewed each title. Inter-rater reliability on a sample of studies was conducted until 90% agreement was achieved. In cases of uncertainty for inclusion based on title, the abstract of the article was considered. If the reviewers were still uncertain, or disagreed regarding the inclusion of the reference based on title and abstract screening, then the full-text of the article was reviewed. The reviewers met to discuss any uncertainties regarding study selection, which occurred in less than 10% of studies. When disagreements or uncertainties remained, a fourth and fifth reviewer were consulted to determine the eventual inclusion of the article (BD & IDG).

The research team (VF, BD, IDG) developed a data-extraction form and determined which variables were to be extracted from the included studies. The form was piloted by 3 reviewers (VF and two research assistants) and modified until agreement was achieved on key elements to extract from included studies. As recommended by Levac et al. (2010), the team members independently extracted data from seven studies and met to compare findings to ensure consistency. Where inconsistencies existed, discussion took place until consensus was achieved.

Following data extraction, the study results were collated and summarized. Analysis of the included studies involved numeric summaries as well as qualitative thematic analysis. The final stage was to engage in a consultation exercise with stakeholders to discuss the results of the scoping study, and to discuss the implications for education, practice and research (Arksey & O'Malley, 2005). Participants in the consultation were nursing faculty members and nursing students. They were provided with data tables, and an abbreviated version of the results and discussion sections. They were asked to reflect on: the completeness of the review; the key results and their relevance; as well as the discussion, in particular implications for education and future research.

3.3 **Results**

3.3.1 Reference retrieval

The search of electronic databases initially retrieved 3,114 references. Following de-duplication, the remaining 3,076 titles were screened (see Figure 3.1, Flow diagram of study selection). The most common reasons for excluding articles at the full-text screening stage were: they were not related to EBP (n=19); they were non-research articles (n=18); and they were not related to clinical practice education (n=10). Six articles were identified through the hand search of journal tables of contents and the reference lists of included articles. In total 37 studies were

included; 14 descriptive studies and 23 intervention studies. Two of the studies included descriptive and evaluation components (Higuchi, Cragg, Diem, Molnar, & O'Donohue, 2006; Smith-Strøm, Oterhals, Rustad, & Larsen, 2012), and were categorized numerically as evaluation studies, though the descriptive results are included in the relevant sections.

3.3.2 What are the barriers, facilitators and other factors that affect nursing students' EBP in clinical education?

Descriptive studies focused on reporting the extent to which participants engaged in EBP, as well as barriers, facilitators and other factors affecting EBP in clinical education. Table 3.1 provides a summary of these studies. Four out of the 14 studies were published from 1998-2004, and the remainder were published from 2010-2015. Studies originated from a wide range of countries, with four from each of Sweden, the United Kingdom and the United States. All studies were written in English, and one was in French. The studies were cross-sectional, with a mix of both quantitative, qualitative and mixed approaches to data collection. Although researchers in a number of cases developed their own questionnaires, there were also a number of existing tools employed: notably Johnston's Knowledge Attitudes and Behaviors questionnaire – which measures attitudinal, perceptual and behavioural factors contributing to EBP (Brown, Kim, Stichler & Fields, 2010); The Funk Barriers Scale – which measure barriers to implementation of EBP from the perspective of the nurse, the setting and the research (Kajermo, Nordstrom, Kruesbrant & Bjorvell, 2000; Stichler et al., 2011; Walti-Bolliger et al., 2007); and the EBP Questionnaire, created by Upton and Upton in 2006 to measure attitudes toward and knowledge/skills for EBP (Stichler et al. 2011; Upton, Scurlock-Evans, Williamson, Rouse and Upton, 2015). Llasus, Angosta and Clark used 2 previously validated tools, Stevens' Academic Center for EBP-EBP Readiness Inventory (reflecting confidence in EBP competencies) and the

EBP Implementation Scale (measure of the extent that EBP is implemented) developed by Melnyk, Fineout-Overholt and Mays.

3.3.2.1 Barriers and facilitators from the student perspective

Of the 14 studies that described barriers to evidence based practice or research use in clinical education, four (29%) investigated barriers from the perspective of nursing faculty members, and the remaining ten focused on nursing students (71%). The categories from the Funk Barriers to Research Utilization Scale (Funk, Champagne, Tornquist & Wiese, 1991) (characteristics of the nurse [student or faculty in this review]; setting; research; and presentation) were used to categorize the barriers described in the included studies. From the student perspective, the most commonly cited barrier was negative attitudes toward EBP and lack of knowledge and skills related to EBP (Ax & Kincaide, 2001; Brooke, Havlic-Touzery & Skela-Savic, 2015; Brown et al., 2010; Smith Strom et al., 2012). Student nurses perceived barriers related to the setting, notably, clinical staff and managers' resistance to the use of research findings and a lack of time for EBP (Ax & Kincaide, 2001; Brooke et al., 2015; Brown et al., 2010; Jonsen, Melender & Hilli, 2012; MacVicar, 1998; Smith-Strom et al., 2012). The only characteristic of the research that student nurses described was identified by Brown and colleagues (2010), notably, that there was too much information when searching for evidence on the internet. From the perspective of presentation, difficulty understanding and ascertaining the relevance of research findings was identified in two studies (Ax & Kincaide, 2001; Kajermo et al., 2000), and challenges with accessing research reports were also described (Kajermo et al., 2000; Smith-Strom et al., 2012).

Student nurses identified a number of facilitators, including: taking a course or participating in education related to EBP (Arslan & Celan, 2014; Kajermo et al., 2000); having

increased knowledge related to EBP (Florin, Ehrenberg, Wallin & Gustavsson, 2012; Smith-Strom et al., 2012); having a positive attitude toward EBP (Florin et al. 2012; Kajermo et al., 2000); having an interest in a particular area of research (Bjorkstrom, Johansson, Hamrin, & Athlin, 2003; Florin et al. 2012); or participating in scientific activities (Arslan & Celan, 2014; Kajermo et al., 2000). Related to the setting, students perceived support from managers, other professionals and students as key facilitators (Kajermo et al., 2000; Smith-Strøm et al., 2012). Kajermo and colleagues described facilitators of having accessible, high quality relevant research that is presented in a user-friendly format in the students' language of choice (2000).

3.3.2.2 Barriers and facilitators from the faculty perspective.

Four studies related the faculty perspective on barriers and facilitators. The most common barriers that related to characteristics of the nurse (in this case faculty members and students) were centered on lack of knowledge and skills for EBP (Higuchi et al., 2006; Hussein & Hussein, 2013; Stichler et al., 2011; Upton et al., 2015; Walti-Bolliger et al., 2007). The most common barrier described relating to the characteristics of the clinical setting was the lack of power that students had in the clinical setting to influence practice (Stichler et al., 2011; Upton et al., 2015). In the academic setting, barriers included curricular issues, lack of resources for faculty training, and infrastructure for EBP (Higuchi et al., 2006; Hussein & Hussein, 2013; Upton et al., 2015). Facilitators of EBP from the perspective of faculty members included mainly characteristics of the nursing faculty, including confidence and skills to engage in EBP, and positive attitudes toward EBP (Hussein & Hussein, 2013; Stichler et al., 2013; Upton, et al., 2015).

A summary of the barriers and facilitators described in all studies is provided in Figure 3.2. Taken together, the largest number of barriers from the perspective of students and faculty

relate to the characteristics of the nurse, and focus mostly on lack of knowledge and negative attitudes. Of the characteristics of the setting, overall lack of support was the most commonly identified barrier. There were fewer barriers identified overall relating to the characteristics of the research and the presentation of the research; students and faculty described the lack of availability and questionable relevance of research evidence as barriers

3.3.3 What are the educational strategies described to promote EBP by nursing students in clinical education?

Twenty-three of the included studies represented evaluations of educational strategies to encourage EBP in clinical placements. One of these studies was published between 1998-2004, twelve were published from 2005-2009, and 10 from 2010-2015. Descriptive evaluation designs were most commonly used (n=10/23, 44%). Ten studies originated in the United States, followed by 4 studies in Finland. The remaining studies originated in a wide variety of countries. Six studies (26%) used a post-test only design and the remainder used one-group pre-test, post-test designs (n=6/23, 26%) or quasi-experimental pre-test, post-test design (n=3/23, 13%). Structured questionnaires were the main method of data collection, but this data collection method was supplemented with other methods such as: open-ended questions; examination of student assignments and journals; practice and role-play observations; diaries; and focus groups.

Twenty of the twenty-three studies (87%) relied on researcher-designed questionnaires, with limited documentation of psychometric properties of the instruments. Kim and colleagues (2009) used the Knowledge, Attitudes and Behaviors questionnaire developed and evaluated by Johnston and colleagues to assess undergraduate EBP teaching and learning. Morris and Maynard (2009) used an adapted version of the Fresno test of competence in evidence-based

medicine to test knowledge and skills in EBP. Oh and colleagues (2010) used eight items from Funk's Barriers to Research Utilization Scale.

A summary of the types of educational strategies that were evaluated in the intervention studies (n=23) is provided in Table 3.2. Most (n=16/23, 70%) evaluated the implementation of EBP projects. EBP projects involved students addressing a relevant clinical question through identification of evidence support practices in the clinical setting. EBP projects were used alone, or in combination with workshops or journal clubs. The next most commonly described intervention was educational workshops and information sessions (n=8/23, 35%), followed by student-led journal clubs (n=4/23, 17%) (note that totals equal more than 100%, as there was some combination of educational strategies).

As evident in Table 3.3, all but two of the intervention studies reported positive subjective or objective outcomes. Four of the twenty-three evaluation studies demonstrated statistically significant improvements in measured outcomes. MacLaren and colleagues evaluated a training program designed to improve nursing students' attitudes toward pain management (2008). The intervention group had significant improvements in knowledge and use of evidence based pain management strategies. Kim and colleagues evaluated the effectiveness of an "EBP-focused interactive teaching intervention" (2009, p.1220). Their quasi-experimental, controlled pre-test/post-test study demonstrated significant improvements in EBP knowledge and use in the experimental group vs. controls (p. 1222). Oh and colleagues (2010) evaluated an EBP project in combination with education and support for students and clinical preceptors. They evaluated the intervention through a one-group pre-test/post-test design with 74 third-year BScN students, and found that scores on all scales of the EBP Efficacy Scale improved significantly (p. 390), and that overall barriers to research utilization decreased (p.

391). Lastly, Zhang, Zeng, Chen and Li (2012) found significant improvements in EBP knowledge, attitudes and behaviours (measured using a research-developed questionnaire) after an educational intervention that included self-directed learning, EBP workshops and a critical appraisal exercise.

3.3.4 Scoping review stakeholder consultation

Participants in the stakeholder consultation included 3 senior nursing students; one in-class/laboratory professor, and two clinical/laboratory instructors. Participants could relate to the findings in the published literature focusing on barriers and facilitators, especially the challenges encountered in the clinical setting (negative attitudes of staff nurses and lack of human resources on clinical units to support EBP), as well as the issue of trying to identify *when* to consult evidence to inform practice, and once evidence is found, to determine *what* is relevant for practice. In terms of the educational strategies discussed in included studies, stakeholders felt the approaches that promoted linkages between students and staff on the clinical units (EBP projects and journal clubs) would be relevant and helpful for clinical nursing education. Agreement was expressed related to the next steps for research in this area. In addition, participants believed that research focusing on strategies that better linked classroom and clinical learning is needed.

3.3.5 Linking barriers and educational strategies

Figure 3.2 illustrates the most common barriers identified in the included studies. The presence of the setting-related barriers was also supported by the stakeholders. Table 3.3 provides a description of the barriers that each of the evaluated educational strategies is attempting to address. There is evidence that some identified barriers are addressed, others have been somewhat addressed, and others have received minimal attention. When looking at strategies that focus on the student/faculty/nurse, most commonly, educational strategies were

focused on addressing the barrier of knowledge and skills on the part of nursing students, faculty and nursing staff (n=22/23, 96%); followed by attitudes (10/23, 44%). No studies looked at the barrier of educational preparation. In terms of characteristics of the setting, educational strategies evaluated looked at addressing support for EBP in 9/23 studies (39%). Curriculum is a barrier that was frequently addressed, in 19/23 (83%) of studies. Resources to support EBP in the clinical setting was a barrier addressed in only 2/23 (9%) of studies. One out of the twenty-three studies (4%) examined the barrier of quality and relevance of the evidence, and 3/23 (13%) of studies focused on the availability of evidence as a barrier. Education alone, and interventions combined with education had the most studies with statistically significant positive outcomes in terms of improvements in participants' knowledge, skills and attitudes toward EBP.

3.4 **Discussion**

Using the Arskey and O'Malley approach to scoping reviews, a number of studies that reflect barriers and facilitators to nursing students' use of EBP were identified; along with studies that reflect the evaluation of educational strategies to promote nursing students use of evidence as part of their clinical placements. The most common barriers identified in the included studies are those related to support in the clinical setting, as well as knowledge, skills and attitudes on the part of nursing students, faculty and nursing staff. Many of the educational strategies evaluated represent approaches that address these barriers, however a number do not. Combining strategies appears to be the best approach to address multiple barriers. Limitations of the literature reviewed include a lack of description of barriers and facilitators from the perspective of staff nurses that support nursing students in clinical placements, and interventions that engage the multiple stakeholders (clinical nurses, interprofessional team members, and faculty) that influence nursing students' EBP in clinical settings.

3.4.1 Implications for Education

This scoping review demonstrates that a number of educational strategies have been evaluated to address the barriers to nursing students' use of evidence in clinical education. There are many ways to improve the situation; it is important as educators that we *do something*, and that something must represent an integrated approach that crosses classroom and clinical settings. Blackman and Giles (2017), in a recent study, have demonstrated that EBP knowledge and skills have the largest positive influence on participants' ability to apply clinical practice improvement strategies (Results section 3, para. 2). As shown in the included studies in this review, education related to EBP processes would help to address the barrier of lack of knowledge and skills. The barriers of negative attitudes to using research findings, and the lack of time available to implement findings in practice would be addressed through EBP projects. In addition, if students engage in the EBP process on clinical units, they will be able to better comprehend the relevance of research findings. Similar to the literature related to strategies to promote EBP by nurses in clinical practice settings (Yost et al., 2014), it is likely that using multiple approaches to nursing student education will improve students' knowledge, attitude and skills related to EBP. Doubtless, many educators may still question how they may be able to make these changes.

One model that may provide guidance in making changes in our approach to education is that of Khan and Coomarasamy (2006). They have proposed a hierarchy of teaching methods for the effective education of health care professionals related to EBP. The authors advocate for "clinically-integrated-interactive" approaches to teaching that are based on the learners' needs and the clinical context. Activities that fall under this include journal clubs, clinical rounds, and case discussions, as well as the previously mentioned EBP projects featured in a number of

studies included in this review. Interventions such as EBP projects engage students; they take an active role in their learning, and act not as mere recipients of knowledge, but also creators of that knowledge.

In order to make these changes in approaches to nursing student education, role development for clinical instructors and clinical nurses supporting students is necessary for these approaches to be used. This would address the barrier identified in the review related to the educational preparation of faculty. Hussein and Hussein (2013) have indicated that those faculty that taught in clinical settings actually had less positive attitudes toward EBP than classroom professors, perhaps because of a lack of training resources and less academic preparation. This reflects a recommendation in the recently published best practice guideline *Practice education in nursing education* from the Registered Nurses' Association of Ontario (RNAO) that: "clinical nursing instructors possess current theoretical and clinical expertise and support ongoing professional development opportunities to promote the transfer of theory to practice" (2016, p. 9). Faculty workshops such as those evaluated by Higuchi and colleagues (2006), hold promise to help address the issue of clinical instructor knowledge and skills related to EBP.

Similar to the findings of studies included in this review that focused on the barriers inherent in the clinical settings, and strategies to try to minimize them, Ryan (2016) has identified that the focus on the more practical, skills based aspects of nursing takes priority over EBP implementation; and that this characteristic of nursing as well as unit culture must be addressed. Henderson, Cooke, Creedy and Walker (2012) indicate that practice areas should have nurse specialists or champions that are encouraged to support EBP in clinical areas; and that leadership in clinical areas should focus on changing unit cultures to be more open to practice improvements through EBP. Additionally, improved partnerships between clinical and

academic agencies may promote EBP by both students and nursing staff. Beal (2012) has indicated the benefits of academic-service partnership include: "…maximization of resources, enhanced opportunity for educators to remain current in practice, cost effective quality care and education of students and staff, increased research productivity, and development of patterns of excellence" (Section 3.3). Successful interventions described in Beal's review were those that emphasized collaboration between clinical staff and student nurses, and nurse educators. Blackman and Giles (2017) identify the importance of nursing students observing EBP practices in the clinical setting; notably that this influences their subsequent confidence in engaging with EBP (Discussion section, para.1). These approaches would help to address common barriers identified, such as lack of supports, negative attitudes toward EBP and students' lack influence in the clinical setting.

3.4.2 Implications for Research

The majority of studies that focused on the identification of barriers and facilitators to the use of evidence in clinical education were from the perspective of students, and secondarily from the perspective of faculty. It would be of benefit to expand the body of literature focusing on the perceptions of faculty, in particular the clinical instructors that are working with students in the clinical setting, and also to focus on the staff nurses that are working side-by-side with students as part of their placements. What do they see as the barriers and facilitators to nursing students' EBP? What do they see as their role in supporting students as part of their clinical education? How do the barriers and facilitators to clinical nurses' EBP link with those identified by nursing students and faculty?

Nursing students' use of evidence in clinical education does not occur in isolation. It is an inherently social process, affected by the faculty members (both in-class and in clinical

settings), nursing staff and interprofessional team members. While many of the educational strategies evaluated did attempt to affect more than one of the parties described above, none of them considered all. An important contribution to this area would be to evaluate strategies that impact on all relevant players influencing nursing students' use of evidence in clinical education, recognizing the potential methodological challenges that would present.

Part of this review included documenting the methods employed in this area of educational research. Overall there is a lack of experimental methods employed, with most studies using single sites with small convenience samples. In its position statement on nursing research, The American Association of Colleges of Nursing (AACN) (2006) calls for "the use of rigorous research strategies in the assessment of the teaching-learning process and outcomes at all levels of nursing education…" (Nursing education research section). The National League for Nursing (NLN) (2016) echoes this call in its *Research Priorities for 2016-2019*, indicating that research efforts: "Build the science of nursing education through the discovery and translation of innovative evidence-based strategies" through the "Creation of robust multi-site, multi-method research designs that address critical education issues" (p.2). The AACN (2006) goes on to acknowledge that a lack of funding for nursing education research has hampered progress in this area. More rigorous studies in this area will help to raise the profile of educational research and result in better educational outcomes for nursing graduates and patient outcomes for those in their care.

An additional research limitation that arose from the scoping review is the apparent lack of evaluation tools that are specific to measuring EBP constructs in nursing student populations. The NLN Nursing Education Research Priorities (2016) recommend: "development and testing of instruments for nursing education research to measure learning outcomes and linkages to

patient care" (p.2). Eighty-three percent of included intervention studies and 50% of descriptive studies used researcher-developed tools, and for those studies that used validated tools, the majority were tools that have been validated in practicing clinicians (nurses and others). Ruzafa-Martinez and colleagues (2013) have described the development and initial validation of the *Evidence-based practice evaluation competence questionnaire (EBP-COQ)*, indicating that it is an appropriate tool to evaluate nursing students' competence in EBP. Upton, Scurlock-Evans and Upton (2016) have recently published a description of the Student(S)-EBPQ, along with reporting results of the tool's reliability and validity. This tool measures frequency of EBP practices and attitudes towards EBP as well as factors relating to sharing and applying EBP and retrieving/reviewing evidence. Having instruments that specifically measure the constructs related to nursing students and evidence-based practice will facilitate the conduct of rigorous, relevant research in this area that can then inform educational practice.

3.5 **Strengths and Limitations**

Davis, Drey and Gould (2009), as well as Pham et al. (2014) advocate for more standardized approaches to this type of synthesis. At this time, there are no reporting guidelines for scoping reviews, as exists for systematic reviews (Equator network, 2016). In their review of scoping studies, Davis and colleagues (2009) compared included studies against criteria described by Anderson, Allen, Peckham and Goodwin (2008). The criteria met in this scoping review include: 1) using a systematic approach to identification of studies; 2) identification of strengths and weakness of the research base; 3) identification of research gaps; 4) providing recommendations for future research; 5) indicating the value of further empirical research; and 6) acting as a resource for research findings.

Additional strengths of this review relate to the procedures that were undertaken to ensure the reliability and validity of the literature search process, the selection of articles for inclusion and the extraction of data. The protocol for the scoping review was created by a team with expertise in nursing education and knowledge synthesis, including library scientists. Two reviewers screened citations and abstracts, with involvement of a third reviewer in cases of disagreement and uncertainty.

One of the possible limitations of this scoping review is that it may have missed some relevant studies, as the grey literature was not searched and online search engines such as Google and Google Scholar were not utilized. This limitation was mitigated through hand searching reference lists of included articles, as well as the tables of contents of relevant journals, and through consultation. This scoping review was limited to English and French articles, this may have limited results, as research in this area is taking place in a number of non-English speaking countries. Limitations of the review also stem from limitations of the included studies. For example, many studies did not provide a fulsome description of the educational strategies evaluated. It is important to recognize that nursing education will vary from country to country and from program to program, so applicability to other settings outside that of the original country of study or study setting may be limited.

3.6 **Conclusion**

This scoping review has considered the unique context of clinical education, and summarized the literature relating to the barriers and facilitators that impact on students' EBP as well as the educational strategies that have been evaluated. There is some evidence to suggest that approaches that engage students in EBP projects in clinical areas, along with the provision of education to students, nurses and faculty to provide EBP knowledge and skills can reduce the

barriers such as limited knowledge and poor attitudes to and enhance facilitators of EBP. The implications of this review are relevant at the level of individual schools of nursing and hospital units, at the level of academic and clinical partnerships, as well as the level of health care research and national nursing accreditation associations. Schools of nursing must look at curriculum models that support the integration of EBP competencies beyond the classroom. Clinical instructors and nurses, in order to have credibility and capacity to support students in this important learning, must have the competencies to do so. As well, academic and clinical agencies must engage in meaningful partnerships that will result in improvements in the student's learning as well as clinical care processes.

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3.7 **References**

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Table 3.1 Summary of studies describing barriers, facilitators and other factors influencing EBP in clinical education

(n=14 - Higuchi et al. & Smith-Strom et al. included numerically in Table 3.2)

Authors	Date	Country	Sample	Theoretical Framework	Design Data Collection	Key findings
Students						
Arslan & Celan	2014	Turkey	263	None described	Descriptive cross-sectional correlational survey	Positive attitudes towards EBP associated with: Taking research course; reading journal articles; participating in scientific activities; desire to do research after graduation.
Ax & Kincade	2001	UK	12	None described	Qualitative descriptive interviews	**Barriers described**: Students' resistance, clinical staff and managers' resistance; difficulty understanding research and its relevance to nursing.
Bjorkstrom, Johansson, Hamrin & Athlin	2003	Sweden	155	None described	Descriptive cross-sectional correlational survey	Positive attitude toward research related to: interest in research area; being female; older age; previous academic study. 77% knew of at least one researcher 25% had never read one of the scholarly journals listed 60% expected to use nursing research. 25% thought nursing education included too much research. 17% felt education did not prepare them very well for the use of research.

Authors	Date	Country	Sample	Theoretical Framework	Design Data Collection	Key findings
Brooke, Hvalic-Touzery & Skela-Savic	2015	UK Slovenia	70	None described	Interpretive Phenomenology focus groups	**Barriers described**: Lack of nurses' involvement in research; time limitations; difficulty accessing information; students' lack of awareness of EBP; maintaining research skills once a nurse. Students perceived that EBP/research: Provided confidence, knowledge and empowerment in clinical practice; is vital for improvements in patient care and safety; and part of students' responsibility to develop nursing as a profession.
Brown, Kim, Stichler & Fields	2010	US	436	None described	Cross-sectional quantitative descriptive survey	52.9% reported too much information 47.8% unable to judge quality of retrieved information. 46.8% too busy to get information. Longer length of time in program associated with: EBP knowledge; attitudes toward; and future use of EBP. Having confidence in clinical decision making associated with: EBP knowledge; EBP use; and future use of EBP. Being prepared for clinical associated with: EBP knowledge; EBP use; future use of EBP. Frequently used sources of evidence: Textbooks-84%,Internet-77%, RNs/MDs-51%.
Florin et al.	2011	Sweden	1440	None described	Cross-sectional quantitative descriptive / correlational survey	Students experienced a higher degree of support for RU during campus education vs. clinical education. Positive correlations from 0.140-0.316 found between students' experience of support for RU and capability beliefs re: EBP skills. Support for RU during clinical education correlated with capability beliefs.

Authors	Date	Country	Sample	Theoretical Framework	Design Data Collection	Key findings
Higuchi, Cragg, Diem, Molnar & O'Donohue	2006 (a)	Canada	20	None described	Qualitative descriptive focus groups & interviews	**Barriers described:** lace of knowledge about BPGs, lack of integration in clinical courses
Jonsen, Melender & Hilli	2013	Sweden Finland	24	None described	Qualitative descriptive focus groups	**Barriers described**: disconnect between theoretical nursing and practice; little attention to EBP on the part of clinical preceptors; clinical preceptors had intolerant and condescending attitudes toward research. **Facilitator described:** getting support from some preceptors to search for articles that related to clinical problems.
Llasus, Angosta, Clark	2014	US	174	None described	Cross-sectional quantitative / qualitative correlational survey	**Barrier described**: relying on teaching EBP in the classroom. **Facilitators described**: using a problem-solving approach in the clinical setting; students' EBP readiness. EBP knowledge M=7.62 (max score = 15); EBP readiness above average; EBP implementation low. EBP readiness and knowledge positively correlated. EBP readiness and implementation positively correlated. EBP implementation and EBP knowledge negatively correlated (decrease in EBP knowledge associated with an increase EBP implementation).

Authors	Date	Country	Sample	Theoretical Framework	Design Data Collection	Key findings
MacVicar	1998	Scotland	10 midwifery students 9 nursing students	None described	Qualitative Ethnography Interviews	**Barriers described**: Negative attitudes, fear of some staff; students' lack of influence/power in clinical setting & poor practice environments. **Facilitators described**: Students being imaginative, creative, perceived benefits of research; peer discussion/reflective sessions; having a research component in clinical course, with assignments and seminars on campus; and manager support.
Smith-Strøm, Oterhals, Rustad & Larsen	2012	Norway	14	None described	Descriptive evaluation, focus groups	**Barriers described**: lack of time; not a priority; searching for articles difficult; articles not written in Norwegian; lack of engagement / encouragement / knowledge of staff nurses. **Facilitators described**: Students' skills in EBP; leaders' and fellow students' commitment to EBP.
Faculty						
Stichler, Fields, Kim & Brown	2011	US	40	Diffusion of innovation Adult learning theory	Cross-sectional quantitative correlational Survey	**Barriers described**: unaware of relevant research; isolated from knowledgeable peers; lack of time; no authority to change focus to EBP; implications for education not clear. Multiple regression analysis indicate barriers to teaching EBP effect the "practice" of teaching EBP more than the "knowledge and skills" or "attitudes" toward EBP. Master's level education associated with positive attitude toward EBP, PhD associated with negative attitude to EBP. EBP knowledge and skills positively correlated with EBP.

Authors	Date	Country	Sample	Theoretical Framework	Design Data Collection	Key findings
Upton, Scurlock Evans, Williamson, Rouse & Upton	2015	UK US Australia	81	None described	Cross-sectional quantitative / qualitative correlational survey	**Barriers described**: Not knowing where to find evidence; having relevant, accessible evidence; lack of time and power to change things in the clinical setting; lack of cohesion between academic and clinical teaching contexts; lack of concordance between nursing education and clinical reality; students feel it is boring and pointless. **Facilitators described**: access to the internet in the workplace; post-graduate education; curriculum enhancements; confidence in EBP skills. Academic faculty reported greater knowledge/skill in EBP than clinical faculty
Walti-Bolliger, Needham & Halfens	2007	Switzerland	222	Diffusion of innovation	Cross-sectional quantitative / qualitative Correlational survey	**Barriers described**: Lack of time to bring new ideas up and to read research; lack of accessibility of research reports; lack of nursing science knowledge of colleagues; lack of collaboration of MDs; lack of support from administration and the team; lack of financial resources, material and expertise. Research experience and research education influence communication of research findings.
Faculty and students						
Kajermo, Nordstrom, Krusebrant & Bjorvell	2000	Sweden	37 faculty 166 students	None described	Cross-sectional quantitative / qualitative descriptive survey	**Barriers described**: implications for practice not clear; research not readily available; nurse is isolated from knowledgeable peers. **Facilitators described**: education for nurses; opportunity to participate in research projects; change of nurses' attitudes toward research; time to read and discuss research; increased staffing; positions devoted to RU; cooperation between academic and clinical settings; support from managers; access to high quality, relevant research.

Table 3.2 Characteristics of evaluation studies

(n=23)

Authors	Date	Country	Sample (N)	Theoretical Framework	Design Data collection	Intervention
Education only						
Higuchi, Cragg, Diem, Molnar & O'Donohue	2006 (c)	Canada	43	None described	Quantitative descriptive survey	Faculty education
MacLaren, Cohen, Larkin & Shelton	2008	US	50	None described	Quasi-experimental, pre-test, post-test survey and observations	Education
Mohide & Matthew-Maich	2007	Canada	9 dyads	None described	Post-test only, survey and interviews	Educational workshop – students and preceptors
Zhang, Zeng, Chen & Li	2012	China	75	None described	Pre/post-test design	Education
EBP practice projects						
Brancato	2006	US	Not reported	None described	Descriptive evaluation surveys + other data sources	EBP project
Foss, Kvigne, Larsson & Athlin	2014	Norway and Sweden	68	Collaborative model of best practice	Post-test only pilot test, survey	EBP project
Helms & Pruitt-Walker	2015	US	Not reported	None described	Descriptive evaluation, data collection approach not specified	EBP project "paint a picture of mental illness"
Kenty	2001	US	29	None described	Pre-test, post-test evaluation survey	EBP project
Kruszewski, Brough, & Killeen	2009	US	24	None described	Descriptive evaluation survey and focus group	EBP project
Morris & Maynard	2009	UK	3 students 2 mentors	None described	Pre-test/post-test, survey	EBP project

Authors	Date	Country	Sample (N)	Theoretical Framework	Design Data collection	Intervention
Schoenfelder	2007	US	13	None described	Descriptive evaluation survey	EBP project
Smith-Strøm, Oterhals, Rustad & Larsen	2012	Norway	14	Lave and Wenger's situated learning	Descriptive evaluation, focus groups	EBP project
Stone & Rowles	2007	US	42	None described	Descriptive evaluation, phone survey	EBP project
Tishelman, et al.	2007	Sweden	107	None described	Post-test only, surveys + other sources of data	EBP project
Other single strategies						
Aari, Elomaa, Yloden & Saarikoski	2007	Finland	20	None described	Pre-test, post-test survey	One PBL cycle with two tutorials during 4-week clinical placement.
Harmer, Huffman & Johnson	2011	US	16 dyads	Situated learning theory Tanner's clinical judgement model	Post-test only, survey	Clinical Peer Mentoring experience on a Dedicated Education Unit
Mattila, Rekola, Koponen & Eriksson	2013	Finland	53	None described	Post-test only, survey	Journal club
Combined educational strategies						
Finotto, Carpanoni, Tuorroni & Camellini	2013	Italy	300	None described	Quantitative descriptive survey	Education + EBP projects, across 3 years of curriculum.
Higuchi, Cragg, Diem, Molnar & O'Donohue	2006 (b)	Canada	Faculty n=19 29 pre, 13 post-test Students	None described	Pilot Pre-test / post-test evaluation Survey and telephone interviews	Faculty education + website

Authors	Date	Country	Sample (N)	Theoretical Framework	Design Data collection	Intervention
			111 pre-workshop 85 end of placement			
Kim, Brown, Fields & Stichler	2009	US	208	None described	Quasi experimental, controlled, pre-test/post-test survey	Education + EBP project
Laaksonen, Paltta, von Schantz, Ylonen & Soini	2013	Finland	Nurses 216 Students 235	None described	Descriptive evaluation using semi-structured survey	EBP project + journal club
Mattila & Eriksson	2007	Finland	50	None described	Descriptive evaluation survey	EBP project + journal club
Morris & Maynard	2010	UK	Nursing 8 Physio 10	None described	Pre-test/post-test, survey	Personal Data Assistant + EBP activity (guideline appraisal)
Oh, Kim, Kim, et al.	2010	Korea	74	None described	One group pre-test/post-test, survey	Education + EBP project

Table 3.3 Summary of results of evaluation studies

(n=23) *denotes statistically significant improvement

Authors	Design Instrument	Barrier(s) Addressed	Outcome	Results
Education only				
Higuchi, et al. 2006 (c) (n=34)	Quantitative descriptive Researcher developed questionnaire	Faculty: Attitude re: BPGs Knowledge re: BPGs	Attitudes to BPGs - instructors	Confidence in implementing BPGs in teaching M=3.76/5 – mean score
			Knowledge of BPGs-instructors	Able to ID BPGs suitable for students M=4.14/5 – mean score
MacLaren, et al., 2008 (n=50)	Quasi-experimental, pre-test, post-test Researcher developed questionnaire	Students': Knowledge re: EBP pain strategies Attitudes toward pain management Curriculum	Knowledge of pain concepts	t-test Control Pre M=10.78; Post M=11.00 Training Pre M=11.26; Post M=13.00* p<0.05
			Attitudes toward pain management	Control same pre & post Training Pre M=3.72; Post M=4.04
Mohide & Matthew-Maich, 2007 (n=18)	Post-test only Researcher developed questionnaire	Students' and Preceptors': Attitudes Knowledge/skills Support Resources Availability	Attitudes	Narrative summary-positive
			Knowledge-preceptors & students	Narrative summary-positive
			Knowledge-students	Narrative summary-positive
			Support/Resources/Availability	Narrative summary-positive
Zhang, et al., 2012 (n=75)	Pre/post-test design Researcher-developed questionnaire	Students': Attitudes/Beliefs Knowledge Curriculum	Attitudes & beliefs	t-test Pre intervention M=35.67 Post intervention M=38.99* p<0.05
			Knowledge	Pre intervention M=11.51 Post intervention M=17.11* p<0.05

Authors	Design Instrument	Barrier(s) Addressed	Outcome	Results
			Behaviour	Pre intervention M=10.99 Post intervention M=17.11* p<0.05
EBP project only				
Brancato, 2006 (n not reported)	Descriptive evaluation Researcher developed questionnaire	Students': Knowledge/skills Support Availability Curriculum	Knowledge/skills	Narrative summary-positive
			Support	Narrative summary-positive
			Availability	Narrative summary-positive
Foss, et al., 2014 (n=68)	Post-test only Researcher developed questionnaire	Students' and nurses': Attitude Knowledge/skills Support Quality/Relevance Curriculum	Attitude	74% 2nd year 95% 3rd year reported EBP important for care RNs narrative summary-positive
			Knowledge/skills	RNs narrative summary-positive
			Support	100% 2nd year 95% 3rd year reported collaboration worked well RNs narrative summary-positive
Helms & Pruitt-Walker, 2015 (n not reported)	Descriptive evaluation Student's anecdotal notes	Students': Knowledge/skills Curriculum	Knowledge/skills	Narrative summary-positive
Kenty, 2001 (n=29)	Pre-test, post-test Evaluation Knowledge, Attitudes and Behaviors for EBP (Johnston et al., 2003)	Students': Attitudes/beliefs Knowledge/skills Curriculum	Attitudes	Scores not provided "increases in student attitude were not significant"
			Knowledge/skills	Scores not provided "increases in student knowledge were significant"
Kruszewski, et al., 2009 (n=24)	Descriptive evaluation Researcher-developed	Students': Attitudes Knowledge/skills	Attitudes	Students' scores above level of competency for belief in importance of EBP

