DESIGNING LAB RESOURCE MANUAL ON PAIN MANAGEMENT FOR UNDERGRADUATE NURSING STUDENTS

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DEDICATION

In memory of my father, Dr. Khushpal Bhullar, who encouraged me to reach for the stars…

ABSTRACT

Pain management (PM) practice in clinical practice continues to be suboptimal (Sinatra, 2010) even in the presence of various strategies and technology introduced to improve patient outcomes in better pain control and mitigate the effects of long-term opioid use. Concerning evidence in research indicates that nurses lack the essential PM knowledge and application skills to provide optimal pain care to patients (Brant et al., 2017). In order to set nursing students up for success in PM practices upon entry-to-practice, efforts must be made to train students on the latest, evidence-based PM knowledge, skills and attitudes required to provide optimal pain care to patients. Teaching PM in a lab setting enables nursing students to apply theoretical knowledge in practice contexts by facilitating critical thinking skills; thus, bridging the theory-practice gap in the future generation of nursing professionals. The Master of Nursing (MN) project's goal was to design a draft lab resource manual on acute pain management for nursing instructors who will teach the 2nd-year NURS 2321-'Health of Persons' course at Lethbridge College, to enhance nursing students' knowledge, skills and attitudes on pain care.

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SECTION ONE: INTRODUCTION

Pain is a complex, subjective, multifactorial phenomenon unique to an individual (Wilson, 2014). Theoretically, it may sound simple to measure one's pain on a Numeric Pain Scale (NRS) and provide treatment(s) accordingly. However, it is challenging for healthcare professionals to truly comprehend one's pain experience as pain scales are one-dimensional and only measure one's pain intensity (Topham & Drew, 2017). To understand the meaning of pain experience for an individual and how it impacts their overall health, "an exchange of meaning" needs to occur between the patient and health care professional (Topham & Drew, 2017, p. 363). Therefore, nurses must be competent in navigating the art of communication when providing pain management to their patients.

Advances in health sciences have been made in regards to new pharmacological discoveries and strategies to decrease the prevalence of adverse patient pain experiences during hospitalization. Yet, studies have reported that pain is still prevalent, suboptimal, and poorly understood (Lin et al., 2016; Saunders, 2015). One of the most concerning reasons is that nurses lack the necessary knowledge, skills and attitude to provide optimal pain care to their patients (Brant, Mohr, Coombs, Finn, & Wilmarth, 2017). Even more troubling is that similar results have been found in the undergraduate nursing population when the priority should be given in education to develop PM competency (Chow & Chan, 2015; Ung et al., 2016). Nursing students are the futureof the nursing profession because what nursing students learn in their undergraduate education lays the foundation for their professional practice. Patients rely on health care professional's expertise and

knowledge when seeking help for pain management. Therefore, it is imperative that nurses have the foundational knowledge, skills and attitudes in addition to the clinical experience to competently assess, treat, and monitor patients' pain in a timely and efficient manner, which may be learned in undergraduate nursing education.

Acute pain, if poorly treated, can give rise to chronic pain, defined as pain lasting more than three months (Torani & Byrd, 2020). Chronic pain, dubbed as 'the silent epidemic,' is on therise in Canada (Collier, 2018). Canadian statistics show an estimated 7.63 million Canadians living with chronic pain, or one in every five (Canadian Pain Task Force, 2020). Uncontrolled pain transcends a person's health, socioeconomic stability, family life, and society. The annual estimated cost of chronic pain in Canada is approximately $60 billion, according to the Canadian Pain Society (Slomp, 2019). Pain management (PM) education needs to be addressed with priority, as it is estimated that economic cost related to inadequate pain management is higher than the combined treatment costs for diabetes, cancer, and cardiac diseases (Slomp, 2019).

Project Rationale

It has been noted that pain education has been limited and fragmented in prelicensure programs (Devonshire & Nicholas, 2018). Even in the presence of an internationally accepted pain curriculum, nursing prelicensure programs do not provide enough hours for nursing studentsto learn and practice PM skill (Herr et al., 2015). This effect has been noticed in new graduate nurses who have reported a disconnect between theoretical and practical PM knowledge and skill (Carr et al., 2019). Hence, it would be beneficial if pain management learning is taught in

increments throughout the four-year nursing program, parallel to the practice specialties such as medical/rural/sub-acute setting, geriatric nursing, surgical nursing etc.

Nursing students have reported that one of the main challenges they have experienced during clinical practicums is learning and navigating through the art of communication (Cowen et al., 2018). Students and instructors have faced the stress of time constraints when one clinical group might include ten students (Wallace et al., 2015), leaving less time to practice skills and critical decision-making under supervision. Consequently, the practical application of theoretical skills becomes a challenge in clinical rotations. Simulations positively affect one's confidence, competence, RN-role preparedness, and bridging the theory-practice gap in learning (Anderson, 2015). Therefore, creating a lab session on pain management for nursing students provides the space and time to practice decision-making and critical thinking skills in understanding the fundamentals in a supportive environment that supplements students' clinical learning experience.

An opportunity was found in the new Nursing Education in the Southwestern Alberta Bachelor of Nursing (NESA BN) program for 2nd-year students at Lethbridge College to design alab session on PM. The NURS 2321 'Health of Persons' course covered the fundamental topics under pain management, yet there was also a prospective space where knowledge application could be practiced using an interactive activity lab. Therefore, the project's goal was to design a draft lab resource manual on acute pain management for nursing instructors who will teach the 2nd-year NURS 2321 course in the fall of 2021, to enhance nursing students' knowledge, skills

and attitudes on pain care.

SECTION TWO: LITERATURE REVIEW

The literature review provides evidence on why effective pain management is vital to health from the patient's health perspective, socioeconomic viewpoint, and health expenditure. Background research on the current knowledge, skills, and attitudes on pain management in nursing practice provides a strong rationale for why education on this concept is essential. Present curriculum gaps on PM are explored to understand the deficits that need to be addressed in curriculum teaching. Identifying the barriers in clinical education and how they might impede learning about PM in practice gives additional evidence on why the lab component is essential to complement the theoretical and clinical learning experience. Additionally, pain management from a multimodal perspective is explored and how it optimizes a patient's pain experience. Lastly, evidence-based strategies are studied to identify possible avenues for designing a lab resource manual, focusing on case scenarios as the preferred teaching team choice at Lethbridge College.

The databases used for researching evidence was CINAHL, ProQuest, Google Scholar, Medline, PubMed, Web of Science, and EBM reviews (Cochrane Collection). Websites were also used, such as the International Association for the Study of Pain and the Government of Canada website. The majority of articles used for the literature review search dated from 2010 to the present. The search terms used for the literature review were assisted using MeSH Browser that included the following terms: pain management, nursing students or undergraduate students, prevalence, pain (acute and chronic), curriculum gap, nursing competency, clinical experience, teaching method, case scenario/case study, lab instructional design,

ADDIE model, and the biopsychosocial model.

Suboptimal Pain Management Prevalence

In the last decade, many discoveries have been made in terms of technologies to treat pain and new innovative strategies to assess and manage pain (Nelson et al., 2014). Unfortunately, pain persists in significant numbers in the population nationally and globally (Lynch, 2011). This trend continues to rise in the face of many active strategies in place to overcome challenges of poor control, resulting in the development of Joint Commission on Accreditation of Healthcare Organizations (JCAHO) pain management standards (Berry & Dahl, 2000). Pain is found to be pervasive in all health care settings with unclear rationale. A higher incidence of pain is seen in community and in-patient hospital populations (Gregory & McGowan, 2016). Hospital-wide pain prevalence is found between 37% to 84%, with the highest prevalence of pain reported by surgical patients (Gregory & McGowan, 2016). Over 80% of surgical patients experience pain despite having effective analgesics, with most of them classifying their pain as moderate or severe (Sinatra, 2010). Although slightly lower than surgical patients, medical patients have also expressed their pain as suboptimal (Gregory & McGowan, 2016). It concerns that 35% of the medical in-patients who reported pain experience in the study perceived it as 'severe' while in hospital (Gregory & McGowan, 2016). Further, if a patient is dealing with pain for more than three months, it is considered chronic pain. A study on Canadian statistics shows that a substantial proportion of the population lives with severe chronic pain (Schopflocher et al., 2011). The prevalence of chronic

pain in adults 18 years and older is 18.9%, with half of those dealing with pain for more than ten years (Schopflocher et al., 2011). From the viewpoint of Entry-level nursing competency 1.12, nurses "implement evidence-informed practices of pain prevention, manages client's pain, and provides comfort through pharmacological and non-pharmacological interventions" (College & Association of Registered Nurses of Alberta, 2019, pg.5). Therefore, its the duty of the practicing nurse to help manage patient's pain effectively with available analgesics orders or advocate for better pain strategies for the patients. Pain should not be overlooked based on their medical diagnosis. Therefore, undergraduate nursing education should provide the time, space, and opportunity to learn the art and science of providing effective pain management in a safe, supportive, and collaborative learning environment.

Adverse Health Effect of Inadequate Pain

Aside from the uncomfortable experience, patients have reported various short- and long-term health effects of suboptimal pain management. In terms of acute pain**,** poorly managed pain increases the risk of health problems such as hypertension, tachycardia, chest infections, pulmonary embolism, deep vein thrombosis, paralytic ileus, and delirium (Gan, 2017; Saunders, 2015). Furthermore, uncontrolled pain compromises the immune system and healing and increases the risk of morbidity and mortality (Gan, 2017; Lynch, 2011). From a functional aspect, acute pain limit**s** mobility, delaying or impeding recovery (Sinatra, 2010).

The psychological effects of persisting acute pain are sleep deprivation, drowsiness, decreased cognitive functioning, decreased social interaction, and anxiety

(Gan, 2017). These psychological effects may cause impediments in patients reaching their treatment goals, thereby indirectly causing a delay in their recovery and successful, safe discharge or transfer from the unit. If the acute pain is not managed appropriately and consistently, the effects can be long-termand may influence the emergence of depression and overall low quality of life (Sinatra, 2010). Persistent acute pain poses a significant risk to the development of chronic pain; therefore, acute pain must be managed in a timely and effective manner. About one in five Canadians live with chronic pain, with two-thirds of this group reporting their pain as moderate (Canadian Pain Task Force, 2019). Among the people affected with chronic pain, activity related to daily living is hugely impacted, resulting in poor quality of life. In fact, research has reported the more substantial the intensity of chronic pain, the poorer the quality of life (Ackerman et al., 2015). Individuals with chronic and acute pain struggle with daily chores, maintaining an independent lifestyle, participation in social activities, and work limitations (Dueñas et al., 2016).

Additionally, a critical issue with chronic pain is the potential risk for prolonged use of opioids. In present times, the opioid crisis is also associated with chronic pain (Compton & Blacher, 2020). Chronic use of opioids may lead to adverse effects such as neuroendocrine abnormalities, opioid-induced hyperplasia, and addiction (Busse et al., 2017). Patients who use opioids in the long-term to manage pain may become dependent on them and have trouble tapering dosages without experiencing debilitating physical and psychological effects. The reality of the Canadian health care system is that even though it is universal, not everyone has the same access to treatments to manage their chronic pain that are alternatives to relying

solely on opioids (Webster et al., 2019). Therefore, nursing students must learn to identify, intervene, advocate, and manage acute pain-related psychological and physiological stressors for in- hospital patients to optimize recovery and mitigate their patient's risk of developing or living with chronic pain.

Economic Impact of Poor Pain Management

The economic impact of acute and chronic pain cannot be ignored. Statistics show chronic pain costs more than cancer, heart disease, and HIV combined, accounting for about six billion dollars per year in Canada (Lynch, 2011). The cost burden from unmanaged pain is carried by the health care system, economy, and the individual. From the health care system perspective, suboptimal pain management can lead to delayed discharges, re-admissions due to pain complications, consumption of primary health care services, and treatment costs (Neogi, 2013). A study done in the United States estimated the total incremental cost to the health care system on pain management ranged from $261-300 billion dollars (Institute of Medicine, 2011).

Furthermore, from a socioeconomic standpoint, uncontrolled pain is the single most common factor in causing disability in the working-age group (Dueñas et al., 2016). About six percent of people who deal with chronic pain eventually end up losing a job (Lynch, 2011). Workplaces are also impacted by individuals taking disability leave, absenteeism, job limitations and productivity (Neogi, 2013). The financial cost bared by the individual suffering is not accounted for in the federal and provincial expenditure costs on PM. It has been estimated that the median economic burden of chronic pain is 1,462 dollars/month/individual, and out of that, 95 % of it

comes from the individual (Canadian Pain Task Force, 2019). Evidence reports that patients waiting to be admitted to specialty pain clinics spend 17,544 annually out of their pocket (Lynch, 2011). Considering the enormous costs endured by the economy and the individual, it is essential that prompt follow-up is being done by nurses caring for adult in-patients dealing with pain issues, thereby reducing future complications and the associated costs arising from it.

Nurses Knowledge, Skills & Attitudes on Pain Management

There is a general census in the research literature that practicing nurses lack the necessary knowledge, skills, and attitude on pain management in all health care settings globally (Aziato & Adejumo, 2014; Khalil & Mashaqbeh, 2019; Latchman, 2014; Topal Hancer & Yilmaz, 2020). Due to its multidimensional nature (McGillion & Watt-Watson, 2015), pain management may be challenging to understand and execute in the face of various pain perspectives seen in real-life practice.