Authors	Design Instrument	Barrier(s) Addressed	Outcome	Results
	interview guide & Performance scale (12 criteria for EBP – based on CURN model)	Curriculum	Knowledge/skills	Students' scores above level of competency for items related to knowledge of EBP
Morris & Maynard, 2009 (n=3)	Pre-test/post-test Fresno questionnaire (Ramos et al., 2003; adapted by McCluskey and Lavoarini, 2005)) plus researcher developed questionnaire	Students': Knowledge/skills Support Curriculum	Knowledge/skills	Fresno score by participant 1: pre = 50, post = 68 2: pre = 57, post = 88 3: pre = 78, post = 87
			Support	Narrative summary-positive
Schoenfelder, 2007 (n=13)	Descriptive evaluation Researcher developed questionnaire	Students': Attitudes toward EBP guidelines Knowledge re: gerontology Curriculum	Attitudes toward EBP guidelines	Narrative summary-positive
			Knowledge re: gerontology	Narrative summary-positive
Smith-Strøm, et al., 2012 (n=14)	Descriptive evaluation Researcher developed interview guide	Students': Attitudes Knowledge/skills Support	Attitudes	Narrative summary-mixed
			Knowledge	Narrative summary-positive
			Support	Narrative summary-positive
Stone & Rowles, 2007 (n=42)	Descriptive evaluation Researcher developed interview guide	Setting: Support (lack of time) Curriculum	Education of nursing staff	59% of nurses surveyed said project educated nursing staff.
			Change of policy / practice on unit	3 projects changed policy 5 projects changed practice
Tishelman, et al., 2007 (n=107)	Post-test only Researcher-developed questionnaire	Students': Knowledge/skills Setting: Support Curriculum	Knowledge	Narrative summary-positive
			Collaborative partnerships academic/clinical	Narrative summary-negative

Authors	Design Instrument	Barrier(s) Addressed	Outcome	Results
Other single strategies				
Aari, et al., 2007 (n=20)	Pre-test, post-test Researcher developed questionnaire	Students': Attitude toward Information retrieval Knowledge/skills Curriculum	Attitude	Scores not provided "no significant difference in attitude"
			Knowledge/skills (PBL)	Scores not provided "increases in PBL skills significant"
Harmer, et al., 2007 (n=32)	Descriptive evaluation Students anecdotal notes	Students': Knowledge/skills Curriculum	Knowledge/skills	Narrative summary-positive
Mattila, et al., 2013 (n=53)	Post-test only Researcher-developed questionnaire	Students': Knowledge/skills Setting: Support Curriculum	Knowledge/skills	40/53 learned to read research articles 37/53 understood what evidence-based nursing is 40/53 were able to search for knowledge from various sources 40/53 learned about the research process
			Support	Narrative summary-positive
Combined educational strategies				
Finotto, et al., 2013 (n=300)	Post-test only Researcher-developed questionnaire	Students': Knowledge/skills Curriculum	Knowledge/skills	Highest rating = 10 M=7- Skills useful M=5 - Difficulty forming clinical question M=6 Used PICO M=7 Use of PubMed M=5 Use of ClNAHL M=7 Effective research on electronic database M=7 Found evidence for clinical problems

Authors	Design Instrument	Barrier(s) Addressed	Outcome	Results
Higuchi, et al., 2006(b) (n= faculty 29 pre, 13 post-test Students 111 pre-workshop 85 end of placement)	Researcher developed questionnaire	Instructors': Attitude Knowledge/skills Students': Attitude	Attitude toward BPGs-instructors	One- way ANOVA Pre-workshop M=3.93 Post-workshop M=3.92
			Knowledge of BPGs-instructors	Pre workshop M=2.62 Post workshop M=3.35*p≤0.01
			Behaviours (Use of BPGs) - instructors	Pre-workshop M=2.21 Post-workshop M=3.08*p≤0.05
			Attitude toward BPGs-students	BPGs useful for learning re: nursing practice Pre-workshop M=3.86 Post-workshop M=3.92 BPGs useful for learning about client care Pre-workshop M=3.82 Post-workshop M=3.99 Easy to implement BPGs in mental health clinical Pre-workshop M=1.59 Post-workshop M=2.29* p≤0.01
Kim, et al., 2009 (208)	Quasi experimental, controlled, pre-test/post-test	Students': Attitudes Knowledge/skills Curriculum	Attitudes	t-test Exp group 4.78, Control group 4.90
			Knowledge	Exp group 5.68, Control group 5.43* P=0.001
			Behaviours	Exp group 2.62, Control group 2.36* P=0.015
			Future use of EBP	Exp group 5.17, Control group 5.04
Laaksonen, et al., 2013 (n=216 nurses, 235 students)	Descriptive evaluation Researcher developed interview guide	Students': Knowledge/skills Setting: Support Curriculum	Knowledge/skills	75% of students reported improved competence in EBP skills
			Support	Narrative summary-positive

Authors	Design Instrument	Barrier(s) Addressed	Outcome	Results
Mattila & Eriksson, 2007 (n=50)	Descriptive evaluation Researcher developed interview guide	Students': Knowledge/skills Curriculum	Learning of research skills	28/132 mentioned familiarization with research article 48/132 mentioned understanding of research concepts 56/132 mentioned understanding of research in nursing practice
			Learning of nursing care	3/64 indicated that assignment did not advance their learning of nursing care.
Morris & Maynard, 2010 (n=18)	Post-test pilot study Researcher developed questionnaire	Students': Knowledge/skills Setting: Resources Presentation: Availability	EBP knowledge and skills	14/19 reported development of EBP skills related to application 13/19 reported development of EBP skills related to critical appraisal 7/19 reported development of EBP skills related to search and retrieval
			Resources/availability	13/30 rarely used PDA 4/30 used PDA in clinical setting 11/30 felt no "added value" to use of PDA
Oh, et al., 2010 (n=74)	One group pre-test/post-test EBP Efficacy Scale developed by researchers; Barriers to RU (Funk et al., 1991)	Students': Knowledge/skills Curriculum	EBP efficacy	t-test Pre-test M=2.30; Post-test M=3.05* p<0.001
			Students' perceptions of Barriers to research utilization	Pre-test M=2.02; Post-test M=1.67* p<0.001

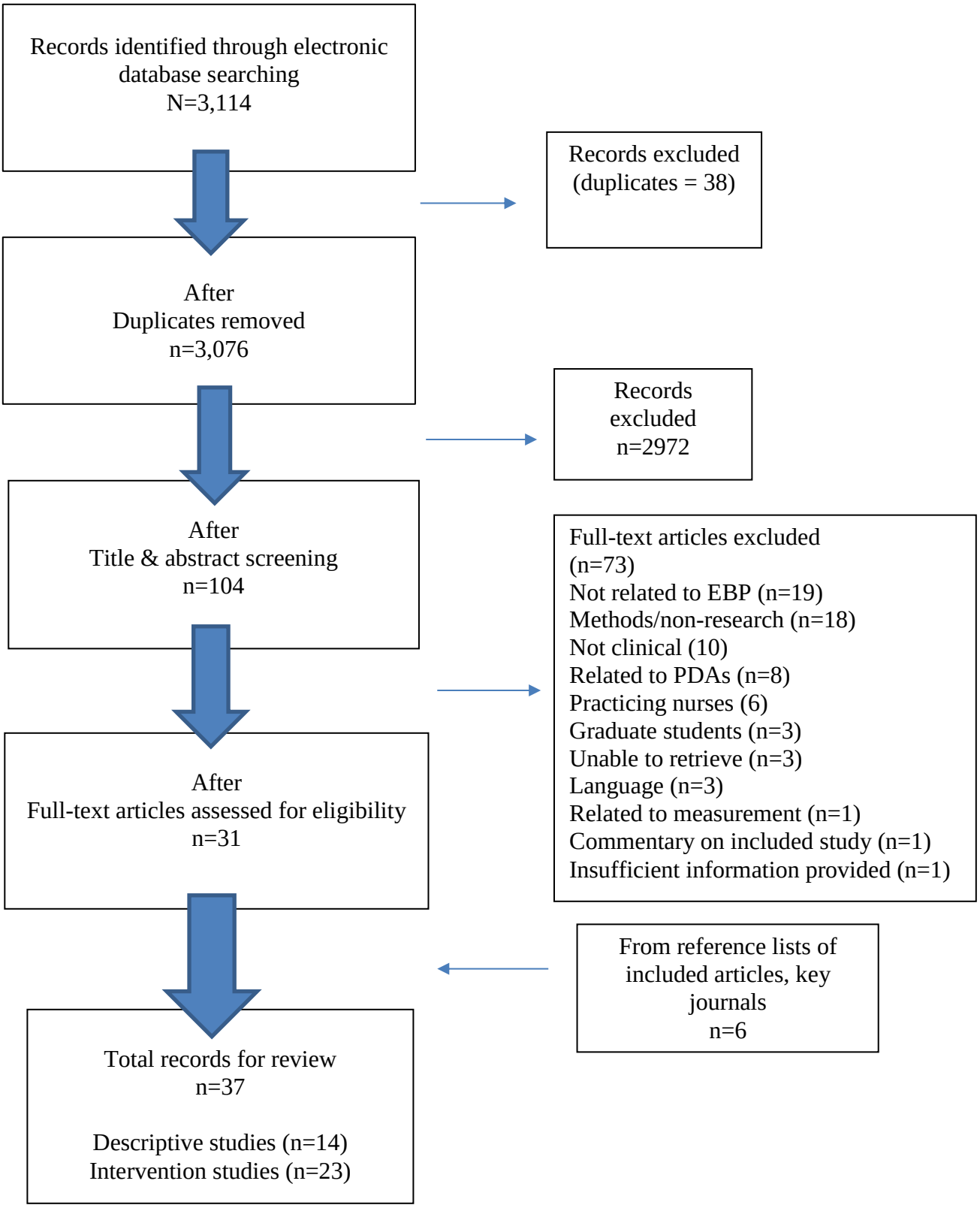

Figure 3.1 Flow diagram of study selection

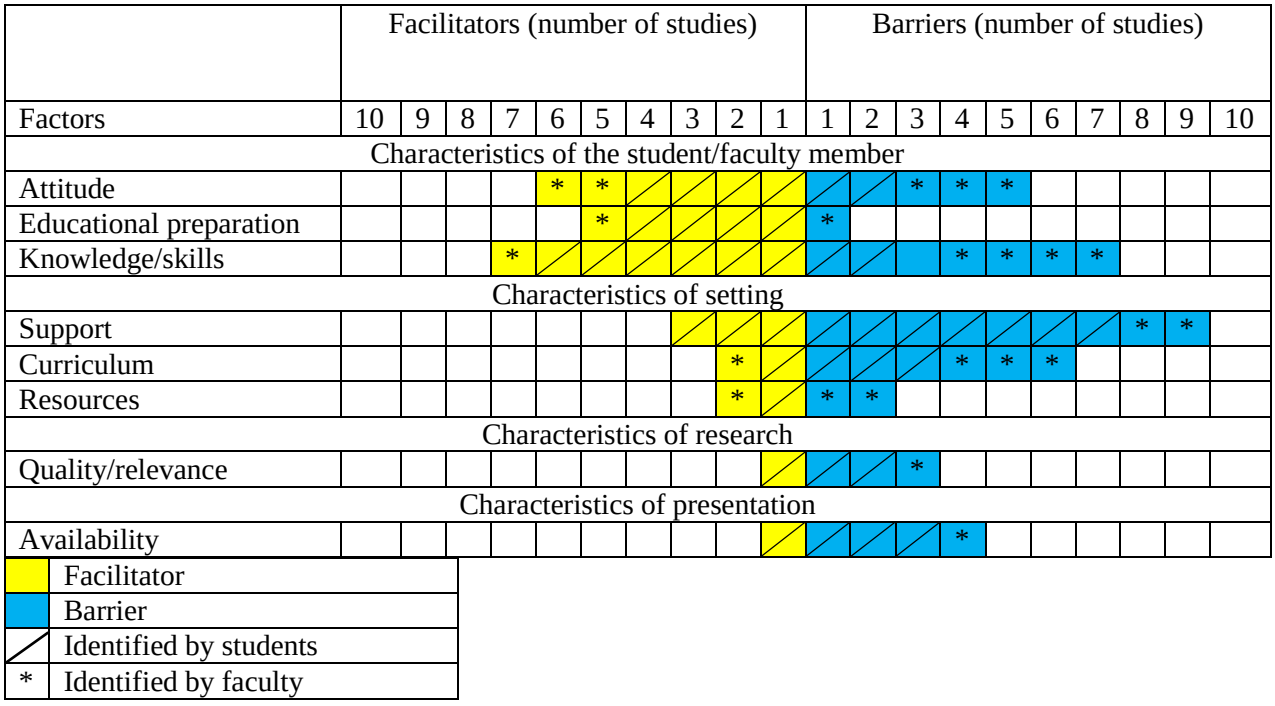

Figure 3.2 Number of studies in which barriers and facilitators to the use of evidence in clinical education have been identified

Chapter 4: Developing guideline-based quality indicators: Assessing gaps in pain management practice

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Abstract

Aim: In this paper, the authors discuss a multi-phase approach for developing quality indicators based on pain practice guidelines, and the challenges associated with the process. The presentation is based on previously published reporting standards for guideline-based quality indicators. **Methods:** the following steps of the indicator development process were undertaken: 1) topic selection; 2) guideline selection; 3) extraction of recommendations; 4) quality indicator selection; and 5) practice test. **Results:** Eleven practice guidelines were reviewed for quality, and 3 high quality guidelines were compared for pertinent recommendations. From these three guidelines, 12 recommendations were extracted and judged appropriate to examine the practice gap for nursing students and clinicians on an oncology and palliative care unit. Quality indicators were then identified by a consensus process, resulting in 24 discrete indicators that were included in the practice test. **Conclusions:** Quality indicators can be used to examine gaps in pain management practice, and to evaluate change after guideline implementation. However, their development can be challenging, and guideline developers could facilitate uptake of guidelines by including clear, relevant quality indicators as part of guideline creation and presentation.

Key words: Evidenced-Based Practice; Pain; Performance Measures; Practice Guidelines; Quality Indicators

What is known about the topic?

- Evidence-based practice guidelines are helpful tools for individuals and teams looking to improve clinical practice.
- It is important to examine evidence-practice gaps prior to implementing guideline recommendations and to evaluate any change in practice following implementation.
- Quality indicators based on clinical practice guideline recommendations can be used to examine evidence-practice gaps and to evaluate practice change, however many practice guidelines do not include them.

What does this paper add to the topic?

- An example of a process for the development of quality indicators from practice guidelines.
- Lessons learned from the process for research teams wanting to create quality indicators from practice guidelines, especially in relation to the evaluation of evidence-based recommendations for patient care processes and outcomes.
- Suggestions for guideline developers related to quality, wording and grading of recommendations, and for including indicator development as part of the guideline development process.

4.1 **Background**

Many health care providers implement best practice guidelines (BPGs) to improve practice and patient outcomes. According to the authors of the Registered Nurses' Association of Ontario (RNAO) *"Toolkit for the Implementation of BPGs"* BPGs: "are developed and implemented to deliver effective care based on current evidence." [1 (p7)] They also indicate that BPG recommendations are statements that reflect the best evidence to support a given practice. The suggested first phase of the BPG implementation process includes conducting a needs assessment to determine the "practice gap" between recommended practices and current practice.[1-4] Authors of the RNAO toolkit for the implementation of BPGs propose a 'gap analysis tool' to determine the extent to which practices are evidence-based, whether they be fully, partially or not at all rooted in BPG recommendations.[1 (p26)] The Joanna Briggs Institute (JBI) Practical Application of Clinical Evidence System (PACES)[5] supports pre-implementation audits to document current practice, prior to implementation of best practice recommendations, and was also used in a number of recent studies.[6-9]

Kitson and Straus[10] indicate that quality indicators (QIs) can also be used to examine practice gaps. They define quality indicators as "measures that monitor, assess, and improve quality of care and organizational functions that affect patient outcomes."[(p.60)]Approaches to developing QIs include: examination of best evidence from high-quality systematic reviews or practice guidelines, formal consensus methods such as the Delphi or nominal group techniques and consensus development conferences.[10,11] In their scoping review of development methods for nursing process health care indicators, Xiao and colleagues[11] also identified focus groups, questionnaires, interviews, workshops

and other meetings as means of elucidating indicators. Once QIs are determined, the gap can be measured through needs assessments and examination via chart audits or observation.[10]

The purpose of this paper is to describe the process used to develop guideline-based quality indicators. This was part of a larger project describing nursing students' use of guidelines for pain management in their oncology and palliative care clinical placements, where the authors set out to describe the gap between the recommended practices from practice guidelines related to pain assessment and management and the actual practice of nursing students, practicing nurses and other clinicians. The research team and advisory committees on each research site anticipated that this gap analysis would in turn provide insights into learning needs and practice processes needed to support improved efficacy of pain management. The starting point for this gap analysis was to develop guideline-based indicators.

4.2 **Methods**

Kotter and colleagues, for the purposes of data extraction for a systematic review of the literature focusing on methodological approaches to guideline-based QI development, identified six steps for guideline-based QI development[12(p3)]: 1) topic selection; 2) guideline selection; 3) extraction of recommendations; 4) quality indicator selection; 5) practice test; and 6) implementation. The latter step was not undertaken as the purpose of this aspect of the larger project was gap analysis. Advisory committees that provided input throughout the process are described below.

4.2.1 Composition of advisory committees

The larger study was conducted at two sites, with advisory committees for each site. The advisory committees at each site consisted of nursing and allied health clinical staff from the units (one medical oncology unit and one palliative care unit), nurse educators from both clinical and academic settings (who also had experience with quality improvement initiatives), and nursing student representatives.

4.3 Results of Process

4.3.1 Topic Selection

Topic selection was undertaken by the primary investigator (PI) (a PhD in nursing candidate and nurse educator with a clinical background in oncology and palliative care), and other members of the research team who specialize in knowledge translation and guideline implementation. Project advisory committees were also consulted during the topic selection phase Despite the fact that pain BPGs exist, and that pain management is a part of professional entry to practice competencies,[13] and pre-licensure competencies[14,15] authors of a recent review of the literature showed that medical and nursing students still lack satisfactory knowledge of pain management.[16] Conceptualizing this evidence-practice gap is essential, in order to best prepare graduates for the realities of practice, and to improve patient outcomes related to pain management. Effective pain management is also an issue of high clinical importance – authors of a systematic review of under-treatment of cancer pain reported that the pain of one in three cancer patients still goes under-treated.[17]

4.3.2 Guideline identification, appraisal and selection

Following topic selection, the next step of the process was to identify practice guidelines for the management of pain. A systematic search of websites and electronic

databases was conducted in 2014. The PIPOH framework (population, intervention, professionals/patients, outcomes, health care setting)[18] was used to define the inclusion and exclusion criteria for the search (see Table 4.1), and a research librarian was consulted regarding the guideline search process. The authors looked to two key publications to guide them: the process for guideline and systematic review search strategy in the *"Best practice guideline: Assessment and management of Pain"*[19] and the search methods for the *"Development and evaluation of evidence-informed clinical nursing protocols for remote assessment, triage and support of cancer treatment-induced symptoms"*.[20] All of the websites searched in the RNAO BPG search strategy were searched for pain guidelines. Additional sources for guidelines searched include: the National Guideline Clearinghouse (https://www.guideline.gov/); the SAGE directory of Cancer Guidelines (http://www.cancerview.ca/treatmentandsupport/grcmain/grcsage/); Fraser Health Hospice Palliative Care Symptom Guidelines (http://www.fraserhealth.ca/health-professionals/professional-resources/hospice-palliative-care/); Cancer Care Ontario symptom management tools(https://www.cancercare.on.ca/pcs/treatment/sympmgmt/); BC Guidelines.ca (http://www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines); and the National Consensus project for Quality Palliative Care (http://www.nationalcoalitionhpc.org/guidelines-2013/). The project was started in 2014, and the previous five years (2009-2014) were chosen for the search time frame to ensure that the guidelines considered were up to date. In addition, Medline, Embase, CINAHL and PsychINFO were searched for guidelines reflecting the following search terms: Pain assessment and management; guideline or practice guideline.

Eleven pain guidelines were identified (Table 4.2). Quality assessment using the AGREE II tool was subsequently completed.[21]This valid and reliable tool was developed to assess the methodological quality of practice guidelines across six domains: 1) scope and purpose; 2) stakeholder involvement; 3) rigour of development; 4) clarity of presentation; 5) applicability; and 6) editorial independence. In order to narrow the number of guidelines for full quality assessment, two reviewers used the rigour domain to assess all 11 of the guidelines. This domain "relates to the process used to gather and synthesize the evidence, the methods to formulate and update recommendations"[21(p10)], and was deemed useful and important by the authors in determining the quality of the guidelines. Guidelines with rigour scores of less than 50% were not included. The process of determining the quality of the guidelines by two reviewers was facilitated by using the online AGREE PLUS appraisal platform. This web application allows reviewers to complete an individual score on each domain, and automatically calculates the domain score based on the assessor's input. The review coordinator (PI) compared scores. In situations of disagreement on the scores on the domains, the reviewers met to discuss to ensure agreement. A third review was not required for any scores. Of the 11 pain guidelines screened, eight were excluded because of low rigour domain scores. Reviewers noted extreme variability in the quality of the guidelines. Of the 11 guidelines reviewed for rigour using the AGREE II criteria, scores ranged from 2% to 75%, mean = 39%. Only three guidelines qualified for full quality assessment (rigour scores >50%). Table 4.3 provides a comparison of the levels and grades of evidence used in each guideline to reflect the quality of their recommendations.

4.3.3 Extraction of guideline recommendations

A summary matrix of the recommendations, based on a template in an article by Graham and colleagues[22], was created, including the level of evidence for each recommendation (where available), as well as the full assessment on all quality domains using the AGREE II tool for each of the three included guidelines. Recommendations were grouped together in the following areas: 1) pain assessment and diagnosis; 2) patient issues and care processes; 3) non-pharmacologic interventions; and 4) pharmacologic/medical interventions. This matrix was presented to the advisory committee at the study sites. As part of a focus group meeting facilitated by the primary investigator, members reviewed the recommendations from the three higher-quality guidelines, and highlighted clinically important recommendations for their specific clinical context, as well as those that were common across two or three of the guidelines. For example, advisory committee members recommended that data gathered included whether patients were being followed by the palliative care consultation team, as part of the indicator relating to the involvement of the interprofessional team in pain management. In addition, members emphasized that data be collected related to the re-assessment of pain following the intervention(s), as related to the recommendation "reassess the person's response to the pain management interventions by using the same re-evaluation tool".[19(p38)] Agreement was sought informally, in line with focus group processes described by Xiao and colleagues.[11] Table 4.4 includes a brief description of the included guidelines and the recommendations that were selected by the advisory committee members.

4.3.4 Quality indicator selection

After selecting relevant recommendations from the included practice guidelines, the advisory committees and research team developed quality indicators. Nothacker and colleagues[26] recommend consideration of relevance, scientific soundness and feasibility when deciding on the most appropriate quality indicators. In this case, relevance and feasibility played a central role, more so than scientific soundness, given the low levels of evidence supporting many of the included guideline recommendations. Committee members looked to those outcomes that would contribute to improvements in patient care, and also considered documentation tools and practices in order to determine how 'measureable' the indicators actually were. In several cases, recommendations were reduced into feasible and measureable indicators, as many of the guideline recommendations reflect more than one clinical "action", or the recommendation was too vague to create a concrete indicator, making it difficult to have one indicator to reflect one recommendation, and to operationalize the indicator.

For example, one recommendation was: "*Screen for the presence or risk of any type of pain on admission or visit with a HCP; after a change in medical status, prior to, during and after a procedure."* For the purposes of gap analysis on an inpatient unit, knowing how pain assessment and management were documented, and the indicator was worded as: "*Proportion of patients that had a pain assessment documented on admission."* In the case of the recommendation: "Reassess the person's response to the pain management interventions by using the same re-evaluation tool", [9(p7)] it was unclear if the recommendation is focused on the *what* - reassessment of the person's response to the pain management interventions, or if it is focused on *how* – through the use of the same re-

evaluation tool. A list of initial indicators was created and specified as proportions, and are included in Table 4.4. A final list of indicators was achieved through informal consensus during focus groups with the advisory committees on each site, and research team meetings. The final list of indicators is included in Table 4.4

4.3.5 Practice test

For the practice test, a retrospective chart audit was conducted, reflecting four days of practice on the two units. The chart audits reflected the full 96 hours of patient care, and included the students', staff nurses' and other clinicians' pain management practices, as well as the patients' pain scores. All the charts were reviewed, as opposed to a just a representative sample of charts, as the goal of the audit was to describe the care of the entire population of patients on the units for the audit days.

Neither site had an electronic health record - at one site scanned electronic versions of charts were used for data collection, at the other, paper versions of charts were used. A codebook was developed with definitions of the indicators, as well as a description of where data could be found in the charts. Chart audits were completed by research assistants (a clinical nurse employed at each hospital, familiar with the patient population and documentation system) and the PI (a nurse educator). Both had clinical expertise in oncology and palliative care. The PI trained the research assistants by reviewing: the overall purpose of the study; the purpose of the audits; the codebook and how to enter data using the Excel spreadsheet.

Chart abstractions were completed jointly (the same charts reviewed at the same time by the research assistant and PI) and then separately, comparing results side-by-side to ensure consistency. At one site, after reviewing five charts, extraction sheets were

developed to promote accurate chart data extraction as each document (i.e.: medication administration records, flow sheets, progress notes) had to be opened separately making it difficult to track documentation across a single patient and pain episode. Data were then entered on an Excel spreadsheet. At each site, ten charts were reviewed by both the principal investigator and the research assistant, and results (by variable and cases) were compared using SPSS version 24 to ensure agreement. When there was a discrepancy between the two auditors, the charts were checked again to ensure correct information was collected. Regular discussions were held between the audit team members to ensure ongoing agreement and opportunities for clarification. Notes were kept by the auditors, providing clear explanation and rationale for some of the data collected. For example, notes were made if patients had a continuous infusion of opioids or if it was uncertain if an opioid analgesic was given for pain, sedation or shortness of breath. The practice test demonstrated that the quality indicators identified were feasible and measureable, and would provide data helpful for identifying practice gaps for pain mangement.

4.4 **Discussion**

The process of identifying practice guidelines and recommendations, through to development and testing of indicators was described. Overall, the process of determining and practice-testing guideline-based QIs is complex and labour-intensive. Throughout this process several observations were made that can help inform the development of guidelines in the future, and serve as guidance for teams seeking to identify the gap between recommended and actual practice.

4.4.1 Guideline selection – retrieval and content

At the guideline selection stage, it was important to ensure that the practice guideline selection process was replicable. It was also important to ensure that the most recent version of the guideline was retrieved as there were, in some cases, a number of versions of guidelines. Access to some guidelines requires membership in associations or networks. The assistance of a research librarian and library technician was pivotal in achieving this component of the project.

One issue related to guideline selection is that there are many types of guidelines for pain management, and they vary in content focus: by types of pain (i.e.: neuropathic, chronic, others); by patient populations (i.e.: homeless); and by phase of the patient care process (i.e.: assessment, procedure-related). Some guidelines are very specific in terms of the types of interventions included. For example, some guidelines focus solely on pharmacologic management. Others have a more holistic and broad focus, providing guidance in terms of approaches to care from assessment to evaluation; and addressing interventions that are both pharmacologic and non-pharmacologic. This latter approach is most helpful to guide practice, especially in light of the subjective and multi-factorial nature of pain.

The content of the three guidelines that eventually informed the indicator development were very similar, one developed in Ontario, Canada, based on a Scottish Guideline,[23,24] by an inter-professional working group; another developed by nurses in Ontario, Canada with national representation on the development panel[19]; and the third developed by a multidisciplinary team of European physicians.[25] Given the similarities across the three guidelines, and the commitment of the World Health Organization[27] to the

adequate treatment of pain, it would be beneficial for international and interprofessional collaborations to develop holistic pain guidelines. The International Association for the Study of Pain (IASP) offers assistance such as administrative support and possibly funding to members and organizations[28] to develop guidelines focused on clinical practice management of a specific clinical situation or condition or new technologies or treatments.

4.4.2 Guideline selection – quality

The variability in guideline quality could be readily addressed by guideline developers using the AGREE II criteria[21], or the Institute of Medicine's (IOM) Standards for Developing Trustworthy Clinical Practice Guidelines[29] to guide the creation of the guidelines. The National Guideline Clearinghouse (NGC) has required, in their most recent inclusion criteria that guideline summaries for consideration be consistent with the latter set of standards.[30] Unfortunately, the NGC website will no longer be available after July 16, 2018, as federal funding for the program is no longer available.[31]

Another issue related to the quality of the guidelines relates to the way in which the levels of evidence were presented and how recommendations were graded (see Table 4.3). At the time that the three included guidelines were developed, there was inconsistency in how the strength of the evidence that supported the recommendations was rated and how the grading systems were used. For example, in the case of the grading of recommendations, Cancer Care Ontario (CCO)[26] graded the recommendations using the ABCD system; the European Association of Urology (EAU)[25] used a modified version of the ABCD grading system, and the RNAO[19] did not grade the recommendations in their guideline.

Approaches to grading of recommendations are evolving. As of 2013, SIGN is not using the ABCD grading of recommendations that was evident in the CCO guideline[32], and are instead implementing the GRADE system, rating recommendations as either "strong" (for interventions that should or should not be used) or "conditional" (for interventions that should be considered).[33] The authors of the GRADE system indicate that quality of a body of evidence (vs. individual studies) should be considered along a continuum of high, moderate, low and very low.[34] The National Institute for Health and Care Excellence (NICE) also support the use of the GRADE system[35], however the NGC is not requiring the use of GRADE for guidelines included in their database.[32] The JBI, as of 2014, is using the GRADE system with similar two levels – Grade A (strong recommendations) and Grade B (weak recommendations).[36] There is a global trend toward using the GRADE system for rating the quality of evidence.[37] Advantages to the use of the GRADE system include: "guideline development by international experts; differentiation between the quality and strength of the evidence; and the provision of clear interpretations of recommendations for stakeholders".[38(p855)]

4.4.3 Wording of recommendations

In terms of selection of the recommendations, it was very helpful to have a sample template for use in comparing the presence and strength of recommendations across included guidelines.[22] This comparison facilitated the review of the recommendations by the advisory committees as part of the determination of QIs selected. Many of the guideline recommendations reflect more than one clinical "action", making it difficult to have one indicator to reflect one recommendation, and to operationalize the indicator. Examples have been provided in the results section, but another includes: "Establish a comprehensive plan

of care that incorporates the goals of the person and IP team".[19(p8)] Given the holistic nature of pain, an interprofessional team approach is essential. The wording of this recommendation includes both *what* – establishing a comprehensive plan of care, as well as *who* – the interprofessional team. The latter indicator was feasible to gather through the practice chart audit, not the former, as there was no documentation tool outlining the plan of care.

In addition, it was challenging to create measureable indicators for some recommendations. For example, in the recommendation above related to interprofessional team, what constitutes involvement of different team members? Is it one team member beyond the physician and nurse? Should consideration be given to the most appropriate member of the interprofessional team given the patient and family circumstance? For the recommendation related to reassessment of pain following an intervention, a timeframe should be included to guide the reassessment, based on the expected time to effectiveness of the intervention delivered.

4.4.4 Selection of indicators

Ideally, guidelines would be presented in a way that facilitates their use for measuring evidence-practice gaps and outcomes. One of the AGREE II items under the applicability domain, is that "the guideline presents monitoring and/or auditing criteria".[2(p3)] None of the three guidelines included in this process provided a complete set of indicators directly related to the included recommendations. Including a range of possible indicators to assess adherence to guideline recommendations would facilitate guideline implementation teams in assessing gaps as well as in evaluating the implementation of the guidelines. An example of a guideline that includes key QIs and targets is the *Canadian*

Stroke Best Practice Recommendations.[39] Evidence summaries from the JBI have indicators that are presented as evidence-based audit criteria that are readily available to members through their Practical Application of Clinical Evidence System (PACES).[40]

The RNAO has developed and made available, to Best Practice Spotlight Organizations[41] (BPSOs), Nursing Quality Indicators for Reporting and Evaluation (NQuIRE). NQuIRE is: "a database of quality indicators derived from recommendations within RNAO's clinical Best Practice Guidelines".[24] This rich source of indicators based on RNAO's guidelines are only available to BPSOs at this time.

4.4.5 Practice test

The practice test was greatly facilitated by the development of the coding book, however one site-specific challenge was extracting data from scanned documents from patient charts. Development of a data tracking form to document each pain episode from a variety of sources (progress notes, medication administration records and assessment flow sheets) expedited the data extraction process. The practice test demonstrated that the quality indicators identified were feasible and measureable, and would provide helpful data for identifying practice gaps for pain mangement. However, the practice test was time consuming, which could limit feasibility for implementation teams, because the the volume of data necessitated having one person dedicated to the data collection (approximately 1.5 hours per chart), and another person available to verify the collected. However, most clinical settings now have electronic health records that would greatly facilitate this process.

4.5 **Project limitations**

One limitation of this project is that the search strategy may not have identified all relevant guidelines. However, we replicated the search strategy used to identify pain guidelines from two credible guideline developer groups and we therefore think it is unlikely we missed important guidelines that may have been available at the time of the search. Only two reviewers conducted the guideline quality assessments. The authors of the AGREE II user manual recommend that: "each guideline be assessed by at least 2 appraisers, and preferably 4, as this will increase the reliability of the assessment."[42] This limitation likely did not result in the erroneous rejection of any of the guidelines as the rigour scores of the excluded guidelines were extremely low, however the use of more than two assessors would have been preferable.

Not using a more structured approach to seek consensus on included recommendations and indicators is another potential weakness of the project. In their recent scoping review of indicator development methods, Xiao and colleagues found that focus groups were used as a development method in 7 of 23 included studies. [11] One of their key conclusions was that formal decision making approach such as the Delphi technique be used after the review of the literature and key stakeholder consultation.

In terms of the clinical implications of our findings, the guideline review is dated. This would limit the ability of using the included indicators as there may be more recent guidelines that would emerge if the search was repeated. Since the time of the search, the RNAO guideline remains the most recent versions produced, the CCO guideline was updated in September, 2018, and the EAU guideline has been discontinued. As the intent of the paper was to describe the process of developing guideline-based quality indicators, the

fact that the actual indicators that were developed may be dated does not take away from the findings about the usefulness and feasibility of the proposed process for developing quality indicators from practice guidelines, or the difficulties in doing so.

4.6 **Conclusion**

Nothacker and colleagues, on behalf of the Guidelines International Network (G-I-N) Performance Measures Working Group developed reporting standards for guideline-based performance measures (a term that has been used interchangeably with quality indicators).[41,42] All aspects of these standards are addressed in this paper, with the exception of "review and re-evaluation of performance measures". [26(table 2)] Challenges in the process of indicator development include the complexities inherent in each step of the process, influenced by the nature of the guidelines and their presentation. In situations where quality indicators are not provided with as part of relevant practice guidelines, organizations implementing BPGs could use this process to determine what guidelines and guideline recommendations are most salient for their clinical setting, and then proceed to develop relevant indicators to be assessed. Once guideline recommendations have been put in to practice, the extent to which practice has changed can be evaluated by using the same indicators. In 2003, Dykes concluded that: "…the ability to measure adherence with guideline recommendations and the impact of those guidelines on practice patterns and patient outcomes is vital".[45(p67)] Fifteen years later, this imperative remains. Experience with developing guideline based quality indicators has shown that this area of health care quality improvement and evaluation continues to evolve and to be an essential part of guideline use.

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Table 4.1 Inclusion and exclusion criteria for guideline search strategy

Criteria	Inclusion criteria	Exclusion criteria
Population	Adults with pain	Children Pain related to a specific condition other than cancer i.e.: chronic pain, lower back pain or specific type of pain
Intervention	Any symptom intervention to assess or manage pain	Limited to pharmacologic interventions only
Professionals targeted	Nurses, physicians and other allied health care providers	
Outcomes	Effective symptom management (decreased incidence of moderate-to-severe pain)	
Health Care Setting	Inpatient, outpatient, long-term care or palliative care settings.	
Methodology	Clinical practice guidelines/consensus statements	Systematic reviews
Language	English or French	Languages other than English or French
Publication dates	2009-2014	

Table 4.2 Summary of guidelines identified

Title		Author, year	Rigor score	Further screening/comments
Included				
1.	Assessment & Management of Pain, 3rd Ed. http://rnao.ca/sites/rnao-ca/files/AssessAndManagementOfPain2014.pdf	RNAO December, 2014[21]	75%	Broad focus, pharmacological management is broad
2.	Symptom Management Guides-to-Practice: Pain https://www.cancercare.on.ca/toolbox/symptools/	Cancer Care Ontario (CCO) August, 2010[26]	66%	Based on SIGN guideline for cancer pain (November, 2008)[23]
3.	Guidelines on Pain Management & Palliative Care	European Association of Urology (EAU), 2013[27] Discontinued	52%	Broad, holistic focus
Excluded low rigor score				
4.	Initial assessment and management of pain: a pathway for care	British Pain Society October, 2013[46]	24%	Focus of guideline very generic. Pathway format vs. guideline format.
5.	Adult Cancer Pain	National Comprehensive Cancer Network (NCCN) 2014 Updated, 2017[47]	23%	Rigor score low – likely related to minimal amount of information available regarding guideline development process. Some general information available. Need to be member to access guideline online.
6.	General Palliative Care Guidelines for the Management of Pain at the End of Life in Adult Patients https://www.rqia.org.uk/RQIA/files/e0/e0a81c25-acb8-4982-9970-1ed62e9f2015.pdf	Guidelines and audit implementation network (GAIN) February, 2011[48]	20%	Informed by SIGN guideline and Cochrane reviews. Holistic guideline

Title		Author, year	Rigor score	Further screening/comments
7.	Care Management Guidelines: Pain Management http://www.dhhs.tas.gov.au/__data/assets/pdf_file/0006/36951/Care_Management_Guidelines_-_Pain_management_in_palliative_care_-_20160622.pdf	Tasmania Department of Health and Human Services December, 2009[49]	16%	Project lead sent development information, though minimal information provided.
8.	Management of cancer pain: ESMO clinical practice guidelines http://annonc.oxfordjournals.org/content/23/suppl_7/vii139.full.pdf+html	European Society of Medical Oncology October, 2012[50]	16%	Good intro with stats for background lit review. Holistic focus.
9.	Nursing Standard of Practice Protocol: Pain Management in Older Adults https://consultgeri.org/geriatric-topics/pain	Ann L. Horgas, RN PhD FGSA FAAN, Saunjoo L. Yoon, PhD, RN, Mindy Grall, PhD APRN BC July, 2012[51]	10%	Holistic focus
10.	Pain Assessment & Management Clinical Practice Guidelines http://www.wrha.mb.ca/extranet/eipt/files/EIPT-017-001.pdf	Winnipeg Regional Health Authority April, 2012[52]	5%	In introduction, says it is based on RNAO guideline (2007), later says "based on a compilation of published CPGs as well as review and feedback".
11.	Pain management guideline http://www.hcanj.org/files/2013/09/hcanjbp_painmgmt2_3.pdf	Health care association of NJ Confirmed for accuracy in 2011[53]	2%	Holistic focus, assessment tools included

Table 4.3 Levels of evidence and grades of recommendations used in selected guidelines

Levels of evidence and Grade of recommendations in CCO guideline[24]	*Levels of evidence in RNAO guideline*[19] *(did not grade recommendations)*	*Levels of evidence and Grade of recommendations in EAU guideline*[25]
Levels of evidence 1++ High quality meta-analyses, systematic reviews or RCTs, or RCTs with a very low risk of bias. 1+ Well conducted meta-analyses, systematic reviews, or RCTS with a low risk of bias 1- Meta-analyses, systematic reviews or RCTs with a high risk of bias 2++ High quality systematic reviews of case controls or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal 2+ Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal. 2⁻ Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal 3 Non-analytic studies, e.g. Case reports, case series 4 Expert opinion **Grades of recommendations** A - At least one meta-analysis, systematic review, or randomized controlled trial	**Levels of evidence** Ia – evidence obtained from meta-analysis or systematic reviews of randomized controlled trials Ib – evidence obtained from at least one RCT IIa – evidence obtained from at least one well-designed controlled study without randomization IIb – evidence obtained from at least one other type of well-designed quasi-experimental study, without randomization III – Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies, and case studies IV – Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.	**Levels of evidence** Ia – evidence obtained from meta-analysis or systematic reviews of randomized controlled trials Ib – evidence obtained from at least one RCT IIa – evidence obtained from at least one well-designed controlled study without randomization IIb – evidence obtained from at least one other type of well-designed quasi-experimental study, without randomization III – Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies, and case studies IV – Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. **Grades of recommendations** A – Based on clinical studies of good quality and consistency addressing the specific recommendations and including at least one randomized control trial. B – Based on well-conducted clinical studies, but without randomized control trials.

(RCT) that is rated as 1^{++}, and is directly applicable to the target population: **or** a body of evidence that consists principally of studies rated as 1+, directly applicable to the target population and demonstrating overall consistency of results B-A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 1++ or 1+ C-A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2++ D- Evidence level 3 or 4; or extrapolated evidence from studies rated as 2+ GOOD PRACTICE POINTS ✓Recommended best practice based on the clinical experience of the guideline development group		C – Made despite the absence of directly applicable clinical studies of good quality.

Table 4.4 Pain guidelines comparison and indicators

	Cancer Care Ontario (CCO)	**Registered Nurses Association of Ontario (RNAO)**	**European Association of Urology (EAU)**
Publication Year	**2010**	**2014**	**2013**
Quality Assessment (all subscales)			
Scope and purpose	**76%**	**95%**	**62%**
Stakeholder involvement	**48%**	**52%**	**33%**
Rigor of development	**66%**	**75%**	**52%**
Clarity	**86%**	**100%**	**76%**
Applicability	**36%**	**64%**	**18%**
Editorial independence	**100%**	**71%**	**79%**
Strengths / Limitations	Nicely laid out, excellent support tools for implementation (pocket guide & algorithm, app) Limited discussion of non-MD focused interventions.	Broad focus, recently updated. Good emphasis on nursing interventions within context of IP team. Long.	Broad focus on many types of pain and management strategies. Focused on urological cancer populations for the most part. Recommendations may not be a fit with Canadian standards. Heavy emphasis on medical intervention.

	Cancer Care Ontario (CCO)	Registered Nurses Association of Ontario (RNAO)	European Association of Urology (EAU)	Initial indicators	Final indicators
Recommendations – Assessment & Diagnosis					
Screen for the presence or risk of any type of pain on admission or visit with a HCP; after a change in medical status, prior to, during and after a procedure.	**Present** **Grade:**	**Present ✓** **Level of Evidence: Ib**	**Present** **Level of Evidence:**	**Pain screening:** Proportion of patients that had a pain assessment documented on admission.	1) Proportion of patients that had a pain assessment documented on admission.
Prior to treatment, an accurate assessment should be done to determine the cause(s), type(s) and severity of pain and its impact on the patient.	**Present ✓** **Grade:** **Based on clinical experience**	**Present ✓** **Level of Evidence: Ib**	**Present** **Level of Evidence:**	**Cause:** Proportion of patients with pain on admission or episodes during hospital stay that have a documented diagnosis of the physical cause of pain. **Type:** Proportion of patients with pain on admission or episodes during hospital stay that have a documented description of their pain. **Severity:** Proportion of patients that had pain with a documented pain score. **Impact:** Proportion of patients that had pain on admission that had a further pain assessment completed (ESAS, BPI).	2) Proportion of patients with pain on admission that have a documented diagnosis of the physical cause of pain. 3) Proportion of patients that had pain on admission that had that had a pain score documented. 4) Proportion of patients that had pain on admission that had a further pain assessment completed (ESAS, BPI). 5) Proportion of patients that had a pain episode that had a pain score documented.

	Cancer Care Ontario (CCO)	Registered Nurses Association of Ontario (RNAO)	European Association of Urology (EAU)	Initial indicators	Final indicators
Patients with cancer pain should have treatment outcomes monitored regularly using visual analogue scales, numerical rating scales or verbal rating scales and multidimensional instruments as necessary.	**Present ✓** **Grade:** **Based on clinical experience**	**Present ✓** **Level of Evidence: Ib**	**Present ✓** **Level of Evidence: not stated**	**Treatment outcomes monitored:** Proportion of patients whose pain was reassessed after an intervention. **Rating scale:** Proportion of patients that had pain with a documented pain score. **Multidimensional instrument:** Proportion of patients that had pain that had a further pain assessment completed (Edmonton Symptom Assessment Scale (ESAS), Brief Pain Inventory (BPI).	3) Proportion of patients that had pain on admission with a documented pain score. 6) Mean and range of pain scores on admission. 4) Proportion of patients that had pain on admission that had a further, more detailed, pain assessment completed (ESAS, BPI). 5) Proportion of patients that had a pain episode that had a pain score documented. 7) Mean and range of pain scores at the time of a pain episode.
The patient should be the prime assessor of his or her pain.	**Present ✓** **Grade: A**	**Present** **Level of Evidence:**	**Present ✓** **Level of Evidence: not stated**	**Patient as prime assessor:** Proportion of patients that had pain episodes who were the prime assessor of their pain.	8) Proportion of patients that had pain episodes who were the prime assessor of their pain.
Reassess the person's response to the pain management interventions by using the same re-evaluation tool.	**Present** **Grade:**	**Present ✓** **Level of Evidence: IIb**	**Present ✓** **Level of Evidence: not stated**	**Reassessment:** Proportion of patients that received an intervention for pain that had their pain reassessed using pain score.	9) Proportion of patients that received an intervention for pain that had their pain reassessed.

	Cancer Care Ontario (CCO)	Registered Nurses Association of Ontario (RNAO)	European Association of Urology (EAU)	Initial indicators	Final indicators
Recommendations – patient issues & care processes					
Establish a comprehensive plan of care that incorporates the goals of the person and interprofessional (IP) team.	**Present ✓** **Grade:** **Based on clinical experience**	**Present ✓** **Level of Evidence:** **III**	**Present** **Level of Evidence:**	**Comprehensive plan of care:** Proportion of patients with pain that have a plan of care documented. **Goals of person:** Proportion of patients with a comprehensive plan of care that explicitly mentions person's goals. **Goals of IP team:** Proportion of patients with a comprehensive plan of care that explicitly mentions IP team member's role in meeting goals. **Involvement of IP team:** Proportion of patients with pain on admission or pain episodes that had interprofessional team members involved in their care (specify IP team members). **Involvement of other services:** Proportion of patients with pain on admission or pain episodes that had other services involved in their care (specify other services).	10) Proportion of patients with pain on admission or pain episodes that had interprofessional team members involved in their care (specify IP team members). 11) Proportion of patients with pain on admission or pain episodes that had other services involved in their care (specify other services).

	Cancer Care Ontario (CCO)	Registered Nurses Association of Ontario (RNAO)	European Association of Urology (EAU)	Initial indicators	Final indicators
Recommendations – Non-pharmacologic interventions					
Evaluate any non-pharmacological interventions (physical and psychological) for effectiveness and the potential for interactions with pharmacological interventions.	**Present** **Grade:**	**Present** ✓ **Level of Evidence: Ib**	**Present** **Level of Evidence:**	**Evaluation:** Proportion of patients that received an intervention for pain that had their pain reassessed. **Type of interventions:** Proportion of patients with pain that had different interventions to ease the pain. (Specify pharmacological, non-pharmacological, pharmacological *and* non-pharmacological, no additional interventions than the current pain management plan (patient is on a pain management regime and no additional medication (including regular dose or as needed medications (PRNs)) are given at that time), or no intervention (The patient is not on a pain management regime and no pain medication is provided). **Non-pharmacologic interventions:** Of patients that had their pain treated with non-pharmacological interventions, what proportion of different interventions were used (specify interventions).	12) Proportion of patients with pain that had non-pharmacological, pharmacological *and* non-pharmacological, no additional interventions than the current pain management plan *(patient is on a pain management regime and no additional medication (including regular dose or as needed medications (PRNs)) are given at that time)*, or no intervention *(The patient is not on a pain management regime and no pain medication is provided)*. 13) Of patients that had their pain treated with non-pharmacological interventions, what proportion of different interventions were used *(specify interventions)*.

	Cancer Care Ontario (CCO)	Registered Nurses Association of Ontario (RNAO)	European Association of Urology (EAU)	Initial indicators	Final indicators
Teach the person, their family and caregivers about the pain management strategies in their plan of care and address known concerns and misbeliefs.	**Present** **Grade:**	**Present ✓** **Level of Evidence: Ib**	**Present** **Level of Evidence:**	**Patient and family education:** Proportion of patients receiving an intervention for pain had documentation of teaching about the pain management.	14) Proportion of patients receiving an intervention for pain had documentation of teaching about the pain management.
Always offer psychological support to cancer patients and their loved ones.	**Present** **Grade:**	**Present** **Level of Evidence:**	**Present ✓** **Level of Evidence: Ia**	**Psychological support:** Proportion of patients with a pain episode that had psychological support documented as a non-pharmacological intervention.	15) Proportion of patients with a pain episode that had psychological support mentioned as a non-pharmacological intervention.
Recommendations – Pharmacological/Medical interventions					
Analgesia for continuous pain should be prescribed on a regular basis not as needed (PRN).	**Present ✓** **Grade: D**	**Present** **Level of Evidence:**	**Present** **Level of Evidence:**	**Regular analgesia:** Proportion of patients with a pain episode for whom analgesic prescribed regularly (not PRN).	16) Proportion of patients receiving pharmacologic interventions for whom analgesic prescribed regularly (not PRN).

	Cancer Care Ontario (CCO)	Registered Nurses Association of Ontario (RNAO)	European Association of Urology (EAU)	Initial indicators	Final indicators
Appropriate analgesia for breakthrough pain (PRNs) must be prescribed.	**Present ✓** **Grade:** **D**	**Present** **Level of Evidence:**	**Present** **Level of Evidence:**	**PRN Prescribed:** Proportion of patients with pain that had a PRN dose prescribed. Proportion of patients with a PRN dose prescribed, for whom the analgesia, dose, route and frequency were appropriate (see below). **Appropriate analgesia:** for PRN (If there is a regular opioid to control pain the breakthrough medication is the same). **Appropriate dose:** for breakthrough pain is available (The usual dose for breakthrough pain is 10% of the total daily dose of the opioid). **Appropriate route:** for PRN analgesia is being used (Oral for mild-mod pain; parenteral for severe pain). **Appropriate frequency:** PRN analgesia is prescribed at an appropriate frequency (Ensure that the breakthrough medication is available at appropriate times (frequency changes depending on the medication and route).	*Proportion of patients with a PRN dose prescribed, for whom the analgesia, dose, route and frequency were appropriate (see below).* 17) Appropriate analgesia for PRN *(If there is a regular opioid to control pain the breakthrough medication is the same).* 18) Appropriate dose for breakthrough pain is available *(The usual dose for breakthrough pain is 10% of the total daily dose of the opioid).* 19) Appropriate route for PRN analgesia is being used *(Oral for mild-mod pain; parenteral for severe pain).* 20) PRN analgesia is prescribed at an appropriate frequency *(Ensure that the breakthrough medication is available at appropriate times-frequency varies depending on the medication and route).*

	Cancer Care Ontario (CCO)	Registered Nurses Association of Ontario (RNAO)	European Association of Urology (EAU)	Initial indicators	Final indicators
Implement the pain management plan using principles that maximize efficacy and minimize the adverse effects of pharmacological interventions including: Multimodal analgesic approach; changing opioids, dose or route PRN; prevention of Adverse Effects; and prevention, assessment and management of opioid risk.	**Present** **Grade:**	**Present** ✓ **Level of Evidence: Ib**	**Present** ✓ **Level of Evidence: IIb**	**Multi-modal approach:** Proportion of patients that had pain episodes for whom a multi-modal analgesic approach was used (see below). A multimodal approach includes non-opioid analgesics (ex: anti-inflammatory drugs), opioids (ex: morphine) and adjuvant medications (ex: anticonvulsants). **Treatment changed:** Proportion of patients that had pain that had the opioid changed/titrated or route changed. **Bowel regime:** Proportion of patients receiving opioids that had a bowel regime prescribed. **Anti-emetic:** Proportion of patients that had an anti-emetic prescribed. **Opioid risk:** Proportion of patients receiving opioids that had an opioid risk assessment completed.	21) Proportion of patients that had a pain episode that were treated with a pharmacologic approach. 22) Proportion of patients that had pain episodes for whom a multi-modal analgesic approach was used (see below). *A multimodal approach includes non-opioid analgesics (ex: anti-inflammatory drugs), opioids (ex: morphine) and adjuvant medications (ex: anticonvulsants).* 23) Proportion of patients receiving opioids that had a bowel regime prescribed. 24) Proportion of patients that had an anti-emetic prescribed.

Chapter 5: Descriptive Case Study

"We don't have time to do all those crazy steps": Nursing students' use of guidelines for pain management in clinical practice – context and influencing factors

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Abstract

Background: The need for health care providers to inform their practice with the best available evidence is now well-recognized as improved patient outcomes and care processes have been linked to evidence based practice (EBP). Educators, through both curricular and teaching/learning innovations, need to challenge and support students to inform their practice with the best available evidence.

Purpose: The purpose of this study was to understand the factors that influence nursing students' use of evidence-based pain management guidelines in their clinical placements. The study objectives were to: 1) Determine the gap between evidence-based guideline recommendations and actual practice; and 2) Understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guidelines.

Methods: The study was carried out using a mixed methods case study design. Data collection methods included a chart audit, interviews and document review to determine the practice gap. Interviews, document review and a site visit were conducted to identify influencing factors. The case examined was a group of 4th year students having a 12-week placement on an oncology unit.

Results: Fifty-four patient charts were audited, and interviews were conducted with nine students, seven nurses, one professor and one clinical instructor. Multiple documents from both the clinical and educational settings were reviewed, and a site visit was conducted. There are gaps between pain guideline recommendations and practice in the clinical setting, however there are discrepancies between the audits and the interviews. Barriers and facilitators related to the users (nursing students, clinical nurses and faculty), the clinical and educational context, as well as characteristics of guidelines were identified. Examples of barriers include the perception that guidelines are not applicable for the clinical setting, lack of knowledge and understanding regarding guidelines and the emphasis on task completion in the clinical setting. Facilitators included access to resources, curriculum changes to better integrate guidelines, and the integration of guidelines in unit policies and procedures.

Conclusions: Knowledge gained from this study could inform the development of teaching/learning strategies and curriculum innovations that will ultimately improve nursing students' use of guidelines in their clinical placements.

5.1 Introduction/Background

Authors have discussed the challenges of integrating EBP in clinical nursing education and have called for a better integration of what is taught in the classroom with the clinical setting[1-3]. In an appeal for radical transformation in nursing education, Patricia Benner and colleagues[4] recommended important changes in nursing education, notably: "From a focus on covering decontextualized knowledge to an emphasis on teaching for a sense of salience...and action in particular clinical situations" and "from a sharp separation of classroom and clinical teaching to integrative teaching in all settings"[4(p89)]. Greenlaugh, Howick, and Maskrey[5] assert that it is necessary for educators to combine the application of evidence with reflection and case discussion, and to rigorously evaluate such shifts in clinically-integrated EBP education strategies. An integrative review of the literature by Ryan[6], describes the extent to which nursing students are involved in research and EBP. Despite a positive attitude and intention to use research and EBP, nursing students did not actively participate in EBP. The authors of included studies (from the US, Jordan, UK, Sweden (3 studies), and Australia (3 studies), related this to a lack of support in the clinical environment, the focus on the completion of tasks in clinical practice education, and the theory-practice gap.

The theory-practice gap has recently been defined by Greenway, Butt and Walthall[7] as: "The gap between the theoretical knowledge and the practical application of nursing, most often expressed as a negative entity, with adverse consequences" [7(p1)]. Factors contributing to the gap in the clinical realm include: increasing complexity of care; shorter lengths of stay, nurse-to-nurse hostility; RN turnover; and inadequate preparation of preceptors[8]. On the academic side, curriculums may not specifically address the use of evidence in clinical education[1,9-12]. Greenway and colleagues[7] indicate attributes of the theory-practice gap relate to characteristics

of the clinical reality (practice settings reflect theoretical knowledge and theory is not seen as relevant for the practice setting, in other words what is taught in the classroom is not what students see in the practice setting and is not seen as something that can been used there). Most authors of papers addressing the theory-practice gap in nursing education call for collaboration between academic and clinical agencies to address these many concerns[7,8,13-16]. This collaboration would include efforts to strengthen and formalize partnerships at administrative levels, as well as innovative clinical placement models that foster great connections between faculty and clinical staff.

The clinical practice environment needs to be part of the equation for nursing students to develop skills in EBP, with relevant curriculum being integrated across years in both the academic and clinical settings[1]. Khan and Coomarasamy[17] propose one model that may provide guidance in making changes in the approach to education, suggesting a hierarchy of teaching methods for the effective education of health care professionals related to EBP. At the highest level of this hierarchy, the authors advocate for "clinically-integrated-interactive" approaches to teaching that are based on the learners' needs and the clinical context[17(p6)]. Activities that fall under this include journal clubs, clinical rounds, case discussions, and EBP projects.

In addition to skills in EBP, nursing students require skills to assess and manage pain[18]. Pain is a clinical problem that is amenable to an EBP approach and evidence-based pain management guidelines exist to support nursing students and clinicians in their practice. However, as Fallon and colleagues assert, the use of these evidence-based guidelines has not been sufficiently widespread to inform practice decisions for cancer or palliative care patients admitted to inpatient units for complications of their disease or treatment, or end-of-life care[19]. The authors of a systematic review and meta-analysis found that pain is a common issue among

cancer patients and is a concern for their families, despite increased efforts to improve pain assessment and management[20]. They found that the pooled pain prevalence rates of patients undergoing cancer treatment was 55.0% (29 studies), and for those with advanced or end-stage disease it was 66.4% (24 studies). In the context of nursing education, Chow and Chan[21] reviewed the literature related to nursing students' knowledge and attitudes related to pain finding the former to be poor and the latter to be inappropriate. Hroch and colleagues[22] found gaps in pain management knowledge and attitudes in 336 nursing students; with the average score on the Knowledge and Attitudes survey regarding pain being 66.7% (where 80% is considered a passing score).

The overall purpose of this study was to understand the factors that influenced nursing students' use of evidence-based pain management guidelines in their clinical placements. More specifically, the study objectives were to: 1) Determine the gap between evidence-based guideline recommendations and actual practice; and 2) Understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guidelines.

Although the definition of EBP includes a broader perspective than the integration of guideline recommendations in practice decisions[23], this study focuses on their use in nursing practice. Clinical practice guidelines (hereafter referred to as guidelines) are "statements that include recommendations, intended to optimize patient care, which are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options"[24]. Guidelines are used to:

> "deliver effective care based on current evidence; resolve a problem in the clinical setting; achieve excellence in care delivery by meeting or exceeding quality assurance

standards; introduce an innovation; eliminate use of interventions not recognized as best practice; and create work environments that enable clinical excellence"[25(p7)].

Guidelines can be particularly useful for nursing students as they are a summarized source of evidence appraised by developers. Knowledge gained from this study will inform the development of teaching/learning strategies that clinical instructors can use in the clinical setting, ultimately improving nursing students' pain management practices.

5.2 Theoretical underpinnings

5.2.1 Constructivism/Social Constructivism

Constructivism is a theory rooted in the belief that the ability to reflect on prior knowledge is the driving force behind learning[26], advocating for a pedagogy that is active, student-focused, and emphasizes building on current or past knowledge[12,27-29]. The social constructivist approach was highly influenced by L.S. Vygotsky, whose research demonstrated that learning is mitigated by social interaction[29]. The constructivist perspective informed the approach to addressing the first research question (identify if there is a gap between evidence-based recommendations and practice) – having participants share what they would do to care for a patient experiencing pain; reflecting their current or past knowledge related to pain management. Social constructivist learning takes place within a constantly changing perspective that is both socially and culturally influenced[30]. Learning in the clinical environment is inherently influenced by the context of the clinical setting as well as the educational context. The focus of the second study objective and associated data collected is to examine how these contexts influence nursing students' use of guidelines.

5.2.2 Adult Learning Theory/Andragogy

Adult learning theory, or andragogy emphasizes that learners are responsible for their learning, that learners will engage in learning if they perceive a need, and that people learn through experience[31]. Knowles and colleagues outlined the steps of the adult learning planning process: 1) assess learning needs; 2) create strategies to address the learning needs; 3) implement those strategies; and 4) assess the outcomes of the learning process. The first study objective is assessing whether there is a learning need by examining the gap between guideline recommendations and practice – which reflects the first step of the adult learning process. In addition, learning in the clinical practice setting reflects the element of adult learning theory that relates to learning through experience, which is also captured in the interview questions that focus on the contextual factors that influence guideline use.

5.2.3 Knowledge to Action (KTA) framework

Multiple theories, models and approaches inform the integration of evidence in practice[32]. One such theoretical framework is the KTA framework[33]. The knowledge creation portion of the framework consists of three phases: knowledge inquiry, knowledge synthesis and creation of knowledge tools and / or products (including practice guidelines)[33]. The action phases of the framework include: identifying the problem or knowledge gap; identifying and selecting knowledge; adapting knowledge; assessing barriers and facilitators; selecting and implementing interventions; monitoring knowledge use; evaluating outcomes, and sustaining knowledge use[33 (p213)]. This study is focused on the first two phases of the framework by selecting knowledge (relevant quality pain guideline recommendations) and assessing the practice gap, in addition to assessing the barriers and facilitators of knowledge use.

5.2.4 iKT approach

The KTA framework falls within a social constructivist paradigm and "privileges social interaction and adaptation of research evidence that takes local context and culture into account as key mechanisms for turning knowledge into action"[33(p209)]. This characteristic of the KTA framework relates specifically to the integrated knowledge translation (iKT) approach used to guide collaborative research efforts. The current study was rooted in an iKT approach[34] and involved including those who will use the research findings throughout the research process. Students, faculty, clinical instructors and inpatient nurses were engaged in this research as they participated on a project advisory committee.

The theories discussed provide a relevant perspective to advance EBP in nursing students, with their emphasis on engagement and responsibility of the learner, learning in a social context, and processes for assessing learning needs and implementing approaches to meet those needs. A summary of the theories and how they influenced the study is provided in Table 5.1.

Table 5.1 Summary of elements of theory used in research

	Constructivism	Social constructivism	Adult learning	KTA Framework	iKT approach
Objective #1 (practice gap)	Knowledge re: pain integrated in to interview questions.		Identification of learning needs.	Identification of knowledge Identification of practice gap	*Overall approach to study, engaging possible users of knowledge in study conception and validation of results.*
Objective #2 (describe context)		Elements of context of learning integrated in interview questions.	Learning through experience in clinical setting.		

5.3 Design and Methods

5.3.1 Study Design

A descriptive case study was carried out using an integrated Knowledge Translation (iKT) approach. According to Yin[35], a descriptive case study is used to examine a phenomenon in the context in which it occurs. A descriptive approach for this study is appropriate given the focus on the context of students' use of guidelines. According to Yin, a descriptive case study is useful to examine a phenomenon in the context in which it occurs[35]. More generally, case study methods are appropriate to answer "how" questions, without control over surrounding events and with a focus on contemporary events[35(p9)]. Donnelly and Wiechula[36] advocate for the use of case study methodology to better understand the complex dynamics of clinical placements and call for an increased use of this this method in nursing education. For the purposes of this study, the particular phenomenon was students' use of guidelines for pain management within the context of clinical placements. In this circumstance, the individual nurses and nursing students were not scrutinized, but rather the data from all sources was examined for points of convergence. The case overall was studied in depth, representing the students' experience within the educational and clinical contexts.

Instead of ascribing to one approach to conducting case study research, the methodology employed consists of elements from two key authors of case study methods, namely, Robert K. Yin, and Robert E. Stake. The perspectives of these authors were compared by Appleton[37] in 2002, Baxter and Jack[38] in 2008, Brown[39] in 2008, Crowe[40] and colleagues in 2011, and Yazan[41] in 2015. Yazan has indicated that researchers may "eclectically combine elements from each approach that best serve and support their design"[41(p150)].

Some of the elements used in these comparisons are in Table 5.2, along with a description of the nature of that element adopted for this study.

Table 5.2 Elements of case study research adopted for study with author origins.

Element of case study	Description	Author
Epistemic foundations	"This all-encompassing method also can embrace different epistemological orientations…"	Yin, 2014[35]
Definition of a case	"a specific, a complex functioning thing" "and integrated system" with "a boundary and working parts"	Stake, 1995[43(p2)]
Design of case study	Flexible design, rooted in research questions that "help structure the observations, interviews and document review".	Stake, 1995[43(p22)]
Gathering data	Qualitative and quantitative sources are combined.	Yin, 2002[42]
Sources of data	Documentation, archival records, interviews, direct observation, participant observation and physical artifacts.	Yin, 2002[42]
Sampling approach	Purposive	Stake, 1995[43]
Data analysis	"Consists of examining, categorizing, tabulating, testing or otherwise recombining both quantitative and qualitative evidence…"	Yin, 2002[42(p109)]
Verifying data	Construct validity (through triangulation of multiple sources of evidence, chains of evidence and member checking); internal validity (through techniques such as pattern matching); external validity (analytic generalization); reliability (case study protocols and databases).	Yin, 2002[42]
	Triangulation (data source, investigator, theory and methodological)	Stake, 1995[43]

5.3.2 Study Methods

A mixed methods approach was employed. Clark and Ivankova define mixed methods as: "A process of research in which researchers integrate quantitative and qualitative methods of data collection and analysis to best understand a research purpose"[44]. It is appropriate to use both quantitative and qualitative methods to answer the study objectives, and this is in line with the pragmatic epistemic stance of the PI. Yin[35] advocates for the collection of data from multiple sources, namely: documentation, archival records, interviews, direct observations, participant

observation and physical artefacts. Integrating these data sources provided a more complete view of the phenomenon, off-setting the weaknesses of each other[44]. In addition, Clark and Invankova[44] maintain that the use of mixed methods provides opportunity for triangulation, allowing for comparison of results for areas of agreement and disagreement, permitting the researcher to reach valid conclusions.

A study advisory committee was formed, consisting of new graduate nurses that had been students on the unit, the clinical coordinator from the University, clinical instructors who had previously taught on the case unit, staff nurses from the unit, the unit educator and palliative care advanced practice nurse (APN). This committee helped to operationalize the iKT approach,

5.3.3 Setting and sampling

The case for this study included fourth year nursing students from one University undergoing a 12-week placement on an inpatient oncology unit. This particular unit was selected based on its geographic feasibility and its relevance to meet the study objectives. Pain management had been a focus for quality improvement for many years at the hospital, and nursing students had a lengthy placement which would allow them to become very familiar with the clinical environment and unit processes. As a professor at the collaborative program partner, the PI was familiar with the curriculum, faculty, and clinical placement logistics. In addition, the PI was previously an APN at the hospital, and their professional networks facilitated completion of the research project.

Purposive sampling within the case was used. The whole cohort of students (12 total) were invited to participate, along with the two clinical instructors that supervised them, and the in-class professor that taught the accompanying theory course. All staff nurses from the oncology unit (50 nurses) were invited to participate, recognizing their influence on the students'

experience. Nursing students and faculty members were invited to participate by the year coordinator. Nurses were invited to participate by the unit manager, and recruitment posters were also placed on the unit. Stake[43] indicated that a sample of more than 10 for each sub-group is difficult to manage and may not be necessary, while a sample smaller than 4 is insufficient, so the PI hoped to recruit at least 5 students and 5 nurses. For nursing students, the only exclusion criteria was if the clinical coordinator judged students unsuitable for participation (i.e. students that were at risk of or were not performing well) so as not to add undue stress to their situation. The only exclusion criterion for nursing staff was not working with nursing students as part of their clinical practice.

5.3.4 Data collection

Four sources of data were used: a chart audit; qualitative interviews; documents; and a site visit.

A retrospective chart audit was conducted to determine the extent to which students' and clinicians' practice reflected key guideline recommendations for pain assessment and management. The audit was conducted during the timeframe of the case study, reflecting four 24-hour periods when the students were on the units. The charts of all patients on the unit were reviewed for 4 days from weeks 7 and 8 of the clinical placement, after students were oriented to the unit, had 6 weeks experience, and were familiar with patient care needs. The chart audit covered the full 48 hours of patient care for the days that the students were on the unit, and included the students' and clinicians' pain management practices. All charts were reviewed, as the goal of the audit was to describe care provided to the entire population of patients on the unit. The charts were audited before the interviews so that the interview process did not inadvertently

affect the nursing staff and students' clinical practices. Indicators used for the chart audit were developed based on high-quality guidelines and associated recommendations[45].

The PI and a trained research assistant conducted qualitative semi-structured interviews with nursing students, clinical nurses, clinical instructors and in-class professor; and the PI carried out the document review and the site visit. Interview participants reflected on how they would approach practice with a patient experiencing pain. Nurses and clinical instructors also reflected on a scenario that involved working with a student that comes to them to discuss a patient experiencing pain. These discussions lead to questions related to participants' experiences with guideline use in clinical practice and clinical education. Members of the advisory committee reviewed the interview guides for face and content validity to ensure the wording and scenarios were typical and could be readily understood by participants. The interviews were audio recorded after participants gave their written consent.

A document review was carried out to confirm and augment data from the chart audit and the interviews. The documents reviewed reflected the research questions in terms of looking at how they related to the pain management guideline indicators, or how they might influence or show nursing students' use of guidelines. Relevant documents were identified in conjunction with the advisory committee, and retrieved from the unit nurse educator, the Palliative Care APN, the unit clerk, and during the site visit. Nursing care plans and evaluations were requested of students at time of interview. Students were emailed reminders to send these documents to investigator. Documents scanned were scanned and imported as sources in NVivo.

By doing a site visit the PI was able to gain additional information about the clinical context and included doing a tour of the unit with the nurse educator. The site visit focussed on access to supports for pain management and guideline use such as: educators, consultants,

computer access, journal articles, posters, and other pain management documents. For the site visit, the PI took notes over the course of the unit tour, using an observation protocol, based on a sample provided by Creswell[46].

5.3.5 Analysis and interpretation

Chart audit data were entered in to IBM SPSS 19 and descriptive statistics were used to describe the frequency of the chosen indicators of pain management practice from the guideline recommendations. Consistent with van de Glind and colleagues[47] in their multiple case study evaluating adherence rates of guideline-based care of venous leg ulcers, a practice was considered to be in line with guideline recommendations if it happened more than 80% of the time. Practices that took place between 50-80% of the time were deemed to be moderately aligned with practice guideline recommendations. Finally, adherence was considered poor if recommended practices occurred less than 50% of the time.

A qualitative descriptive approach was used for the interview, document and site visit analysis[48]. Directed content analysis was the specific analytic approach used as "existing theory or prior research exists about a phenomenon… that would benefit from further description"[49]. Qualitative data analysis software (NVivo 11) was employed to organize data, code the interviews and documents, and allowed more efficient retrieval of data[46].

Qualitative interviews were transcribed, and the transcripts reviewed for accuracy. All interviews were read through, then coded to sort and organize the data, taking note of illustrative quotes. The qualitative content analysis process involved describing and interpreting which was both inductive and deductive in nature[50,51]. For the deductive analysis, an analytic filter was generated based on: 1) the guideline recommendations for pain assessment and management included in the chart audit; 2) the headings for barriers and facilitators to research use as

described by Funk and colleagues (characteristics of the user; characteristics of the setting; and characteristics of the research and presentation)[52]; and 3) elements of context related to EBP as described by McCormack and colleagues[53] and Meijers and colleagues[54]. The elements of context based on these 2 sources are summarized in Table 5.3.

Table 5.3 Elements of context relevant to clinical education

Element	Sub-element	Relevant indicators for clinical education
Context		Decision making processes
		Power & authority
		Resources
	Culture	Values & beliefs
		Emphasis on tasks vs. learning
	Leadership	Approach to teaching/learning/managing
	Evaluation	Feedback on performance
		Sources of information on performance
	Education	Education related to EBP
		Education level of nurses

Stake proposes an "analytic filter" to "foreshadow the potential concepts inherent in the case study without being prescriptive or exhaustive"[55(p450)]. Deductive analysis proceeded using the concepts in the analytic filter as provisional codes and further inductive codes were developed for any aspects of the data that did not fit the pre-existing codes[50].

The analysis involved the triangulation of all data gathered: chart audits, document review, interviews and the site visit of the clinical setting. In order to facilitate comparison of the data across all sources, matrices were created for each of the two research objectives addressed in the case study. The PI conducted the initial coding, which was iteratively reviewed by the thesis supervisors, and discussed at team meetings. Results were also presented to the advisory committee for verification and member checking.

5.3.6 Strategies for validation

Creswell, in the book *Qualitative Inquiry and Research Design*[46] describes a number of validation strategies that are similar to those espoused by Yin[35] and Stake[43,56]. Stake, rather than using the term validation, refers to approaches to promote the "accuracy" of findings[57(p34)]. Triangulation within cases is the approach recommended by Stake to "assure that the right information and interpretations have been attained"[57(p35).] Stake has outlined investigator triangulation, theory triangulation, data source triangulation and methodological triangulation as methods to increase the accuracy of descriptions[43]. Yin suggests triangulation to promote construct validity[35]; achieved through using multiple sources of evidence. Triangulation was the first validation strategy employed in this study, achieved by collecting data from different groups of participants (students, clinical instructors/in-class professors and nurses) as well as through different mechanisms (chart audits, qualitative interviews, document review and site visit).