A Canadian Quantitative study done to assess students' PM knowledge and attitudes showed that out of the sample of 336 nursing students, only 4.5% scored a passing mark of 80% (Hroch et al., 2019). To understand the area of deficiencies, the researchers identified that students score higher on understanding the pathophysiology and epidemiological aspects of pain but lack the skills to apply this knowledge in the context of patient scenarios. Furthermore, students struggled to understand the role of PRN (as needed) medications and decision-making skills on the best possible option(s) to choose given the patient's situation, indicating their lack of understanding of applying pain pharmacology in practice. In essence, Hroch et al. (2019) study implies the theory- practice gap discussed in nursing academia. Similar

results have been reflected in literature review studies done from a global perspective on evaluating nursing students' understanding of PM (Chow & Chan, 2015; Latchman, 2014; Ung et al., 2016). Pharmacology-related concerns identified include inadequate knowledge of medication actions, side effects, administration strategies and appropriate timing, and personal biases on the use of opioids (Chow & Chan, 2015; Latchman, 2014). Further, nursing students have shown a lack of knowledge and training when choosing and applying proper tools and techniques to assess pain in patients from a pain assessment perspective (Chow & Chan, 2015).

Nurses have an essential role in managing acute and chronic pain in patients, as suggested by the 11 entry-to-practice pain-related competencies presented by the Canadian Association of Registered Nurses of Alberta (Carr et al., 2019). However, poor pain knowledge, attitude and skills hinder effective decision-making and translation of evidence-based knowledge into practice. Although nursing students are taught the foundational knowledge on PM, they lack the essential critical thinking skills to apply it in practice settings. The theory classes on pain are necessary and foundational for knowledge attainment in undergraduate nursing degree programs. However, theory classes would be incomplete in providing students with holistic knowledge without accompanied lab session(s) to understand how to modify, apply and understand the pain concepts relevant to the individual patient context.

Nursing Curriculum Gaps

In consideration of the pain crisis and the gaps in knowledge, skills & attitudes noticed in nursing students, priority should be made to ensure pain content is being effectively taught in health science education programs. Yet according to Chow

& Chan (2015); Herr et al. (2015); Lynch (2011), pain curricula in health sciences across all programs, including nursing, are inadequate. Over the last three decades of research, the inadequacies remain in the pain curriculum being taught to students (Mackintosh-Franklin, 2017), which may be one of the reasons why the theory-practice gap in pain management continues to this day. Lack of proper education on pain contributes to poor quality of care being provided to patients (Ung et al., 2016), which may lead to adverse health impacts for the patient population dealing with pain. Studies done with undergraduate nursing students have failed to track pain management knowledge and skills development throughout the undergraduate degree program (Chow & Chan, 2015), making it difficult to understand the trends and gaps in their teaching and learning processes. The cycle continues with the health institutions and government funneling more resources in quality control efforts to tackle poor pain outcomes with no success in sight.

According to research, only one-third of Canadian universities identified designated time for mandatory teaching on pain content in health sciences programs (Lynch, 2011). Surprisingly, the study revealed that the mean number of hours used to teach pain was the most in veterinary schools and the least in medical schools (Lynch, 2011). The nursing program scored somewhat in the middle, with the average number of hours designated for 31 hours on pain management learning throughout the program (Lynch, 2011). Only thirty-one hours does not set enough time for nursing students to learn the role of pain across all health care settings, disease contexts and populations. Actively working nurses have voiced that part of the issue behind lack of knowledge and skills in pain management stems from

inadequate preparation on pain concepts in their undergraduate program (Aziato & Adejumo, 2014). In practice, the multifaceted nature of pain experience should focus on complex treatment plans encompassing a patient's functional capacity, self-care, quality of life, comorbidities management, and emotional status (Byma & Wheeler, 2021). Undergraduate and post-graduate nurses have realized that their nursing education on pain covered learning from a linear and context-free perspective (Byma & Wheeler,2021; Carr et al., 2019), suggesting a lack of preparation provided by nursing curriculums. Thus, it does not surprise when practicing nurses have reported that what they learned in school is not readily applied in practice (Aziato & Adejumo, 2014), making them ill-prepared to understand how to help a patient suffering holistically.

Pain curriculum.

According to the International Association for the Study of Pain, pain curricula should cover four core domains in pain management: 1) multidimensional nature of pain, 2) assessment and measurement, 3) management, and 4) the context of pain (Fishman et al., 2013; Wright, 2015). These four domain competencies provide a foundation for designing a pain curriculum and, for the purpose of project development, a lab session. Furthermore, the inclusion of these competencies in lesson planning will ensure the learning outcomes for nursing students will be comprehensive in content in terms of knowledge and skills "necessary [for] cultural transformation in the perception and treatment of people with pain" (Fishman et al., 2013, p.973). In support, when a Canadian study applied the four core domains to develop and implement pain curriculum in six health sciences faculties, they noticed

students demonstrating improved knowledge and beliefs about pain in their study outcomes (Watt-Watson et al., 2004). It has been said that attitudes are learned through socialization (Hroch et al., 2019). Thus, pain management education in an interactive group environment ensures learning transfer of core values and principles such as advocacy, collaboration, communication, teamwork, patient-centered care, and evidence-based practice (Herr et al., 2015), required to understand and navigate the real-world complexities of clinical practice.

In conclusion, nurses have the ethical, moral, and professional responsibility to help those suffering (CARNA, 2019). Furthermore, they play a pivotal role in preventing, screening, assessing pain, promoting evidence-based pain practices, and leading effective interprofessional partnerships through advocacy in pain management. While change is contextual at multiple levels in health care organizations, effort should be made to initiate change where an opportunityarises. Evidence shows a paucity in pain education regarding the absence of core pain competencies and values (Fishman et al., 2013). Therefore, undergraduate nursing students must be provided with pain education based on the pain competencies and values to increase learners' capacity to apply PM concepts efficiently in real-world settings.

Multimodal Pain Management

Multimodal opioid-sparing analgesia, also called multimodal pain management, is well recognized and highly recommended by professional medical societies and government organizations (Montgomery & McNamara, 2016). In response to high pain complications in post-op recovery and the rise of the opioid

crisis, ERAS (Enhanced Recovery After Surgery) protocol brought forward the concept of multimodal opioid-sparing analgesia (Kaye et al., 2019), applied throughout patient's care continuum, from preoperative care to after the successful discharge from the hospital. Although enhanced recovery protocols are primarily surgical, standardized PM knowledge is also transferable in non-surgical pain care contexts (Pawasauskas et al., 2020).

The multimodal approach to pain care aims to use a combination of different classes of analgesics that work along multiple sites of the nociceptive pathway to "provide superior pain relief [that] minimizes opioid use and opioid-related adverse events" (Beck et al., 2015, p. 408). The realistic goal here is not entirely to eliminate opioids for analgesia treatment but to avoid relying on opioids as a sole treatment for pain by limiting their use as much as possible. The benefits of multimodal PM could not be overlooked from a patient's outcomes standpoint; these include decreased opioid-related adverse events such as drug-drug interactions, hasten recovery, a short length of stay and improved pain relief (Manworren, 2015; Montgomery & McNamara, 2016). For example, the pharmacological multimodal pain regimen components in the orthopedic hip pathway include acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), N-methyl-D-aspartate receptor (NMDA) antagonists, gabapentin, serotonin inhibitors, regional techniques, and opioids as needed (Goode et al., 2019).

Although pharmacological methods might be the most obvious method for treating pain, a health care professional cannot ignore the benefits of non-pharmacological methods (Hargett &Criswell, 2019). Non-pharmacological methods

complement the analgesia regimen by influencing patients' psychological health affected by acute and chronic pain experiences. Innovations explored under alternative therapies that are non-reliant on conventional medication treatment are gaining momentum in health care. Helpful alternative therapies include cryotherapy, TENS therapy, heat therapy, guided imagery, music therapy, progressive relation therapy and massage, to name a few (Torani & Byrd, 2020). Thus, alternative therapies can also be included in the individualized multimodal pain treatment plan based on the patient's cultural and personal preference to provide holistic pain care.

An essential concept behind multimodal pain management treatment is individualized patient care by understanding the patient's context. The role of nurses is to understand the patient-specific risks, benefits, history, and preferences to modify the pain management regimen as needed (Montgomery & McNamara, 2016). Pain management is one of the foremost responsibilities of a nurse (Montgomery & McNamara, 2016) and, nurses are well-positioned to be primary active players in influencing pain outcomes for in-hospital patients. To provide effective pain management, nursing students need to understand how the multimodal medication adjuncts collectively target a pain response and apply this knowledge appropriately in their clinical practice context. The lab resource manual on acute PM did not include management of regional techniques as it is too advanced for the 2nd-year undergraduate nursing program. Hence, only oral and parenteral medications were used to meet the PM learning requirements for the 2nd year Health of Persons' course.

Challenges in Clinical Education

Clinical rotations are embedded in the nursing curriculum for students to gain

practice experience under supervision. However, students have reported some challenges when learning in clinical rotations, the predominant factors being stress, fear, and anxiety (Blomberg et al., 2014; Farzi et al.; Jamshidi et al., 2016; Jasemi et al., 2018). A study done by Jamshidi et al. (2016) found that students expressed a lack of readiness in knowledge, practice skills and communication, which contributed to the fear of anxiety and stress. For instance, undergraduate nursing students reported being overwhelmed by new experiences in the unfamiliar clinical environment and not getting enough time to practice skills, which contributed to stress, thereby decreasing their self-confidence (Jamshidi et al., 2016; Jasemi et al., 2018). When entering clinical rotations, students have to gather knowledge understanding from skills practice and learn how to communicate effectively with the staff and patients simultaneously. Having basic communication skills makes it easier for students to navigate the complexities of the healthcare systems by asking guiding questions for further clarification, further increasing their motivation to learn, as Hanifi et al. (2012) noticed.

Furthermore, students have reported fear of making mistakes with patients in real practice settings, contributing to the feelings of fear and anxiety in clinical rotations (Farzi et al.). Although eager to learn in a clinical rotation, the students are hindered by the need to ensure they are doing the procedures correctly without inadvertently harming the patients. Even though the clinical instructor is present to support and provide a safe learning environment, having a large group of clinical students and the hospital's in-patient units' busy environment may challenge the instructor's adequate supervision of each student (Wallace et al., 2015).

From an educator's perspective, the increasing number of students admitted to the program has increased the demand for clinical practicums (Blomberg et al., 2014). Clinical educators might deal with teaching more students at a time due to the limited number of educators available to teach clinical rotations (Blomberg et al., 2014). There is a paucity in research studies where no contemporary clinical studies have been done on how student nurses explore pain encounters in a clinical rotation (Carr et al., 2019). This might hamper the understanding of nursing students' concerns for clinical practicums and help the teaching team implement appropriate support strategies. Furthermore, the fast-paced hospital environment on the units might not be enough to provide timely feedback to everyone, especially when discussing analgesic regimen options for a given patient assignment. Hence, implementing a lab session for pain management as a supplement to the theory class helps the instructors observe potential concerns that students might present in PM and support their learning accordingly with timely feedback

In conclusion, a lab session that is complementary to clinical and theory learning can ensure adequate time is being provided to nursing students to practice pain management concepts usingreal-life-like clinical case scenarios in a safe and controlled environment. Furthermore, it also provides an opportunity and resource for further quality improvement education practices for educators to ensure the pain content is being taught based on the latest and the best evidence practice guidelines.

Methods for Teaching Pain Management

Various teaching methods are comprised under the umbrella of two main types of approaches in health sciences curricula: pedagogy and andragogy (Twycross,

2002). Although pedagogy is common in schools, undergraduate & graduate studies still use this teaching format (Pew, 2007), such as classroom lectures, where the learner is dependent on the teacher for knowledge, guidance, and evaluation. The pedagogical approach is teacher-centered, where responsibility lies with the instructor of 'what,' 'when,' and 'how' something will be learned by the students (Pew, 2007). On the other hand, the andragogical approach is more learner-centered and uses adult learning principles (Twycross, 2002) to highlight that the learner is self-motivated to control knowledge acquisition. From a nursing discipline perspective, the pedagogical approach is beneficial when nursing students learn a new concept. The instructors provide learning tasks and guide their knowledge attainment to become more self-sufficient in applying the learning to practice situations.

However, lectures are insufficient in facilitating the andragogical dynamics of promoting critical decision-making skills and learn how to apply new knowledge to real-life problems. The Andragogy approach is more effective with adult learners as it emphasizes the importance of contextual learning relevant to the students' experiences. Thus, if education is made interactive and practice relevant using an andragogical approach, it may help bring life-long behavioral change observed missing in the design elements of nurses' education on pain management (Drake & de C. Williams, 2017). Quinn (2000) reports that both approaches, andragogy and pedagogy, can be used coequally to make the teaching experience effective. For example, theory class lessons on PM can be supplemented with a lab session for students to apply theoretical concepts in real-life cases scenarios.

The term 'interactive teaching' is used in most research articles evaluating

students' knowledge, skills, or attitudes as outcomes for the studies conducted. Case studies, scenarios, vignettes, unfolding case studies, workshops, in-services, high fidelity simulations, videos, presentation, interactive lectures, e-learning, and inter-professional educations have been reported in research studies when teaching PM or health sciences related concepts (Afrasiabifar & Asadolah; Fragemann et al., 2012; Horntvedt et al., 2018; Keefe & Wharrad, 2012; Liu et al., 2020; Naqib et al., 2018; Padgett et al., 2020; Rababa & Masha'al, 2020; Secomb et al., 2012). In all the research mentioned above, case scenarios were used to make the lessons interactive by promoting discussions and reflections on the theoretical knowledge and its application in a practice context, making the lesson relevant and effective for the target audience.

The type of content, hours available, target audience, the expertise of educators, and resources available all need to be considered when designing a lab session. In terms of pain management, evidence supports that nursing student learning is effective when the education teaching method addresses both the affective and cognitive learning domains (Twycross, 2002). Furthermore, effective teaching needs to consider the learner's needs for knowledge, clear communication strategy and stimulating students to learn, think and communicate concurrently (Brown et al., 1988).

Case-based learning (CBL) is the most popular teaching method in recent times (Thistlethwaite et al., 2012). CBL is inquiry-based guided learning based on constructivist and experiential approaches using clinical and social sciences (Thistlethwaite et al., 2012). CBL uses real-life case scenarios with the aim to make

theory relevant to practice (Thistlethwaite et al., 2012). CBL has been found to increase knowledge, increase competency in performing skills, motivate and promote active participation from students, increase confidence in learners, and is valuable when learning new clinical skills (Thistlethwaite et al., 2012). Simulations are one typeof strategy to teach case-based learning.

Simulations are activities designed to mimic real-world practice (Billings & Halstead, 2016). They are helpful when real practice training is too expensive, rarely occurs or puts participants at risk (Billings & Halstead, 2016). When executed correctly, simulations effectively provide learner's practice in their own scope of practice, critical thinking, and problem-solving in a non-threatening environment (Billings & Halstead, 2016). Simulations can be high, low or medium-fidelity, depending on the sophistication of technology and strategies used to make the activity realistic as possible (Billings & Halstead, 2016). For example, high-fidelity simulation can include using a mannequin that is interactive and mimics a human patient, actors portraying a patient scenario, or a virtual reality game/activity. The degree of realism used for medium- fidelity is less than a high-fidelity simulation, for example, a mannequin presenting heart or breathing sounds but not verbally interacting with participants. Participants have the least amount of realism in a low-fidelity simulation, such as using a static mannequin, role-playing, or case studies. However, simulation using low-level realism can still provide impactful learning of principles and concepts (Billings & Halstead, 2016), which was the focus of this project.

Research supports simulations held in person or online, use a mannequin or

standardized patient, are effective critical thinking skills in a safe, supportive environment using real-life case scenarios (Hoelzer et al., 2015; Rababa & Masha'al, 2020). Furthermore, simulations help learners monitor and reflect on their performance and receive immediate feedback (Rababa & Masha'al, 2020). Choosing the level of fidelity in a simulation activity depends on the teaching institution's time and resource availability. Thus, if the program does not have enough resources or time to plan a lesson in a simulation center, case studies or scenarios can also be used in a laboratory setting using faculty or students as role players.

Future Direction

Understanding pain pharmacology is vital in clinical practice as the patients in hospitals nowadays are older with complex medical histories. Evidence supports that interactive instructional methods, such as lab session using case scenarios, are effective in knowledge acquisition in undergraduate nursing students and ultimately patient satisfaction with pharmacotherapy (Gill et al., 2019). Further, recent evidence also shows that inadequate use of PM poses adverse effects on patients' health, prolongs hospital stay, complicates recovery, and increases hospital costs (Hunter Revell & McCurry, 2013). Traditional lecture-based lessons in big classrooms are ineffective in teaching applied pharmacology due to the incompatibility of the classroom environment to enact in-patient hospital setting, being monotone in style, and the lack of space to allow the students to practice the application of the nursing skills in context-based learning (Gill et al., 2019). There is a need for the teaching team to provide PM learning in a laboratory setting outside of clinical rotations that will provide undergraduate students with space and time to learn and practice in a

safe, supported, collaborative, and supervised environment. Thus, the project's goal was to design a draft lab resource manual on acute pain management for nursing instructors who will teach the 2nd-year NURS 2321 course in the fall of 2021, to enhance nursing students' knowledge, skills and attitudes on pain care.

SECTION THREE: PROJECT DISCRIPTION

This section covers the stakeholder description, ethical considerations, and deliverable description. Further, the project development process, implementation, and evaluation design is illustrated in detail with supporting rationale. The biopsychosocial model of pain was applied to the content of pain management education whereas, the ADDIE model was applied to the design framework for the laboratory resource manual.

Stakeholders

The primary stakeholder advising the project development process was a member of the nursing faculty and the program chair of the NESA BN Programs at Lethbridge College, Alberta, Canada. The primary stakeholder was involved from the inception to the completion of the deliverable for this project. The secondary stakeholders in this project were the two instructors ofthe NURS 2321 'Health of Persons' course. All stakeholders were involved in the revision of the deliverable.

Ethics Screening

Web-based "A pRoject Ethics Community Consensus Initiative ethics screening tool" (ARCCI) (Alberta Innovates, 2017), was used to ensure the project meets quality improvement standards. Results of the screening tool indicated there were no ethical risks identified, thus, the result was zero. This project was deemed quality improvement, so no additional ethical screeningwas needed.

Deliverable Description

Designing a lab resource manual on acute pain management for instructors was chosen for the project's deliverable to address the need identified by the teaching

team of NURS 2321 at Lethbridge College. Furthermore, a lab resource manual will enable instructors to enhance nursing student's knowledge skills and attitudes on acute pain management. The production of the deliverable is supported by the mounting evidence provided in the literature (see section two of the paper) that indicates the need to improve nursing students' knowledge, skills, and attitudes on pain management. The two-hour lab session will serve as a supplement learning activity to the education content schedule already in place for NURS 2321 'Health of Persons' course. The project's objective was to design the acute PM lab resource manual in collaboration with the stakeholder(s) so that the draft manual will be accepted for pilot testing with 2nd-year nursing students at Lethbridge College in the fall of 2021.

To keep the lab session's content aligned with the class's theoretical component, the context of the case scenarios designed in the lab resource manual considered the rural and sub-acute nursing practice settings. Furthermore, since the lab will be taught in week 12 of the course, which covers the hip/knee pathway under the musculoskeletal system, the scenarios included were based on hip fractures, rehabilitation post-surgery, geriatric populations and elements of chronic pain. The hip/knee pathway under the musculoskeletal system is taught in week 12 of the course, during which the lab will be introduced. It is to be noted that the hip/kneepathway was only discussed from the acute pain management perspective.

Deliverable Format & Layout

The lab session was formatted in a lesson plan according to the preference of the primary stakeholder and supportive evidence indicating its usefulness in providing

an effective learning environment. A lesson plan is a written description or a ‘map’ that offers stepwise direction on how students will move toward the learning outcomes set up for the learning session (Farrell, 2002). A typical lessons plan covers goals, knowledge content, sequenced activities, implementation, and assessment (Farrell, 2002). Although lesson plans are a well-known concept in the education academe, every instructor has their unique way of planning & formatting lessons. Evidence shows that instructors are less inclined to write out a comprehensive lesson plan because they are time-intensive when one has to consider lesson plans for several modules in a course curriculum (Helterbran, 2008). However, a written comprehensive lesson plan is beneficial for students' learning and an educator’s teaching experience. From a student’s perspective, well-thought-out lesson plans will likely keep the students engaged in the activity and minimize confusion among student’s expectation (Farrell, 2002). From an instructor’s perspective, lesson plans help organize the learning content, standardize the learning process, guide time management, boost instructor’s confidence in teaching, and foresee & resolve any problems that may arise (Sahin-Taskin, 2017). The lesson plan in the lab resource manual considered a student-centered learning experience and provided proper scaffolding for the educator’s role in facilitating the lab session.

The lab resource manual consisted of two sets of lesson plans; for students and instructors. Furthermore, an outline of the lab session was created for the students to access electronically as a preparation tool before class. Supplemental information was included for the instructor’s use in the lab resource manual, such as the background information on the purpose of the lab, an optional student exit survey tool and

appendices. The student copy of the lesson plan consisted of three case scenarios, each with a set of student assessment questions for practice. The instructor's lesson plan copy was like the student's copy, except it also included an answer key to each scenario's assessment questions and optional debriefing questions with answers. To see the format and layout of the PM lab resource manual (see appendix A).

The lesson plan for the lab session contained a detailed outline of the progression of the two-hour lab with set time stamps for each activity. The lab was split into three sections consisting of pre-briefing, activity, and debriefing. This process is adopted from the recommendations set up by International Nursing Association for Clinical Simulation and Learning (2017), which recommends that to begin the simulation-based experience with pre-briefing and end with debriefing. Pre-briefing provides an opportunity for instructors to introduce the topic, delineate the learning objectives and expectations for learners, and provide orientation to the lab environment and process. The debriefing process in a facilitated group discussion is essential to enrich the learners' experience by guiding them to derive the meaning behind the activity, learning from deficiencies and thus, improving performance (Agency for Healthcare Research and Quality, 2019). Furthermore, the de-briefing session can also provide timely feedback to students' questions or concerns and suggestions for future learning opportunities. The activities are further split into two steps, first starting with small group activities with each group working on one scenario, and later the groups presenting their scenarios in a skit (role play) in front of the class.

Theoretical Frameworks

Two theoretical models were used to design the lab resource manual on pain management: the biopsychosocial model of pain and the ADDIE model. The biopsychosocial model of pain acts as an overarching paradigm reflecting the importance of holistic care in providing pain management. The ADDIE model serves as the instructional design framework for the deliverable.

The Biopsychosocial Model of Pain

The Biopsychosocial model (Darnall, Carr, & Schatman, 2017) emerged to describe the holistic aspect of the patient's subjective pain experience encompassing biological, psychological, and social factors. Pain expression is not a one-dimensional byproduct of an injury. A patient's biological, genetic, gender, age, emotional, cognitive, spiritual, environmental, and cultural factors also contribute to the patient's subjective experience (Darnall, Carr, & Schatman, 2017). The biomedical approach prominent in medicine gives importance to the pathophysiology aspect of pain, which, though important, ignores the fact that the mind is inseparable from the body. Further, the biopsychosocial model of pain rehumanizes the pain experience of a person by highlighting the role of social and psychological influences on one's pain experience (Wright, 2015). Student nurses need to think about pain management care from a holistic perspective when providing care, not only to guide effective treatment decisions but also to consider all aspects of the person's care and the recovery process. The case scenario activities designed in the lab resource manual reflected the holistic perspective of the framework by prompting students to reflect on the patient's verbal, non-verbal and emotional expression of pain. Furthermore, family

dynamics were also included when caring for patients in pain. Lastly, a mock-up history of clients was included to promote reflective thinking in students on how environmental, medical history, demographics, and mental orientation may influence a patient's pain experience and expression.

The ADDIE Model

ADDIE acronym stands for Analysis, Design, Development, Implementation and Evaluation. The origins of this model are obscure; thereby, it is instead a colloquial term used todescribe a systematic approach to instructional development. Although generic, the ADDIE model has been used in diverse disciplines such as medicine and nursing for curriculum development (Cheung, 2016; Hsu et al., 2014). The model is versatile for designing instructional material for either online or face-to-face education. The following Table 1 outlines the steps in the ADDIE Model and how they informed actions taken to develop the lab resource manual.

Table 1

The ADDIE Model

ADDIE Model Step	Action Taken
1) Analysis: ascertain the needs of learners, determine learning goals.	✓ A literature review was done on the importance of PM in healthcare practice, the gaps in knowledge, skills, experience, and attitudes of nursing students on pain management, pain education, gaps in the nursing curriculum, teaching strategies & barriers, and evidence-based practice guidelines/recommendations on PM. ✓ Zoom meetings and email correspondence were done with the primary stakeholder to find an opportunity for the project on pain management.
2) Design: create a broad overview or blueprint that includes teaching methods to be used and action-orientated objectives.	✓ Discussion done (via Zoom) with the main stakeholder regarding the overall design of the lab, time allotment, the context, and the number of case scenarios desired.
3) Development: creating and designing the actual learning material.	✓ Developed five scenarios, each with a specific pain management focus. Each scenario included probing questions for students and an answer key for instructors. Additional instructional material was developed for debriefing. ✓ Multiple reviews via zoom and email were done on the content to ensure it was course relevant and evidence-based. Three out of five case scenarios were finalized. ✓ Timeline of the lab readdressed. ✓ The format of the overall lab resource manual and the lesson plan template was determined. ✓ A formative evaluation survey tool was designed to be completed by the instructors who will use the manual.
4) Implementation [a]: delivery of product with or without pilot study.	✓ The first draft of the resource manual was emailed for review by the stakeholders at the same time ✓ Only one set of draft review was completed.
5) Evaluation: tools to evaluate the effectiveness of instruction material/product.	✓ The formative evaluation survey tool was included with the first draft for review. ✓ The primary stakeholder and two members of the teaching team reviewed the draft and completed the evaluation tool. ✓ Results were analyzed, and improvements were made.