The research team, consisting of thesis committee members, validated interpretations and insights and provided an "external check of the research process"[46(p251)]. Yin[35] recommends that the "draft report [of the case study] be reviewed by informants as part of validating procedure, promoting construct validity"[35(p199)]. The advisory committee members provided feedback on the results. Stake[56] endorses a similar process of "member checking" with research participants; in this study, the advisory committee members took on this role.

Reliability is another consideration for judging the quality of the conclusions of a study. Yin[35] indicates that the objective of achieving reliability is: "to be sure that, if a later researcher follows the same procedures as described by an earlier researcher and conducts the same case study over again, the later investigator should arrive at the same conclusions and findings"[35(p48)]. He goes on to describe documenting the case study procedures and conducting the research so

that an auditor "could in principle repeat the procedures"[35(p49)] as strategies to promote reliability. Miles, Huberman and Saldana[58] state that reliability can be achieved in qualitative research by ensuring that processes have been carried out with "reasonable care"[25(pg312)]. Although Stake[56] does not specifically refer to reliability in his work, he does explicate methods to promote reliability through systems of documentation and data storage. Throughout the research process, the PI kept a log book of study notes. Data collection protocols for the chart audits, interviews, document retrieval/review and site visit were developed and followed. The PI's research supervisors performed data quality checks and reviews by supervisors, thesis committee members and advisory committees were in place.

5.3.7 Summary of case study methods

An illustration of the overall case study design is in Figure 5.1, using a graphic representation of case studies based on work by Rosenberg & Yates[55]. This graphic summarizes all elements of the project.

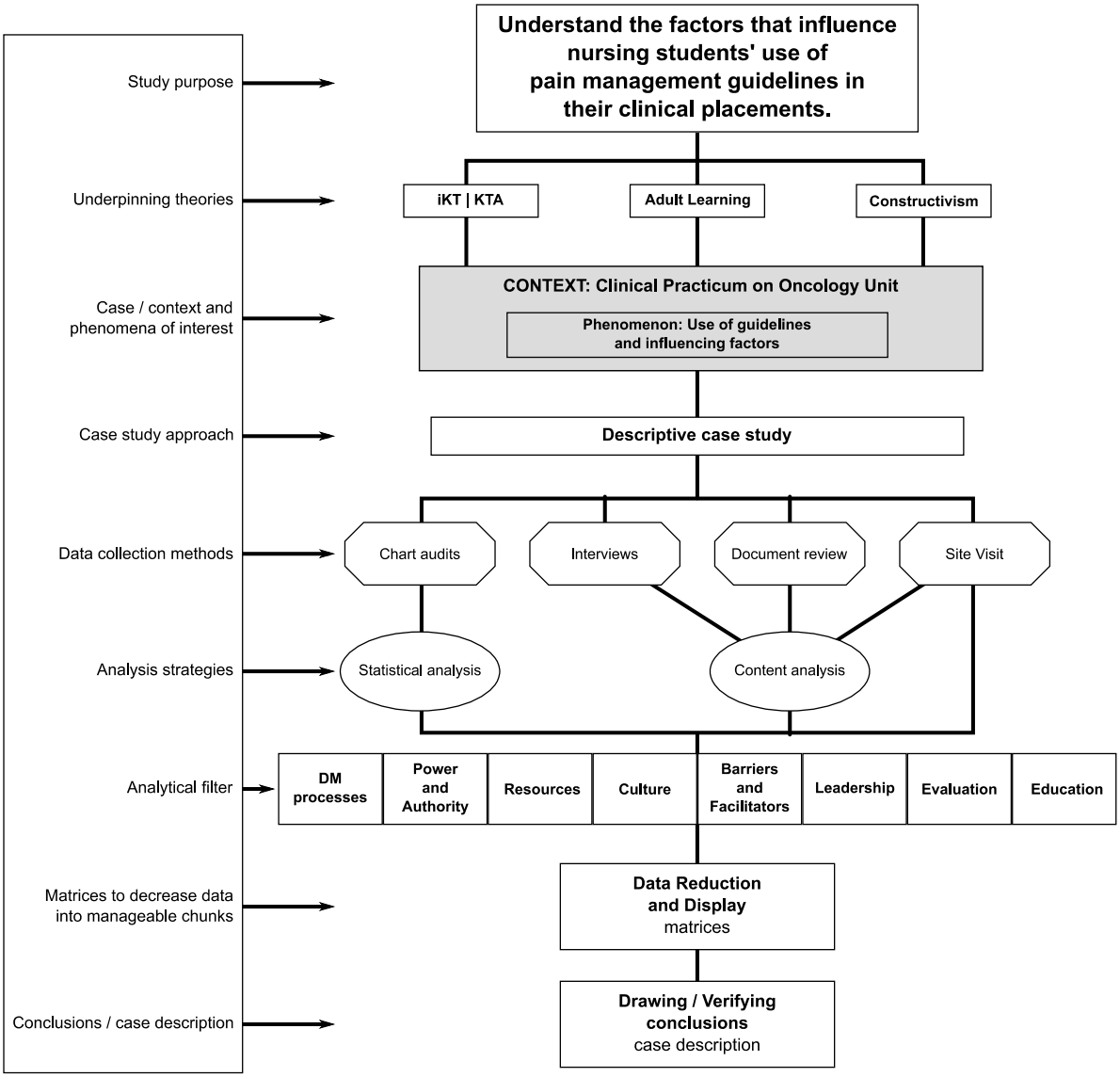

Figure 5.1 Graphic representation of case study

5.4 Ethical considerations

The PI obtained relevant administrative approval from both the clinical and academic institutions. Prior to commencement of the study, the research ethics boards of the hospital and university gave their approval. Key individuals, such as clinical coordinators and nursing managers who assisted with contacting participants, were provided with relevant information such as email scripts and information letters for potential participants (clinical instructors/in-class professors, nursing staff and nursing students). They provided the contact information of the PI to those interested in participating. Potential participants emailed the PI, and arranged a mutually convenient meeting time. At no time did the investigator directly approach potential participants, and written informed consent was obtained prior to participation in interviews.

5.5 Results

5.5.1 Description of case

The characteristics of the case (i.e. academic and clinical characteristics), are summarized in Table 5.4. In the fall semester, two groups of six, fourth-year BScN students are on the unit, alternating day and evening shifts, 2 days per week. The students are from a large undergraduate nursing program, in an urban area. The curriculum relevant to the study is outlined in Figure 5.2. Of the course outlines reviewed, content specific to the nursing role in pain assessment and management was addressed in the third year pediatric and adult medical/surgical nursing courses. The fourth year complex nursing care course addressed other symptoms such as delirium, but also included material related to symptom assessment that was relevant for pain assessment. There was one class specific to EBP in the winter of year 2, the remainder of the research course was focused on quantiative and qualitative research methods.

Table 5.4 Characteristics of case

Characteristic	Case elements
Clinical unit	• Medical oncology unit + off service (non-oncology) • All RN staffing (50 RNs employed on the floor) • 34 Beds • 6 students on day shift & 6 students on evening shift (alternating) for 12 weeks
Hospital	• One site (550 beds) of a multi-site tertiary hospital with 1,117 beds total. • Nursing professional practice department with heavy focus on guideline implementation (previous Best Practice Spotlight Organization)
Cancer Centre	• Comprehensive cancer centre on-site
School of Nursing	• Collaborative partner with a Best Practice Research Centre at time of study)
BScN Program admissions	• Admitted 389 students in 2013
Group clinical placements	• 2nd-4th year of program • Clinical instructors employees of University School of Nursing
Timing of placements	• Fall of 4th year (2014)
Community characteristics	• Population 947, 031 (2014)

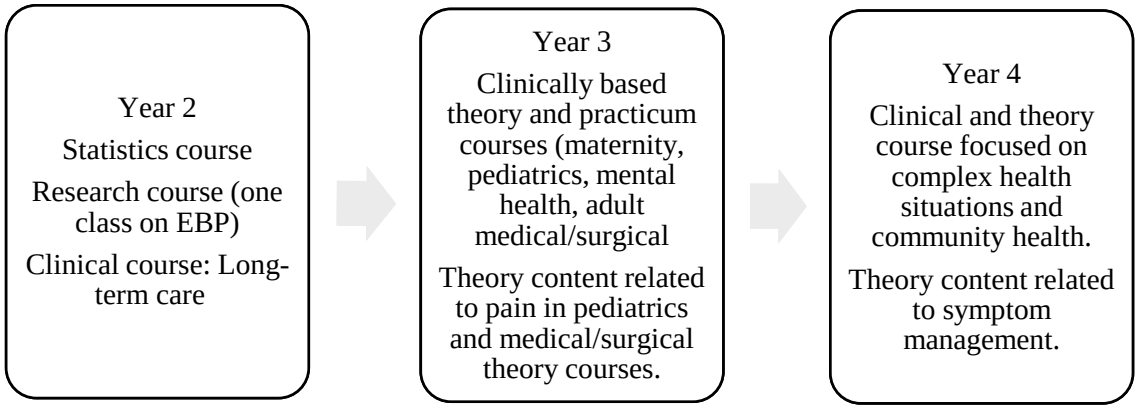

Figure 5.2 Relevant curriculum

The clinical unit is a 34-bed medical oncology unit within a tertiary care hospital, where patients are admitted primarily for complications from their cancer or treatment. The unit has all RN staffing, with a variety of allied health professionals available for patient consultation. The unit had recently experienced considerable turnover of nursing staff (approximately 16 nurses

out of 50) as well as a change in the nurse:patient ratio (Personal communication, L.Kachuik, February 27, 2019). Fifty-four patients were on the unit during the case study timeframe dates (October 20, 21, 27 and 28, 2014). The mean age of patients was 64.9 years of age, and they had a wide variety of cancers, with a smaller number having non-cancer primary diagnoses. The primary factor contributing to the patients' admission to hospital was symptom management. On admission, 37/54 patients had pain, and the mean pain score on admission was 5.6, with a low score of 1/10, and a high score of 10/10. During the audit time frame dates, the mean pain score for patients experiencing pain episodes (499 episodes in 47 patients) was 3.93, range 1-10.

5.5.2 Interview participant characteristics

In all, 18 interviews were conducted; nine out of 12 invited students; seven of 50 nurses; one out of two clinical instructors; and one theory professor participated. Of note, no participants had taken courses or had any additional education related to EBP or research use. Further characteristics of the sample are described in Table 5.5.

Table 5.5 Characteristics of participants

Characteristic	Students (n=9)	Nurses (n=7)	Clinical Instructor (n=1)	Professor (n=1)
Sex				
F	9	7	1	1
Age				
20-24	6	1		
25-29	2	1	1	
30-39	1	1		1
45+		2		
Not reported		2		
Highest level of education				
RN Diploma	N/A	2		
BScN	9 (in progress)	5	1	
Graduate degree	N/A			1
Number of years in practice				
<1-10	N/A	5	1	
10-21+	N/A	2		1
Number of years teaching in academic setting				
1-5	N/A	N/A	1	
6-10	N/A	N/A		1
Previous degree				
Yes	2	N/A	N/A	N/A
No	7	N/A	N/A	N/A

5.5.3 Documents reviewed

Table 5.6 includes a list of the documents that were used for the document analysis.

Table 5.6 Documents included in the review

Documents from clinical setting	Documents from educational setting
Documents from chart: admission history form, Brief Pain Inventory (BPI), (Edmonton Symptom Assessment System) ESAS form; hourly rounding form; Admission orders	Course outlines for theory and clinical courses
Education slides: care in the last days and hours of life; corporate pain orientation; oncology pain orientation	Course outline from research course
Policies and procedures: pain assessment and management policy; pain decision aid	5 student care plans
Pain management education pamphlet	3 student evaluations

5.5.4 What is the gap between evidence-based guideline recommendations and actual practice?

Additional file 1(Table 5.7) contains a summary of findings encompassing the chart audit, document review, site visit and interviews. There is varying consistency across the data sources related to pain assessment practices. The document review and site visit revealed that the corporate pain assessment and management policy, as well as education provided to nurses were clearly based on guideline recommendations and documentation tools incorporate recommended practices. Based on the chart audit the following practices were in line with guideline recommendations (>80% adherence): assessment of pain on admission, cause of pain, and patient as the prime assessor of their pain. Corroborating these audit findings, students, nurses and the clinical instructor indicated in the interviews that they assessed the cause of pain and ensured patient's input was part of their assessment, illustrated in the following quotes:

> *Look at… look at all of them [the patient] because sometimes that pain is anguish or suffering because of something else and it gets really mixed up in suffering pain versus real pain. (Nurse #6)*

> *And then all the qualifiers, "What type of pain is it? Sharp, stabbing. Oh is stabbing pain actually new and you never had stabbing pain?" That kind of stuff. (Nurse #5)*

The frequency of the documentation of pain scores was moderately aligned with practice guideline recommendations (between 50-80% adherence); but incongruent with the interview findings where students, nurses and clinical instructors consistently mentioned they assessed pain scores.

> *So it would be, you know, you need… you need to assess what it is. Where is the pain? What are they rating it on a scale and then what… what is that from the baseline? Is that their baseline? (Nurse #3)*

Documented assessment practices that were poorly aligned with recommendations (<50% adherence) included multi-dimensional pain assessment and the reassessment of pain after an

intervention was carried out. During the interviews, participants emphasized the importance of multi-dimensional assessments (pain assessments beyond severity score) however the tools for documenting these assessments were not used (for example: Brief Pain Inventory (BPI) and Edmonton Symtom Assessment System (ESAS)). Nurses who were interviewed also mentioned the importance of assessing patients' total pain experience (looking at other factors that can contribute to pain such as emotional distress), however this was not evident in the students' responses nor in their documentation. In terms of reassessment of pain following intervention, this was seldom documented but it was commonly mentioned in the interview data by nurses, students and the clinical instructor.

> *So as with every complaint of pain I would go through the PQRSTU [Provoking/Palliating-Quality/Quantity-Region/Radiation-Severity-Timing-Understanding] and get a good understanding of her pain. I would see what she's currently receiving for pain and ask her if she finds that adequate. And how it is at rest and activity, those general questions you ask. (Student #7)*

> *But like checking back in a half hour because sometimes… a lot of times it's not working for them, you know, and also I think assessing… is there some sort of other distress? (Nurse #3)*

Adherence to involving the interprofessional team was not evident in charts that were audited, despite the fact that it was promoted in corporate documents and apparent in the site visit and interview data. Similarly, non-pharmacologic interventions and patient education were emphasized in the corporate policy and staff education, but were not documented in patient charts. In contrast, students, nurses and the clinical instructor mentioned the importance of non-pharmacologic interventions in the interviews, and nurses discussed patient/family education and psychological support as part of their approaches to pain management.

> *OT for splinting and supports and chairs and that kind of stuff. Physio for timing and fatigue management with patients, making sure that they're not tiring them out so we*

> *can't do our work. I've done complex dressings with patients that have had the pastoral care person sit and pray with them while they're doing it. (Nurse #2)*

> *Because there's a lot of distress associated with it. Is it another situation where you might want to sit with them or, you know, pop in more often just to check on how they're feeling. (Nurse #3)*

There was congruence across the pain management policy, chart audit results and the interview data sources about pharmacologic approaches to pain and the regular use of analgesia. Chart audit results showed a moderate level of adherence with recommendations for a multi-modal pharmacologic approach, while interview respondents did not commonly discuss using a multi-modal approach. While the chart audit showed a high level of adherence with recommendations related to PRN administration, less emphasis was placed on the proper medication, route, frequency and dose in the interviews. Lastly, the high levels of adherence to recommendations related to the prevention of side effects was not reflected in the interview responses, with almost no mention of side effects and their prevention.

> *Well it depends on the type of pain. If it's like neurologic pain it would be a different medication, like targeted towards the nerves. But if it was more like non-nerve pain, then maybe start with what she usually takes at home, like Tylenol or Ibuprofen and then work your way up depending on how severe the pain is. (Student #2)*

> *Again, if it's significant amount of pain, injectable versus oral. (Nurse #1)*

5.5.4.1 Validation of results by Advisory Committee.

The results were summarized and presented to the advisory committee members. The committee members believed that the areas of high levels of adherence were related to previous hospital wide work that had been done related to the implementation of pain guidelines, but they were not surprised by areas of lower adherence (documentation of multi-dimensional pain assessment, non-pharmacologic interventions, and reassessment of pain). One committee member commented: "That part of nursing though (non-pharmacologic interventions), it never

gets captured, right?" to which another member replied "No, and that's the whole thing that if it's not documented, it's not done…for research, that's what you have, in the documents". A committee member mentioned that there is a form for the documentation of patient education, but that nurses do not use it to document teaching that is done. Another indicated that they were not surprised that the chart audit results were different than what interview participants described as their practice – that people do things, but don't go back and document it. They recognized that lack of documentation is an issue because students will do what they see in terms of practice, unless the clinical instructor is very prescriptive in their expectations, and comfortable with going against unit norms.

Committee members also indicated that they were not surprised that many interprofessional team members were not involved in pain management per se. They pointed out that the team members are most likely to be asked to be involved in the patient's care for another reason (physiotherapy for mobility; social work for discharge planning), and that pain may get addressed as part of their care, but is not explicitly documented.

5.5.5 Understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guidelines.

Results are presented as barriers and facilitators related to the perceived characteristics of: 1) the guidelines; 2) the users (students, nurses, faculty); and 3) the context (environment, culture, education, evaluation, and leadership). A summary of the barriers and facilitators with sources of data is provided in Additional file 2 (Table 5.8).

5.5.5.1 Barriers

Guidelines. Participants indicated that the lack of applicability of guidelines to clinical practice was a barrier to their use. In addition, it was mentioned that the length of the guidelines

hindered their use – it was difficult to find relevant materials in a long document, and it was daunting to read the full document given time constraints.

> *What you learn at school is different from what we actually do on the unit because we don't have time to do all those crazy steps. (Student #3)*

> *But a lot of those documents are just so big and I know…I can't remember if it's the standards or the BPGs or both that have the summaries but I found those really helpful because it's basically everything you need to know. (Nurse #7)*

Users. Characteristics of the users (students, nurses, clinical instructor) represented barriers for guideline use. Student users did not see guidelines as a "go-to" source of information in the clinical practice setting preferring rather to consult with nurses, clinical instructors or books and other on-line sources. Knowledge and understanding of guidelines and how to access them varied. Some participants verbalized a good understanding of what practice guidelines were, and how to access them, and others did not. Students were aware of practice guidelines, but saw their utility as more for classroom and academic purposes, and a number were not sure how to access them or use them to support their clinical practice. Nurses were aware of guidelines, but relied heavily on policies and procedures rooted in guideline recommendations.

> *I: Who would you go to or what would you do if you weren't really sure? R: Well, the RN that I'm working with or my instructor or… those would be like the immediate people that I'd go to like for advice or just because like they have a lot of experience and they might know from their experience how best to deal with it…(Student #4)*

> *I can't even sit here and go through a whole bunch [of guidelines] with you because I'm trying to think. Now I know there's so many for everything but to name you specifically… But I mean you ask me to do anything we do here with the policies and procedures and I could probably read it off to you. (Nurse #6)*

Context. A number of the contextual elements described in Table 5.3 were evident in the findings. Elements of the environment discussed by participants included a lack of time to access

and read guidelines and challenges accessing guidelines, the latter being related to difficulty accessing computers and the stigma associated with using smart phones to look up information.

> *There's always something else coming up and if you can't find a computer very quickly, then that's just out the window. I don't have time to wait for someone to find a computer to look something up. So you just ask someone else what to do. (Student #3)*

> *Just like if… they're always kind of like if the manager sees me doing something then it's really bad so they were like just don't use your phone, so I just kind of keep it away. Don't use it. (Student #3)*

From the perspective of the unit culture, participants related that it did not reflect a value for or support use of guidelines as part of students' practice experience nor students' ability to make and document clinical decisions rooted in guideline recommendations. The unit culture emphasized the completion of tasks.

> *I think in general the clinical teacher does not have a lot of say or a lot of leeway. (Clinical instructor)*

> *Say I sit down to read or I stand to read… it doesn't matter. Someone sees you standing there not doing a task, they would… then it's like, hey, you. You can come help me with the boost (repositioning patient). (Nurse #3)*

From the academic perspective, guidelines were not part of recommended resources in the clinical course outline, nor explicitly included as a resource for discussion in clinical conferences. Students and the clinical instructor said that they believed more education related to guideline use was needed, and that classroom education needed to be better connected to the clinical reality. The clinical instructor identified the need for education on how to use guidelines as part of clinical teaching.

> *We had this clinical for three months now and only just like a week or two ago I found out about that [hospital intranet] and definitely what we get taught in class is really different than what we use in clinical. So I think that's a big barrier to using guidelines is that we really don't get taught how to do that. (Student #7)*

> *I didn't have an orientation to teaching. Yeah. So that [information about how to use guidelines in teaching] would be also very useful for me to know how to integrate them more other than just reviewing policies constantly. (Instructor)*

The student evaluation form (documentation tool of how students met course outcomes) included reference to the use of evidence sources in practice. Although use of evidence was described as an objective for the clinical course evaluation, guidelines were not specifically mentioned as a source of evidence in any of the student evaluations. Skills in evidence-based practice were not identified as essential outcomes of clinical placements. The teaching approach used by clinical nurses was not focused on using guidelines directly, but on accessing policies and procedures grounded in guidelines and evidence, and carrying out associated tasks. Nurses believed in the importance of being positive role models and supporting students, but did not see their role as helping nursing students use practice guidelines.

> *It's more of hands-on teaching. I don't think we honestly will use the guidelines as per se here they are. This is what we need you to know. It's just… I've never really done that. I've never referred anybody to the best practice guidelines really because they're really not in the forefront of my brain in my practice. To be honest, they're not. (Nurse #1)*

5.5.5.2 Facilitators

Guidelines. Students and both the clinical and in-class educator reported that guidelines are a good source of information for students, given their limited experiential knowledge. Nurse participants perceived that practice in line with guidelines promoted safe, high quality care. Quick fact sheets or guideline summaries were suggested to facilitate their use.

> *For me as a student, I think they're really good because like we're learning. We obviously don't know it off by heart and in those kind of situations you get panicked and then you can't think straight. So it's… I think they're really good resources just to look back onto, like to refresh your memory and like give you some more confidence with dealing with those situations. (Student #8)*

Users. In terms of characteristics of the user, students related that they would be more likely to use guidelines if their clinical instructors and professors prompted them to use them.

> *Like maybe giving us a list of resources that would be helpful to draw back on and just like letting them… letting us know where we can access them and where they're available because a lot of the time it's like I don't even know where to look for them. (Student #8)*

Context. The clinical environment had material and human resources to support practice rooted in guideline use. These resources were evident in the documents reviewed, the site visit and in the interview data. Participants mentioned that guideline use was facilitated by the integration of guideline recommendations in hospital policies and procedures as well in clinical conferences. From the perspective of the unit culture, students and nurses described a positive, welcoming environment for clinical education overall.

> *Well, as a student, I would go to the staff nurse first of all and let them know what I found. And what I've usually noticed in my experience is if the staff nurse doesn't have the answer they call the doctor. I'd mention it to my clinical teacher and see what their perspective is on that. On the unit they have the pain control… there's certain people that are experienced at pain and you can call them if they're available as well and that can be helpful. There's the nurse educator and she's usually in and she's really helpful. And she also is really helpful helping you find guidelines so if you have a question for her she'll not only answer your question but she'll show you how to find the answer yourself. So that's helpful. (Student #7)*

> *I have used some BPGs from RNAO in my clinical conference time when I talk about end of life care with the students and just kind of what our goals in care are with compassionate care. So my rule of thumb with any kind of procedure or experience in clinical is to have them refer to the hospital policy and procedures which are based upon practice guidelines. (Instructor)*

> *I mean it's all culture of where you work, right, so if your management or whomever, educators, are…I: Putting an emphasis on that [guideline use]? R: That's right. Well, then it becomes your culture too. So, but we do get a lot of research stuff, you know, stuff to use here. (Nurse #3)*

Aspects of education that were seen as facilitators included integrating guidelines in curriculum and educational activities and providing education specific to guidelines or EBP (from course outlines and interview responses). As indicated in the description of the sample, none of the participants had additional education related to EBP or research use beyond their

entry-level program education.The final contextual element related to leadership for guideline implementation; interview participants identified the support of unit leaders as necessary for guideline use.

> *But other than that, in classes we were never really looking deeply into them. They were just part of like the recommended readings. No one really does the recommended readings and, yeah, I think if we were like quizzed on it or something like that we would look into it more deeply. (Student #2)*

> *Like even just managers and educators supporting that new initiative which I do think they do just I don't know that it's always a priority. I think that helps drive it forward as well. (Nurse #5)*

5.5.5.3 Validation of results by Advisory Committee.

As with the first study objective, advisory committee members agreed with the identified barriers and facilitators to guideline use in the clinical setting. They were not surprised that students looked to clinical nurses as a point of reference for what they should be doing in practice. They confirmed that students are not allowed to use their phones in the clinical setting, it is a policy that has arisen out of privacy breeches and lack of professional use of devices in the clinical setting. They indicated that students are able to access information on their phones when they do their clinical preparation, or during breaks. Anticipating the implementation of an electronic health record, advisory committee members considered whether there may be a change in the students' access to computers for researching information, including guidelines.

Advisory committee members recognized that at the time of the study, students did not have access to corporate and unit orientation materials. However, this is something that could be readily rectified moving forward, giving students access to the materials, and ensuring clinical instructors let students know how and where to access them, and perhaps also use the information as part of their unit orientation or clinical conferences.

In terms of how student input could be communicated on the unit, the advisory committee members emphasized that nursing students could indicate changes on the Kardex, and that the clinical instructor's level of input might be influenced by whether they are actual clinical nurses on the unit or not. They agreed that a heavy emphasis on the unit, and in nursing in general, is the completion of tasks, and that nurses may not recognize that they are following guideline recommendations, when in fact they are, because they are embedded in unit policies and practices. One committee member emphasized how important it is for the students to bring a questioning nature to clinical practice, to always be asking "why"; and in turn that the nurses that they are working with suggest resources to answer the question – not just say "well this is how we do it".

5.6 **Discussion**

5.6.1 Evidence-practice gap

There is a gap between certain recommendations and documented practice, notably: 1) conducting multi-dimensional pain assessments and documenting those assessments using relevant tools (BPI, ESAS); 2) involvement of interprofessional team members for pain management; 3) documentation of non-pharmacologic interventions; and 4) reassessment of pain. Of note, interview participants indicated that: they would conduct multi-dimensional pain assessments; interprofessional team members were highly involved in patient care; non-pharmacologic interventions were used for pain management; and pain was reassessed. The chart audit findings are similar to those of Choi et al.[59], who audited 65 inpatient oncology patient charts, and indicated that patient and family education was not documented; Herr et al.[60] who found that multidimensional assessments, pain reassessment and non-pharmacologic pain practices were not documented in a chart audit of 399 hospice patients; and Kasasbeh et al.[61],

who found deficits in documentation of multi-dimensional pain assessment in a baseline audit of cancer pain management practices in 15 cancer patients' charts. Song and colleagues[57] found that in the charts of 37 hospitalized oncology patients the areas of suboptimal practice included pain reassessment, pharmacologic interventions, and bowel regimen prescription with an opioid order.

The gaps in practice identified in this study as well as in the literature suggest that assessment and interventions for pain management are not wholly reflective of guideline recommendations – some guideline recommendations are clearly evident and others are not. It is important to address these gaps in order to ensure that optimal, evidence-based care is provided to patients and families. Nurses and clinical instructors play a key role in influencing the practice of students in clinical placements. Blackman[62], in a study of factors that impact graduating nurses' ability to engage in EBP, found that one strong influencing factor was whether students had actually seen other staff delivering EBP. In a large Italian study looking at nursing students' opportunity to access evidence-based tools (clinical practice guidelines), the authors found that students that were supervised by a clinical nurse and clinical instructor were more likely to access guidelines, compared to those that were supervised solely by a clinical nurse. Ó Lúanaigh[63] and Webster et al.[64] found that RNs had highly influenced nursing students' clinical experience, though their findings did not specifically focus on EBP. Finally, Matthew Maich et al.[65] found that students value clinical instructors that have strong knowledge and practice in both the clinical and teaching realms. In addition, students in this study identified the importance of clinical instructors acting as role models in practice. The study results and literature point to the need to prepare clinical instructors and practicing nurses for their role in supporting nursing students in relation to EBP.

The discrepancy between documented practices and what was discussed by participants was discussed by the advisory committee members. Their sense was that the assessments and interventions that were not documented were in fact addressed by the nurses and students but not documented. Issues with documentation identified in this study are supported by observations in the published literature. Two review articles have looked at issues associated with nursing documentation. Jefferies and colleagues[66] indicated that studies included in their review found that patient education and psychosocial support are rarely recorded in nursing documentation and that nurses must be mindful to document practice that reflects these practices. A systematic review by Wang et al.[67] found that there are many gaps in nursing documentation notably as it relates to psychosocial and educational aspects of care. The authors of two studies have examined documentation practice specific to palliative care settings. Gunhardsson and colleagues[68] reviewed 15 charts, finding gaps in multi-dimensional pain assessment, an emphasis on documenting medication administration for pain (and not other nursing actions), and a lack of evaluation of interventions for pain. As part of a quality improvement project, Stewart et al.[69] looked at documentation practices in 10 charts. They found that documentation focused on routine tasks by nurses, did not capture elements such as emotional care or what the nurses actually did for the patient and family, and did not include reassessment data. These gaps in documentation support the need for future studies to triangulate data from multiple sources (and not solely relying on chart audit data) as was done in the current study.

5.6.2 Influencing factors

Factors that influenced nursing students' use of guidelines were characterized as barriers and facilitators in both the clinical and educational contexts. Guidelines were not viewed as practical in terms of both content and format despite the fact that they formed the basis of

clinical policies and procedures, orientation material and documentation tools. Guidelines were not seen as a "go-to" source of information, nor particularly relevant for clinical practice although benefits were discussed in terms of providing a good resource for nursing students and being important for nursing practice overall. Interview participants did not have a strong overall understanding of what guidelines are and how they could access them, recommending that summary sources of guidelines would promote their use.

Contextual barriers included: not having time to access the guidelines in the clinical setting; not being able to access them on unit computers or personal smart phones; not having the power and authority to implement guideline-based practices; a lack of education related to guideline use; guideline use not being valued in the clinical setting nor in student clinical evaluations; perceiving guidelines as part of classroom education that is separate from clinical education; and staff nurses not referring students to guidelines as part of their teaching in the clinical setting. Facilitators related to context included the many resources for guideline use identified as part of the document and site visit; a positive unit culture that promoted learning overall and research use; the integration of guidelines in the educational curriculum, and the provision of education related to guidelines or guideline based clinical education.

These influencing factors reflect some of those identified in the scoping review by Fiset et al.[70] that looked at the factors that affect nursing students' use of EBP in clinical education. Specifically, the scoping review identified: the attitude and knowledge of students; the support of the clinical setting; integration of EBP in the curriculum; the availability of EBP resources in the clinical setting; and the relevance of the evidence to the clinical practice setting. Blackman and colleagues[62] also identified skills in the analysis, critique and synthesis of clinically based research as an influencing factor. In a study published in 2019, Lam and Schubert[71] found similar

factors influencing EBP competence in nursing students: they confused EBP with research; they focused on fact-based knowledge such as medications, lab results and procedures; they used textbooks, clinical materials and Google to find clinical information; they did not use devices such as smartphones to access information; they used research for academic assignments and did not see classroom knowledge as relevant for the clinical setting; and they did not see nurses as a resource to support evidence based practice.

The results of this study support the existence of the theory-practice gap discussed in the introduction. It is necessary to have approaches to teaching within the clinical setting that promote linkages between guidelines (which students and nurses view as the purview of the academic setting) and clinical practice; addressing one of the attributes of the theory to practice gap identified by Greenway[7], namely, that theory is perceived as being irrelevant to practice. Engaging students through learning activities that are rooted in constructivist and adult learning approaches will help them to see the value of guidelines for practice[72]. A number of strategies to promote EBP in clinical education have been described in the literature. Examples include: workshops for clinical instructors and/or students to promote critical appraisal and the use of best practice guidelines (BPGs) and evidence in clinical education[73-75]; journal clubs[75-77]; and having the students conduct evidence-based projects during their clinical rotations[78-80].

Not all elements of context, used as part of the analytic filter, were evident in the current study. Of note, power and authority, leadership, sources of information on performance and the education level of the nurses were not found to be influencing factors in this study. It may therefore be useful to examine context with a different lens for clinical education purposes. Characteristics of the context that were shared by interview participants related to: 1) the environment – having time to access and read guidelines, access to tools such as computers or

smart phones and the integration of guidelines in unit policies and procedures; and 2) education – participants' perceptions that what is taught in the classroom (including guidelines) is not relevant for the clinical setting, teaching is focused on the "practical" not the theoretical and the need to integrate guidelines in the curriculum. Recognition of these contextual factors and creating strategies to address them could potentially increase nursing students' use of guidelines in the clinical setting.

In addition, the action phases of the KTA framework could be adapted to increase its relevance for clinical education. For example, exploring the gap between recommended and actual practice could be extended to include the specific learning needs of students. In adapting knowledge and strategies to the local context the broader "learning context" of students in the clinical setting and the disconnect between the classroom and the practice reality should be considered. As previously mentioned, barriers and facilitators for students in the clinical education context will be different from what is typically seen with health care providers. Interventions to address barriers affecting students will be educational in nature, involving faculty, clinical staff and students.

5.6.3 Strengths and limitations

The descriptive case study approach contributed to developing an in-depth picture of the factors that influence nursing students' use of guidelines in clinical education. Donnelly and Wiechula[36] propose that case study methodology is suitable for research focused on clinical education, in that the methods promote the discovery of the complex intricacies inherent in this area. The project allowed for the collection of data from multiple sources, and the iKT approach helped to ensure the credibility of the process and the results of the study. Involving future users of the knowledge generated in this study will help to ensure its applicability; in fact, advisory

committee members commented on changes they could readily make in curriculum and resources at the final validation meeting. The iKT approach is challenging in the context of PhD research as there are other actors that influenced the study, such as thesis supervisors and committee members.

There are limitations inherent in the case study approach and the methods employed. The overall study was limited in scope as it focused on one program during one clinical placement experience. Results would potentially vary depending on characteristics of the nursing program, student level in the program, and the clinical setting. In terms of specific methods, limitations related to the chart audit include the challenges with data collection (having to review separately scanned documents for each patient chart); not being able to reliably discriminate between nursing students and nurses' practice on many variables; and the challenge of capturing, in the chart audit, what was documented vs. what was actually done.

For the document review, key documents may have been missed as there was not a systematic process used for identifying documents. This limitation was mitigated by the advisory committee directing the PI to relevant documents, and the site visit which prompted the PI to seek out selected documents, such as the patient education booklet. In addition, few students submitted care plans and course evaluations for analysis, despite multiple requests. For the interviews, the potential for response bias existed as the interviewers were known to many staff members; responses may be shaped by what the respondents think the interviewers want to hear vs. what they would actually do. Selection bias may also have been present in that those that agreed to participate may have felt comfortable with their approaches to guideline use in clinical practice and therefore may have reflected a more positive picture than is actually the case. Crowe and colleagues[40] have described potential pitfalls of case study research, and possible mitigating

actions. The issues identified above relate to the pitfall they describe as lack of rigour[40(p7)]. These authors suggest triangulation, respondent validation and transparency throughout the research process as actions to lessen these threats, and all were used in this study.

5.7 Conclusion

The aim of this study was to understand the factors that influenced nursing students' use of evidence-based pain management guidelines in their clinical placements. Given the presence of a practice gap for some pain assessment and management strategies, and the likely influence of nurses' practice on the care nursing students provide in the clinical milieu, it is important to develop approaches to education that encompass both the academic and clinical settings. By closely examining the influencing factors identified and creating approaches to learning that are rooted in constructivist and adult learning theories and the phases of the KTA framework, educators will be able to encourage guideline use in context-specific ways.