[a] Since the project created is in the developmental phase, no formal implementation was done with instructors and nursing students. The project did not involve pilot testing with students due to the Lethbridge College being closed for the summer semester.

Evaluation

A formative evaluation design was chosen for this project due to its scope consisting within the development phase. The purpose of formative evaluation is for quality assessment and improvement before the project concludes (Mckenzie et al., 2013), thereby ensuring the very best product or services are being offered to the target population. Formative evaluation is beneficial in assessing the product (lesson) from the instructors' perspective. Based on their knowledge and experience, the instructors provide critical feedback on whether the lesson is feasible, appropriate and acceptablebefore it is implemented (Lavin et al., 2007). Thereby, receiving feedback on the instructional material included in the lesson plan, the consequent revisions ensure quality learning standards are upheld, increasing the probability of the product's sustainability. Although pretesting and pilot testing phases are also included in a standard formative evaluation (Mckenzie et al., 2013), it is not in this project's scope.

Elements of Formative Evaluation

The goal of the formative evaluation for this project was to assess the degree of satisfaction stakeholders have with the completed draft of the lab resource manual (Mckenzie et al., 2013). The formative evaluation aimed to determine stakeholders' satisfaction with the lab resource manual's design, content, usability and clarify its weaknesses to revise the final draft further. The formative evaluation design used two types of procedures: subject matter experts (SME) and project evaluation form. SMEs are a small group of professionals who have the necessary expertise to help analyze the project deliverable, identify strengths and weaknesses, and provide

recommendations accordingly (Lavin et al., 2007). The SMEs in the formative evaluation were the primary and secondary stakeholders of the project.

A questionnaire survey was used as a data collection method. Since no existing measurement tool was available to evaluate a lesson plan from the perspective of faculty, the formative tool was designed by the project lead. The questionnaire reflected the elements included in the lab resource manual and measuring the project outcomes. Mixed methods were used in the formative evaluation tool, consisting of 10 quantitative questions and 2 qualitative questions (see appendix B) to collect rich and comprehensive data. The quantitative questions from 1 to 9 asked the evaluator's response on a 4-point Likert scale, whereas question 10 used a 3-point Likert scale. Question 11 and 12 were open-ended questions to provide an opportunity for stakeholders to expand on their answers and provide detail on areas of further improvementon the final draft.

Evaluation Process

Informal feedback was collected throughout the development of the draft deliverable in collaboration with the primary stakeholder. The formal evaluation process involved receiving feedback on the formative evaluation tool for all three stakeholders/SMEs. An email invitation was sent detailing the project's lead information and the project's purpose; a couple of weeks before sending the first draft. The primary stakeholder recruited the two secondary stakeholders on behalf of the project lead due to the institution being closed for the summer break. The evaluators were provided a week to return feedback on the survey form to the project lead. The response rate was 100 percent (n=3), and the results were

compiled and analyzed by the project lead. The quantitative data were analyzed using Word Excel, while the thematic analysis was done with qualitative data.

Quantitative Data Analysis

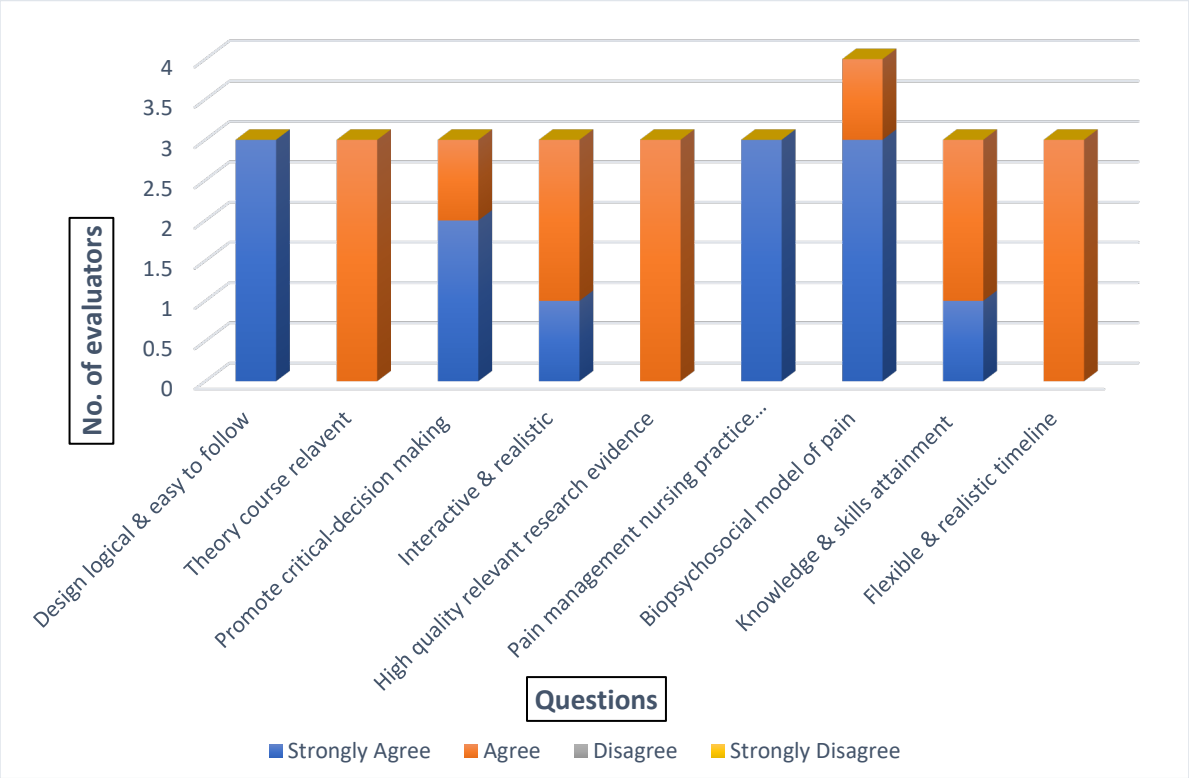
All three evaluators ‘strongly agreed’ to the design of the lab resource manual being logicaland easy to follow (question 1.). Furthermore, they all 'strongly agreed' to the case scenarios' answers consistent with pain management practice standards (question 6.). All three evaluators answered 'agreed' to question 2, 5 and 9 in the evaluation form, suggesting there could be room for improvement. The topics covered in the questions were: the goals, objectives, and case scenarios are relevant to the theory course NURS 2321 'Health of Persons'; incorporation of high-quality, relevant research evidence, and the lesson plan incorporating flexible and realistic timeline. For question 7, four responses are shown because one evaluator clicked two answers. However, all three evaluators agreed that the lab followed the biopsychosocial model of pain.

There was a variation of responses seen in questions 3, 4 and 5. For question 3, two out of three evaluators ‘strongly agreed’ that case scenarios will promote critical decision making in students, while one evaluator stated 'agreed.' For question 4, two out of three 'agreed' to the interactive and realistic case scenarios, while the third evaluator 'strongly agreed'. For question 5, two indicated 'agreed' when asked if the scenarios would promote students' knowledge and skills attainment on patient-centered and holistic pain management, whereas one evaluator expressed 'strongly agreed'. In conclusion, all three stakeholders were satisfied with the lab resource manual as they all replied as either 'agreed' or 'strongly agreed' to the questions from 1

to 9. In addition, sixty-seven percent of the evaluators (two out of three) agreed to use the draft in the coming fall semester of 2021 when the course is offered, with only one reviewer (thirty-three percent) expressed 'maybe' to the question. The following figure 1 and 2 highlights the data collected fromquestions 1 to 10.

Figure 1

Quantitative Evaluation Results



Note: The chart covers questions one to 9 in the instructor's evaluation form (see appendix B).

Figure 2

Future Use of the Draft (Question 10)

Qualitative Data Analysis

Two out of three evaluators were concerned the content of the lab resource included the immediate post-surgical content in the case scenarios. One out of three evaluators expressed more props in the scenarios to make the lab activity more realistic, like the clinical setting. There was a range of views on what the evaluators liked about the lab resource manual. The consensus was that the lab resource manual included a well-planned, evidence-based lesson plan that will promote critical thinking among students on PM principles. The following table 2 highlights the thematic analysis on responses to question 11 and 12, which ask the evaluator to explain what they liked and did not liked about the lab resource manual (see appendix B for qualitative questions).

Table 2

Thematic Analysis of Qualitative Feedback

Evaluator	Strength	Weakness
#1	- "Enabl[es] students think critically."	- "NURS 2321 does not cover immediate post-op stages of fracture or replacement surgery."
#2	- "well-organized" - "Integration of pain management principles." - "Evidence is well-incorporated." - "Meaningful activity for students to engage in within the lab setting."	- "[The scenarios should] not focus on the more acute management of surgical orthopedic patients, but rather the rehabilitation and discharge needs." - "Add additional lab supplies to each station for demonstration."
#3	- "Well thought out and outlined for ease of instructor usage."	- "Nothing"

Final Draft Revision

After carefully considering the stakeholders' responses in the survey evaluation form, revisions were made to case scenarios to align them to the course curriculum requirement andprogram focus. Additional props were added in the lesson plan to improve the element of 'realism' in the lab session. See appendix A for the final draft of the deliverable.

SECTION FOUR: REFLECTION

Adult learning is about making meaning of the experience from reflection. As a Master's preparing nurse, one must invest time in the relational practice of reflection to critically analyze the overall process of knowledge delivery process and how it impacts their personal and professional growth to gain meaningful perspectives for future advancement as change agents. This section covers reflection insights on the project development process, lessons learned, and future nursing implications.

Project Development Process

Knowledge not only comes from experience but also from going through the procedure of developing a project. At the inception of the idea, the intricate details involved in creating a project were not visible. The details of the project emerged as it progressed from finding a practice problem, doing the background research, evaluating the needs of the service organizations, brainstorming quality feasible solution(s), the actualization of the solution throughthe development of the deliverable through collaborative partnership, and evaluating the results. Ideas kept changing by refining the shared vision and multiple trials and errors to enact the concept for practice use. Problem-solving and goal realization through collaboration is "not compromise of ideas, but [an] amplification of ideas" (Robinson, n.d., p.8). Therefore, one must trust the process to gain experiential knowledge and produce quality ideas for practice improvement.

Initially, the lab resource manual on acute PM was to include post-surgical hip/knee orderset form in case scenarios. However, keeping in mind the needs of the education institution for whom the deliverable was designed, the focus on the

hip/knee pathway was modified to teach PM in the context of rural & sub-acute nursing practice settings using hip fracture-related scenarios only.

Lessons Learned

According to the National Nurses Education Framework, a Masters' preparing nurse demonstrates advanced communication skills " [by] participat[ing], [and] lead[ing] diverse teams to improve outcomes and to initiate and/or support policy changes." (Canadian Association of Schools of Nursing, 2015, p.15). Clear, logical, and effective communication was essential in presenting ideas, setting project's agenda and leading discussion during the development phase of project planning. In the initial stakeholder buy-in stage, the vision of the overall project idea may have been articulated clearly; however, the developer did not fully realize the method of reaching that goal. This led to many revisions in the creation draft deliverable, modifying the outcomes for the project, creating extra work, and re-clarifying expectations of the process of project planning to the stakeholders. Furthermore, communicating the progress and strategy for the project involved a two-way process that included updating the supervisor and the stakeholder. Having concise information to report was beneficial in setting agenda and leading the discussions sessions, thus helped develop essential leadership qualities as an advanced practicing nurse. Although the project's development phase may require multiple revisions to produce a quality product, a meaningful, concise and well-articulated communication strategy is essential to avoid barriers in the engagement process. Therefore, the project development process provided an experiential learning opportunity to learn the art of communication.

Writing out the questionnaire for the evaluation tool was also a form of exercise to communicate clearly. Formulating a list of questions for the sake of data collection is easy, however, "producing worthwhile & generalizable data from questionnaires needs careful planning and imaginative design" (Boynton & Greenhalgh, 2004, p. 1312). To avoid misleading answers, it is essential to use appropriate words to produce high-quality generalizable data. Questions need to reflect the purpose and outcomes of the project development and the relevancy of the project to practice context. A well-rounded questionnaire ensures not only the value but also the sustainability of the innovation. One of the mistakes in writing out the questionnaire wasthe use of 'double-barreled' questions (Western University, n.d.), where the respondent was asked to reflect on two things in one query. Upon analyzing the results, the writer realized the mistake when specific outcomes were not being successfully measured due to misleading answers in the data collection. In order to ensure reliability and validity in the data collection method, free text open option at the end of each question could have been used for the respondent to comment on their experience of using the survey (Boynton & Greenhalgh, 2004).

One cannot become a change agent in isolation. Change in healthcare practice is a collaborative effort of various stakeholders with different specialties to improve practice. Collaboration with stakeholders provided a meaningful activity as a venue for sharing experiences and a reciprocating shared vision for the future of the nursing discipline in improving PM practice in graduating nurses. Furthermore, in practice, innovation is often envisioned by change agents. However, at times, all the parties are

not on the same page on its feasibility, which creates unnecessary use of time and expenses. Therefore, collaboration throughout the development process ensured the innovation was sound, logical, context-relevant, and met the needs of the curriculum team at Lethbridge College.

In conclusion, Master's level project development taught specific skills & knowledge of enhancing one's capacity to question the status-quo of current practice problems and view them from the lens of multiple professional perspectives. The process of reflective thinking prompted a deeper understanding of the critical thinking and decision-making skills involved to bring innovation to life that is collaborative and supported by the best literature and peer evidence.

Lastly, the project development process prompted the growth of self-awareness as a project leader and receptive to exploring and receiving ideas, thereby empowering one's agency to become a more self-directed learner in the future.

Future Nursing Implications

Nursing students have a thorough grasp of pharmacotherapy, pharmacokinetics and pathophysiology. However, when connecting the dots of all three concepts involved in PM, they lack the necessary practice experience to critically process all the information to come up with the best evidence-based and patient-specific practice solution. Hence, the lab resource manual on acute PM for instructors will help increase students' knowledge, skills, and attitude on PM as an effort to bridge the nursing practice gap. Additionally, the lab will enrich the course NURS 2321 by providing experiential learning context on PM. Lastly, from the research perspective, the project's approach on delivering the best practice evidence

for PM in a lab session format could be further evaluated as part of improving PM practices in the nursing discipline and its impact on patient pain care outcomes.

Future Project Development Opportunities

Since the project did not involve actual implementation with students, the next step for the Lethbridge College curriculum team would be to perform pilot testing of the lab in the fall of 2021 to evaluate the labs' effectiveness in enhancing students' competency in PM practices. Further evaluations can also consist of performing a formative and summative survey with students on how they find the lab experience and its influence on their attitudes and awareness of the importance of PM. In addition, the formative evaluation can assess the students' view on the effectiveness of the lab session in promoting practice realism and asking them what further improvements are needed to enhance their experience. Although the project was a success as the teaching team expressed a positive review of the draft, future formative and summative evaluations can also be performed among the course's teaching team to enhance the lab session further. For instance, a SWOT analysis could be completed on the lab resource manual after it is pilot tested to streamline the lab session further, standardize the learning experience and support future educators teaching the course.

CONCLUSION

Suboptimal pain management can negatively influence an individual life's physical, psychological, and social aspects (Lynch, 2011). Furthermore, increasing incidences of poorly controlled pain experienced by people can create a financial burden on society (Lynch, 2011). Evidence indicates that nurses (Drake & de C.

Williams, 2017), and student nurses (Topal Hancer & Yilmaz, 2020), lack the necessary knowledge, skills, and attitudes to practice in a clinical setting competently. Gaps in the nursing curriculum on PM have been identified in literature evidence (Fishman et al., 2013). The goal of the project development was to design a draft for lab resource manual on PM that is interactive, and would supplement the theory classes and clinical rotations, thus, improving the pain management practice in the future generation of the nursing discipline.

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APPENDIX A

Acute Pain Management Lab Resource Manual

Acute Pain Management Lab Resource Manual

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Table of Contents

INSTRUCTOR Lesson Outline

Course:	NURS 2321 Health of Persons –lab class
Participants	2nd-year NESA BN students
Lab delivery method:	Standardized client (SP) case scenarios included in this resource: ➢ Student case scenarios with questions ➢ Instructor answer keys for each scenario
Lab Session goal and Learning outcomes:	To provide undergraduate nursing students in NSG 2321 – Health of Persons with integrated learning opportunities in the lab environment related to acute pain management in hip/knee pathways to build knowledge, skills, and attitudes essential for providing competent pain care. 1. Practice provision of evidence-informed, ethical, and individualized holistic pain care. 2. Integrate the knowledge of pathophysiology into the care of persons. 3. Apply the principles of pharmacodynamics & pharmacokinetics of conventional and alternative therapies of pain management. 4. Explore the psychomotor skills involved in pain assessment, monitoring, documentation, and teaching. 5. Practice role of therapeutic communication and collaboration with clients, family, healthcare professionals. 6. Demonstrate the application of cognitive and critical thinking skills in delivering safe client pain care.
CARNA entry-level competencies:	Clinician: 1.1, 1.2, 1.4, 1.5, 1.6, 1.7, 1.11, 1.12, 1.13, 1.21, 1.22 Professional: 2.1, 2.2, 2.3, 2.5 Collaborator 4.1 Coordinator 5.1, 5.7, 5.8 Advocate: 7.2, 7.6, 7.7, 7.9 Educator 8.1, 8.2, 8.3, 8.4 Scholar: 9.1
Materials required:	➢ 5 paper copies of each STUDENT scenario and 1 copy of the ANSWER KEYS for each scenario for the instructor ➢ Print 5 copies for each AHS hip pathway order sets for scenario # 1 and #2. ➢ 15 copies of lab exit survey for end of the class ➢ Props for roll play: vitals machine, oxygen tubing, hospital bed set-up, pillows (for repositioning), pivot disk, transfer belt, walker, hospital gown, IV poles with IV tubing, clipboard, slider board, fake prescription slip, medication cups, 1cc &3cc syringes, chair, binder (for scenarios), food tray. ➢ Computer and projector
Pre-requisite readings:	Readings recommended in week 1, week 6 & week 12. **Post the student lesson outline with required reading and lab information on the LMS one week before class**

Steps and timeline:	A) Pre-briefing: 15 minutes B) Small group activity: 20 – 30 minutes ➢ Short break for students C) Group presentations: total 45 minutes ➢ 10 minutes per group plus 5 min Q & A / group ➢ 3 groups of 5 students	Total time allotted: 2 hours
	D) Debriefing: 10 minutes E) Post-lab exit survey: 5 minutes	
	Activity plan	
A) Pre-briefing	➢ Ice-breaker question: *"Have any of you taken care of a client experiencing pain? "If so, what were some of the challenges you saw/experienced?"* ➢ Introduce the topic of the lab activity: Acute pain management. Briefly describe the lesson objectives for students and how they link to the overall class objectives ➢ Provide an overview of the 2-hour lab class ➢ Divide the class into three groups (five students/group). ➢ Hand out one scenario to each group (see student resources section).	15 min
B) Small group activity	➢ Students move into their small groups to work on the assigned case scenario ➢ Students answer case scenario questions and then prepare a skit to present to the class. ➢ Coach students to highlight the answers to the case scenario questions.	20 – 30 min
C) Group Presentations	➢ Use a computer to project the case scenario for all students to read. ➢ AHS order set for Scenario # 1 will be circulated around the class during the presentation (see Appendix D). ➢ Each student group will present for 10 minutes and facilitate a 5 minute Q & A to demonstrate their understating of the case scenario.	10 min each scenario & 5 minute Q & A = 45 minutes

D) Debriefing	➢ Open Q & A session guided by the questions posed by the students ➢ Optional questions for the instructor to use to facilitate discussion: I. How would you educate the role of scheduled versus PRN pain medications in pain management? II. What is the difference between tolerance, dependency, and addiction to narcotics? III. In terms of pain care, what should nursing documentation include?	10 min
E) Post-lab exit survey	➢ The instructor will provide an electronic or paper copy of the student survey to be completed	5 min

Case Scenario #1: Pre-operative hip fracture - admission

Pre-operative hip fracture admission scenario

Mary Jean is an 80-year-old female who is being admitted to the orthopedic surgical floor for left hip fracture. In the report received by the primary nurse, Mary fractured her hip when she slipped in her bathroom about 30 hours ago. Believing that the pain would go away if she just rested, Mary decided not to go to the hospital and recuperated at her home with the help of her husband. However, Mary had increasing pain in her left hip to the point that she cannot bear weight on her left foot, which led to calling 911. Upon arriving at the hospital ER, the doctor's assessment indicated an unstable hip fracture requiring surgery. Now the client is being admitted to the hospital for hip surgery. The ER nurse reported Mary has a history of peptic ulcer, hypertension, arthritis in her bilateral knees and hips. Mary is aware of the incident, orientated and able to answer questions appropriately. In ER, she had her ECG, labs, and hip-Xray were done. In addition, she has a 20 G IV started and is receiving Ringers Lactate and 100 cc/hr. NPO (nothing by mouth) order has been received for possible surgery today. An orthopedic consult has been done, and the client has signed consent for surgery. Furthermore, the ER nurse mentioned the client appeared to be in distress when transferred to the stretcher; however, she only took Tylenol 650 mg at 0330 from the nurse as she fears "being addicted to drugs." The time is now 1000, and you, as hub nurses, are waiting to receive the client from ER.

During the transfer of the client to the bed from the stretcher, you noticed Mary was worried when she realized she is being moved and started breathing rapidly along with guarding her left leg. Upon transfer, Mary screamed in pain and grabbed onto the staff, which made the transfer difficult. Her admission vitals are 160/80 BP, 107 HR, 22 Respirations, 95%/RA SatO2, and 36.7°C.

1. **What pain scale(s) will you consider using to assess the clients' pain?**

Physician pain medication orders:

Tylenol 650 MG PO/PR Q6H
Dilaudid 0.25 mg SQ/IV Q2H (PRN)
Ibuprofen 300 mg PO Q6H (PRN)

Once settled in bed, the client verbally rates pain as "2/10", stating "its only severe when I am moving." Mary is highly apologetic for her behaviour during the transfer and keeps repeating, "I am sorry for causing trouble."

2. **What are the visible signs/objective of distress seen in the client?**

3. **You noticed that the client's behaviour and verbal rating are quite different? What is the most ethical way to manage her pain in this situation? Provide rationale.**

Upon further discussion, the client reports reluctance with taking medication because "I don't know about their effects if they are too strong for me, and if taking them will cause me to become addicted to them." Mary further adds, "I don't understand why I should treat pain before surgery if I am barely moving?"

4. **How will you educate the client to address mistrust in receiving pain medication?**

5. **After discussion, Mary has agreed to take pain medication. Which pain medication will you consider administering and why?**

6. **How often should you re-assess pain after administering pain medications?**

NOTE: Please discuss the hip fracture pre-op order set with students. Specifically, the medication section.

Case Scenario #1 – ANSWER KEY
Pre-operative hip fracture- admission

1. **What pain scale(s) will you consider using to assess the client's pain?**

   - The primary pain measurement scales used in practice are the Number Rating Scale (pain intensity), The Verbal Rating Scale (pain intensity), Visual Analogue Scale, and Wong-Baker FACES pain rating scale (Wright, 2015).
   - Pain education is important in the clinical setting. Therefore, it is essential for a nurse to collaborate with a cognitively competent client to identify appropriate client preferred pain scale, teach how to use the pain scale and its purpose in pain management (Registered Nurses' Association of Ontario [RNAO], 2013).
   - The Number Rating Scale, with or without the Verbal Rating Scale, is most effectively used in post-operative settings. The client understands their purpose is to measure the effectiveness of pain management interventions (Wright, 2015).
   - Some clients, regardless of age, may prefer the Wong-Baker FACES scale (Wright, 2015).
   - It is important to use the scale the client prefers consistently to avoid discrepancies in the client's pain assessment (Murphy, 2013).

2. **What are the visible/objective signs of distress seen in the client?**
   - Pain with movement, guarding her injured leg, verbally distressed (screaming) during the transfer.
   - Tachypnea or hyperventilation could be a sign of anxiety and/or pain. Systematic evidence reports pain influences respiration by increasing its flow, frequency, and volume (Jafari, Courtois, Van den Bergh, Vlaeyen, & Van Diest, 2017).
   - Uncontrolled pain influences stimulation of the sympathetic nervous system and adrenal glands, which cause an elevation in blood pressure and heart rate (Tennant, 2011).

3. **You noticed that the client's behaviour and verbal rating are quite different? What is the most ethical way to manage her pain in this situation? Provide rationale.**

   - Clients in pain usually tend to avoid activities (in Mary Jean's case, reposition and transfer) that cause them pain.
   - Nursing responsibilities on assessment and measurement of pain should focus on pain at rest and during activities to avoid pain-related complications (Chou et al., 2016).
   - Suppose the pain impairs the client's functional goals (for eg. In Mary Jean's case repositing and transferring). In that case, this assessment should be considered into the individual's pain management plan (along with ensuring the client does not suffer from other clinical issues such as sedation, delirium, nausea, or any other adverse effects related to pharmacological interventions).

- It is a fundamental human right of a client to receive effective pain relief (Canadian Pain Society, 2010).
- In Mary's case, first, ensure the client understands the importance of repositioning (to prevent bed sores) and the role of pharmacological interventions for pain relief. Second, remeasure pain intensity at rest and with repositioning. Third, offer the pharmacological interventions available. Lastly, explore if the client would also prefer any non-pharmacological interventions alongside medication treatment.

4. **How will you educate the client to address mistrust in receiving pain medication?**

- Explore Mary's misconceptions concerning pharmacological intervention. Provide clarification to those misconceptions with evidence (ensure the information provided is age and the client's health literacy appropriate) (RNAO, 2013).

Misconceptions & nursing considerations:

1. Fear of addiction
   Nursing consideration: Define addiction-a neurobiological disease with genetic, psychological, and environmental factors associated with it. The behaviours include impaired control of drug use, craving, compulsive use, and continued use despite harm. Reassure Mary that the addiction is least likely in clients who are taking opioids for pain relief (Lewis et al., 2019).
2. Fear of fatalism: Reassure Mary that pain can be managed in most cases with proper monitoring. Adverse effects with opioids can be managed and monitored effectively. Explain that pain medication therapy requires trial and error to observe its level of effectiveness (Lewis et al., 2019).