5.8 **References**

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Table 5.7 Additional file 1 *Summary of results – Pain assessment and management practices*

Aspect of practice	Audit results[a]	Illustration (data source)
Assessment		
Patient as prime assessor of pain	High adherence	Documents aligned with recommendations (corporate policy for pain assessment and management; orientation content; and documentation tools) For pain, I guess it's a lot of like what the patient tells you. (Nurse #4) Look at… look at all of them [the patient] because sometimes that pain is anguish or suffering because of something else and it gets really mixed up in suffering pain versus real pain. (Nurse #6) Like I said, we have documents too for patients to rate their own pain, which we should give them on admission. Sometimes they don't get done. (Nurse #6)
Screen on admission/document score	High adherence	Documents aligned with recommendations (corporate policy for pain assessment and management; orientation content; and documentation tools)
Cause of pain documented	High adherence	Documents aligned with recommendations (corporate policy for pain assessment and management; orientation content; and documentation tools) And then all the qualifiers, "What type of pain is it? Sharp, stabbing. Oh is stabling pain actually new and you never had stabbing pain?" That kind of stuff. (Nurse #5)

Aspect of practice	Audit results[a]	Illustration (data source)
Document score for pain episode	Moderate adherence	Documents aligned with recommendations (corporate policy for pain assessment and management; orientation content; and documentation tools)
		What the causing factor is for the pain. Like if it's a constant pain. Is it new onset or more chronic? How the patient rates their pain like on a scale of one to ten as well as the classification, so dull, throbbing, et cetera. (Clinical instructor)
		So it would be, you know, you need… you need to assess what it is. Where is the pain? What are they rating it on a scale and then what… what is that from the baseline? Is that their baseline? (Nurse #3)
		So I'd ask about her pain and like the quality and the scale on zero to ten, if she's able to do that and what makes it worse and all that and what makes it better. So then whatever works for her, I would try to do that as much as I can…(Student #2)
Multidimensional assessment	Low adherence	Documents aligned with recommendations (corporate policy for pain assessment and management; orientation content; and documentation tools)
		Finding out what triggered the pain that time as well. Is… he suddenly was doing something that stressed and gave him the increased pain. To make whatever triggered not trigger it. (Nurse #2)
		So as with every complaint of pain I would go through the PQRSTU [Provoking/Palliating-Quality/Quantity-Region/Radiation-Severity-Timing-Understanding] and get a good understanding of her pain. I would see what she's currently receiving for pain and ask her if she finds that adequate. And how it is at rest and activity, those general questions you ask. (Student #7)

Aspect of practice	Audit results[a]	Illustration (data source)
Reassessment after intervention	Low adherence	Documents aligned with recommendations (corporate policy for pain assessment and management; orientation content; and documentation tools) But like checking back in a half hour because sometimes… a lot of times it's not working for them, you know, and also I think assessing… is there some sort of other distress? (Nurse #3) Well, if I give a PRN, after it's expected, I don't know how to word this, like peak of action, I would reassess and see if it worked. And if it doesn't then that's when you call the doctor and have them re-evaluate the pain control. (Student #7)
Care processes		
Involvement of interprofessional team members and consultation services	Low adherence	Documents aligned with recommendations (corporate policy for pain assessment and management; orientation content; and documentation tools) Presence of interprofessional team and palliative care team members (site visit) OT for splinting and supports and chairs and that kind of stuff. Physio for timing and fatigue management with patients, making sure that they're not tiring them out so we can't do our work. But I can see a patient maybe having two or three members of the team, even the social worker in the pastoral care. I've done complex dressings with patients that have had the pastoral care person sit and pray with them while they're doing it. (Nurse #2)
Considering the patient's goals and preferences for pain management	Not examined	Documents aligned with recommendations (corporate policy for pain assessment and management; admission history) I think everybody's very patient focused, quality of life focused, symptom management focused probably all the time may be our biggest downfall. It's whatever works for the person in the centre court. (Nurse #2) And move up and ask, I guess like if she has any preferences for pain relief, I guess, in addition to… so medications or warm blankets or…Then if not, checking what they have available PRN and knowing that… like giving them the options, seeing if they have a preference for one med over the other. (Student #9)

Aspect of practice	Audit results[a]	Illustration (data source)
Non-pharmacologic interventions	Low adherence	Documents aligned with recommendations (corporate pain orientation, student care plan; pain education booklet)
		Positioning. Looking at the bed surface the patient is on. Maybe we need to change the surface once the patient is in better pain control. Heat, using heat. Using ice, warm blanket if it's a stress thing. (Nurse #2)
		Because there's a lot of distress associated with it. Is it another situation where you might want to sit with them or, you know, pop in more often just to check on how they're feeling. (Nurse #3)
		So I think it's really important for them to have that support and that could help their pain and it could help their shortness of breath or their anxiety, whatever's causing those symptoms. (Nurse #5)
		Patient booklets and even the guidelines could be in more of a public place even for our patients and families to understand because another barrier is the families because they don't understand what we're using medication for, even with the teaching. (Nurse #1)
Pharmacologic recommendations		
Regular analgesics vs. PRN	High adherence	Documents aligned with recommendations (corporate pain orientation, corporate pain assessment and management policy, unit pain orientation, medical admission order sheets, decision aid for dying patient, student care plans)
Multimodal analgesia	Moderate adherence	Usually like checking first if they have a straight dose of something coming up or if I'm in the timeframe of giving a straight dose of something that's not like an extended release. (Student #9)
Correct PRN medication	High adherence	Well it depends on the type of pain. If it's like neurologic pain it would be a different medication, like targeted towards the nerves. But if it was more like non-nerve pain, then maybe start with what she usually takes at home, like

Aspect of practice	Audit results[a]	Illustration (data source)
Correct PRN dose	High adherence	Tylenol or Ibuprofen and then work your way up depending on how severe the pain is. (Student #2)
Correct route	High adherence	Again, if it's significant amount of pain, injectable versus oral. (Nurse #1)
Correct frequency	High adherence	Making sure the student knows the regular meds the patient's given with the effects they're going to have as well as the PRN, our timing when we can give and when we can, you know, need to get extra doses maybe from a physician. We need to look at boluses, understanding whether or not the student knows how to give boluses to the patient. (Nurse #2)
Anti-emetic prescribed (opioids)	High adherence	
Bowel regime prescribed (opioids)	High adherence	

[a] high adherence = >80%; moderate adherence = 50-80% ; low adherence = <50%

Table 5.8 Additional file 2 ***Summary of results – Barriers and facilitators***

		Illustration (data source)
Barriers		
Perceptions related to characteristics of guidelines	Guidelines are not practical	I mean I think the whole problem with being a nursing student is there is best practice and then there's actually what people do and you don't want to be the person who's doing wacky things…(Student #1)
		Definitely what we use in class is really different than what we use in clinical. (Student #7)
	Guidelines are too long/not available in language of choice	But a lot of those documents are just so big and I know…I can't remember if it's the standards or the BPGs or both that have the summaries but I found those really helpful because it's basically everything you need to know. (Nurse #7)
		I think the barriers though for sure are the time, access to a computer, maybe your first language isn't English, can you access it in French? (Nurse #5)
	Guidelines not helpful or in line with clinical practice	So the only way that I've used practice guidelines is when I'm doing nursing care plan for those recommendations, because we have to cite a few of them or to come up with new recommendations. So I have looked at the pain one and the RNAO pain one many times. But I don't think I used it so much for my own - it's more for a care plan. (Student #1)
		I: What's been your experience in using this or any other practice guidelines as part of your clinical placement? R: I haven't honestly really even looked at it. I looked at it for an exam. We had our (theory) exam and she gave us the algorithms for these ones. I: No, it's not been something as part of your day to day? R: No. (Student #8)
		I think it helps you to know that that's evidence based and most up to date because sometimes people in the unit will tell you something and then you'll read the guideline and just be like actually, this says that you should do this instead of that so it's good just to have like a foundation if you disagree with something that you see and you're like, well, this says that. (Student #3)

Characteristics of the user	Don't see guidelines as "go-to" source of information	I: Who would you go to or what would you do if you weren't really sure? R: Well, the RN that I'm working with or my instructor or… those would be like the immediate people that I'd go to like for advice or just because like they have a lot of experience and they might know from their experience how best to deal with it or…(Student #4) I've definitely seen like there's lots of books there that you can always look up extra things on. I like that we have a lot of computers so that we are able to look up anything that we want to pretty much. (Student #5) I don't think that's something that in practice I'm going to go into their website and look for the particular one that's relevant. So I find that when I'm at the hospital I'm referring to the hospital sources, its better. (Student #7) I think what was really disappointing in doing that (referring to guidelines and algorithms) was when I was going through the algorithms in class and talking about them, and I had asked everyone… I could just tell they… like they hadn't read. (Professor)

Mixed understanding of what guidelines are	Something nurses can look to so that they know they're doing things in the right manner…because you can't just go in and do whatever you want. I: If you had to name some, would you know where to look for any? R: Maybe… I don't know if there's some with like the nurses' association or like ONA [Ontario Nurses' Association – Union] or those types of… like I would start maybe like search there. (Student #4)
	I guess sort of almost like a review of current research with sort of a checklist of the best way to deal with the situation. (Student #9)
	I: Have you had to use any like in any of your assignments or anything? R: I think we did, if I'm right, for an ethics paper [student was referring to another course where regulatory body standards were included as part of content and key resource for a paper]. (Student #4)
	I see a policy and procedure as a guideline. It's like more specific. (Student #6)
	They're guidelines set in place to ensure that we give the best possible care to our patients and that they are evidence based and not just something somebody kind of made up. (Clinical Instructor)
	So my understanding of them is they're sort of like… well in general the most current research that's been pooled together from the experts within our field. (Nurse #5)
	I guess it's just like something to help us to know what we can do and what we should do in situations, I guess. I don't know that much about them at this point. I didn't really come across a whole lot. I know we did study them in school and like they were definitely brought up... (Nurse #4)
Not sure how to access guidelines	Well, we've been only exposed to the RNAO ones in like classes. And so if there are more other than that, that'd be nice to know. (Student #2)
	We've been taught to use like practice guidelines and stuff but like we just… they've just kind of like said like oh you should be using them but it's like well, which ones or where do we get them and like all that kind of stuff. (Student #8)
	I don't see any barriers (to using practice guidelines). Maybe just like not knowing that they're there really. If it was made known to us more than once, obviously, because it's hard to just take everything for that one time. We do always need reminders. (Nurse #4)

Characteristics of context-environment	Lack of time	There's always something else coming up and if you can't find a computer very quickly, then that's just out the window. I don't have time to wait for someone to find a computer to look something up. So you just ask someone else what to do. (Student #3)
		Time constraints is the biggest thing for anything you don't do in nursing. It's never because people don't want to be the best or follow the rules exactly. It's like, you know, how do you squeeze time in? (Nurse #3)
		Being in a faculty position in a university, there's always competing demands but I find this… and for me as a newer faculty, I find it very hard because what I'm evaluated on, you know, like in terms of my research productivity…I'm constantly pulled between the teaching and the research. You know, like so I just wish I had… I wish I had more time to develop the course. (Professor)
	Difficulty accessing guidelines	Computers in the vestibule outside each pair of rooms, however many do not work. Computers at nursing station occupied by non-nursing staff. Physicians have their own office space with computers, and they also have iPads. (site visit)
		There's never a very good access to computers. So it's always just kind of knowing which computer won't work and if there's someone working at the station getting a med ready, you don't really want to move them to use the computer to look something up. So it's just… it's hard to get computer access. (Student #3)
		Yeah, just having it available, I think, is probably the biggest thing. (Nurse #4)
		Having them visible on the unit. You know, people are aware of them then. You know, it's just like there's so much online. It's just like another thing you can find on Google. If it's there, present it as a resource we should be using on the unit and it's physically on the unit, you know, and it's, you know, it's kind of promoted for us to use. (Nurse #7)

	Stigma of smart phone use	The nurses will pull them out in front of us to look stuff up, but I don't really feel comfortable pulling my phone out and looking stuff up. Just like if… they're always kind of like if the manager sees me doing something then it's really bad so they were like just don't use your phone, so I just kind of keep it away. Don't use it. (Student #3)
		And kind of the last thing you want to be caught with is your cell phone with your patients. Like obviously if you can't get access to a computer and you're just looking up a med really quick then it's fine but I don't really like to… And it does look bad like from your patient's perspective and their families if you're looking on your phone. (Student #5)
		But I know even when I started four years ago, if you have an iPhone and you pulled it out of your pocket that was like a no-no, you know; like that's social mixing with work versus now. I don't care. I'll take out my phone.So I think part of the, like the stigma attached to having a phone and looking at it, that going away has helped, you know, having an app on your phone that would make it easier. I have it [Cancer Care Ontario] symptom management tools) on my phone as an app so I could show that to them (students). (Nurse #3)
Characteristics of context - clinical unit culture	Lack of power and authority to make clinical decisions	I mean, you know, the biggest barrier I have… like with pain is that it's something… like because it's usually controlled with narcotics and that we don't have any kind of…any leeway or anything like that. (Student #1)
		Everyone has their own way of doing it and if you tell them that someone else told you that, it's just kind of like well, that's their way, I do it differently. So I don't know how well it would go if I tried to be like, hey, when I go, can you guys keep doing it this way? They would not. (Student #3)
		I think in general the clinical teacher does not have a lot of say or a lot of leeway. (Clinical instructor)

Valuing task completion	There's not a lot of time for education that's not procedure related. Like it's very… how to push this or how to do this dressing and it's not a lot of critical thinking. I feel like a lot of students are very… they just want to get the procedures done. Like a forward thinking idea is not… that's not what… where the people's minds are at. It's just like how do I not look like an idiot. So it's like assess pain, and then and give the med. And oh I've assessed it. I've given the med and that's all I need to do. (Student #1)
	So it's definitely like your focus is if you don't know like ask the nurse, ask your teacher and then it's more like what can we do to get this done as fast as possible so that we can help our patient? Like you just don't have time and especially when you're trying to answer call bells, it's just not possible. (Student #5)
	Say I sit down to read or I stand to read… it doesn't matter. Someone sees you standing there not doing a task, they would… then it's like, hey, you. You can come help me with the boost [repositioning patient]. (Nurse #3)
	So we'll get the patient comfortable but we can go beyond that. So explaining, you know, it's not just… I think the big thing is in their minds it's very tasked and it's what's your pain? What's the number? Is it aching? Yes. And they leave. And they forget to go beyond that. So I think it's important… go beyond that. When is it worse? You know, is it worse in the morning or at night? You know, go beyond all that … telling them that it's a person and it's not just tasks. It's not just questions. You've got to go beyond that. (Nurse #6)

Characteristics of context-education	Lack of education related to guideline use	Recommended resources for students: Regulatory body standards and guidelines; physical assessment textbook; medical surgical textbook; and a nursing fundamentals text book. (course outline)
		They'll get mentioned in class sometimes. For example, the Edmonton System Symptoms Assessment, our teacher mentioned that briefly and she gave us readings on it but it was just like a side reading, I guess. So I feel like they're not explored as thoroughly as they should be. (Student #7)
		And then like encouraging us to do it like - like before we go do a procedure, maybe the teacher could be like, oh, like did you look at this? First, yeah, just kind of prompting us to use them more. (Student #8)
		I didn't have an orientation to teaching. Yeah. So that [information about how to use guidelines in teaching] would be also very useful for me to know how to integrate them more other than just reviewing policies constantly. (Instructor)

Student evaluation not focused on guideline use	Learning objective on the student evaluation form: "5.3.5 Uses most recent and up to date evidence based knowledge from nursing science, social science, and the biomedical sciences when choosing appropriate nursing interventions [for example, applies evidence-informed practices of pain prevention and management]". *None of the students' evaluations included reference to examples for how the students were meeting it.* (student evaluation form)
	Another learning objective is: "consults a wide variety of learning resources". In their self-evaluation of this objective, one student indicated: "I consult a variety of learning sources to prepare for the clinical setting such as lab practice, textbooks, drug manuals, and authoritative websites" and "While in clinical, I consult my clinical instructor and staff RNs, drug manuals, and policies & procedures." (student evaluation form)
	Well, I'd like to see them functioning safely in like a full assignment, but also to have, you know, come a long way from their beginning where they're just focusing on like one thing at a time. Seeing the bigger picture of the patient and starting to put all the pieces of that puzzle together. (Clinical instructor)
	Feeling confident in all their hard work and the skills that they did do; they walk away feeling confident and not discouraged which I know is a little subjective for some. It just depends on the person as well, but feeling confident that the care they provided was good and that they did… they did well as a student. Understanding the interdisciplinary team and that we work together and you're not alone and use the team to make that patient's experience much better. And use the resources; you know, use the resources you have. (Nurse #6)
Classroom education not connected to clinical	We had this clinical for three months now and only just like a week or two ago I found out about that [hospital intranet] and definitely what we get taught in class is really different than what we use in clinical. So I think that's a big barrier to using guidelines is that we really don't get taught how to do that. (Student #7)
	And, you know, and you hear a lot of that too [from the students]. What I did and learn in class I don't feel like - whether they're not sure how to put the connection together or they feel it was useless compared to what they're doing here. They don't feel prepared and they're just eyes wide open and have no idea what to expect. So it can be tough on them the first couple weeks. (Nurse #6)

Teaching role of nurses in clinical setting not focused on using guidelines	It's more of hands-on teaching. I don't think we honestly will use the guidelines as per se here they are. This is what we need you to know. It's just… I've never really done that. I've never referred anybody to the best practice guidelines really because they're really not in the forefront of my brain in my practice. To be honest, they're not. (Nurse #1)
	Referring them to resources I feel like…like probably it is not going to go anywhere. (Nurse #7)
	I'm not that big on using the little books [Cancer Care Ontario guidelines] anymore because they're all outdated. The computer is probably the easiest one. Pull the policies up. If it's a really odd thing, we're not quite sure what it is, Google. (Nurse #2)
	So sharing your knowledge is a big piece I think. But also just encouraging them, sharing skills and I think also it's… I think the nurse on the unit is probably sometimes one of the best teachers for students because they're in the job. (Nurse #5)
	If you go in with them and show them, like model, like she'll remember that today because we went and we did it together and next time hopefully…Just like modeling behaviour that this is actually how it is out here in the real world. Like it's not just in the textbook. (Nurse #3)
	But getting the student to think through it themselves rather than just like telling them to do it. And then explaining the rationale behind them or asking them, okay, why did we do this? You know. And if they don't know or a bit confused about it, you know, explaining it or saying like, here's good resource to go to to find out more on why we do this. (Nurse #7)
	But I think one of our most important roles is to help the students feel comfortable. I mean that might sound really funny but I think half the battle is being so nervous and new in a place and feeling overwhelmed by all the information, the complexity of the patients. And so I think if we can help them to ease that transition to feel comfortable, they're going to learn more. Encouraging them to gain more knowledge and then feel more competent in their practice. (Nurse #5)

Facilitators		
Perceptions related to characteristics of guidelines	Guidelines are useful	For me as a student, I think they're really good because like we're learning. We obviously don't know it off by heart and in those kind of situations you get panicked and then you can't think straight. So it's… I think they're really good resources just to look back onto, like to refresh your memory and like give you some more confidence with dealing with those situations. (Student #8)
		The CCO [Cancer Care Ontario] ones [guidelines] I think focus very differently than just a task at hand because they look at symptoms from… like in a bigger perspective or in bigger light. They kind of help the students maybe critically think or open their eyes to how many things can impact one symptom that you're having. (Clinical Instructor)
		Having that understanding and knowing what those backgrounds are, that's where you get to be a little bit more critical, you know, or an advocate for your patient if, you know, if symptom management isn't optimal. (Professor)
		It's how we explain what it is we do and why we do it. It's the patient's safety. Its patient delivery of care; nursing giving care to the patients. Almost everything we do has got some background in a practice guideline. You can justify to other disciplines why we do what we do and where our background is. So I think that's… it's standardized how we can talk to other people about what it is we do in my mind. It also gives us a way to refer to what we do and justify our professional status with the people in the public. People who don't understand what nurses do. We don't just shuffle bedpans; we do care that improves peoples' lives. (Nurse #2)
	Adapting guidelines to make them more accessible.	Like maybe giving us a list of resources that would be helpful to draw back on and just like letting them… letting us know where we can access them and where they're available because a lot of the time it's like I don't even know where to look for them. (Student #8)
		Quick fact sheets. I think that would be… that would be helpful. But I think most of them do come with like the sort of the, the smaller version or the quick and dirty version of the guideline. (Professor)

Characteristics of the user	Encouraging students to access guidelines in clinical setting	Cancer Care Ontario came up with dyspnea guidelines a few years ago that are really good and I try to redirect students to that. Because, if anything, it's something we use all the time. I mean I've called docs on call and said to them, "We have a decision tree," there's also apps on their phone they can use which I've showed students as well and I have them. (Nurse #5) Use your best practice. Use your policies and procedures here. Go to your manuals and before you go in and do a task, look it up. Check it out. Read about it. And then go in and whether it has to be with your preceptor or whatever, go in and do it. (Nurse #6)

Characteristics of context-environment	Resource availability on the clinical unit	Advanced Practice Nurse (APN) for Palliative Care is a resource for staff. (educational slides for a presentation on "care of individuals and families in the last days and hours of life")
		APNs for Acute Pain, Chronic Pain and Palliative Care are listed as resources. (corporate pain assessment and management orientation)
		Oncology Nurse Educator is listed as a resource. (slides for the Oncology program pain management orientation presentation)
		Palliative Care specialists, Nurse Educator, Clinical Care Leader and Clinical Expert were on the unit as a resource for nursing staff. (site visit)
		Presentation slides for "Care of individuals and families at the end-of-life" were available in the staff break room. Posters that had pain prevalence study results were evident in the hallways; and quality improvement posters were evident in the staff break room. Journals, books and binders were on bookshelves at the nursing station and in the staff break room. Some journal articles were tacked up on a bulletin board in the break room. Laminated symptom management algorithms based on the Cancer Care Ontario guidelines were hanging on a ring outside each patient's room. Symptom management guides reflecting guideline recommendations were available in the family room and at the nursing station (site visit).
		We had a lecture from someone from the pain service, a nurse practitioner, and she talked about giving, you know, like with different kinds of pain… like the different meds for different kinds of pain. (Student #1)
		And our clinical instructor also showed us how to find like policy and procedures and all these kind of documents on their website. (Student #2)
		There's… well, there's just pamphlets, handouts, looking up their medication to find out exactly what we're looking at. I mean there's CCO [Cancer Care Ontario] as well, guidelines, and all of that kind of other information but I think it has to be tailored to that patient. (Nurse #1)
		So the Cancer Care Ontario has a booklet on like symptom management…I: The pocket guide? R: Yes, the pocket guide that goes through dyspnea and shortness of breath, as well as anxiety. I think the newer one has pain there too, so I actually handed those all out to my students before, and had them refer to that as needed for whatever symptoms they encountered. (Clinical instructor)

	And if people are doing something that doesn't make sense to a couple of people listening then the couple of people listening speak up and say, "I don't think that's quite right." We should find out… use our educators, find out what's the right way to do it. I trust my people in professional practice have put it (policy and procedure) together based on those practice guidelines. (Nurse #2)
Integration of guidelines in unit policies and procedures	Corporate pain assessment and management policy refers to the Registered Nurses' Association of Ontario (RNAO) Best Practice Guideline (BPG) on Pain Assessment and Management in the reference list, and many of the recommended practices are taken from this guideline. The corporate pain orientation refers to the RNAO BPG and suggests it as an additional resource for pain management. The hospital hourly rounding protocol includes the recommended practice of incorporating pain assessment as part of the process (document review).
	I think we're pretty focused on them [guidelines] anyway because we're very policy driven. So if you want to just pluck out the ones [policies] that are important to you and you go back and read them, you realize that our policies are written from them [guidelines]. (Nurse #2)
	But it's how… what has actually been done within an organization to implement those guidelines and then implementing the guideline but what does that actually look like? Because you may not on the surface notice that they've implemented the guideline but say, for example, you've got a certain set of standing orders…a pathway. And you actually start to sort of dissect what's on that clinical pathway. The guidelines may be woven through but you don't… like as a clinical nurse, I wouldn't know that right? Like I would have to actually research the… whatever the tool was to find out if this was actually based on recommendations from the guidelines, you know. (Professor)

Characteristics of context-culture	Positive culture on the unit	I think our attitude towards students has to be nurture the student or you have an unreliable co-worker, really. And maybe that's a selfish attitude. It's a team building attitude. I honestly believe that. I don't think anybody on the medical oncology floor feels threatened by any other person on the medical oncology floor. It's very… I think it's a very strong team that way. (Nurse #2) [expect that students are] able to provide care for the patient using what they've learnt out of their books and their theory in order to do it. My expectation from the student is you get the work done in a period of time, get it done safely with some form of theory or intelligence attached to it. (Nurse #2) I mean it's all culture of where you work, right, so if your management or whomever, educators, are…I: Putting an emphasis on that [guideline use]? R: That's right. Well, then it becomes your culture too. So, but we do get a lot of research stuff, you know, stuff to use here. (Nurse #3)

Characteristics of context-education	Integration of guidelines in curriculum	The course outline of the theory course that the students were taking concurrently to their clinical course refers to palliative care symptom management, specifically "current best practices related to symptom management" and makes reference to the Cancer Care Ontario symptom management toolbox. (course outline)
		Clinical conferences a venue to "help students reflect on their practice, apply theory to practice and examine nursing care issues relevant to each clinical milieu. Clinical conferences are customized to meet the learning needs of students in each clinical group." (course outline)
		But other than that, in classes we were never really looking deeply into them. They were just part of like the recommended readings. No one really does the recommended readings and, yeah, I think if we were like quizzed on it or something like that we would look into it more deeply. (Student #2)
		So maybe like even teaching us, like giving us some case studies before, like in our post-conference or pre-conference so that we're like equipped to deal with the possible situations. (Student #8)
		I have used some BPGs from RNAO in my clinical conference time when I talk about end of life care with them and just kind of what our goals in care are with compassionate care. So my rule of thumb with any kind of procedure or experience in clinical is to have them refer to the hospital policy and procedures which are based upon practice guidelines. (Instructor)
	Education related to guidelines or EBP	Objective from theory course is to: **"**Apply theoretical and evidenced-based concepts to complex client care needs" (course outline).
		Objective from nursing research course: "1. Identify the importance of research in the evolution of health care professions; 2. Distinguish concepts and principles relevant to research; 3. Understand the steps of the research process; 4. Demonstrate understanding of the appropriateness of different research methods; 5. Demonstrate basic skills in critical appraisal of research articles; and 6. Discuss research findings related to clinical practice." (Course outline)
		I just know our in-services that we're given and our Lunch 'N Learns, when they talk about pain, symptom management, when they're those topics that the best practice guidelines are always kind of involved and what they're trying to bring us up to a level of care. (Nurse #1)

Characteristics of context-leadership	Leadership for guideline use	I think there's a clinical manager but I don't know if he would help with this type of stuff. I know he mainly just talks to patients. Like I know he checks the like Whiteboards and hourly rounding, but I don't know if he would be helpful for practice guidelines, maybe. (Student #3)
		Like even just managers and educators supporting that new initiative which I do think they do just I don't know that it's always a priority. I think that helps drive it forward as well. (Nurse #5)
		So just having our senior nurses or our mentors or managers or whoever encourage that and provide us with the time and resources to do it. (Nurse #7)

Chapter 6: Integrated discussion

My dissertation was focused on describing the factors that influence nursing students' use of pain management practice guidelines in the context of their oncology clinical placement. In the first part of this chapter I summarize the findings of the three dissertation studies. I then discuss the implications of this work and how they relate to current literature in three areas: 1) the need for improvements in academic-clinical partnerships; 2) theory to inform approaches to education and research related to nursing students' use of EBP in clinical education; and 3) implications for nursing practice, education, and research.

6.1 Summary of dissertation findings

For the first study, I conducted a published scoping review of the literature using the Arskey and O'Malley framework for scoping studies (2005) and process recommendations by Levac, Colquhoun and O'Brien (2010) (Chapter 3). The goals of the scoping review were to describe the barriers, facilitators and other factors that influence nursing students' evidence-based practice (EBP) in clinical education and to identify educational strategies that have been developed and evaluated to promote EBP by nursing students in their clinical placements. The most common barriers identified were negative attitudes toward EBP and lack of knowledge and skills for EBP followed by lack of time to engage in EBP activities, and lack of support for EBP in the clinical setting. Educational strategies identified include information sessions and EBP projects (both in combination and separately), where students relate evidence to a clinical issue they have encountered or that is deemed important by clinical staff. Other strategies included student-led journal clubs, workshops for clinical instructors, peer mentoring, problem-based learning and use of smart devices to access evidence. The evaluation of interventions was overall

positive, however most studies were non-experimental in nature, with single sites and small sample sizes.

The second published manuscript (Chapter 4) describes the process of developing quality indicators from practice guideline recommendations. Indicator development was the first step in the chart audit I conducted to address the fourth research objective of the study. I carried out the following steps: 1) topic selection; 2) guideline identification and appraisal and 3) extraction of recommendations; 4) selection of indicators; and 5) practice test (Kotter, Blozik, Sherer, 2012). Three high-quality guidelines informed the development of twenty-nine indicators. The challenges of this development process included issues such as the labour-intensive nature of the process, the need for library support and the large numbers and types of pain guidelines available. In addition, the guidelines identified were of variable quality, used different approaches to the grading of recommendations, and included recommendations that were often multi-faceted and difficult to measure practically. I make the case for including quality indicator development as part of guideline creation, in order to facilitate the identification of evidence-practice gaps as well as the evaluation of guideline implementation.

The third study (Chapter 5) was a single descriptive case study that employed mixed methods with fourth year nursing students during a placement on an oncology unit. A chart audit, qualitative interviews, document review and a site visit were carried out to examine the gap in practice between recommended pain management practices as well as the contextual factors related to guideline use. Many recommended pain management practices were evident in all data sources (chart audit, interviews and documents). Areas of inconsistency between the data sources (evident in interviews and documents, but not in chart audits) include: multi-dimensional pain assessment; reassessing pain after intervention; the involvement of the interprofessional team;

and non-pharmacologic interventions, including psychological support. Patient education was included as part of corporate documents, but was not documented or raised by respondents during the interviews.

Influencing factors linked to barriers and facilitators of guideline use primarily related to students, nurses and faculty, as well as characteristics of the educational and clinical contexts. Many interview participants also mentioned the lack of applicability of guidelines and their length as key barriers to their use. Guidelines were not seen as a go-to source of information in the clinical setting, with a greater reliance instead on people, hospital policies and procedures and 'Google'. Students and nurses were of the view that guidelines were relevant for the academic and not the clinical setting and emphasized valuing the completion of tasks over EBP in the clinical context. Some students and nurses were uncertain of what guidelines were and how to access them.

Contextual factors in the educational environment related to time needed to adapt curriculum to integrate guidelines into clinically-based theory courses, and to have the 'space' in an already crowded curriculum. The research course had a heavy emphasis on research methods rather than EBP. Many human and material resources in the clinical environment were identified in the document review, interviews and site visit however students reported that resources thought to be important to access to guidelines (computers and smart devices) were not available or not acceptable for use in the clinical setting. Lack of time was a frequently mentioned characteristic of the clinical environment, along with the need for manager and educator support for the implementation of guidelines. Influencing factors are summarized in Figure 6.1.

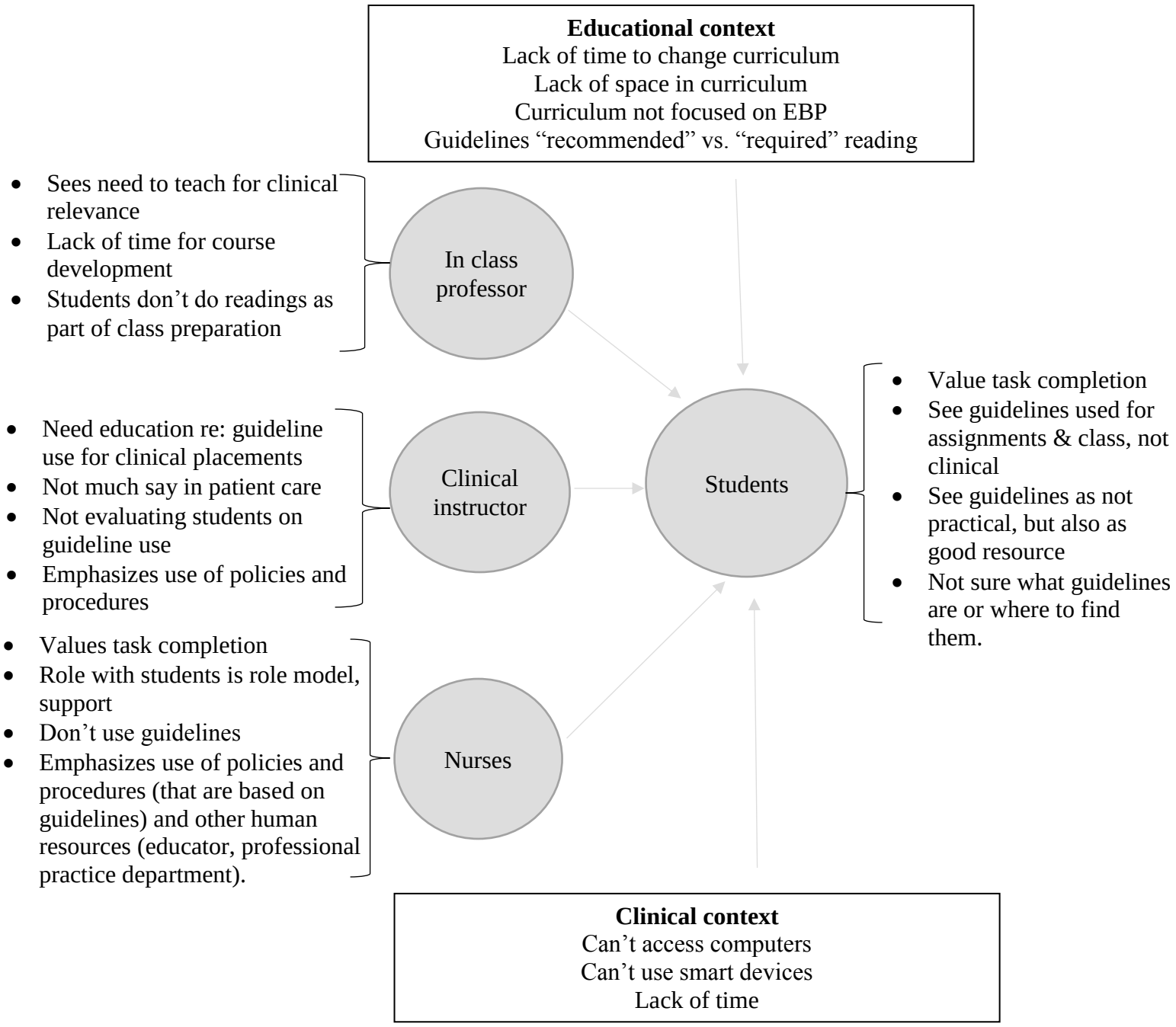

Figure 6.1 . Graphic summary of influencing factors

Through the case study, I have revealed that there are gaps between clinical practice and what is recommended in pain guidelines, however, there are discrepancies across the data sources (chart audits and qualitative interviews). Given the influence of nurses, clinical instructors and the educational and clinical contexts, it is necessary to develop and implement curriculum and learning strategies that connect the academic and clinical environments, and encourage nursing students to use guidelines and research evidence more broadly as part of their practice experiences. The findings from this dissertation leads to two broad discussion points, notably, the need for the implementation of academic-clinical partnerships as well as the need for a theoretical approach that combines educational theory and the Knowledge to Action (KTA) framework.

6.2 **Academic-practice partnerships**

As the findings of the scoping review and the case study have demonstrated, nursing students' use of guidelines in clinical placements is not solely within the purview of the education or the clinical setting and factors from both environments and their associated stakeholders play a role in transforming nursing education. One approach to addressing the multiple factors at play is to capitalize on partnerships between academic centres and clinical agencies. Authors of the Registered Nurses' Association of Ontario (RNAO) Guideline on Practice Education (2016) promote these partnerships through two recommendations, notably that service agencies: "Engage in ongoing collaboration with educational institutions to develop strategies that promote a supportive learning environment for nursing students and encourage communication between service agency staff nurses and nursing faculty members" (p.37) and "Create mutually beneficial partnerships with academic nursing programs that foster quality

practice education and support strategies to address gaps in service, including offering clinical instructor roles to nursing staff and increasing recruitment of new graduates" (p.38).

These partnerships attempt to move beyond the situation where the academic and clinical realities are segregated; academic institutions take responsibility for securing placements and hiring clinical faculty and clinical agencies are concerned with ensuring quality patient care (Warner & Burton, 2009). Three reviews of studies related to partnerships have been published (Beal, 2012; Buumbwe, 2016; Nabavi, Vanaki & Mohammad, 2012). The authors of the reviews concluded that there is much descriptive literature addressing the nature and processes of partnerships, including models of clinical education. However, the major gap identified is that there has been minimal formal evaluation of the partnerships described, making it difficult to determine an optimal model.