5. **After discussion, Mary has agreed to take pain medication. Which pain medication will you consider administering and why?**

- Ibuprofen would not be appropriate in Mary's case, as the client has a history of peptic ulcers (Power & Colvin, 2013a) and is NPO. [note for instructor: ibuprofen is typically not ordered pre-op in orthopedic surgical clients. The intention here is for students to successfully identify ibuprofen contraindicated in Mary's case due to her history of peptic ulcers]
- Mary is due for another dose of Tylenol (can be provided with sips of water even though she is currently NPO).
- Mary also can receive Dilaudid, as her pain was "severe" with recent repositioning. For moderate to severe pain, step 3 on the WHO analgesic ladder is considered (see appendix A), unless otherwise contraindicated by client's context. If the client is afraid of needles, offer an IV route. Although the IV route is faster acting and the healthcare practitioner hasmore control over titration, evidence reports SQ is a better option than IV in opioids due to fairly lasting absorption and longer peak time (Wright, 2015). The Dilaudid SQ route peaks in 30 to 90 minutes, compared to the IV route that peaks in 15-30 minutes.

- In elderly clients, the authorities recommend, "start low and go slow" (Lewis et al., 2019; Rogers, Mehta, Shengelia, & Reid, 2013). If there were a range of dose provided with Dilaudid, the recommendation would be to start with the lowest amount.

6. How often should you re-assess pain after administering pain medications?

- After administering an analgesic, the timing of assessment should be informed by the time it takes to reach peak effects of the medication (Chou et al., 2016).
- If the client complains of any adverse effects after administering analgesics, assess, provide available treatment, and notify the doctor if needed, regardless of the peak time range.

Case Scenario #2: Hip fracture and dementia

Post-operative Hip fracture & dementia

Margaret Thatcher is a 95-year-old female client admitted to the surgical floor following a non-displaced right hip fracture. She lived in a long-term dementia cottage for the past five years and usually ambulated independently with a walker before her injury. Margaret has a history of severe dementia, chronic heart failure, previous myocardial infarction, atherosclerosis, arthritis, dysphagia, macular degeneration, left rotator cuff injury, and old spinal compression fracture. The client has recently been experiencing an increased number of falls, and the doctor diagnosed her with orthostatic hypotension. On the day of her injury, the client expressed increased anger and agitation, which prompted the nurse to give her a PRN dose of olanzapine. Margaret was trying to avoid nurses when she fell and broke her hip. Due to comorbidities and advanced age, Margaret is a poor surgical candidate. Upon consultation with the family, they decided to forgo surgery. For mobility, the doctor has ordered non-weight-bearing to right leg for six weeks, then re-assess.

As her primary nurse, you are receiving Margaret on the day shift. Margaret has been primarily asleep during the night, but now she is awake, moaning, weeping, and displaying increased agitation following repositioning in bed. Margaret has difficulty comprehending the questions asked by the nursing staff and has difficulty following directions. Pain orders are as follows:

Physician orders:	
Acetaminophen 650 mg PO/PR QID Hydromorphone 0.25 mg SQ Q2H (PRN) Hydromorphone 0.5-1 mg PO Q2H (PRN)	Continue home medications as at home: Gabapentin 100 mg PO OD Oxycodone 5mg SR PO BID

1. **What pain scale(s) will be appropriate for assessing Margaret's pain?**

2. **What needs to be considered when providing opioid analgesic treatment to frail elderly clients?**

3. **What medication treatment(s) would you consider giving to Margaret, its route, and how much?**

1.5 hours after administrating PRN pain medication, Margaret still seems to be grimacing, clutching her thigh, and attempting to move in bed unsuccessfully in bed. However, she is awake, coherent in her verbal responses, and a little calmer. It is breakfast time now.

4. **Should you attempt to get the client up at this time or not? Provide rationale**

5. **What should be your next step in terms of pain treatment?**

Later in the evening, Margaret's family comes in to visit her. They notice Margaret being up but withdrawn. Margaret's appetite is poor, is displaying increase confusion, and tires easily. The family is upset watching Margaret's behavior and her discomfort with any mobilization (the client is being mobilized using pivot disk transfer due to her non-weight bearing status on right leg). They blame the nurses for not taking care of Margaret's pain properly.

6. **How should you approach the family in discussing Margaret's present condition?**

Case Scenario #2 – ANSWER KEY
Hip fracture and dementia

1. **What pain scale(s) will be appropriate for assessing Margaret's pain?**

   - Older adults with mild to moderate cognitive impairment can usually use & comprehend scales, given demonstration (Wright, 2015). In Margaret's case, pain assessment is challenging to assess due to cognitive impairment resulting from severe dementia. The steps recommended are (RNAO, 2013):
     I. Attempt the assess client's self-report capability: A simple "yes"/" no" or behavioural cues such as nodding /shaking head in question is enough to establish if the client is experiencing pain or not.
     II. Use behavioural pain scales specifically designed for clients who are unable to self-report pain. Check to see if the healthcare institution has a policy & procedural manual on the behavioural pain assessment scale. Possible behavioural pain scales that could be used in Margaret's context: Wong-Baker FACES pain scale, Pain Assessment in Advanced Dementia Scale (PAINAD), Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC), and DOLOPLUS 2 scale.

2. **What needs to be considered when providing opioid analgesic treatment to frail elderly clients?**
   - Older adults tend to have a slower metabolism rate, and their brains tend to be more sensitive to opioids. Elderly clients are more likely to experience mood disorders, heart and lung problems, memory problems, which drugs can exacerbate. Furthermore, they might experience other opioid-related side effects such as to impair judgement, slow reaction time, and unsteady gait. (National Institute of Health, 2020).
   - Use the "start low & slow" approach when treating pain in elderly frail clients (Rogers etal., 2013)
   - Change route of opioid administration for better pain control and few side effects (leave the parenteral route for severe pain) (Rogers et al., 2013).
   - Consider symptomatic management of adverse effects to opioids that target specific symptoms. Once tolerance develops to the side effect, discontinue to medication used to treat the side effect. Commonly used in practice; however, fewer studies show its efficacy or safety. (Rogers, Mehta, Shengelia, & Reid, 2013).
   - Use NSAIDs with caution in the elderly population due to, high risk of gastrointestinal toxicity, interactions with medications such as SSRIs, aspirin, antihypertensives, and contradictions with clients who have a blood disorder, heart, or renal dysfunction problems (Hulla et al., 2019).
   - Common adverse effects seen in the elderly taking opioids are constipation, nausea, GI complications, respiratory depression, increased falls, and sleep disturbances (Hulla et al., 2019).
   - Sedation canbe transient or can persist over time- therefore, it is essential to review and minimize polypharmacy. Symptomatic management of adverse effects should be based

on case-by-case context (Rogers et al., 2013).

- The overall pain treatment goal with elderly clients should be to provide pain control with limited side effects, use around-the-clock medication dosing, and use PRN analgesia for breakthrough pain. Furthermore, it is recommended to use one opioid at a time to prevent polypharmacy and titrate its dose to effect. (Chau, Walker, Pai, & Cho, 2008).

3. **What medication treatment would you consider giving to Margaret, its route, and how much?**
    - The nurse's decision-making rationale should guide by the last analgesics used (at the unit or in PACU), her current medication list (if it includes analgesics on scheduled bases), and family report Margaret's normal behaviours (if they are present).
    - Behavioral & motor activities of pain such as moaning, restricting movements, facial expressions and inconsolability are validated indicators of pain in older clients who have severe dementia (Helme, 2013; Lewis et al., 2019). It is important to note that even though the behavioural indices indicate pain, they do not substitute pain intensity measures (Wright, 2015). In Margaret's case, her behaviours may or may not show moderate to severe pain.
    - It is recommended to continue medication treatment for chronic pain at home and additional analgesia (multimodal) for acute pain management (Mehta & Langford, 2006). Only considering PRN analgesia has the disadvantage of inadequate or ineffective treatment (Wright, 2015). Scheduled medications ensure that the drug plasma levels are at the therapeutic levels at target tissue sites and cell sites of action (Wright, 2015). Therefore, scheduled gabapentin and oxycodone should be provided to Margaret if she is due for them in the morning or missed an earlier dose.
    - Since peak action of gabapentin, oxycodone ER and Tylenol onset of action are not immediate, PRN dose of hydromorphone should be considered. PO and SQ options are viable for acute pain, although SQ route is faster acting than PO route. In conclusion, Multimodal pain treatment for Margaret should include her home medications (if not provided yet), Tylenol (if not delivered yet), and PRN dose of hydromorphone (starting from the lowest dose).
    - Drug bioavailability varies according to the route of administration. PO drugs go through the first-pass metabolism, therefore, have a variable amount of variability. SQ/IV have 100% bioavailability as they bypass absorption barriers (Wright, 2015).

4. **Should you attempt to get the client up at this time or not? Provide rationale**
    - Yes. Firstly, Margaret seems to have responded a little to the analgesic treatment as she is calmer and coherent in her verbal responses. Secondly, she is attempting to get out of bed. Thirdly, bedrest predisposes the client to complications such as weakness, loss of muscle tone, thrombosis, pulmonary complications, orthostatic circulatory disturbances, decrease GI motility, and increase joint stiffness (Wright, 2015). Fourth, clinical practice guidelines recommend ambulating clients 6 hours post-transfer from PACU (Morris, Benetti, Marro, & Rosenthal, 2010).

5. **What should be your next step in terms of pain treatment?**
   - After providing an intervention, the timing of pain assessment should be guided by the drug's time range to reach its peak effects (Chou et al., 2016). Pain re-assessment can be obtained by Margaret's self-report of the pain experienced or using an appropriate behavioural assessment pain scale. (see answer 1.)
   - Evidence indicates that the pain threshold is significant in the elderly population (Kaye, Baluch, & Scott, 2010). Hence, older clients may verbalize or present observable signs of pain after experiencing persisting pain for some time. Pain should be considered significant if it is persistent and affecting the client's functional (Margaret is unable to move comfortably) and psychosocial (Margaret is grimacing with movement) capacity (Kaye et al., 2010).
   - Every individual metabolizes and absorbs drugs at a different rate ("Approaches for using analgesic agents," 2009); thus, every client should receive individualized attention. Consideration should be pain score, the experience of side effects, sedation scores, and respiration status in clients who receive analgesia, regardless of age (Chou et al., 2016). Vital signs should not be solely relied on to determine the presence or intensity of the pain (Chou et al., 2016).
   - Most opioids, when administered alone, have a little direct effect on cardiac contractility (Chen & Ashburn, 2015). However, there is a risk for decreased cardiac function when combined with other medications, such as benzodiazepines (Chen & Ashburn, 2015). Administration of opioids can have other adverse effects on the cardiovascular system, such as vagus nerve-mediated bradycardia, vasodilation and decreased sympathetic tone (Chen & Ashburn, 2015). Therefore, monitor signs of hypotension with the administration of opioids analgesics.
   - At every assessment point, it is essential to: formulate pain management to include pharmacological and non-pharmacological interventions, re-assess and document the effectiveness of the treatment at appropriate time intervals and, advocate for the client's treatment plan as required (Wright, 2015).
6. **How should you approach the family in discussing Margaret's present condition?**
   - Promote family-centred pain management care for Margaret. Clients suffering from cognitive impairments are likely to be poor historians. Therefore, involving the family in Margaret's care treatment will be valuable in gathering her pain history, expression/behaviours, and preferred treatments (Buffum, Hutt, Chang, Craine, & Snow, 2007).

   Possible actions that the primary nurse can take:
      - Ensure the family that proper care is being given to Margaret by explaining what treatments were being provided so far to the client.
      - Explore words with the family that might be more familiar to Margaret for pain expression, e.g., ache, discomfort.
      - Explain how behaviour indices are being used to assess the client's pain & explore Margaret's behaviours/expressions with her family.
      - Explain to the family that post-op fatigue may occur up to several weeks after surgery. Pain and fatigue may also impact appetite.

Case Scenario #3: Post-operative hip fracture - discharge teaching

Discharge teaching post elective knee replacement surgery

Mathew Thompson is a 68-year male who received an elective right knee replacement two days ago for moderate to severe osteoarthritis. He has a history of cardiovascular disease and type-2 diabetes. During his post-op recovery, he transitioned to PO Tylenol#3 in the last 12 hours with an average pain rating of 3-4/10 pain after taking medicine. The client tolerates Tylenol#3 well without severe adverse effects, except experiences mild nausea if Tylenol#3 is taken on an empty stomach. In the last 24 hours, the nurses have noticed Mathew being reluctant to ask for pain medication and would only ask when his pain is borderline severe. When asked, the client reports he does not understand when to take pain medication. This morning, Mathew did stairs with physiotherapy and passed for discharge. His vitals have been blood pressure 130/70, Temperature 36.2°C, Sat O2 93%/RA, respirations 16 breaths/min, heart rate 72 beats per minute. In the last 6 hours, the client had no complaint of nausea/vomiting and is tolerating food/fluids. He can void but not have bowel movement yet (Mathew reported his last bowel movement was three days ago, and he usually experiences constipation at home). There are no issues with his surgical incision site as well. Overall, Mathew is satisfied with his progress except for the generalized fatigue and expressed concerns about "not understanding what I should watch out for, and when should I take my pain medication." Upon further assessment by the primary nurse to assess his self-care management skills with medications, Mathew appears overwhelmed. He states, "normally, my wife manages my medications, and I would like her to be involved in my discharge process."