Benefits of academic-clinical partnerships include: 1) resource sharing and improved collaboration across settings and partners (Beal, 2012; Buumbwe, 2016; Nabavi, Vanaki & Mohammad, 2012); 2) higher numbers of clinical placements of improved quality (Beal, 2012; Nabavi, Vanaki & Mohammad, 2012); 3) evidence-based practice (Buumbwe, 2016); and 4) improved satisfaction among all stakeholders with clinical placements (Beal, 2012; Buumbwe, 2016; Nabavi, Vanaki & Mohammad, 2012). Establishing partnerships requires effort from leaders in both academic and clinical settings. Melnyk and Davidson (2009) emphasize the importance that leadership plays in creating an environment where change and innovation can blossom. They argue that the creation of an innovative culture, seeking buy-in from team members, and creating reward and recognition systems are key to solving issues in health care. They emphasize the inadequacy of the current nursing education system, with its emphasis on content rather than outcomes and the importance of developing students' abilities in the synthesis

and application of knowledge (Melnyk & Davidson, 2009). The challenges to moving forward at the leadership level are many, and Nabavi and colleagues have discussed this transition as "moving from being competitors to collaborators" (2012, p. 126). A cultural shift in nursing is needed, whereby, in the context of practice, it is expected that students and faculty are a contributing element, and not seen as detracting from practice.

Some partnerships described in the literature also include accounts of how the linkages were achieved. In a Canadian article, MacPhee (2009) discusses the use a logic model to build collaborations between a large urban hospital and a nursing faculty. The logic model prompts participants to consider what inputs and activities are required for the partnership, what activities need to be carried out to achieve the partnership and how will participants know that the partnership outputs and goals have been achieved. Warner and Burton (2009) recognize the policy and political implications of emerging academic-clinical partnerships. In a paper describing the process of creating a dedicated educational unit model, the authors emphasize that partners are required to let go, accept and shift their thinking to achieve change. They emphasized the need to let go of an "us vs. them" mentality for the realization of program objectives through situated learning (Warner & Burton, 2009).

As mentioned, there are few published examples of evaluations of academic-clinical partnerships. Dobalian and colleagues (2014) report on the first year of the implementation of a large scale project, where local nursing programs established formal links with Veterans Affairs (VA) hospitals. They propose critical elements of the partnership: the crucial importance of collaboration; the challenges associated with linking organizations that have different priorities and processes; identifying nurses from the clinical setting to take on teaching roles; scheduling courses and clinical placements; and the fact that partnerships went beyond simply clinical

placement delivery to improve EBP in the clinical setting and the use of simulation for continuing education of nursing staff. Pearson and colleagues (2014) evaluated this same partnership from the perspective of staff nurses in the participating VA hospitals, demonstrating that nurses did not perceive higher workload supporting students; that they noticed an increase in EBP activities and that they were satisfied with the clinical training program that arose out of the partnership. The perspective of faculty members in the VA partnerships was described by Needleman, Bowman, Wyte-Lake and Dobalian (2014). Faculty members reported a high level of satisfaction with their role which was influenced by: support from leadership and colleagues; a positive work environment in both the clinical and academic settings; and the quality of students. Participants reported that increased support for curriculum development and preparation for their role as teachers was needed.

Teel, MacIntyre, Murray and Rock (2011) reported on an evaluation of three clinical education partnerships in Florida and Texas. Their evaluation found the following themes: the need for supportive relationships at the level of students, faculty, and clinical staff as well as across organizations; the need for a good "fit" among program participants – for example, ensuring that higher level or performing students have placements in more complex areas, or that nurses who enjoy working with students were tasked with being preceptors; the need for flexibility – being able to adapt to new practices or changes within either organization as part of the partnerships; and communication – both in terms of preparing all stakeholders for what to expect but also to evaluate the partnerships on an ongoing basis.

Academic-clinical partnerships have the potential to influence the experience of EBP by nurses and nursing students in the clinical setting. If faculty are increasingly engaged in the clinical practice environment they may be able to support EBP initiatives to improve patient care

as well as gain a better understanding of the realities of clinical practice that can be brought back to the classroom. Clinical nurses, as described in the studies by Needleman et al. (2014) and Buumbwe (2016), may also see benefits in terms of increased EBP in the clinical setting. Given the impact that both faculty and nursing staff have on the experience of nursing students, it is highly likely that this will increase the likelihood that students engage in EBP as part of their placements.

6.3 **Theory to Support Nursing Students' EBP in Clinical Practice – Proposal for a Hybrid Framework.**

Along with the need for partnerships to support nursing students' EBP, there is also need to integrate theory that has typically been in the purview of either the education or the clinical setting. Educational theories and the knowledge to action (KTA) framework were used as theoretical underpinnings for the study. Now, I propose a hybrid KTA/Education framework in Figure 6.2, that adapts the KTA action cycle (Graham & Tetroe, 2010), the adult learning planning process (Knowles, Holton & Swanson, 1998), and includes the evaluation framework for educational outcomes (Kirkpatrick, 2007). The process proceeds from determination of a practice gap or learning need and identification of knowledge and resources to meet the need, through to thoughtful planning of educational and knowledge translation (KT) interventions, including adapting knowledge and resources to the local context and the consideration of barriers to learning and knowledge use. Implementation of educational and KT interventions is followed by monitoring knowledge use and evaluating outcomes. In the context of education, helpful outcomes to consider include: 1) reaction or satisfaction with the learning experience; 2) the learning that has occurred, by examining participant knowledge or skills; 3) the presence of behaviour change indicating that knowledge is being put into action; and 4) the impact of the

change in behaviour (Kirkpatrick, 2007). The second and third outcomes are similar to measures of knowledge use proposed by Graham and colleagues (2010), notably: conceptual knowledge use - that learners understand the new information; and behavioural or instrumental knowledge use – that learners apply the new knowledge in practice. Principles from constructivist and adult learning theory, and the overarching theme of learner engagement (supported by iKT, constructivist and adult learning theories) project on the entire process, by having the student at the centre of the model.

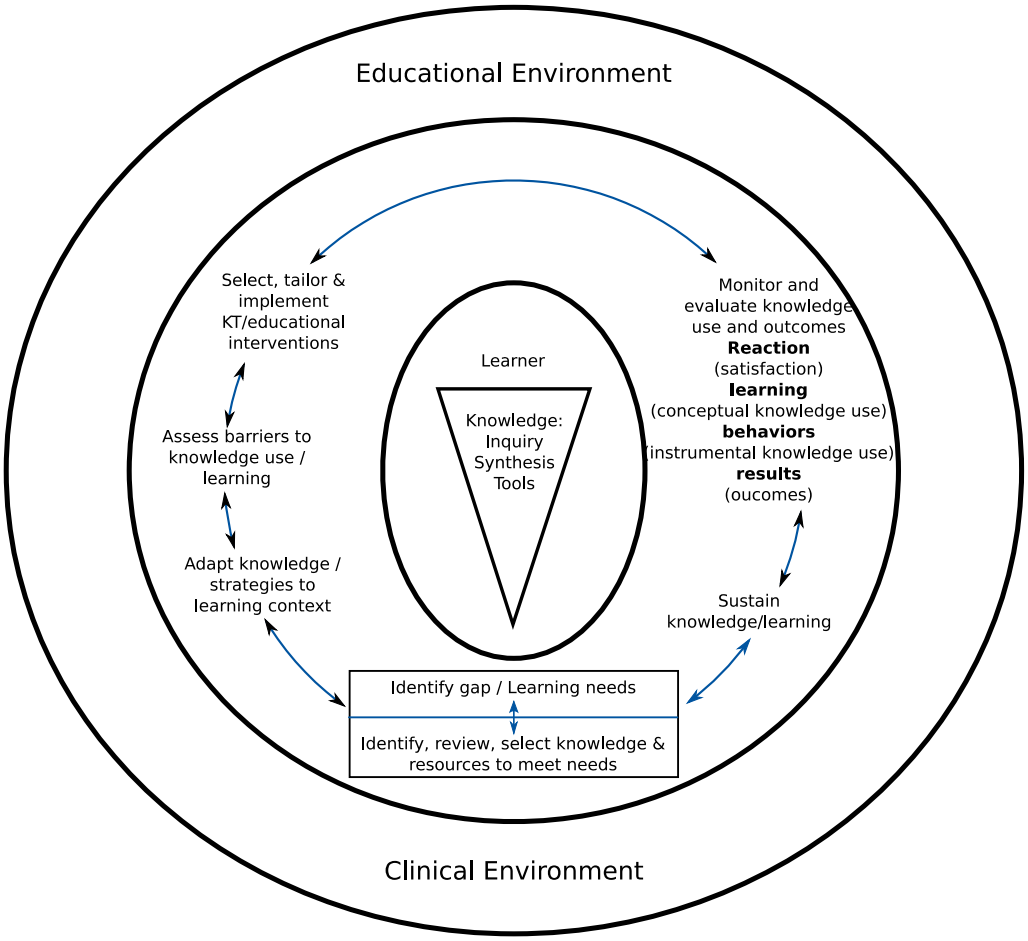

Figure 6.2 Hybrid KTA/Educational Framework

6.3.1 Application of the model.

An example of how this model could inform educational interventions for undergraduate nursing students in the clinical practice setting specifically relates to nursing students in situations where they would be caring for patients experiencing pain. In the first phase of the hybrid model, identification of practice gap or learning needs, one can consider the challenges that nursing students have applying information from practice guidelines related to pain assessment and management. Students learn about these guidelines in the classroom setting, but then may face issues in practicing according to guideline recommendations in the clinical setting. Exploring learning needs would include assessing what the students know and understand about pain guidelines and their use and the extent to which their pain management practices reflect guideline recommendations in the actual clinical setting. Exploring practice gaps from the perspective of the clinical setting would also be relevant in supporting students' practice, and KT interventions may be solutions to improve nursing students' practice. For example, the setting may not have documentation tools that facilitate the documentation of non-pharmacologic interventions, such as drop-down lists in an electronic health record. By improving this area of practice in the clinical setting, it will also improve nursing students' practice.

The next phase of the hybrid model is to adapt knowledge or resources to the local context as well as assessing barriers to using this knowledge and the need for learning. For nursing students, this would involve discussing the fit of guideline recommendations with their clinical placement experience and focusing on those recommendations that are within the power of students to implement. For example, some guideline recommendations are only realizable through physicians' prescriptions. In this case, the student needs to learn how to advocate for changes to a patient's medication regime. In theory or lecture courses, professors must be aware

of potential differences in practice from what is recommended in guidelines and empower the students in their advocacy on behalf of patients. Clinical instructors must be aware of current guidelines and what is being taught in the classroom setting, as well as the clinical processes of the setting. Another example of how knowledge may need to be adapted for students is that often guidelines are lengthy and difficult to read and understand. Computer or smart phone applications that summarize key aspects of guidelines may be a helpful adaptation to support their use.

It is essential to ask students and clinical instructors about their perceived barriers to guideline use in their clinical placements. Possible barriers from a student and clinical instructor perspective may include lack of access to relevant guidelines, lack of knowledge on the part of students and clinical instructors regarding appropriate guidelines and associated recommendations, or an emphasis on the execution of technical skills in the clinical setting versus a focus on EBP.

The design and implementation of interventions to promote evidence-based practice is the subsequent phase of the model. Although education is one focus of the hybrid framework, interventions may be broader than would typically be considered traditional educational strategies. Interventions could be educational in nature, such as the provision of information or using interactive techniques such as role play or case study discussions or relate more to what would be broadly considered KT or implementation interventions such as making changes in care or educational processes to incorporate guideline recommendations. In the case of students' use of guidelines for pain management, interventions could range from post-conference discussions regarding how the guidelines could apply to relevant clinical cases; promoting access to the guidelines through mobile device use; or working to shift attitudes toward the importance

of EBP as part of clinical education through EBP projects. Knowledge brokers, facilitators or guideline champions who support clinical instructors and in-class professors may improve EBP skills and attitudes by providing information about relevant sources of evidence, as well as strategies for how they may be used in nursing education (Dogherty, et al., 2010).

Educators monitor knowledge use after the implementation of educational strategies that support implementation of guideline recommendations. In this case, they assess the conceptual use of knowledge (understanding) by examining students' knowledge regarding pain management practices, or attitudes toward guideline use in practice or pain management. Instrumental knowledge use (application) can be measured by doing chart audits to determine the extent to which students' practices related to pain assessment and management reflected in practice guidelines (RNAO, 2012). Additionally, educational content and curriculum are monitored by examining course outlines for material and learning strategies related to guideline use or EBP. Using the outcomes of educational interventions described by Kirkpatrick (2007), educators assess reaction or satisfaction with the learning experience by gauging learner satisfaction with the strategies and whether learning and behaviour change have occurred through similar evaluation approaches for conceptual and instrumental knowledge use. Finally, educators determine the impact of the change in behaviour by noting whether there is a reduction in pain in patients who are cared for by students. Although the Kirkpatrick framework typically evaluates educational interventions, it is also broad enough to encompass outcomes typically examined as part of KT such as conceptual and behavioural knowledge use (RNAO, 2012).

Ideally, educators promote sustainability of the practice change throughout the process of implementation. From a student-focused perspective, this involves using a consistent approach from one clinical placement to another, with similar expectations related to EBP and knowledge

use. Achieving sustainability of guideline integration in nursing education potentially necessitates changes in curriculum, and provision of support and education for clinical instructors and professors so they can continue to deliver and support students' engagement in EBP as part of clinical placements. This is a cycle of ongoing reassessment and implementation of required changes to interventions and evaluation strategies.

The preceding is an application of the hybrid framework to the clinical education of nursing students. Strategies that promote the use of evidence move beyond the typical nurse-professor interaction and recognize the student in the broader clinical and academic contexts.

6.4 Implications for Education, Practice and Research

6.4.1 Implications for Education and Practice.

Typically, PhD dissertations separate out the implications for practice and education as part of the integrated discussion. In the case of this dissertation, I make the case for the inseparability of practice and education as they relate to nursing students' use of guidelines in the context of clinical placements. This linkage, demonstrating the connection between the educational context, including in-class and clinical instruction, the clinical context, where staff nurses intersect with the clinical instructor, and the connection with the student, is demonstrated in Figure 6.3.

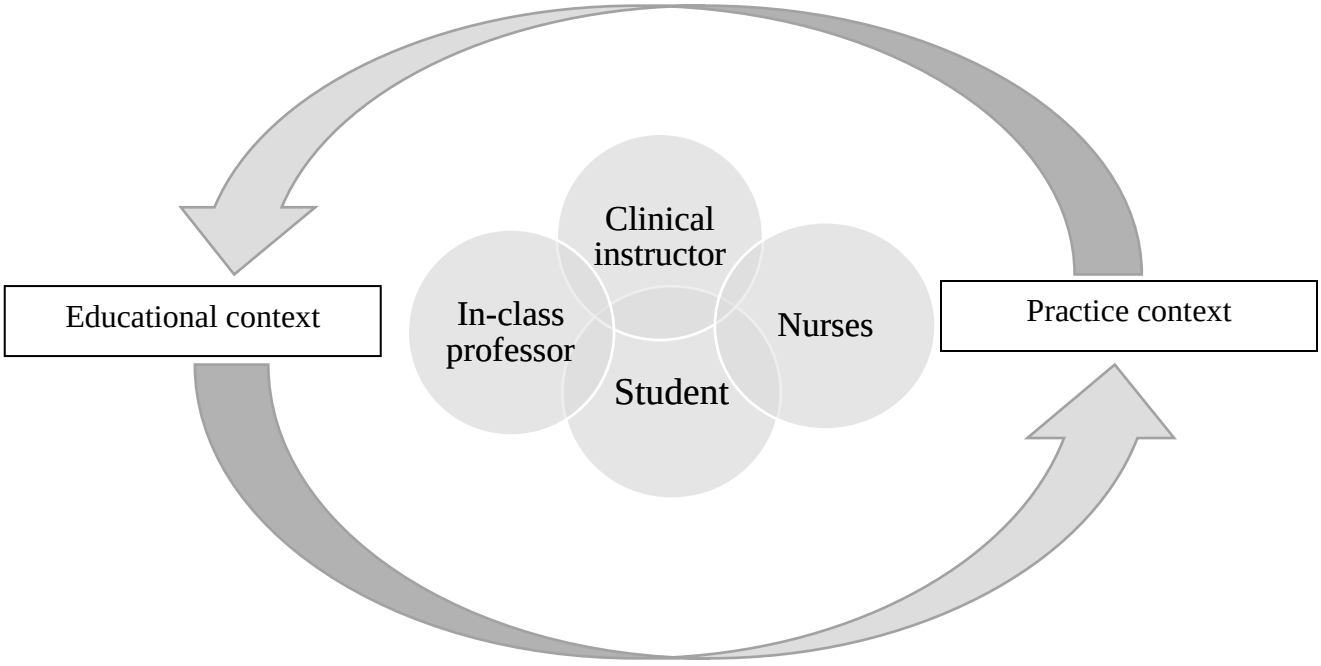

Figure 6.3 Linkage among educational and clinical context

6.4.1.1 Curriculum and educational strategies.

The first area that I will address includes factors related to curriculum and educational strategies in the classroom and educational settings. These implications arise from the concerns related to the curriculum identified in the case study, particularly by the in-class professor and the students. In addition, students identified that changing the curriculum would facilitate nursing students' use of guidelines in clinical practice.

Barriers and facilitators identified in the scoping review (Chapter 3) also focused on curriculum issues. The lack of curriculum materials that integrate an EBP approach as well as negative attitudes and knowledge gaps of students and faculty have been identified as factors influencing EBP in other studies (Al Hadid, Abu Hasheesh & Al Momani, 2011; Huang, Hung, Tsai and Chang, 2015; Malik, McKenna & Griffiths, 2017; Ramis, Chang & Nissen, 2018).

A number of authors have addressed the importance of undergraduate curriculum changes to prepare future nurses for EBP. Melnyk (2015), in a presentation to an Institute of Medicine (IOM) standing committee, indicated that: "EBP must be the foundation of care, and be integrated throughout entire academic programs in both didactic and clinical courses" (slide #24). To achieve this change curriculums must change. Similar to the course outlines reviewed in the case study, other researchers have found that the emphasis in research courses is on research methods rather than EBP, and that when EBP is addressed, it is done so only briefly (Malik et al., 2018). These authors, in a grounded-theory study, propose an approach to curriculum changes that shifts EBP from the domain of the research course to all courses. Other authors support this integrative and leveled approach (Bloom, Olinzock, Radjenovic & Trice, 2013; Cronje & Moch, 2010a; Moch, Cronje & Branson, 2010; and Moch & Cronje, 2010b). Melnyk et al. (2014) developed EBP competencies for nurses, and Albarqouni et al. (2018) have generated EBP competencies for all health care professionals. These competencies could be employed to guide EBP curricular innovations. Another initiative to promote EBP in undergraduate nursing curriculums is to become an Academic Best Practice Spotlight Organization (BPSO) (Cable-Williams, 2014; Kearsey, 2019; Zhao, 2017). Academic BPSOs integrate RNAO Best Practice Guidelines in their curriculum, promoting students' abilities to use them in course work and clinical placements (Kearsey, 2019).

6.4.1.2 In-class education strategies.

In concert with curriculum changes, approaches to teaching and learning strategies in the classroom need to change in order to promote EBP (Flood & Robinia, 2014; Khan & Coomarasamy, 2006; Malik et al., 2018). In the case study, the in-class professor mentioned that she discussed an approach to assessing pain and other symptoms in-class, and that she included

evidence-based clinical tools in the class readings. In reflecting on her experience teaching that content, the professor indicated that students did not come prepared to discuss the tool nor the approach to symptom assessment. A student referred to that same class, indicating that the professor spoke briefly to the assessment approach, and that the readings related to it were "side readings". A number of authors suggest that interactive classroom approaches such as flipped classroom, gaming, journal clubs, case studies, problem-based learning and small group work will improve uptake of foundational concepts related to EBP and how it is related to clinical practice (Davidson & Candy, 2016; Flood & Robinia, 2014; Horntvedt, 2018; Khan & Coomarasamy, 2006; Pierce & Reuille, 2018). Aglen (2016), in a systematic review of approaches to teach EBP, reported that the majority of studies they examined focused on information literacy skills (searching and critiquing literature), and not on promoting an understanding of the application of evidence for clinical practice. Included studies emphasized the importance of active learning strategies when addressing research-related topics. Flood and Robinia (2014) suggest that the in-class professor explicitly connect the in-class content to the clinical placement experience of students. In addition to teaching-learning strategies in the classroom, some authors also propose assignments that link classroom learning to the clinical setting (Alexander, Canclini & Krauser, 2014; Balakas, 2010; Coyne, Kennedy, Self & Bullock, 2018; Gray, 2010; Herron & Strunk, 2019; Kim, Gu & Chang, 2019; Pennington, Moscatel, Dacar & Johnson, 2010; Rickbeil & Simones, 2012). In these studies, nursing students did an evidence-based project based on issues identified by clinical staff or managers, but it was not directly linked to their own clinical placements.

6.4.1.3 Clinically-integrated teaching learning strategies.

Students that participated in the case study were required to complete a nursing care plan based on the care they provided to a patient. Five students submitted their care plans for analysis as part of the document review, and only 2 used valid sources of evidence (practice guidelines, recent text book, and original research article). While this exercise holds promise as a clinically-integrated teaching-learning strategy, it did not appear to be effective in promoting the students' application of evidence. The scoping review in chapter 3 describes a number of clinically-integrated learning activities and assignments that have been implemented and evaluated. Sixteen out of 23 included studies used EBP projects where students identified, appraised and summarized research evidence to answer a clinical question that arose out of their clinical placements. These EBP projects addressed the barriers of students' EBP knowledge and skills; attitudes towards EBP; support for EBP; and curriculum issues. Additional clinically-mediated strategies identified outside of the scoping review include student-led journal clubs (Moore, 2009); the creation of a new protocol or practice guideline (Raines, 2016); evaluation of a clinical policy (Yimmee, Fitzwater, Donovan & Tong, 2018); and integrating evidence sources in clinical reflections (Charania, Ross-Durow, Sullivan & Dansel, 2017). Key to implementing these clinically-integrated teaching strategies is the need to prepare clinical instructors to be able to facilitate them.

6.4.1.4 Clinical instruction.

Human resource issues in the educational context were identified in the case study interviews by the in-class professor and clinical instructor. In particular, the clinical instructor mentioned that they had not received education specific to their role, nor in relation to how to use guidelines as part of the clinical placement. They indicated that if they had received such training

that would have reduced their reliance on policies and procedures as sources of knowledge for teaching. In the interviews, students indicated that their clinical instructors were the "go-to" person when they needed information or support, so it is important to ensure that the clinical instructors are prepared to help students problem solve using an evidence-based approach. Barriers and facilitators identified in the scoping review (Chapter 3) focused on the inadequacy of faculty knowledge and skills for EBP, a shortage of resources for faculty training and lack of infrastructure for evidence-based practice such as access to library resources and databases. Lack of qualified professors and negative attitudes and knowledge gaps of professors were also been identified as factors influencing EBP in other studies (Al Hadid, Hasheesh & Al Momani, 2011; Horntveldt, Nordsteien, Fermann & Severinsson, 2018; Hung, Huang, Tsai and Chang, 2015; Malik, McKenna & Griffiths, 2017; Ramis, Chang & Nissen, 2018). Morrison-Beedy (2018), in a guest editorial in *Worldviews on Evidence-Based Nursing,* indicates that: "Instilling in current faculty and those in the queue, a true understanding of EBP and expanding the capacity of faculty to integrate EBP…within curriculums will be an essential component of current faculty development within academic institutions"(p.246).

Matthew-Maich and colleagues (2015) examined nursing students' perceptions of effective clinical teachers, and participants confirmed that clinical instructors played a key role in creating a valuable experience for students, motivating students to be successful through relevant learning opportunities. More specific to guideline use in clinical practice education, Palese and colleagues (2018), in a large descriptive study, found that students were more likely to use guidelines if they were supervised by clinical instructors that were using evidence-based problem solving. Few studies have addressed how to best prepare faculty to teach EBP at the undergraduate levels. Flood and Robinia (2014) discuss the importance of the clinical instructor

being connected to the in-class professor and that they be given access to lecture notes and invited to attend classes. The authors suggest that clinical instructors capitalize on clinical post conferences to link classroom theory and clinical practice and discuss EBP articles and ways to integrate the findings in to practice. They emphasize the important need to create connections between faculty that teach in the classroom and the clinical setting.

The scoping review (Chapter 3) identified a study by Higuchi, Cragg, Diem, Molnar and O'Dononhue (2006) that described a faculty development initiative to promote the integration of Best Practice Guidelines (BPGs) in clinical courses. They did a pilot study of a full-day workshop for 3rd year clinical instructors and in-class professors with positive outcomes related to knowledge and attitudes towards implementing BPGs as part of their teaching. A second four-hour workshop was conducted with all faculty, emphasizing the difference between nursing practice standards and clinical guidelines (a knowledge gap identified in the case study interviews), and focusing on guidelines that would be relevant for a wide variety of clinical settings. This second workshop was evaluated positively by participants and they again reported improvements in knowledge and attitudes toward BPGs. One other study identified in the scoping review focused on the education of preceptors, who provide one-on-one student supervision (Mohide & Matthew-Maich, 2007). Dyads of students and preceptors participated in a workshop in which EBP concepts and their application through clinical case studies were reviewed. Qualitative evaluation of the intervention reported positive outcomes in terms of EBP knowledge and skills, attitudes towards and support for EBP. While clinical instructors play a very important role in supporting nursing students' EBP, nurses in the clinical setting also have an influence (Blackman & Giles, 2017; Palese et al., 2018).

6.4.1.5 Nurses in the clinical setting.

In the case study, nursing students indicated that in addition to the clinical instructor, the person they would most likely consult with regarding questions related to patient care was the staff nurse responsible for the patient. Nurses, in turn, indicated that they saw their role with students as being a supportive role model and that they would not likely refer students to guidelines as a resource for clinical practice. The important effect that staff nurses have on the clinical education experience has been described in the literature (Hegenbarth, Rawe, Murray, Arnaert & Evans, 2014; Luanaigh, 2015; Webster, Bowron, Matthew-Maich & Patterson, 2016), and authors of the first two papers emphasize that it is important that nurses understand the goals of the clinical placement in order to be able to support the students' successful attainment of outcomes. The staff nurses in the case study saw favourable outcomes for the students focused on the successful completion of patient care tasks and socialization to the unit, and did not mention use of guidelines or EBP as something that was an indicator of a successful student placement (despite it being an actual objective in the student evaluation form).

Other studies have shown specifically that students' intent to use EBP is related to seeing the nurses' using an EBP approach (Blackman & Giles, 2017; Lam and Schubert, 2019; Ramis, Chang & Nissen, 2018). In the case study, while nurses indicate they would not necessarily go to guidelines as a source of information; they repeatedly mentioned the importance of policies and procedures as a key source to guide their practice. They indicated that they understood that the policies and procedures in their hospital, created by nursing professional practice leaders and nurse educators, are rooted in guideline recommendations and, to some extent, were guidelines themselves. The results of a study by Lam and Schubert (2019), were similar, in that students indicated that nurses and clinical instructors did not refer to research as sources of information

for practice, but rather to policies and what they know to improve patient care. Kislov and colleagues (2019) found that direct care providers were most likely to rely on "evidence by proxy", which they describe as "performance standards, organizational policies, and local data"(evidence for practice section). These authors describe the benefits of this approach as allowing for contextualizing evidence with input from all levels of an organization, however they caution that it could contribute to a reduction of fidelity to original sources of evidence, and diminish clinicians' EBP skills, and motivation to question existing policies and procedures.

The findings of this study reflect the current literature related to shortcomings in nurses' engagement in EBP (Melnyk et al., 2018; Renolen, Hoye, Hjalmhult, Danbolt & Kirevold, 2018; Saunders & Vehvilainen-Julkman, 2016; Saunders, Stevens & Vehvilainen-Julkman, 2016). Factors that contribute to this ongoing challenge include: 1) EBP knowledge and skills (Melnyk et al., 2018; Saunders & Vehvilainen-Julkman, 2016; Saunders, Stevens & Vehvilainen-Julkman, 2016); 2) lack of resources for and facilitation of EBP (Melnyk & Williamson, 2010; Renolen et al., 2018; Wangensteen, Johansson, Bjorkstrom & Nordstrom, 2011); 3) organizational culture (Melnyk et al., 2018; Melnyk & Williamson, 2010); supports (Renolen et al., 2018; Wangensteen, et al., 2011); 4) perceived self-efficacy and positive attitudes toward EBP (Melnyk et al., 2018; Saunders et al., 2016); and 5) heavy workload (Renolen et al., 2018). Given the previously mentioned impact that nurses' practice has on nursing students in their clinical placements, it is important that these factors be addressed to support nurses' EBP.

6.4.1.6 Nursing students' experience.

Nursing students in the case study identified a number of the factors described above as influencing their ability to use guidelines in the clinical setting, notably lack of resources (access to computers and smart devices) as well as lack of time to search for and read guidelines during

the clinical day. Other influencing factors described by students include: valuing task completion; seeing guidelines as part of the in-class realm vs. the clinical realm; and knowledge gaps related to understanding what guidelines are or where to find them. The scoping review (Chapter 3) identified that the most common barrier to EBP, from the perspective of nursing students, is attitudes toward EBP and EBP knowledge and skills. Authors of studies included in the scoping review also described issues in the clinical setting such as lack of time and support for EBP and issues related to the nature of evidence - that there was often too much to review and that it was difficult to know what evidence was relevant (Ax & Kincaide, 2001; Brooke et al., 2015; Brown, Kim, Stichler & Fields, 2010; Jonsen, Melender & Hilli, 2012; MacVicar, 1998; Smith-Strom, Oterhals, Rustad & Larsen, 2012). Facilitators that were identified in the scoping review included education related to EBP, having a positive attitude toward EBP, participating in research activities, having an interest in a specific area of research, and having access to evidence that is relevant, high quality and user-friendly (Arslan & Celan, 2014; Bjorkstrom, Johansson, Hamrin, & Athlin, 2003; Florin, Ehrenberg, Wallin & Gustavsson, 2012; Kajermo, Nordstrom, Krusebrant & Bjorvell, 2000; Smith-Strøm et al., 2012). Authors of other papers published since the scoping review have reflected on factors that influence nursing students' use of evidence, and are summarized in Table 6.1.

Table 6.1 Factors influencing nursing students' EBP

Authors	Influencing factors identified									
	Positive culture on the clinical unit	Knowledge re: EBP	Nurses and Instructor use EBP	Refer to P&Ps and other sources of info	Confidence & attitude toward re: EBP	Gap between academic & clinical settings	Lack of support in clinical setting	Emphasis on tasks	Lack of knowledge	Access to evidence
Blackman et al. (2017)		✓	✓		✓					
Kim et al. (2018)		✓					✓			
Labrague et al. (2018)		✓			✓					✓
Lam & Schubert (2019)				✓		✓			✓	✓
Palese et al. (2018)	✓	✓	✓							
Pashaeypoor et al. (2016)	✓	✓	✓		✓					
Ramis et al. (2018)		✓			✓		✓			
Ryan (2016)							✓	✓		
Whitehouse (2017)	✓					✓				

6.4.2 Implications for research

In this section, I will address the strengths and limitations of the methods used in this study, and also discuss future research priorities in the area of nursing students and EBP.

6.4.2.1 Case study

Engaging in a descriptive case study approach provided a comprehensive view of nursing students' use of pain management guidelines in the authentic contexts of the clinical and academic environments. Donnelly and Weichula (2012) advocate for the use of case study methodology to "discover more of the complexity of nursing education". While the amount and variety of data collected in this study through chart audits, qualitative interviews, document review and a site visit definitely contributed to the complexity of the study, they did provide a holistic and multi-faceted view of this aspect of nursing education. In addition, the approach taken was in line with my pragmatic approach as a researcher, including not only quantitative data through the chart audit, but also rich qualitative perspectives. Luck, Jackson and Usher (2006) advocate for the use of a case study approach, with mixed methods techniques, as employed in this study. These authors indicate that a case study approach provides a "bridge" across traditional research paradigms (p. 107), advocating that the researcher can reasonably apply both quantitative and qualitative approaches.

6.4.2.2 Examining practice gaps.

As part of the quantitative approach to this study, chart audits were conducted to look at whether practice in the clinical environment reflects pain guideline recommendations. While the process of developing the indicators in consultation with the advisory committee did produce indicators that were contextually relevant, the process was labour-intensive and time consuming. In retrospect, it would have been more straightforward and efficient to have adopted existing,

comparable indicator sets such as the Cancer Pain Summative Index, developed by Fine and Colleagues (2010) which was used to evaluate evidence-based pain management practice in 3 studies (Herr et al., 2010; Son, Eaton, Gordon, Hoyle & Doorenbos, 2015). In addition, the pain management evidence summary from the Joanna Briggs Institute has indicators that are presented as evidence-based audit criteria and are readily available to members through their Practical Application of Clinical Evidence System (PACES). This system was used in a study by Choi and colleagues (2015), who looked at evidence-based pain management practices for hospitalized cancer patients. Again, these indicators were comparable to those used in the case study chart audit.

6.4.2.3 iKT approach.

An iKT approach was employed as part of my PhD research, and was achieved by creating and engaging a project advisory committee consisting of representatives from the clinical and academic settings to provide advice and recommendations on many elements of the project. Specific contributions of the advisory committee included: 1) providing feedback on the research proposal and data collection tools such as the interview guide and site visit checklist; 2) validating the recommendations from the scoping review; 3) providing feedback on the selection of relevant recommendations and indicators for the creation of indicators; 4) validating and commenting on the results of the case study; and 5) assisting with setting specific study activities such as recruitment. The advisory committee consistently provided helpful feedback and were instrumental in ensuring that the results of the study will be useful to eventual users.

While the iKT approach did contribute to the study producing results relevant to the clinical and educational contexts, the logistics of engaging the advisory committee did provide an additional level of complexity to the study overall. It was necessary to seek out interested

members for the committee, create the advisory committee partnership agreement, arrange meetings, seek consent from the advisory committee members, and record, transcribe, and analyze the meeting notes. In addition, I did not conduct "true" iKT in that I had identified the research aim and objectives prior to engaging the advisory committee (a necessary part of the PhD research approval process), and this is definitely something to consider when employing an iKT approach as part of a PhD study. This issue of engaging the advisory committee early in the research process, as well as time and logistical concerns, were identified by van der Meulen (2011) in their discussion of the challenges and importance of community-engaged graduate research. Gagliardi and Dobrow (2016) examined the conditions needed for iKT in health care organizations. A number of them are particularly relevant for graduate students undertaking this approach, namely: lack of familiarity or comfort with iKT; the time required for iKT and a lack of incentives for iKT research. Despite the presence of these challenges, I believe benefits of an iKT approach merit its consideration for future studies in nursing education.

6.4.2.4 Future research.

Despite the fact that this case study reflects a local situation, results can be extrapolated to the broader context of nursing education, especially when viewed in light of the findings of the scoping review, and the broader literature relating to the development of nursing students' EBP knowledge and skills. Key research priorities now include using iKT and theory-driven approaches for developing and evaluating learning strategies that encompass both the educational and clinical contexts. From the student perspective, learning strategies should focus on addressing barriers related to EBP knowledge and skills, changing students' attitudes toward EBP, and improving access to EBP tools such as practice guidelines in the clinical setting.

Interventions must also include in-class professors, clinical instructors and practicing nurses supporting students as part of their clinical practicums.

Context remains an important consideration in implementing and evaluating learning strategies, and a multiple case study approach would enable the ongoing consideration of the factors that may influence their implementation (Stake, 2006; Yin, 2014). All elements of context used as part of the analytic filter for the case study analysis were evident in the interview data, with the exception of power and authority and sources of information on performance. Squires and colleagues (2019) described 62 unique features of context, across 14 broad categories. The elements of clinical context identified in the case study were among the factors included in Squires' study, however future study in educational research should validate the relevance of the factors they identified (because this study focused on clinical implementation vs. EBP in clinical education) as well as others that may be solely applicable to education. Collaborative nursing programs provide a "natural" environment where a common curriculum is delivered on multiple sites, making them appropriate settings for this type of research.

There are a number of challenges to evaluating the effectiveness of measures to improve nursing students' EBP knowledge, skills and attitudes in the clinical settings, and one of them includes approaches to measurement. As discussed earlier, there are a number of approaches ranging from assessing the satisfaction of the learner to whether they actually implement the knowledge gained and see positive outcomes from their behaviour (Kirkpatrick, 2007). In the context of EBP, the evaluation could be related to the clinical topic itself, so for example, how students implement evidence-based clinical practices. These practices would need to be evaluated by observation or self-report. In addition, the outcomes of students' practice could be evaluated, but for many clinical issues this would be difficult, as it is a challenge to evaluate the

difference that an individual student's care made in patient outcomes, as they provide care concurrently with other health care team members and nursing staff.

From the perspective of EBP skills and knowledge, Bostwick and Linden (2016) have proposed evaluation criteria for nursing student application of EBP. While these criteria have been suggested for the purposes of clinical evaluation, they may also have some utility for research purposes. In addition, authors have described the development and validation of tools specific to measuring EBP in nursing students. Ruzafa-Martinez and colleagues (2013) described the development and validation of the Evidence Based Practice Competence Questionnaire, which they subsequently used to evaluate an EBP course in 75 undergraduate nursing students (Ruzafa-Martinez, Lopez-Iborra, Barranco & Ramos-Morcillo, 2016). Upton, Scurlock-Evans and Upton (2016) describe the adaptation of the Evidence Based Practice Questionnaire for nurses and its psychometric properties after testing in 244 UK undergraduate nursing students. Cardoso and colleagues (2017) have registered a systematic review with the Joanna Briggs Database of Systematic reviews the aim of which is to determine the most valid and reliable instrument for measuring EBP knowledge, skills and attitudes in nursing students. Having these measures available will facilitate future research studies evaluating the effectiveness of learning strategies to promote EBP.

The final challenge with conducting research in this area relates to the lack of profile for nursing education research, mentioned in the conclusions of the published scoping review. Early in the dissertation, I mention one of the triggers for this study being the publication of the book by Benner, Sutphen, Leonard and Day (2009), that calls for the radical transformation of nursing education. Nine years later, one pundit (O'Lynn, 2018) questioned whether there is evidence that this transformation is underway, and states that "Increased support for high-quality nursing

education research is greatly needed". They also indicate that: "nursing scientists must be encouraged and rewarded for engaging in nursing education research" (p. 803). A group of Canadian nurse academics have created a framework for Contemporary Nursing Education Research, which represents one approach to addressing this gap in developing the science of nursing education. They propose three pillars for the framework: 1) collaboration and links between academic and clinical settings; 2) clarification of what works in educational interventions in terms of competency development; and 3) determining "nursing education sensitive patient and system outcomes". By moving forward with a network of researchers using this framework, the authors will aim to better understand the impact of educational interventions. This model could be adopted by other clinical and academic groups to advance knowledge development in nursing education.

Key messages of the dissertation raised in the integrative discussion are summarized in Table 6.2.

Table 6.2 Key messages for different stakeholders

Key message	Academic administrators	Clinical administrators	Professors	Clinical instructors	Nurses	Students
Practice	Work with clinical administrators to develop effective academic-clinical partnerships.	Ensure access to electronic resources and other resources to promote access to guidelines and evidence-based resources on clinical units. Ensure the availability of resources to support EBP in the clinical setting.	Engage in classroom learning strategies that promote students, linking theory and clinical education i.e.: case studies, problem-based learning, and simulation.	Balance need for development of psychomotor skills with EBP and critical thinking skills in the clinical setting.	Increase knowledge of EBP and its role in improving the quality of nursing care.	In conjunction with clinical instructor and theory professor, strive to make linkages between the classroom and clinical education. Apply evidence-based practices in clinical placements.
Education	Ensure the availability of resources to support curriculum change, implementation of effective teaching/learning strategies and faculty role development.	Work with academic administrators to develop effective academic-clinical partnerships. Promote EBP by staff and students on clinical units.	Adapt curriculum to include education related to EBP, guideline appraisal and use, and how to use guidelines and other evidence-based clinical resources in the clinical setting.	Implement theory-based, contextually appropriate educational strategies (i.e.: clinical conference discussions or EBP projects) to promote nursing students' use of evidence in clinical settings, and evaluate students accordingly. Ensure access to electronic resources in the clinical	Be aware of objectives of students' clinical experience and support students in their attainment.	Reflect and communicate personal learning needs as they relate to EBP.

Key message	Academic administrators	Clinical administrators	Professors	Clinical instructors	Nurses	Students
				setting to promote access to guidelines and other evidence-based resources.		
Research	Promote and raise the profile of evidence and theory-informed educational research.	Encourage educational and EBP research in the clinical setting.	Engage in research to test the hybrid KTA educational framework to assess learning needs, determine and implement appropriate learning strategies, and evaluate students accordingly (using iKT approach, case study design, and mixed methods). Adapt curriculum to include education related to EBP, guideline appraisal and use, and how to use guidelines and other evidence-based clinical resources in the clinical setting.	Participate in research when given the opportunity.	Participate in research when given the opportunity.	Participate in research when given the opportunity.

6.5 **Conclusions**

Between 2012 and 2019, I conducted a scoping review of the literature, developed guideline-based quality indicators, and conducted a descriptive case study that set out to determine the gap between evidence-based guideline recommendations and actual practice and to understand the clinical and educational contextual factors that influence nursing students' use of pain management practice guidelines. Guideline use was chosen as a proxy for students' EBP in their clinical placements and pain management was chosen as an exemplar clinical focus. To date, much of the literature has focused on nursing students' EBP in the context of the classroom, or on the small-scale evaluation of learning strategies to promote EBP. This research describes the many factors that influence nursing students' EBP in clinical education, contributing unique knowledge that will help to inform future study in this area.

Findings of the dissertation point to the need for the development, implementation and evaluation of evidence based educational strategies that take into consideration the multiple actors that impact nursing students' experience namely in-class professors, clinical instructors, and staff nurses. It is no longer sufficient to solely focus on nursing students given the inherently social nature of EBP in the clinical practice setting. Theory such as the proposed hybrid KTA/Education framework should underpin these approaches to education and research. In addition to strategies to address the issue at the level of the student, the nature of academic and clinical partnerships must shift to promote a higher level of collaboration focused on education and research, to the benefit of faculty, students, clinical staff, and ultimately patients that receive care based on the best available evidence.

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Chapter 7: Contributions of Collaborators

In this chapter, I outline each collaborator's contribution to each of the published papers and/or manuscripts included in the dissertation. Decisions related to authorship were informed by the Guidelines from the International Committee of Journal Editors (2019) and Academic Regulation II-7 – Theses from the University of Ottawa (2019).

7.1 Primary Researcher and Thesis Committee

Valerie Fiset, RN, MScN, PhD(c) formulated, led and participated in all elements of the multiple methods research outlined in this dissertation, in partial fulfillment of the requirements of the Doctorate of Philosophy in Nursing at the University of Ottawa. She accepts full responsibility for each manuscript and the dissertation as a whole. The main collaborators are Professors Ian Graham, PhD, Wendy Gifford, RN, PhD, and professor emeritus Barbara Davies, RN, PhD, FCAHS. Additional thesis committee members are Professors Kirsten Woodend, RN, MSc, PhD and Chantal Backman, RN, MHA, PhD as well as advisor Lynn Kachuik, RN, MS. Table 7.1 provides a summary of the contribution of collaborators.

7.1.1 Primary Researcher

I am a registered nurse with a Bachelor of Science in Nursing degree (Queen's University), a Master's of Science in Nursing degree (University of Ottawa), and have a clinical background in oncology and palliative care. Prior to becoming a nurse educator at Algonquin College in 2004, I worked in roles as a staff nurse, clinical educator, research fellow, unit manager and Advanced Practice Nurse (APN). I am currently a professor at St. Lawrence College – Brockville, teaching in a collaborative BScN program. My doctoral studies were financially supported by a Canadian Institutes for Health Research doctoral research award

(2012-2015), and Excellence Scholarships and Tuition Fee Scholarships from the University of Ottawa (2012-2016).

7.1.2 Co-supervisors.

Barbara Davies and Ian Graham were co-supervisors from the beginning of my studies until Barbara Davies' retirement in March, 2017. Wendy Gifford took on the role of co-supervisor at that time. Barbara Davies is a registered nurse and a professor emeritus at the School of Nursing at the University of Ottawa. She was the founding co-director of the Nursing Best Practice Research Unit/Centre and a Vice Dean Research for the Faculty of Health Sciences. Her research program aimed to increase the translation and uptake of evidence into practice, and focused on the development, implementation, evaluation and sustainability of best practice guidelines (BPGs) in health care.

Ian Graham is a medical sociologist, and a full professor in the School of Epidemiology and Public Health with the Faculty of Medicine at the University of Ottawa. He is a Senior Scientist with the Centre for Practice Changing Research at the Ottawa Hospital Research Institute. He is the recipient of an inaugural Canadian Institutes of Health Research Foundation Grant entitled, "Moving knowledge into action for more effective practice, programs and policy: A research program focusing on integrated knowledge translation". Ian's program of research focuses on knowledge translation and integrated knowledge translation.

Wendy Gifford is a registered nurse and an associate professor at the School of Nursing at the University of Ottawa. She is co-director of the Centre for Research on Health and Nursing. Her research focuses on leadership for knowledge translation to improve healthcare delivery, and she collaborates with other researchers worldwide. She is also working with Indigenous people in Canada to support culturally safe cancer care.

7.1.3 Committee members/advisor.

Kirsten Woodend is a registered nurse, associate professor, and Dean of the Trent/Fleming School of Nursing at Trent University. She was the president of the Canadian Association of Schools of Nursing from 2015-2016, and is a tireless advocate for baccalaureate nursing education in Canada. Her research interests focus on the care of older adults, chronic disease management and health services delivery.

Chantal Backman is a registered nurse, associate professor in the School of Nursing at the University of Ottawa, and Affiliate Investigator at the Ottawa Hospital Research Institute and the Bruyère Research Institute. Her program of research focuses on improving the quality, safety and experience of older adults as they navigate the health care system.

Lynn Kachiuk recently retired from her role as APN, Palliative Care, at the Ottawa Hospital. A large part of her role as an APN was focused on leadership for the implementation and evaluation of BPGs in clinical practice. She was a member of the development panel of the *Registered Nurses' Association of Ontario (RNAO) BPG: Care in the Last Days and Hours of Life* and the RNAO *Toolkit for the Implementation of Best Practice Guidelines*.

7.1.4 Knowledge users

My dissertation used an integrated knowledge translation approach (CIHR, 2012), relying on the contributions of advisory committee members that brought an invaluable perspective to the study. Kelly Tousignant is a coordinator in the BScN program at the University of Ottawa. Simone Hamilton, Aleisha Yawney and Jennifer Newton are all oncology nurses that had also worked as clinical instructors. Phillip Nguyen was a new grad at the time of the study, working on an oncology unit, and bringing the important perspective of nursing students to the table. Lori-Ann Holmes is an oncology clinical educator. Lynn Kachuik was the APN for palliative

care at the time of the study. Knowledge users provided feedback about the research process, results of the scoping review, the development of the indicators and conduct of the chart audit, helped to recruit participants and collect data, and assisted by validating the interpretation of the case study results.

7.2 Other Acknowledgements

Although not part of the thesis committee, other team members made important contributions to the research. A description of their contributions is provided.

Scoping review (Chapter 3). Candice McMullen is a library technician working for the Government of Canada. She provided assistance with the literature search, article retrieval and database management. Lindsay Sikora, a health science research liaison librarian at the University of Ottawa consulted on the development of the search strategy. Tarra Findlay is a registered nurse and educator at Algonquin College, and Jessica Ross and Jenny Lin were undergraduate student research assistants. They participated in the screening and data abstraction of the included studies.

Indicator development paper (Chapter 4). Candice McMullen provided assistance with the search for and retrieval of practice guidelines. Jennifer Newton, an oncology registered nurse and clinical educator screened guidelines for inclusion and quality appraisal of included guidelines. Ainslie Moors provided assistance with manuscript preparation.

Case study research (Chapter 5). Aleisha Yawney, a Master's prepared oncology registered nurse and clinical instructor assisted with data collection through the chart audit. She also assisted with recruiting and interviewing research participants. Enrique Soto, a research associate at the University of Ottawa at the time of my research project, provided invaluable

assistance with quantitative data analysis and management. Ainslie Moors provided assistance with manuscript preparation.

7.3 References

Canadian Institutes of Health Research (CIHR). (2012). More about knowledge translation at CIHR. Retrieved from http://www.cihr-irsc.gc.ca/e/39033.html

University of Ottawa (2017). *Academic regulations II-7-Theses.* Retrieved from: https://www.uottawa.ca/administration-and-governance/academic-regulation-II-7-theses

International Committee of Medical Journal Editors (2018). *Recommendations for the conduct, reporting, editing and publication of scholarly work in medical journals.* Retrieved from: http://www.icmje.org/recommendations/

Table 7.1 Contribution of collaborators for published articles and prepared manuscripts

Element	Chapter 3 (Published)	Chapter 4 (Published)	Chapter 5 (Manuscript)
Title	Evidence-based practice in clinical nursing education: A scoping review	Developing guideline-based quality indicators: Assessing gaps in pain management practice	"We don't have time to do all those crazy steps": Nursing students' use of guidelines for pain management in clinical practice – context and influencing factors
Conceptualization and design	VF IDG BD	VF IDG BD KW	VF IDG BD KW WG CB LK
Data collection	VF CM JL TF JR	VF CM JN	VF AY
Data analysis and interpretation	VF IDG BD	VF IDG BD WG KW	VF BD IDG WG
Draft manuscript	VF	VF	VF
Manuscript revisions for important intellectual content	VF IDG BD	VF IDG BD WG KW	VF IDG WG BD KW CB LK
Approval of final version for publication	VF IDG	VF IDG	VF IDG

	BD	BD WG KW	WG BD KW CB LK
Responsible for overall content	VF	VF	VF

Appendices

Appendix A Eligibility Check List & Data Extraction Form for Scoping Review

Eligibility checklist

Study	**Authors:** **Year of publication:** **Country:**

Undergraduate nursing students

- ☐ **Yes**
- ☐ **No**

Intervention focused on use of research evidence in *clinical* education (may include a theory course with an assignment that is completed in a clinical setting.

- ☐ **Yes**
- ☐ **No**

Health care setting

- ☐ **Yes**
- ☐ **No**

Research study (qualitative, quantitative, mixed methods, not merely a description of an educational intervention or program)

- ☐ **Yes**
- ☐ **No**

English or French?

- ☐ **Yes**
- ☐ **No**

Publication between 1998-2004

- ☐ **Yes**
- ☐ **No**

IF "NO" then not eligible

Scoping Review Extraction Tool

Study	**Authors:** **Year of publication:** **Country:**
Objective	
Theoretical Framework	
Methods	**Design:** **Sampling:**
Participants (in results section)	**Sample size:** **Description of participants (year of study, clinical setting):**
Intervention(s) (if applicable)	**Type of intervention/teaching methods:** **Description of the Intervention:**
Data collection	**Data Collection approach:** **Type of measurement (objective (measures) / subjective (personal opinions)-include what objective scales/measures used):** **Description of procedures:**
Results	**Outcomes of intervention:** **Barriers and facilitators/contextual factors:** • **Described as part of study results** • **Described in discussion/other areas of paper**

Appendix B – Hospital Research Ethics Board Initial Approval for Case Study

Ottawa Hospital Research Institute
Institut de recherche de l'Hôpital d'Ottawa

uOttawa

University of Ottawa Heart Institute
Institut de cardiologie de l'Université d'Ottawa

Ottawa Health Science Network Research Ethics Board/ Conseil d'éthique de la recherche du Réseau de science de la santé d'Ottawa
Civic Box 411 725 Parkdale Avenue, Ottawa, Ontario K1Y 4E9 613-798-5555 ext. 14902 Fax : 613-761-4311
http://www.ohri.ca/ohsn-reb

May 9, 2014

Dr. Ian Graham
The Ottawa Hospital Research Institute
Centre for Practice-Changing Research
501 Smyth Road, Box 711
Ottawa, ON K1H 8L6

Dear Dr. Graham:

Re: Protocol # 20140089-01H **Nursing students' use of guidelines for symptom management: Context and influencing factors**

Protocol approval valid until - May 8, 2015

I am pleased to inform you that this protocol underwent expedited review by the Ottawa Health Science Network Research Ethics Board (OHSN-REB) and is conditionally approved to recruit only English-speaking participants. No changes, amendments or addenda may be made to the protocol or the consent form without the OHSN-REB's review and approval.

PLEASE NOTE: THE APPROVAL OF THIS PROTOCOL IS CONDITIONAL UPON A FULLY-SIGNED STUDY CONTRACT/AGREEMENT BETWEEN THE OTTAWA HOSPITAL RESEARCH INSTITUTE, THE PRINCIPAL INVESTIGATOR AND THE SPONSOR (OR AS OTHERWISE REQUIRED). YOU CANNOT START THE STUDY, OR BEGIN TO RECRUIT RESEARCH PARTICIPANTS INTO THE STUDY UNTIL THE STUDY CONTRACT/AGREEMENT HAS BEEN SIGNED BY ALL PARTIES, AND HAS BEEN RECEIVED BY THE OTTAWA HOSPITAL RESEARCH INSTITUTE'S CONTRACTS OFFICE. FOR FURTHER DETAILS, PLEASE CONTACT CHRISTINE LAFONTAINE, CONTRACTS ADMINISTRATOR AT CHRILAFONTAINE@OHRI.CA OR AT 613-798-5555 EXT. 19690.

The study is also conditional upon receipt of the University of Ottawa Research Ethics Board approval letter.

Approval is for the following documents:
- Protocol, uploaded January 13, 2014
- Document Summary Form, uploaded January 13, 2014
- Draft Audit Form, uploaded January 13, 2014
- Student Interview Guide, uploaded January 13, 2014
- Unit Observation Protocol, uploaded January 13, 2014
- English cover letters to approach participants, uploaded April 14, 2014
- English Information Sheet and Consent Form – Advisory Committee members - Participant Informed Consent Form dated April 14, 2014
- English Information Sheet and Consent Form – Clinical Instructors, In-class Teacher & Nursing Staff - Participant Informed Consent Form dated April 23, 2014
- English Information Sheet and Consent Form – Nursing Student Participant Informed Consent Form dated April 23, 2014

The REB no longer requires a 'valid until' date at the bottom of all approved informed consent forms. The consent forms currently approved for use by the REB are listed above.

If the study is to continue beyond the expiry date noted above, a Renewal Form should be submitted to the REB approximately six weeks prior to the current expiry date. If the study has been completed by this date, a Termination Report should be submitted.

.../2

/2

The Ottawa Health Science Network Research Ethics Board (OHSN-REB) was created by the merger of both the Ottawa Hospital Research Ethics Board (OHREB) and the Human Research Ethics Board (HREB) for meetings held at the University of Ottawa Heart Institute.

OHSN-REB complies with the membership requirements and operates in compliance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans; the International Conference on Harmonization - Good Clinical Practice: Consolidated Guideline; the provisions of the Personal Health Information Protection Act 2004.

Yours sincerely,

Vice-Chairperson
Ottawa Health Science Network Research Ethics Board

/cb

Appendix C – University of Ottawa Research Ethics Board Initial Approval for Case Study

File Number: H05-14-21 Date (mm/dd/yyyy): 07/31/2014

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

Ethics Approval Notice

Health Sciences and Science REB

Principal Investigator / Supervisor / Co-investigator(s) / Student(s)

First Name	Last Name	Affiliation	Role
Barbara	Davies	Health Sciences / Nursing	Supervisor
Ian A.	Graham	Medicine / Medicine	Co-Supervisor
Valerie	Fiset	Health Sciences / Nursing	Student Researcher

File Number: H05-14-21

Type of Project: PhD Thesis

Title: Nursing students' use of guidelines for symptom management: Context and influencing factors

Approval Date (mm/dd/yyyy)	Expiry Date (mm/dd/yyyy)	Approval Type
07/31/2014	07/30/2015	Ia

(Ia: Approval, Ib: Approval for initial stage only)

Special Conditions / Comments:
N/A

550, rue Cumberland, pièce 154 Ottawa (Ontario) K1N 6N5 Canada
550 Cumberland Street, room 154 Ottawa, Ontario K1N 6N5 Canada
(613) 562-5387 • Telec./Fax (613) 562-5338
www.recherche.uottawa.ca/deontologie/ www.research.uottawa.ca/ethics/

File Number: H05-14-21 Date (mm/dd/yyyy): 07/31/2014

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement (2010) and other applicable laws and regulations in Ontario, has examined and approved the ethics application for the above named research project. Ethics approval is valid for the period indicated above and subject to the conditions listed in the section entitled "Special Conditions / Comments".

During the course of the project, the protocol may not be modified without prior written approval from the REB except when necessary to remove participants from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the project (e.g., change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, including consent and recruitment documentation, should be submitted to the Ethics Office for approval using the "Modification to research project" form available at: http://www.research.uottawa.ca/ethics/forms.html.

Please submit an annual report to the Ethics Office four weeks before the above-referenced expiry date to request a renewal of this ethics approval. To close the file, a final report must be submitted. These documents can be found at: http://www.research.uottawa.ca/ethics/forms.html.

If you have any questions, please do not hesitate to contact the Ethics Office at extension 5387 or by e-mail at: ethics@uOttawa.ca.

Signature:

Riana Marcotte
Protocol Officer for Ethics in Research
For Daniel Lagarec, Chair of the Health Sciences and Sciences REB

550, rue Cumberland, pièce 154 Ottawa (Ontario) K1N 6N5 Canada
550 Cumberland Street, room 154 Ottawa, Ontario K1N 6N5 Canada
(613) 562-5387 • Téléc./Fax (613) 562-5338
www.recherche.uottawa.ca/deontologie/ www.research.uottawa.ca/ethics/

Appendix D Email Cover Letter for Interview Participant Recruitment

Dear 4th year nursing student:

Valerie Fiset, a PhD candidate at the University of Ottawa School of Nursing, is interested in hearing about your experience using practice guidelines for the management of pain and dyspnea as part of your oncology clinical placement this semester. The purpose of this study is to help better understand how nursing students use practice guidelines. It is hoped that the information from this study will help inform the development of learning activities to encourage nursing students' use of practice guidelines in their clinical placements. Participation in the study involves participating in an interview at a place and time convenient to you which will last about 45 minutes - 1 hour. You will also be asked to share your clinical evaluations and clinical assignments with the researcher.

Participation in this research study is completely voluntary, and will in no way affect your grades or clinical performance. Participants will be selected on a first come, first served basis. If you are interested in participating, please contact the primary investigator at the contact information listed below.

Thank you,

Valerie Fiset RN, MScN, PhD(c)

Dear nurse:

Valerie Fiset, a PhD candidate at the University of Ottawa School of Nursing, is interested in hearing about your experience using practice guidelines for the management of pain and dyspnea, and your work with students having clinical placements on an oncology unit. The purpose of this study is to help better understand how nursing students use practice guidelines. It is hoped that the information from this study will help inform the development of learning activities to encourage nursing students' use of practice guidelines in their clinical placements. Participation in the study involves participating in an interview at a place and time convenient to you which will last about 45 minutes - 1 hour.

Participation in this research study is completely voluntary, and will in no way affect your employment. Participants will be selected on a first come, first served basis. If you are interested in participating, please contact the primary investigator at the contact information listed below.

Thank you,

Valerie Fiset RN, MScN, PhD(c)

Appendix E Interview Participant Recruitment Poster

uOttawa

Université d'Ottawa
Faculté des sciences de la santé
École des sciences infirmières
University of Ottawa
Faculty of Health Sciences
School of Nursing

NURSES AND NURSING STUDENTS PARTICIPANTS NEEDED FOR RESEARCH ABOUT NURSING STUDENTS' USE OF GUIDELINES

Nurses would be asked to: Participate in an interview at a time and place convenient to you

Nursing students would be asked to: Participate in an interview at a time and place convenient to you and share your nursing care plans and clinical evaluations.

In appreciation for your time, you will receive a Chapters Gift Card

For more information about this study, or to volunteer for this study, please contact:
Valerie Fiset RN, MScN, PhD(c)
University of Ottawa School of Nursing
Email:

This study has been reviewed by, and received ethics clearance by the Research Ethics Board.

☎ 613-562-5473
613-562-5443
451 Smyth
Ottawa ON K1H 8M5 Canada
www.uOttawa.ca

Appendix F Advisory Committee Partnership Agreement

Nursing students' use of guidelines for symptom management: Context and influencing factors

Primary investigator: Valerie Fiset RN, MScN, PhD(c)
Thesis committee members: Drs. Barbara Davies and Ian Graham (co-supervisors), Dr. Kirsten Woodend, Lynn Kachuik, RN, BA, MS, CON(C), CHPCN(C)

Advisory committee partnership agreement

Project aims & objectives: The aim of this research is to describe how nursing students use guidelines for symptom management as part of their clinical placements. More specifically, the study objectives are to:

1. Determine to what extent students use guidelines for the assessment and management of cancer-related pain and dyspnea; and
2. Describe how the context of the clinical unit and other factors influence the students' use of guidelines for practice related to pain and dyspnea in cancer patients.

This project is taking an integrated knowledge translation (iKT) approach. IKT involves engaging and involving those who will need to act on the findings in the research process. CIHR (2009) indicates that "iKT requires researchers and knowledge users to develop partnerships and engage in a collaborative process with the overarching goal being the co-production of knowledge, its exchange and its translation in to action."

Advisory committee membership (6 to 8): one or two BScN students, one clinical instructor, one clinical coordinator, two clinical nurses (one from palliative care team), one interprofessional team member and either a manager, educator or APN from the clinical unit. One person from the committee will chair the advisory committee meetings with support and guidance of the PI/Project lead.

Role of advisory committee members (approximately 10 hours' time commitment over 8-10 months):

1. Consent to participate in research project so that meeting minutes/discussions may be used as part of study data.
2. Act as key informants regarding the reality of clinical and academic settings, validating components of each case (1 hour meeting).
3. Provide input into determination of fit with guidelines for practice setting, as well as which recommendations best indicate adherence to practice guidelines (1 hour document review, 1 hour meeting).
4. Review findings of literature review, using them to adapt content of interview guides (1 hour document review).
5. Assist with refinement of audit tools and document extraction forms (30 minutes document review, 1 hour meeting).
6. Assist with interpretation of findings of audit & document review (1 hour document review, 1 hour meeting).
7. Assist with refinement of interview guides and facilitate access to participants (1 hour document review).
8. Assist with interpretation of interview and observation findings and provide member checking for within and cross-case analyses (1 hours reading, 1 hour meeting).
9. Facilitate two-way communication between the project and the overall knowledge users of the research results (ongoing).

Role of PI/project lead:

1. Provide overall direction for the project and responsible for all aspects of project implementation.
2. Conduct an environmental scan of each site.
3. Coordinate meetings of advisory committee.
4. Conduct ongoing literature and guideline review.
5. Develop and manage timeline with each site respecting diversity in site priorities.
6. Draft documents and email to advisory committee members 1 week before meetings.
7. Meet on a regular basis with thesis committee.
8. In conjunction with thesis committee members, have final decision making regarding all scientific and methodological aspects of the study design. Note that both Trent University and TOH have membership on the thesis committee for direct interaction.
9. Provide site specific feedback of results once final analysis completed.
10. Supervise research assistants as required.

Appendix G Consent forms

Information Sheet and Consent Form – Advisory Committee members
Participant Informed Consent Form

Title: Nursing students' use of practice guidelines for symptom management: Context and influencing factors

Principal Investigator:
Ian Graham, PhD, FCAHS

Thesis Student: Valerie Fiset RN, MScN, PhD(c)

Thesis Co-supervisors:
Barbara Davies RN, PhD
Ian D. Graham PhD

Funding Source: The thesis student is the recipient of a Canadian Institutes for Health Research doctoral research award which provides partial funding for the study.

Participation in the research study is voluntary. Please read this Information Sheet and Consent Form carefully before you decide you would like to participate. Ask as many questions as you like.

Request to participate
You are being asked to participate in this research study because you are a project advisory committee member.

Purpose of the Study
The purpose of this study is to help better understand how nursing students use practice guidelines to help them care for cancer patients with pain or shortness of breath. It is hoped that the information from this study will help inform the development of learning activities to encourage nursing students' use of practice guidelines in their clinical practice. Approximately 14 people from two advisory committees will be asked to participate across 2 sites for the study.

Participation
If you agree to participate, you will be asked to participate in project advisory committee activities and meetings as described in the Advisory Committee partnership agreement. It is anticipated that this participation will take up 13 hours of your time from January, 2014, to January, 2015. This may happen during work or on your own time, depending on possible arrangements with your employer. Specific activities include:

1. Act as key informants regarding the reality of clinical and academic settings, validating components of each case (1 hour meeting).
2. Provide input into determination of fit with guidelines for practice setting, as well as which recommendations best indicate adherence to practice guidelines (1 hour document review, 1 hour meeting).
3. Review findings of literature review, using them to adapt content of interview guides (1 hour

document review).
4. Assist with refinement of audit tools and document extraction forms (30 minutes document review, 1 hour meeting).
5. Assist with interpretation of findings of audit & document review (1 hour document review, 1 hour meeting).
6. Assist with refinement of interview guides and facilitate access to participants (1 hour meeting).
7. Assist with interpretation of interview and observation findings and provide member checking for within and cross-case analyses (2 hours reading, 2 hours meeting).
8. Facilitate two-way communication between the project and the overall knowledge users of the research results (ongoing).

Advisory Committee meetings will be audio recorded, transcribed into meeting minutes and analysed as part of project data.

Risks

No risks are anticipated except giving up your time. Your participation in the study might include expressing some negative opinions and this may cause you to feel some discomfort. These negative opinions will be kept confidential.

Benefits of the Study

You may not receive any direct benefit from your participating in this study. Your participation in this study will ensure that project results are relevant for academic and practice settings, and will contribute to the eventual development of learning activities to promote student's use of guidelines. You will be provided with information about practice guidelines relevant for your setting.

Do I have to participate? What alternatives do I have? If I agree now, can I change my mind and withdraw later?

Your participation in this study is voluntary. The alternative to this study is not to participate.

You may decide not to be in this study, or to be in the study now, and then change your mind later without affecting the relationship or other services to which you are entitled or are presently receiving at this institution.

If you withdraw your consent, the study team will no longer collect your personal identifying information for research purposes. The information you have already provided will be removed.

Will I be paid for my participation or will there be any additional costs to me?

You will be provided with a light lunch during the Advisory Committee meetings. There will be no added costs to you for participating in this study.

Confidentiality

- All information collected during your participation in this study (the contents of the meeting minutes) will be identified with a unique study number, and will not contain information that identifies you, such as your name, address, etc.
- To protect your anonymity, contributions to meetings will not be associated with the names of participants. Contributions to the meetings may be quoted by the investigator

but with no personal identification information and as long as the content of the quote does not disclose your identity.

- The link between your unique study number and your name and contact information will be stored securely and separate from your study records, and will not leave this site.
- Any documents leaving the Hospital will contain only your unique study number. This includes publications or presentations resulting from this study.
- Information that identifies you will be released only if it is required by law.
- For audit purposes only, your original study records may be reviewed under the supervision of Dr. I. Graham's staff by representatives from:
    - the Research Ethics Board,
    - the Hospital.
- Research records will be kept for 10 years, after this time they will be destroyed.
- The thesis student's (Valerie Fiset) supervisors (Dr. Barbara Davies and Dr. Ian Graham) and thesis committee members (Dr. Kirsten Woodend and Lynn Kachuik) will have access to the information.

Who do I contact if I have any further questions?
If you have any questions about this study, please contact Valerie Fiset.

The Research Ethics Board has reviewed this protocol. The Board considers the ethical aspects of all research studies involving human participants at the hospital. If you have any questions about your rights as a study participant, you may contact the Chairperson.

Consent Form

Nursing students' use of guidelines for symptom management: Context and influencing factors

Consent to Participate in Research

- I understand that I am being asked to participate in a research study about nursing students' use of guidelines for cancer symptom management.
- This study was explained to me by _____.
- I have read, or have had it read to me, each page of this Participant Informed Consent Form.
- All of my questions have been answered to my satisfaction.
- If I decide later that I would like to withdraw my participation and/or consent from the study, I can do so at any time.
- I voluntarily agree to participate in this study.
- I will be given a copy of this signed Participant Informed Consent Form.

Signatures

_____
Participant's Name (Please print.)

_____ _____
Participant's Signature Date

Investigator Statement

I carefully explained to the research participant the nature of the above research study. To the best of my knowledge, the research participant signing this consent form understands the nature, demands, risks and benefits involved in participating in this study.

_____
Name of Investigator (Please print.)

_____ _____
Signature of Investigator Date

Information Sheet and Consent Form – Nursing student
Participant Informed Consent Form

Title: Nursing students' use of practice guidelines for symptom management: Context and influencing factors

Principal Investigator:
Ian Graham, PhD, FCAHS

Thesis Student: Valerie Fiset RN, MScN, PhD(c)

Thesis Co-supervisors:
Barbara Davies RN, PhD
Ian D. Graham PhD

Funding Source: The thesis student is the recipient of a CIHR doctoral research award which provides partial funding for the study.

Participation in the research study is voluntary. Please read this Information Sheet and Consent Form carefully before you decide you would like to participate. Ask as many questions as you like.

Request to participate
You are being asked to participate in this research study because you are a student having a clinical placement on an oncology unit at. Students, nurses and clinical instructors from the are also being asked to participate.

Purpose of the Study
The purpose of this study is to help better understand how nursing students use practice guidelines to help them care for cancer patients with pain or shortness of breath. It is hoped that the information from this study will help inform the development of learning activities to encourage nursing students' use of practice guidelines in their clinical practice. Approximately 10 students will be asked to participate.

Participation
If you agree to participate you will be asked to participate in an interview to talk about how you use guidelines for your care of cancer patients with pain and shortness of breath, and also to talk about the things that help and impede your use of guidelines. The interview will take 45 minutes – 1 hour to complete. As well, your documentation of patient care, your clinical assignments and your clinical evaluations will be reviewed by the researcher. Your responses to questions in the interview will be audio-recorded and transcribed for analysis. The interview will take place at a time and place convenient to you. You will also be asked to participate in a 1-hour follow up focus group to review the preliminary results of the analysis of the interviews.

Risks
Your participation in this study will entail that you volunteer personal information, and this may cause you to feel somewhat vulnerable. The researcher assures you that every effort will be made to minimize these risks by ensuring that all information you provide will be kept confidential and will not affect your performance as a student. The researcher has no influence over your academic performance or results.

Benefits of the Study
You will be provided with copies of guidelines for pain and symptom management. Your participation in this study will help the researchers to develop an intervention for nursing students which may be of benefit to future nursing education and patient care.

Do I have to participate? What alternatives do I have? If I agree now, can I change my mind and withdraw later?

Your participation in this study is voluntary. The alternative to this study is not to participate.

You may decide not to be in this study, or to be in the study now, and then change your mind later without affecting the employment or other services to which you are entitled or are presently receiving at this institution.

If you withdraw your consent, the study team will no longer collect your personal identifying information for research purposes. The information you have already provided will be removed.

Will I be paid for my participation or will there be any additional costs to me?

You will be provided with a $20.00 Chapter's gift card for participating in the interview. You will received this gift card even if you choose to withdraw from the study. There will be no added costs to you for participating in this study.

Confidentiality

- All information collected during your participation in this study will be identified with a unique study number, and will not contain information that identifies you, such as your name, address, etc.
- The link between your unique study number and your name and contact information will be stored securely and separate from your study records, and will not leave this site.
- Any documents leaving the Hospital will contain only your unique study number. This includes publications or presentations resulting from this study.
- Information that identifies you will be released only if it is required by law.
- For audit purposes only, your original study records may be reviewed under the supervision of Dr. I. Graham's staff by representatives from:
    - the Research Ethics Board,
    - the Hospital.
- Research records will be kept for 10 years, after this time they will be destroyed.
- The thesis student's (Valerie Fiset) supervisors (Dr. Barbara Davies and Dr. Ian Graham) and thesis committee members (Dr. Kirsten Woodend and Lynn Kachuik) will have access to the information.

Voluntary Participation
You are under no obligation to participate. If you choose to participate, you may withdraw from the study at any time without suffering any adverse consequences related to your status as an employee. If you do choose to withdraw from the study, you will get to decide if your data will be used in this research project.

Who do I contact if I have any further questions?
If you have any questions about this study, please contact Valerie Fiset.

The Research Ethics Board has reviewed this protocol. The Board considers the ethical aspects of all research studies involving human participants at the Hospital. If you have any questions about your rights as a study participant, you may contact the Chairperson.