1. **What are the indicators for safe discharge in Mathew's case?**

2. **What does your assessment reveal about Mathew's pain learning needs, and what would be the likely objectives for his pain education?**

3. **What teaching strategy(s) would you apply to ensure Mathew's learning needs are met regarding pain management?**

4. **What would the content of discharge pain education include?**

5. **How will you evaluate that Mathew understands the pain content?**

Case Scenario #3 – ANSWER KEY

Post-operative hip fracture - discharge teaching

1. **What are the indicators for safe discharge in Mathew's case?**
   - Pain controlled with preferred analgesia (Tylenol no. 3).
   - Nausea is managed if pain medication is taken with food.
   - Vitals stable, oxygen maintained on room air.
   - Passed physiotherapy.
   - Tolerating fluids and solids well.
   - Able to void with no voiced discomfort.
   - The surgical site appears healthy.
2. **What does your assessment reveal about Mathew's pain learning needs, and what would be the likely objectives for his pain education?**
   - There is no optimal evidence-supported teaching method (Chou et al., 2016). However, supportive evidence indicates that the client education information should be based on adult learning principles that include goal-orientated, relevant and practical information (Ingadóttir & Zoëga, 2017). Identifying learning needs helps in establishing individualized client-centred education.
   - Evidence supports pain treatment plans should be considered part of hospital discharge (Chou et al., 2016). Elements included should be: medications safety and how to manage side effects, adverse health and safety effects from the concurrent use of central nervous system depressants (e.g. alcohol) and other illicit drugs while on pain medications, plan for reduction and discontinuation of opioids as acute pain resolves, and appropriate disposal of unused opioids and other analgesics (Chou et al., 2016).
   - Mathew provides verbal affirmation for readiness to learn about pain-related discharge education. Family-centred education on pain management (involving his wife in discharge education). Tylenol #3 drug contraindications, pain management and mobility, adverse effect of constipation with Tylenol#3, and other considerations when taking analgesia (such as driving or operating heavy equipment).
3. **What teaching strategy(s) would you apply to ensure Mathew's learning needs are met regarding pain management?**
   - The education process should include: A) assessment of potential needs and barriers, B) planning educational objectives, C) implementing client preferred teaching methods and tools, and D) evaluate client learning (Ingadóttir & Zoëga, 2017).
   - Clients have reported preferring verbal education or a combination of oral and written information. The use of technology is up to the client's preference (Ingadóttir & Zoëga, 2017).
   - Client education is recommended to be multi-sessional, individualized, culturally & gender appropriate, and interactive to empower and support self-management in the client (Ingadóttir & Zoëga, 2017).
   - Finding 'teachable moments' throughout the client's stay at the inpatient unit (Ingadóttir & Zoëga, 2017).

- Collaborate with other health care professionals to obtain expertise, provide well-rounded information, and promote continued education throughout all nursing shifts.

4. **What would the content of discharge pain education include?**

   - Education should include both pharmacological and non-pharmacological pain management interventions.
   - Research evidence indicates that clients tend to focus on how to manage pain at home after discharge, what medications to take, how to manage associated side effects, how to cope if pain persists, and where/when to seek support (Ingadóttir & Zoëga, 2017).

5. **How will you evaluate that Mathew understands the pain content?**

   - Providing discharge education is a one-way communication that does not support the client's learning (Ingadóttir & Zoëga, 2017).

   Possible strategies to evaluate client's learning: (Ingadóttir & Zoëga, 2017)

   - Short test (verbal or written)
   - Demonstrating skill(s) learned and receive immediate feedback
   - 'teach back' method

Optional Debriefing Questions – ANSWER KEY

I. How would you educate the role of scheduled versus PRN pain medications in pain management?

- Around-the-clock (ATC) /scheduled drugs are used to ensure the drug plasma concentration level is maintained at therapeutic levels at the target tissues and cell sites of action (Wright, 2015).
- For most drugs, a steady concentration level is reached at approximately 5 times the drug's half-life. For medications with a longer half-life, an initial loading dose followed by a smaller maintenance dose might be prescribed. (Wright, 2015).
- PRN drugs ('pro re nata') require the client's request when the scheduled dose of analgesic is either insufficient or ineffective (Wright, 2015). Breakthrough (BT) drugs are available to clients on an as-needed basis that could be provided before painful procedures such as physiotherapy, painful dressing change or repositioning. There is a potential for PRN drug treatment (Wright, 2015); therefore, it needs to be carefully evaluated post-administration.
- Clients need to be taught the purpose and use of PRN medications to learn how to self-monitor their pain management.

II. What is the difference between tolerance, dependency, and addiction to narcotics?

- Tolerance is the need to increase the dose or frequency of the drug to achieve the same degree of analgesic effect. Tolerance is slow to develop, and if a client is presenting signs of tolerance, the mediation may have to be changed. (Lewis et al., 2019).
- Physical dependency occurs when a client is regularly exposed to pharmacologic agents. Dependence manifests as withdrawal syndrome when a drug is abruptly stopped, reduced, or an antagonist is administered (Lewis et al., 2019). Withdrawal symptoms include anxiety, insomnia, agitation, restlessness, diaphoresis, fever, flu-like symptoms, tremors, and tachycardia (Lewis et al., 2019). Therefore, the drug has to be slowly tapered and monitor side effects.
- Hyperalgesia (increased pain sensation) and anhedonia (inability to feel pleasure) can be seen in clients when an opioid is tapered or after detoxification (Ballantyne, Sullivan, & Kolodny, 2012).
- Addiction is a neurobiological disease that causes irreversible changes in the brain. One or more of the following behaviours characterize it: poor control over drug use, compulsive and continued use despite harm, and craving. Tolerance and dependence are not indicators of addiction. Instead, they are normal physiological responses to chronic exposure to drugs. (Lewis et al., 2019)

III. In terms of pain care, what should nursing documentation include?

- Best practice guidelines suggest the following to be communicated in the documentation: Plan of care, assessment findings, interventions implemented and their effectiveness, education provided, follow-up actions on reassessments, and clients & their family involvement in the planning and monitoring pain care plan (RNAO, 2013).

- Pain management documentation in an acute inpatient surgical setting should include the following: Date &time, PQRST, intensity, pharmacological and non-pharmacological interventions, client's response, and adverse effects.

STUDENT Lesson Outline

Welcome to the NSG 2321 – Health of Persons week 12 lab session! Please read the lesson outline PRIOR to the lab to understand the format and expectations.

Lab delivery method:	Standardized patient (SP) case scenarios will be provided during the lab class
Goal	To provide undergraduate nursing students in NSG 2321 – Health of Persons with integrated learning opportunities in the lab environment related to acute pain management in hip/knee pathways to build knowledge, skills, and attitudes essential for providing competent pain care.
Lab Session Learning outcomes:	1) Practice provision of evidence-informed, ethical, and individualized holistic pain care. 2) Integrate the knowledge of pathophysiology into the care of persons. 3) Apply the principles of pharmacodynamics & pharmacokinetics of conventional and alternative therapies of pain management. 4) Explore the psychomotor skills involved in pain assessment, monitoring, documentation, and teaching. 5) Practice role of therapeutic communication and collaboration with clients, family, healthcare professionals. 6) Demonstrate the application of cognitive and critical thinking skills in delivering safe patient pain care.
CARNA entry-level competencies:	Clinician: 1.1, 1.2, 1.4, 1.5, 1.6, 1.7, 1.11, 1.12, 1.13, 1.21, 1.22 Professional: 2.1, 2.2, 2.3, 2.5 Collaborator 4.1 Coordinator 5.1, 5.7, 5.8 Advocate: 7.2, 7.6, 7.7, 7.9 Educator 8.1, 8.2, 8.3, 8.4 Scholar: 9.1
Pre-requisite readings:	Readings recommended in week 1, week 6 and week 12 will prepare you for the lab activities
Steps and timeline:	1) Pre-briefing: 15 minutes 2) Small group activity: 20 – 30 minutes ➢ Short break for students 3) Group presentations: total 45 minutes ➢ 10 minutes per group plus 5 min Q & A / group ➢ 3 groups of 5 students 4) Debriefing: 10 minutes 5) Post-lab exit survey: 5 minutes
Scenario Topics	• Pre-operative hip fracture - admission • Hip fracture and dementia • Post-operative hip fracture - discharge teaching

Case Scenario #1 - STUDENT COPY

Pre-operative hip fracture - admission

Instructions:

1. In your small group, read the case scenario and answer the questions.
2. After completing the questions, prepare to role-play the scenario for your peers
3. The skit should be 10 minutes and reflect your answers to the case study, followed by a 5-minute Q & A session.
4. Students in the group facilitate the Q & A with their peers.

Scenario#1 Pre-operative hip fracture admission scenario

Mary Jean is an 80-year-old female who is being admitted to the orthopedic surgical floor for left hip fracture. In the report received by the primary nurse, Mary fractured her hip when she slipped in her bathroom about 30 hours ago. Believing that the pain would go away if she just rested, Mary decided not to go to the hospital and recuperated at her home with the help of her husband. However, Mary had increasing pain in her left hip to the point that she cannot bear weight on her left foot, which led to calling 911. Upon arriving at the hospital ER, the doctor's assessment indicated an unstable hip fracture requiring surgery. Now the client is being admitted to the hospital for hip surgery. The ER nurse reported Mary has a history of peptic ulcer, hypertension, arthritis in her bilateral knees and hips. Mary is aware of the incident, orientated and able to answer questions appropriately. In ER, she had her ECG, labs, and hip-Xray were done. In addition, she has a 20 G IV started and is receiving Ringers Lactate and 100 cc/hr. NPO (nothing by mouth) order has been received for possible surgery today. An orthopedic consult has been done, and the client has signed consent for surgery. Furthermore, the ER nurse mentioned the client appeared to be in distress when transferred to the stretcher; however, she only took Tylenol 650 mg at 0330 from the nurse as she fears "being addicted to drugs." The time is now 1000, and you, as hub nurses, are waiting to receive the client from ER.

During the transfer of the client to the bed from the stretcher, you noticed Mary was worried when she realized she is being moved and started breathing rapidly along with guarding her left leg. Upon transfer, Mary screamed in pain and grabbed onto the staff, which made the transfer difficult. Her admission vitals are 160/80 BP, 107 HR, 22 Respirations, 95%/RA SatO2, and 36.7°C.

1. **What pain scale(s) will you consider using to assess the clients' pain?**

Physician pain medication orders:

Tylenol 650 MG PO/PR Q6H
Dilaudid 0.25 mg SQ/IV Q2H (PRN)
Ibuprofen 300 mg PO Q6H (PRN)

Once settled in bed, the client verbally rates pain as "2/10", stating "its only severe when I am moving." Mary is highly apologetic for her behaviour during the transfer and keeps repeating, "I am sorry for causing trouble."

2. **What are the visible signs/objective of distress seen in the client?**

3. **You noticed that the client's behaviour and verbal rating are quite different? What is the most ethical way to manage her pain in this situation? Provide rationale.**

Upon further discussion, the client reports reluctance with taking medication because "I don't know about their effects if they are too strong for me, and if taking them will cause me to become addicted to them." Mary further adds, "I don't understand why I should treat pain before surgery if I am barely moving?"

4. **How will you educate the client to address mistrust in receiving pain medication?**

5. **After discussion, Mary has agreed to take pain medication. Which pain medication will you consider administering and why?**

6. **How often should you re-assess pain after administering pain medications?**

Case Scenario #2- STUDENT COPY

Hip fracture and dementia

Instructions:

1. In your small group, read the case scenario and answer the questions.
2. After completing the questions, prepare to role-play the scenario for your peers
3. The skit should be 10 minutes and reflect your answers to the case study, followed by a 5-minute Q & A session.
4. Students in the group facilitate the Q & A with their peers.

Scenario#2 Hip fracture & dementia

Margaret Thatcher is a 95-year-old female client admitted to the surgical floor following a non-displaced right hip fracture. She lived in a long-term dementia cottage for the past five years and usually ambulated independently with a walker before her injury. Margaret has a history of severe dementia, chronic heart failure, previous myocardial infarction, atherosclerosis, arthritis, dysphagia, macular degeneration, left rotator cuff injury, and old spinal compression fracture. The client has recently been experiencing an increased number of falls, and the doctor diagnosed her with orthostatic hypotension. On the day of her injury, the client expressed increased anger and agitation, which prompted the nurse to give her a PRN dose of olanzapine. Margaret was trying to avoid nurses when she fell and broke her hip. Due to comorbidities and advanced age, Margaret is a poor surgical candidate. Upon consultation with the family, they decided to forgo surgery. For mobility, the doctor has ordered non-weight-bearing to right leg for six weeks, then re-assess.

As her primary nurse, you are receiving Margaret on the day shift. Margaret has been primarily asleep during the night, but now she is awake, moaning, weeping, and displaying increased agitation following repositioning in bed. Margaret has difficulty comprehending the questions asked by the nursing staff and has difficulty following directions. Pain orders are as follows:

Physician orders: Acetaminophen 650 mg PO/PR QID Hydromorphone 0.25 mg SQ Q2H (PRN) Hydromorphone 0.5-1 mg PO Q2H (PRN)	Continue home medications as at home: Gabapentin 100 mg PO OD Oxycodone 5mg SR PO BID

1. **What pain scale(s) will be appropriate for assessing Margaret's pain?**

2. **What needs to be considered when providing opioid analgesic treatment to frail elderly clients?**

3. **What medication treatment(s) would you consider giving to Margaret, its route, and how much?**

1.5 hours after administrating PRN pain medication, Margaret still seems to be grimacing, clutching her thigh, and attempting to move in bed unsuccessfully in bed. However, she is awake, coherent in her verbal responses, and a little calmer. It is breakfast time now.

4. **Should you attempt to get the client up at this time or not? Provide rationale**

5. **What should be your next step in terms of pain treatment?**

Later in the evening, Margaret's family comes in to visit her. They notice Margaret being up but withdrawn. Margaret's appetite is poor, is displaying increase confusion, and tires easily. The family is upset watching Margaret's behaviour and her discomfort with any mobilization (the client is being mobilized using pivot disk transfer due to non-weight bearing statues to her right leg). They blame the nurses for not taking care of Margaret's pain properly.

6. **How should you approach the family in discussing Margaret's present condition?**

Case Scenario #3 - STUDENT COPY Post-operative hip fracture - discharge teaching

Instructions:

1. In your small group, read the case scenario and answer the questions.
2. After completing the questions, prepare to role-play the scenario for your peers
3. The skit should be 10 minutes and reflect your answers to the case study, followed by a 5-minute Q & A session.
4. Students in the group facilitate the Q & A with their peers.

Scenario#3 Discharge teaching post elective knee replacement surgery

Mathew Thompson is a 68-year male who received an elective right knee replacement two days ago for moderate to severe osteoarthritis. He has a history of cardiovascular disease and type-2 diabetes. During his post-op recovery, he transitioned to PO Tylenol#3 in the last 12 hours with an average pain rating of 3-4/10 pain after taking medicine. The client tolerates Tylenol#3 well without severe adverse effects, except experiences mild nausea if Tylenol#3 is taken on an empty stomach. In the last 24 hours, the nurses have noticed Mathew being reluctant to ask for pain medication and would only ask when his pain is borderline severe. When asked, the client reports he does not understand when to take pain medication. This morning, Mathew did stairs with physiotherapy and passed for discharge. His vitals have been blood pressure 130/70, Temperature 36.2°C, Sat O2 93%/RA, respirations 16 breaths/min, heart rate 72 beats per minute. In the last 6 hours, the client had no complaint of nausea/vomiting and is tolerating food/fluids. He can void but not have bowel movement yet (Mathew reported his last bowel movement was three days ago, and he usually experiences constipation at home). There are no issues with his surgical incision site as well. Overall, Mathew is satisfied with his progress except for the generalized fatigue and expressed concerns about "not understanding what I should watch out for, and when should I take my pain medication." Upon further assessment by the primary nurse to assess his self-care management skills with medications, Mathew appears overwhelmed. He states, "normally, my wife manages my medications, and I would like her to be involved in my discharge process."

1. **What are the indicators for safe discharge in Mathew's case?**

2. **What does your assessment reveal about Mathew's pain learning needs, and what would be the likely objectives for his pain education?**

3. **What teaching strategy(s) would you apply to ensure Mathew's learning needs are met regarding pain management?**

4. **What would the content of discharge pain education include?**

5. **How will you evaluate that Mathew understands the pain content?**

Acute Pain Management Lab- Student Survey

Please choose one response to the following questions:

Question	Strongly Agree	Agree	Disagree	Strongly agree
1) Did you find this lab interactive and enjoyable?				
2) Did you find the information provided in this lab relevant to the course Health of Persons theory content?				
3) Did this lab facilitate knowledge and skills development in pain management?				
4) Was the instructor helpful in guiding your learning in this lab activity?				
5) Would you recommend this lab to future nursing students?				

If there was one thing you could change about this activity, what would it be?_____

_____

_____

Any closing comments?_____

_____

_____

Background

Pain is a universal human experience, yet each experiences it differently (Slomp, 2019). The International Association for the study of Pain (2017) defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage." According to the Declaration of Montreal on pain management, pain relief is a fundamental human right (International Pain Summit of the International Association for the Study of, 2011). Yet, concerns have been made in the research literature on the poor quality of pain management provided to post-operative clients (Klejka, 2018).

Evidence in the literature indicates that nurses lack the necessary knowledge and skills in pain management practice (Brant, Mohr, Coombs, Finn, & Wilmarth, 2017). What is more concerning is that similar evidence has also been found in the student nurses' population who are the future of the nursing profession (Chow & Chan, 2015). Learning about pain management involves assessment, treatment, and monitoring and developing communication skills with the patient and team members to collaborate and come best effective pain management strategy given the patient context. Patients rely on the nurses' expertise and knowledge when seeking help for pain management. Therefore, nurses must have the foundational knowledge and skills in addition to experience in clinical practice to assess, treat competently, and monitor patients' pain in a timely and efficient manner.

Within nursing education, faculty strive to enhance student understanding of pain management in their undergraduate nursing education experience to prepare them for nursing practice. According to the International Association for Study of Pain (Wright, 2015), pain curricula should cover four core domains in pain management (see appendix C):

1) multidimensional nature of pain (see appendix B)

2) assessment and measurement

3) management

4) the context of pain.

The purpose of the lab resource manual on acute pain management is to provide an opportunity to practice decision-making and critical-thinking skills in understanding the fundamentals of acute pain management that will supplement their theoretical and clinical learning experience. It is to be noted that the lab resource manual does not cover pediatric, critically ill, palliative or patients with substance abuse disorder. Furthermore, the lesson activity only focuses on parenteral and oral analgesics, which is suitable for 2nd year undergraduate nursing students learning.

The following items are included in the acute pain management-lab resource manual:

- A lab session outline for students
- Case scenarios for the lab sessions to provide to students
- Lesson plan for faculty including answers to the case scenarios

References

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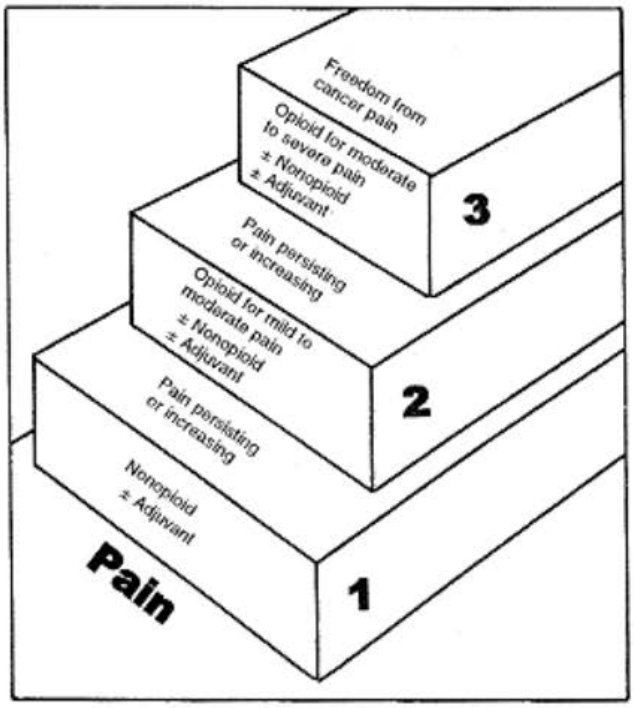
Appendix A

Figure 1.
WHO Analgesia Ladder

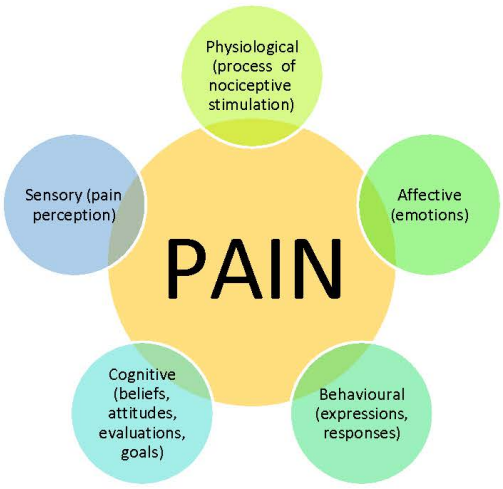


Note: Three step ladder approach designed by World Health Organization that guide different medication treatment based on the intensity of client's subjective pain experience. Taken from https://professionals.wrha.mb.ca/old/professionals/files/PDTip_AnalgesicLadder.pdf

Appendix B

Figure 2

Multidimensional nature of pain

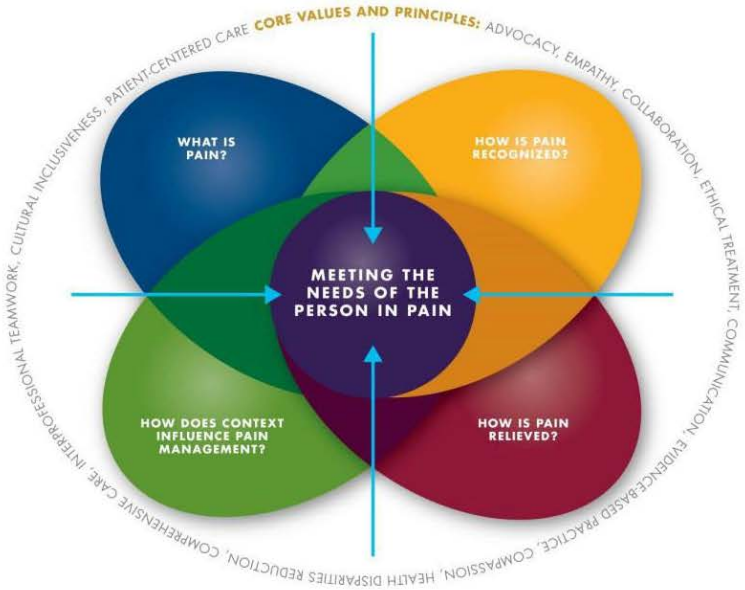


Note. The diagram presents complex nature of pain experience. Adapted from (Lewis et. al, 2019)

Appendix C

Figure 3

Pain curriculum model



Note. This model was developed by UC Davis Center for Advancing Pain Relief (2016). It highlights the pain education concepts based on the 4 core domains of pain curricula: 1) Multidimensional nature of pain, 2) Pain assessment and measurement, 3) Management of pain and 4) Context of pain. The surrounding values and principles are embedded in the 4 core domains. From "Strengthening Pain Content in Baccalaureate Nursing Curriculum" by UC Davis Center for Advancing Pain Relief, 2016. Copyright 2016 by UC Davis School of Medicine and Betty Irene Moore School of Nursing.

Appendix D

Alberta Health Services. (2018). Hip fracture, adult pre-op order set.

https://www.albertahealthservices.ca/assets/about/scn/ahs-scn-bjh-hf-pre-operative-orders.pdf

APPENDIX B
Feedback Tool

Acute Pain Management Lab Resource Manual- Instructors Formative Evaluation Form

Hello, my name is Tarundeep Bhullar, and I am currently a Master of Nursing (MN) Student at the University of Lethbridge. For the project route chosen in the MN program, I created a draft lab resource manual on acute pain management for second-year NESA BN students at Lethbridge College who will be taking NURS 2321 'Health of Persons' course in the fall, 2021 (please see attachment). The instructor evaluation tool is part of the 'implementation' strategy for my project. Your feedback will much be appreciated in evaluating the effectiveness of the deliverable created as part of the MN project. The approximate time to read and complete the evaluation form will be approximately 1 to 2 hours. The questions reflect the design, content, and timeline of the lesson plan for the 2 hours lab in week 12 of the course. Please email the completed individual evaluation tool to tarundeep.bhullar@uleth.ca in one week (if possible). Thank you! for your cooperation.

Directions: In your best opinion, please choose one of the following answers; 'strongly agree,' 'agree,' 'disagree,' or 'strongly disagree.'

Question	Strongly Agree	Agree	Disagree	Strongly Disagree
1) The design of the lab resource manual is logical and easy to follow.	☐	☐	☐	☐
2) The goals, objectives, and case scenarios are relevant to the theory course NURS 2321 'Health of Persons'	☐	☐	☐	☐
3) The case scenarios will promote critical-decision making in students	☐	☐	☐	☐
4) The case scenarios are interactive e and realistic	☐	☐	☐	☐

5) The lab resource manual incorporates high quality relevant research evidence	☐	☐	☐	☐
6) The scenario(s) answers are consistent with 'pain management nursing practice standards.	☐	☐	☐	☐
7) The lesson plan truly upholds the biopsychosocial model of pain	☐	☐	☐	☐
8) Student participation in the scenarios will promote knowledge and skills attainment on patient-centred and holistic pain management in students.	☐	☐	☐	☐
9) Does the lesson plan incorporates a flexible and realistic timeline	☐	☐	☐	☐

10) Would you recommend the draft for pilot use in the fall 2021 semester for 2nd year NESA BN students at Lethbridge College? Please select one response.

Yes	**No**	**Maybe**
☐	☐	☐

11) What did you like about the lab resource manual?

_____

12) What did you not like about the lab resource manual? If possible, provide a viable solution(s) to your concerns.

_____