The University of Ottawa Research Ethics Board has reviewed this protocol. The board considers the ethical aspects of all research students at the University of Ottawa. If you have any questions about your rights as a study participant, you may contact the office at:

Tabaret Hall
550 Cumberland St
Room 154
Ottawa, ON, Canada
K1N 6N5
Tel.: (613) 562-5387
Fax.: (613) 562-5338
ethics@uottawa.ca

Consent Form

Nursing students' use of guidelines for symptom management: Context and influencing factors

Consent to Participate in Research

- I understand that I am being asked to participate in a research study about nursing students' use of guidelines for cancer symptom management.
- This study was explained to me by _____.
- I have read, or have had it read to me, each page of this Participant Informed Consent Form.
- All of my questions have been answered to my satisfaction.
- If I decide later that I would like to withdraw my participation and/or consent from the study, I can do so at any time.
- I voluntarily agree to participate in this study.
- I will be given a copy of this signed Participant Informed Consent Form.

Signatures

_____
Participant's Name (Please print.)

_____ _____
Participant's Signature Date

Investigator Statement

I carefully explained to the research participant the nature of the above research study. To the best of my knowledge, the research participant signing this consent form understands the nature, demands, risks and benefits involved in participating in this study.

_____
Name of Investigator (Please print.)

_____ _____
Signature of Investigator Date

Information Sheet and Consent Form – Clinical Instructors, In-class Teacher & Nursing Staff
Participant Informed Consent Form

Title: Nursing students' use of practice guidelines for symptom management: Context and influencing factors

Principal Investigator: Valerie Fiset RN, MScN, PhD(c)

Thesis Co-supervisors:
Barbara Davies RN, PhD
Ian D. Graham PhD

Funding Source: The principal investigator is the recipient of a CIHR doctoral research award which provides partial funding for the study.

Participation in the research study is voluntary. Please read this Information Letter carefully before you decide you would like to participate. Ask as many questions as you like.

Request to participate
You are being asked to participate in the above mentioned research study because you are a clinical instructor or staff member on.

Purpose of the Study
The purpose of this study is to help better understand how nursing students use practice guidelines to help them care for cancer patients with pain or shortness of breath. It is hoped that the information from this study will help inform the development of learning activities to encourage nursing students' use of practice guidelines in their clinical practice. Approximately 4 clinical instructors and 12 staff nurses will participate.

Participation
As a participant in the study, you will be asked to participate in an interview to talk about how nursing students' use practice guidelines for pain and dyspnea, and also to talk about your work with students and how you use practice guidelines. The interview will take 45 minutes – 1 hour to complete. Your responses to questions in the interview will be audio-recorded and transcribed for analysis. The interview will take place at a time and place convenient to you. This may happen during work or on your own time, depending on possible arrangements with your employer. You will also be asked to participate in a 1-hour follow up focus group to review the preliminary results of the analysis of the interviews.

Risks
No risks are anticipated except giving up your time. Your participation in the study might include expressing some negative opinions and this may cause you to feel some discomfort. These negative opinions will be kept confidential.

Benefits of the Study
As recognition of your time commitment to participating in the study, you will be provided with a Chapter's gift card. You will also be provided with copies of guidelines for pain and symptom management if you wish. Your participation in this study will help the researchers to develop an intervention for nursing students which may be of benefit to future nursing education and patient care.

Confidentiality

The information you share will remain confidential, unless their release is required by law. The files may be reviewed by the Research Ethics Board and the. The contents of your interview will be used only for the purposes of this research. The information you share will remain strictly confidential. To protect your anonymity, all information identifying you will be removed from the interview transcripts and a code will be assigned. A master list linking the codes and names will be kept in a locked filing cabinet at all times. Your responses during the interview may be quoted by the investigator but only after all personal identification information is removed and the content of the quote does not disclose your identity. Your identity will not be revealed in any publications or presentations resulting from the research.

All data related to the study such as meeting minutes will be kept in a locked cabinet in the locked Nursing Best Practice Research Centre at the University of Ottawa's School of Nursing. Electronic transcripts and computer files will be password protected on the researcher's computer. The only people with access to the data will be the thesis student's supervisors (Dr. Barbara Davies and Dr. Ian Graham) and thesis committee members (Dr. Kirsten Woodend and Lynn Kachuik). As per policy, papers and computer files will be kept in the locked Nursing Best Practice Research Centre at the University of Ottawa, School of Nursing for ten years after data collection and will then be destroyed.

Voluntary Participation

You are under no obligation to participate. If you choose to participate, you may withdraw from the study at any time without suffering any adverse consequences related to your status as an employee. If you do choose to withdraw from the study, you will get to decide if your data will be used in this research project.

Who do I contact if I have any further questions?

If you have any questions about this study, please contact Valerie Fiset.

The Research Ethics Board has reviewed this protocol. The Board considers the ethical aspects of all research studies involving human participants at the. If you have any questions about your rights as a study participant, you may contact the Chairperson.

Consent Form

Nursing students' use of guidelines for symptom management: Context and influencing factors

Consent to Participate in Research

- I understand that I am being asked to participate in a research study about nursing students' use of guidelines for cancer symptom management.
- This study was explained to me by _____.
- I have read, or have had it read to me, each page of this Participant Informed Consent Form.
- All of my questions have been answered to my satisfaction.
- If I decide later that I would like to withdraw my participation and/or consent from the study, I can do so at any time.
- I voluntarily agree to participate in this study.
- I will be given a copy of this signed Participant Informed Consent Form.

Signatures

_____
Participant's Name (Please print.)

_____ _____
Participant's Signature Date

Investigator Statement

I carefully explained to the research participant the nature of the above research study. To the best of my knowledge, the research participant signing this consent form understands the nature, demands, risks and benefits involved in participating in this study.

_____
Name of Investigator (Please print.)

_____ _____
Signature of Investigator Date

Appendix H Interview Guides

Student interview guide

Ask participant to read through the consent form. Ask if they have any questions and if they feel comfortable going ahead with participation. Remind them that they can withdraw at any time. Ask them to sign both copies of the consent form, give them the full information sheet and the signed version attached.

Introduction
Thanks very much for agreeing to be interviewed for the study. We hope that the information provided will help us to better prepare students in the future. The interview will start by me asking a few questions about yourself. Then I will go on to a couple of scenarios where I will get you to tell me a bit about how you would approach caring for a patient with pain and a patient with dyspnea. Then, I will ask you a few more questions about your experience using practice guidelines as part of your clinical placements.

Scenario#1: You have just started your shift. You are caring for Mrs. Levesque, who has advanced breast cancer with bone metastases. She has severe back pain, making bed mobility difficult.
Discuss your approach to care for Mrs. Levesque in relation to her pain.

- Assessment, management, resources used…

Scenario #2: You have just started your shift. You are caring for Mrs. Levesque, who has advanced breast cancer with pleural effusions. She is very short of breath, and is very anxious.
Discuss your approach to care for Mrs. Levesque in relation to her shortness of breath.

- Assessment, management, resources used…

Thoughts regarding guideline use:

1. What is your understanding of what practice guidelines are?
2. Can you tell me about your experience using practice guidelines in your current clinical placement?
    - What are the benefits that you see to using practice guidelines?
3. What things would make it easier for you to use guidelines as part of your practice in your current clinical placement?
    - What resources (human and material) are available to you to help you use guidelines on the unit?
    - How much independence do you have in clinical decision making?
4. What are the challenges and barriers to using practice guidelines in your current clinical placement?
    - What teaching have you had about using practice guidelines?
    - Do you have sufficient resources on the unit to help you use guidelines?
5. Good symptom management depends on how the interprofessional team works together. What has been your experience with the interprofessional team as it relates to symptom management and using guidelines?

Study ID _____

Demographic information:

1. Year of study
2. Age
3. Gender
4. Previous degree

☐ Yes
☐ No

Specify _____

Staff Nurse interview guide

Ask participant to read through the consent form. Ask if they have any questions and if they feel comfortable going ahead with participation. Remind them that they can withdraw at any time. Ask them to sign both copies of the consent form, give them the full information sheet and the signed version attached.

Introduction
Thanks very much for agreeing to be interviewed for the study. We hope that the information provided will help us to better prepare students in the future. The interview will start by me asking a few questions about you. Then I will go on to outline scenarios where I will get you to tell me a bit about how you would approach caring for patients with pain and dyspnea, and how you would support a student caring for these patients. Then, I will ask you a few more questions about your experience using practice guidelines.

Scenario #1: You have just started your shift. You are caring for Mrs. Levesque, who has advanced breast cancer with pleural effusions. She is very short of breath, and is very anxious.

- Discuss your approach to care for Mrs. Levesque in relation to her shortness of breath.
- Discuss your approach to a student that is caring for Mrs. Levesque and indicates to you that she is not sure how to best help the patient.

Scenario #2: You have just started your shift, and are working with a nursing student, who is caring for two of the patients in your assignment. One of them is Mr. Bowen, who has advanced prostate cancer with bone metastases. He has severe back pain, making bed mobility and ambulation difficult. The student nurse approaches you, indicating she is not sure how to best help the patient.

- Discuss your approach to care for Mr. Bowen in relation to his pain.
- Discuss your approach to a student that is caring for Mr. Bowen and indicates to you that he is not sure how to best help the patient.

1. What is your understanding of what practice guidelines are?
2. Can you tell me about your experience integrating practice guidelines in your clinical practice?
    - What are the benefits that you see to using practice guidelines?

3. What things would make it easier for you to use practice guidelines as part of your practice?
    - What resources (human and material) are available to you to use guidelines on the unit?
    - How much independence do you have in clinical decision making?

4. What are the challenges and barriers to using practice guidelines in your clinical practice?
    - What teaching have you had about using practice guidelines?

5. What are your expectations of students related to the use of practice guidelines in their clinical placements?
    - What are some of the most important outcomes of clinical placements?
    - What do you see as your role in clinical education?
6. Good symptom management depends on how the interprofessional team works together. What has been your experience with the interprofessional team as it relates to symptom management and using guidelines?

Study ID _____

Demographic information:

1. Number of years of practice
   _____
2. Level of education
   _____
3. Age
   _____
4. Gender
   _____
5. Last course with focus on research?
   _____
6. Any continuing education on research evidence use in practice?
   _____

Clinical instructor interview guide

Ask participant to read through the consent form. Ask if they have any questions and if they feel comfortable going ahead with participation. Remind them that they can withdraw at any time. Ask them to sign both copies of the consent form, give them the full information sheet and the signed version attached.

Introduction
Thanks very much for agreeing to be interviewed for the study. We hope that the information provided will help us to better prepare students in the future. The interview will start by me asking a few questions about you. Then I will go on to outline scenarios where I will get you to tell me a bit about how you would approach caring for patients with pain and dyspnea, and how you would support a student caring for these patients. Then, I will ask you a few more questions about your experience using practice guidelines.

Scenario #1: You have just started your shift. You are caring for Mrs. Levesque, who has advanced breast cancer with pleural effusions. She is very short of breath, and is very anxious.

- Discuss your approach to care for Mrs. Levesque in relation to her shortness of breath.
- Discuss your approach to a student that is caring for Mrs. Levesque and indicates to you that she is not sure how to best help the patient.

Scenario #2: You have just started your shift, and are working with a nursing student, who is caring for two of the patients in your assignment. One of them is Mr. Bowen, who has advanced prostate cancer with bone metastases. He has severe back pain, making bed mobility and ambulation difficult. The student nurse approaches you, indicating she is not sure how to best help the patient.

- Discuss your approach to care for Mr. Bowen in relation to his pain.
- Discuss your approach to a student that is caring for Mr. Bowen and indicates to you that he is not sure how to best help the patient.

1. What is your understanding of what practice guidelines are?
2. Can you tell me about your experience integrating practice guidelines in your work with students?
    - What are the benefits that you see to using practice guidelines in your teaching or for student practice?
    - What are some of the most important outcomes of clinical education?
3. What things would make it easier for you to use practice guidelines as part of your work with students?
    - What resources (human and material) are available to help you and students use guidelines on the unit?
4. What are the challenges and barriers to using practice guidelines in your clinical practice (unit staff) in your work with students?
    - What teaching have you had about using practice guidelines in clinical education?
    - How much independence do you have in clinical decision making on the clinical unit?
    - Who do students approach when they have a clinical question?
    - What role do staff nurses play in teaching students?
5. What are your expectations of students related to the use of practice guidelines in their clinical placements?
6. Good symptom management depends on how the interprofessional team works together. What has been your experience with the interprofessional team as it relates to symptom management and using guidelines?

Study ID _____

Demographic information:

7. Number of years of practice
   _____
8. Number of years of teaching
   _____
9. Level of education
   _____
10. Age
    _____
11. Gender
    _____
12. Last course with focus on research?
    _____
13. Any continuing education on research evidence use in practice?
    _____

In-class teacher interview guide

Ask participant to read through the consent form. Ask if they have any questions and if they feel comfortable going ahead with participation. Remind them that they can withdraw at any time. Ask them to sign both copies of the consent form, give them the full information sheet and the signed version attached.

Introduction
Thanks very much for agreeing to be interviewed for the study. We hope that the information provided will help us to better prepare students in the future. The interview will start by me asking a few questions about you. Then I will go on to outline scenarios where I will get you to tell me a bit about how you would approach caring for patients with pain and dyspnea, and how you would support a student caring for these patients. Then, I will ask you a few more questions about your experience using practice guidelines.

Scenario #1: You have just started your shift. You are caring for Mrs. Levesque, who has advanced breast cancer with pleural effusions. She is very short of breath, and is very anxious.

- Discuss your approach to care for Mrs. Levesque in relation to her shortness of breath.
- Discuss your approach to a student that is caring for Mrs. Levesque and indicates to you that she is not sure how to best help the patient.

Scenario #2: You have just started your shift, and are working with a nursing student, who is caring for two of the patients in your assignment. One of them is Mr. Bowen, who has advanced prostate cancer with bone metastases. He has severe back pain, making bed mobility and ambulation difficult. The student nurse approaches you, indicating she is not sure how to best help the patient.

- Discuss your approach to care for Mr. Bowen in relation to his pain.
- Discuss your approach to a student that is caring for Mr. Bowen and indicates to you that he is not sure how to best help the patient.

1. What is your understanding of what practice guidelines are?
2. Can you tell me about your experience integrating practice guidelines in your in-class teaching with students?
    - What are the benefits that you see to using practice guidelines in your teaching or for student practice?

3. What things would make it easier for you to use practice guidelines as part of your work with students?
    - What resources (human and material) are available to help you and students use guidelines in the classroom?

4. What are the challenges and barriers to using practice guidelines in your work with students?

5. What are your expectations of students related to the use of practice guidelines in their clinical placements?

Study ID _____

Demographic information:

14. Number of years of practice
    _____
15. Number of years of teaching
    _____
16. Level of education
    _____
17. Age
    _____
18. Gender
    _____
19. Any continuing education on research evidence use in practice?
    _____

Appendix I Unit Observation Protocol (site visit)

Date & time of observation		
Focus of observations: Human and material resources that support symptom management and guideline use.		
Descriptive notes	Reflective notes	Follow up needed
Human resources: ☐ Advanced practice nurse ☐ Palliative care specialist nurses/MDs ☐ Nurse educator ☐ Clinical instructor ☐ IP team members ☐ MD ☐ RN ☐ Student nurse ☐ Physiotherapist ☐ Occupational therapist ☐ Social Worker ☐ Psychologist ☐ Pastoral care ☐ Volunteer ☐ Other _____		
Material resources: ☐ Posters ☐ Presentations ☐ Computers ☐ Journals/journal articles ☐ Protocols/guidelines Other:		

Appendix J Chart Audit Code Book

	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rational / Comments
1	Site-Patient ID		0001- 0002-				
2	Observation period	Time frame of chart audit.	1- Oct. 20 2- Oct. 20 & 21 3- Oct. 27 4- Oct. 27 & 28 5- Oct. 20, 21, 27, 28 6- Oct. 21, 27, 28 7- Feb. 12 8- Feb. 12 & 13 9- Feb. 13, 26, 27 10- Feb. 26 11- Feb. 26 & 27 12- Feb. 12, 13, 26, 27				Patients that are admitted to the unit on the 21st and discharged before the 27th will not be included in the study. Patients that are admitted to the unit on the 28th will also not be included. Ideally, 48 hrs of care will be audited. The observation period reflects the dates that the patient is admitted to the unit of study. If the pt is admitted on Oct 20th but is transferred to the unit on the 21st the observation periods would begin on the 21st.
3	Cancer diagnosis	Primary cancer diagnosis of patient whose chart is being audited.	1- Breast 2- Colon 3- Prostate 4- Lung 5- Brain 6- Other 98- Unavailable 99- Missing		Admission history	Progress notes written same day as chart audit.	

4	Age	In years, the age of patient whose chart is being audited at the time of our observations			Patient information stamp		
5	Reason for admission	What was the primary factor contributing to the patient's admission to hospital?	1- Chemotherapy 2- Symptom management 3- End-of-life care 4- Radiation 5- Febrile Neutropenia 6- Re-staging 7- Failure to cope/thrive 8- Other 98- Unavailable 99- Missing		Admission history		

Background Information Pain and Dyspnea Assessment on Admission

Col. #	**Column Header from Excel Spreadsheet**	**Column Header Definition**	**Response Options**	**Response Options Definitions**	**Where to find data: Best Source**	**Where to find data: 2nd best source**	**Rational / Comments**
6	Pain documented on admission	Was a pain assessment documented on admission?	1-Yes 0-No 98- Unavailable	Yes: a pain assessment was documented on admission No: a pain assessment was not documented on admission	Admission history ESAS	BPI Flow sheet CADD MAR Progress notes	Admission package in patient history section of chart Screen for the presence or risk of any type of pain on admission or visit with a HCP; after a change in medical status, prior to, during and after a procedure. (RNAO) If "no" was answered the following questions pertaining to the pain assessment on admission will be left blank (column #7-9)

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rational / Comments
7	Pain score	What was the pain score between 0 and 10 in the pain assessment on admission	0 -10	0 – no pain 1-3 “mild pain” 4-6 “moderate pain” 7-10 “severe pain”	Admission history ESAS	Flow sheets CADD MAR Progress notes	Admission package in patient history section of chart When a range is given for a pain score, go with the higher number or round up to the nearest whole number (ex: 3-4 would be 4, 4.5 would be 5)
8	HCP Documented pain admission	Health care professional who documented the pain assessment on admission	1 –Nurse 2- Student Nurse 3- MD 4- Other 98- Unavailable 99- Missing		Admission history sheet	Flow sheets CADD MAR Progress notes	
9	Additional pain assessment	If pain was present on admission, was a further pain assessment completed	1-Yes 0-No		Brief pain inventory (BPI)	Progress notes CADD MAR	Admission package in patient history section of chart Pain assessment on CADD MAR has a more detailed assessment including sensation of pain, sedation scale etc.

General Questions on Pain

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
10	Pain diagnosis	Is there a documented diagnosis of the physical cause of pain	1-Yes 0-No 98- Unavailable 99- Missing		Admission note in patient history	Palliative care consults Progress notes	
11	HCP involved in pain mgmt	All the health care professional involved in patients pain management during admission	1- MD 2- RN 3- Student Nurse 4- Physiotherapy 5- Physiotherapy Aide 6- Occupational Therapist 7- OT Aide 8- Social Worker 9- Psychologist 10- Pastoral Care 11- Volunteer 12- Other		Progress notes	Consults section	Can be more than one answer Pain management Refers to a range of therapeutic interventions (i.e., pharmacological, non-pharmacological, interventional techniques, physical, psychological, educational) that can be provided to prevent, reduce or eliminate suffering related to pain. RNAO recommend: Establish a comprehensive plan of care that incorporates the goals of the person and IP team. CCO & EAU recommendation: The use of ketamine or methadone as an analgesic for refractory cancer pain should be supervised by a specialist in pain or palliative medicine

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
12	Services consulted for pain	Have other services been consulted to assist in pain management	1-Yes 0-No N/A –	Yes – services were consulted for pain No – no services were consulted for pain N/A – pt had no pain during stay so no services consulted	Consults section		RNAO recommendation: Establish a comprehensive plan of care that incorporates the goals of the person and IP team.
13	List of services consulted for pain	Type of service consulted to assist with pain management	1- Palliative Care 2- Complex Cancer Pain Service 3- Anaesthesia 4- Radiation Oncology 5- Acute pain service 6- Interventional Radiology 7- Surgery 8- Enterstomal therapy 9- Other		Consults section	Progress notes	Can be more than one answer At if Dr. was consulted for abd pleurex - Pleurex was coded for service consulted.

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
14	Adverse effects prevented - CONSTIPATION	Prevention of CONSTIPATION during the administration of opioid analgesics is evident	1-Yes 0-No N/A	Yes: There are regular laxatives ordered for the patient that is taking opioids. No: no regular laxatives ordered for patient on opioids. N/A: Regular laxatives were not ordered purposefully as it was not necessary i.e.: patient has diarrhea or pt. refused.	MAR PRN MAR	Flow sheets	Nurses should anticipate adverse effects and initiate measures to protect against them For example common adverse effects: Constipation – the patient should always be started on laxatives concurrently with opioids. Example of when no laxatives needed: pt is having loose or frequent stools. N/A will be chosen when no medications were administered during the pain episode
15	Adverse effects managed – NAUSEA & VOMITTING	Prevention of NAUSEA & VOMITTING during the administration of opioid analgesics is evident	1-Yes 0-No N/A-patient not on opioids	Yes: There are ANTI-EMETICS (regular and/or PRN) ordered for the patient who is on opioids. No: patient is on opioids but no anti-emetic prescribed.	MAR PRN MAR		N/A will be entered if no opioid was given to the patient.

Pain Episode

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
16	Date	The date that the pain episode occurred	0- Oct. 20 1- Oct 21 2- Oct 27 3- Oct 28		Progress note Flow sheet	CADD MAR #1 CADD MAR #2	Pain episode is any time when the patient verbally expresses the presence of pain or demonstrates non-verbal signs of pain (moaning, grimacing, crying, restlessness, bracing).
17	Time	Time that the pain episode occurred 24 hour clock.	98- Unavailable 99- Missing		Progress note	Flow sheet CADD MAR	
18	Pain Score	What was the pain score between 0 and 10 in the pain assessment	0-10 98- Unavailable 99- Missing	0 – no pain 1-3 “mild pain” 4-6 “moderate pain” 7-10 “severe pain”	Flow sheet	CADD MAR #1 CADD MAR #2 Progress notes	CCO/RNAO/EAU recommendation: Patients with cancer pain should have treatment outcomes monitored regularly using visual analogue scales, numerical rating scales or verbal rating scales and multidimensional instruments as necessary. When a range is given for a pain score, go with the higher number or round up to the nearest whole number (ex:4.5 would be 5)

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
19	Where documented	The location in the patient chart that the pain episode was documented	1- Daily flow sheet 2- BPI 3- Progress notes 4- CADD MAR #1 5- CADD MAR #2 6- MAR 7- PRN MAR		Flow sheets	Progress notes CADD MAR #1 CADD MAR#2 BPI PRN MAR	Can be more than one answer CCO/RNAO/EAU recommendation: Patients with cancer pain should have treatment outcomes monitored regularly using visual analogue scales, numerical rating scales or verbal rating scales and multidimensional instruments as necessary.
20	HCP Documented pain episode	The health care professional who documented the episode of pain	1- Nurse 2- Nursing student 3- MD 4- Other 98- Unavailable 99- Missing		Flow sheets	Progress notes CADD MAR PRN MAR	
21	Information Source for pain	Person who gave the information during the assessment of pain	1- Self- Report 2- Family 3- Health Care Provider 4- Other 98- Unavailable 99- Missing		Progress notes		CCO/EAU recommendation: The patient should be the prime assessor of his or her pain. CCO/RNAO recommendation: Self-assessment pain scales should be used in patients with cognitive impairment, where feasible. Observational pain rating scales should be used in patients who cannot complete a self-assessment scale.

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
22	Pain treatment provided	What kind of intervention was provided to ease the pain of the patient	1- Pharmacological 2- Non-Pharmacological 3- Pharmacological and non-pharmacological 4- No additional interventions than the current pain management plan 5- No intervention	1. Pharmacological- an analgesia is given at the time of the pain episode either a regular dose that is due, a PRN or both. 2. Non-pharmacological- some intervention is done that does not involve medications i.e.: repositioning, heat & cold. 3. (1+2) 4. Patient is on a pain management regime and no additional medication (including regular dose or PRN's) are given at that time 5. The patient is not on a pain management regime and no pain medication is provided	PRN MAR MAR	Progress notes CADD MAR #1 CADD MAR #2	RNAO/EAU Collaborate with the person to identify their goals for pain management and suitable strategies to ensure a comprehensive approach to the plan of care. Time treatment provided will be left blank for CADD medication administration. The time it is administered is not collected as it is continually infusing and has a bolus limit within 30 – 60 minutes.

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
23	Time	Time pain treatment was provided		The time will be entered using the 24 hr clock	PRN MAR	CADD MAR MAR Progress notes	This will be left blank when pt is on a CADD pump with boluses. Pt self-administers according to program however the time is not recorded. If a pt is on a CADD pump and can self-administer but is also given another PRN analgesia in addition to self-administering the time will be written in the column. If a non-pharmaceutical intervention is used the time of the intervention will be written. If multiple times are documented in different locations but are part of one pain episode, the earliest time will be coded.
24	HCP administered pain intervention	The health care professional who administered the intervention to ease the pain.	1- Nurse 2- Nursing student 3- MD 4- Palliative care 5- Self 97- N/A 98- 99- Unavailable 100- Missing	N/A – no pain intervention was provided Self – pt self-administered pain medication using a programmed CADD pump or other similar device	MAR PRN MAR	Progress notes CADD MAR	Physicians who are part of the palliative care team will be coded as palliative care. Self will be used as the code when pt is on a CADD pump or another device that allows for pt control over medication boluses.

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
25	Multi-modal Analgesia	Was there a multi-modal analgesic approach with the use of adjuvant medications?	1-Yes 0-No	Yes: More than one pharmacologic approach was used to manage the pain episode.	PRN MAR MAR	CADD MAR #1 CADD MAR #2	A multimodal approach includes non-opioid analgesics (ex: anti-inflammatory drugs), opioids (ex: morphine) and adjuvant medications (ex: anticonvulsants). A combination is used to manage people's pain through different mechanisms.
26	Regular dose	Analgesic prescribed regularly	1-Yes 0-No	Yes: The analgesic was prescribed regularly. This could be every 2,4,6,8 or 12, hours. This could also be a continuous infusion of pain medication	MAR	CADD MAR #1 CADD MAR #2	
27	PRN Analgesia	PRN analgesia was offered to the pt.	1- Yes 0- No	Yes a prn analgesia was offered to the patient No: no PRN was offered to patient even though there was one ordered	PRN MAR Progress notes	MAR	If it is clearly charted that a PRN is offered to patient and patient does not accept it "Yes" will still be entered. If a "one time dose" is ordered for pain this will be included in the yes answer that a PRN was given

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
28	Appropriate analgesia for PRN	Appropriate medication for breakthrough pain is available	1-Yes 0-No	Yes: There is appropriate PRN medication available. If there is a regular opioid to control pain the breakthrough medication is the same,	PRN MAR MAR	CADD MAR #1 CADD MAR #2	Breakthrough pain is a transient flare up of moderate or severe pain arising on a background of controlled pain. It usually has a fast onset and has a short duration.
29	Appropriate analgesia DOSE for PRN	Appropriate dose for breakthrough pain is available	1-Yes 0-No	Yes: The pain medication DOSE available is appropriate according to the nature of the breakthrough pain.	PRN MAR MAR	CADD MAR #1 CADD MAR #2	**Dose**: The usual dose for breakthrough pain is 10% of the total daily dose of the narcotic
30	Appropriate analgesia ROUTE for PRN	Appropriate dose for breakthrough pain is available	1-Yes 0-No	Yes: The route of administration for the pain medication(s) is appropriate according to the nature of the breakthrough pain.	PRN MAR MAR	CADD MAR #1 CADD MAR #2	**Route**: oral or parenteral depending on how fast relief is needed. Oral – mild-mod pain Parenteral – severe pain

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
31	Appropriate analgesia FREQUENCY for PRN	Appropriate dose for breakthrough pain is available	1-Yes 0-No	Yes: The FREQUENCY of administration for the pain medication(s) is appropriate according to the nature of the breakthrough pain.	PRN MAR MAR	CADD MAR #1 CADD MAR #2	**Frequency**: Ensure that the breakthrough medication is available at appropriate times (frequency changes depending on the medication)
32	Heat/Cold	Heat/cold compresses	1-Yes Blank if not done	Yes: a heat compress or a cold compress was used on the patient and evaluated for effectiveness and interactions with pharmacologic interventions	Progress notes		Both heat and cold compresses can reduce inflammation and pain.
33	Touch therapies	Massage, pressure or vibration	1-Yes Blank if not done	Yes massage, pressure or vibration was used was used on the patient and evaluated for effectiveness and interactions with pharmacologic interventions	Progress notes		Massage therapy may reduce stiffness and swelling therefore helping with pain relief. Applying pressure to certain trigger points on the body may help ease pain. Vibration therapy is when vibrations of different frequency, force and amplitude is transferred to a specific body part using an instrument.

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
34	Imagery or music	Imagery or music was used to help ease the pain of the patient	1-Yes Blank if not done	Yes The patient was brought through a guided imagery session and/ or they had music playing. These were evaluated for effectiveness and interactions with pharmacologic interventions.	Progress notes		Guided imagery and music are believed to help with relaxation and may provide pain relief
35	Relaxation	Relaxation was used to help relieve pain	1-Yes Blank if not done	Yes: Relaxation was used as an intervention to ease pain. It was evaluated for effectiveness and interactions with pharmacological interventions	Progress notes		Relaxation for pain relief has the goal of reducing stress and easing pain. There are various techniques used (ex: progressive muscle relaxation).
36	Repositioning	Repositioning was used to help relieve pain	1-Yes Blank if not done	Yes: Repositioning was used as an intervention to ease pain. It was evaluated for effectiveness and interactions with pharmacological interventions	Progress notes		Proper positioning and changing positions may help with pain relief
37	Other non-pharmacological interventions for pain	Any non-pharmacological intervention not listed above.	1 Yes Specify_____		Progress notes		Possible examples: TENS, acupuncture, supportive surfaces

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
38	Pain education documentation	Documentation of teaching the person, their family and caregivers about the pain management strategies in their plan of care and address known concerns and misbeliefs.	1-Yes 0-No	Yes: There was documentation that the patient or family member or caregiver received education on their pain management.	Progress notes	Patient teaching record Palliative care consult	Teach the person, their family and caregivers about the pain management strategies in their plan of care and address known concerns and misbeliefs. (RNAO)
39	HCP who documented pain education	The health care professional who documented the teaching of pain management	1- Nurse 2- Student Nurse 3- MD 4- Palliative care 5- Other 98- Unavailable 99- Missing		Progress Notes	Palliative care consult Patient teaching record	

Col. #	Column Header from Excel Spreadsheet	Column Header Definition	Response Options	Response Options Definitions	Where to find data: Best Source	Where to find data: 2nd best source	Rationale / Comments
40	Reassessment of pain	Was the pain reassessed after the intervention?	1-Yes 0-No	Yes the pain was reassessed at an appropriate time after the intervention. The maximum length of time for reassessment when a pt has pain is 2 hours. Unless the pain is severe (7-10) then the maximum length is 1 hour. May also be indicated as part of a block note in progress notes i.e.: PRNs given with effect.	Flow sheets	CADD MAR Progress notes	The frequency of reassessing pain depends on the severity of the pain and the distress associated with it. It is important to assess frequently to ensure proper pain management strategy is in place. Reassessment should be done using the same tool. RNAO recommendation: Evaluate any non-pharmacological interventions (physical and psychological) for effectiveness and the potential for interactions with pharmacological interventions. RNAO/EAU recommendation: Reassess the person's response to the pain management interventions by using the same re-evaluation tool.
41	HCP reassessment of pain	Which health care provider reassessed the pain?	1- Nurse 2- Student Nurse 3- MD 4- Other 98- Unavailable 99- Missing		Flow sheets	Progress notes CADD MAR	

Notes:

Missing = Document is present, but documentation is not complete i.e.: missing signature, initials, pain score in a situation when pain has been documented)

Unavailable = The actual document is not in the chart i.e.: MAR missing

N/A (Not applicable) = i.e.: patient admitted with no dyspnea, so no score is included (N/A), and it is not documented, other examples see definition.

Blank = i.e.: if there is no reassessment of pain, the column for HCP who reassessed pain will be left blank. If no non-pharmacological interventions done, non-pharmacological options will be left blank vs. “no”

Change wording column N – delete pain score

For pain and dyspnea episodes, put in actual score vs. range

CADD MAR on is labelled as: Pain Assessment and Medication administration record – operative notes

Flow sheets on is labelled as: Medicine/Surgery- Documentation flowsheets- nursing notes

Appendix K Case Study Additional Data from Chart Audit

Table 1

Patient characteristics (N=54)

Characteristic	N(%)
Diagnosis	
Cancer	
Gastrointestinal	13 (24%)
Lung	10 (18.5%)
Breast	9 (16.7%)
Hematologic	5 (10.8%)
Prostate	4 (7.4%)
Pancreatic	3 (5.6%)
Other	7 (13.0%)
Non-Cancer	
Respiratory	1 (1.9%)
Gastrointestinal	1 (1.9%)
Pheocryomocytoma	1 (1.9%)
Total	54
Reason for Admission[a]	
Symptom management	35 (54.7%)
Disease/Complication Related Treatment - Medical	13 (18.7%)
Failure to cope/thrive	6 (9.4%)
Febrile Neutropenia	4 (6.3%)
End-of-life care	3 (4.7)
Investigation	3 (4.7)
Disease/Complication Related Treatment - Surgical	1 (1.6%)
Total	64
Age	
Average	64.9
<60	23 (42.6)
60-79	21 (38.9)
≥80	10 (18.5)
Total	54

[a]May be more than one reason for admission

Table 2

Adherence to recommended pain practices during audit period

	Documentation n (%)	
	Yes	**No**
Pain on admission (n=54)		
Recommendation = Screen for the presence of pain on admission	54 (100%)	
Cases with pain on admission (n=37)		
Recommendation = assessment to determine the cause, severity and impact of pain		
Cause of pain documented	31 (83.8%)	6 (16.2%)
Pain score documented (severity)	31 (83.8%)	6 (16.2%)
Multidimensional pain assessment documented (impact on patient)	17 (45.9%)	20 (54.1%)
Pain episodes during audit period (n=499 for 47 patients)		
Recommendation = assessment to determine the cause, severity and impact of pain		
Episodes with pain score documented (severity)	379 (76%)	120 (24%)

Table 3

Adherence to recommendations related to reassessment following intervention

Total number of pain episodes addressed with pharmacological interventions or pharmacological + non-pharmacological interventions[a] n=365	Frequency of reassessment N (%)
Reassessment[a,b] (n=363)	177 (48.8%)
Reassessment by nurse	117 (63.6%)
Reassessment by student nurse	67 (36.4%)

[a]A pain episode can have more than one intervention and more than one reassessment.
[b]Number of cases with data (valid cases).

Table 4

Interprofessional team members and consult services involved in care of patients experiencing pain on admission or during audit time period[a] (N=50[b])

Team members/services involved in patient care	Number of patients with that team member involved in their care (%)
Interprofessional team members	
MD	50 (100%)
RN	50 (100%)
Student Nurse	39 (78.0%)
Occupational therapy	6 (12.0%)
Physiotherapy	2 (4.0%)
Pastoral Care	2 (4.0%)
Social Worker	1 (2.0%)
Consult services	
Palliative Care	27 (54.0%)
Radiation oncology	7 (14.0%)
Complex Cancer Pain Service	3 (6.0%)
Acute pain service	2 (4.0%)
Surgery	2 (4.0%)
Interventional Radiology	1 (2.0%)
Other	9 (18.0%)

[a]Patients can be cared for by multiple providers and services
[b]50 patients had pain on admission *or* during hospital stay out of the total 54 patients included in the audit

Table 5

Pain management approaches used (N=499 pain episodes)

Pain management approach	**Number of times approach was used N (%)**
Pharmacological only	359 (71.9%)
Patient was on a pain management regime and *no additional medication* (including regular dose or PRN's) were given at the time of the episode	96 (19.2%)
Patient was not on a regular pain management regime and no pain medication was provided	34 (6.8%)
Pharmacological and non-pharmacological	6 (1.2%)
Non-pharmacological only	4 (0.8%)

Table 6

Adherence to recommended practices for pharmacologic interventions [a]

Recommended practices – pharmacologic interventions	Frequency of recommended practice N (%)
Intervention	
Regular analgesia	301 (82.5%)
Multi-modal analgesia	238 (65.2%)
PRN analgesia prescribed	
Appropriate analgesic	362 (99.2%)
Appropriate dose	358 (98.1%)
Appropriate route	353 (96.7%)
Appropriate frequency	340 (93.2%)

[a] total number of pain episodes addressed with pharmacological interventions or pharmacological + non-pharmacological interventions