LEARNING MODULE FOR BSCN STUDENTS AT THE UNIVERSITY OF ONTARIO INSTITUTE OF TECHNOLOGY FOR THE RISK MANAGEMENT OF STAGE I PRESSURE ULCERS

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By

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Abstract

Background: Student nurses need to develop competency providing nursing care to patients at risk of developing a Stage I Pressure Ulcer in the clinical setting. This practicum developed an educational tool for The Bachelor of Science in Nursing students at The University of Ontario Institute of Technology for the risk management of Stage I Pressure Ulcers.

Objectives: The objectives of this clinical project are: 1) To conduct a thorough literature review to critically appraise evidence-based information and clinical practice guidelines related to the risk management of Stage I Pressure Ulcers, 2) To conduct consultations with key stakeholders to determine relevant clinical skills and techniques used to implement risk management of Stage I Pressure Ulcers, and 3) To develop the appropriate educational resource tool based on learning needs identified during consultations for the risk management of Stage I Pressure Ulcers.

Methodology: A literature review and consultations were used to determine the learning needs of the students within the program to determine relevant information to be included in the educational tool. The educational resource was used Knowles Adult Learning Theory as the theoretical framework underpinning the development of the project.

Results: Findings demonstrated that the students experience difficulty with the ability to assess, interpret, and develop care plans based on The Braden Scale scores of their clinical assignments

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Introduction

As the elderly population rises in North America, the incidence of pressure ulcers will increase in health care facilities across Canada. A pressure ulcer is defined as a pressure sore, bedsore, and decubitus ulcer (Quality Compass, 2015). Alongside causing significant financial strain on the health care system, pressure ulcers cause significant morbidity and mortality for patients who develop this type of wound (Braga, Pirett, Ribas, Filho, & Filho, 2013). Therefore, the prevention, assessment, and management of these types of wounds is a critical skill for nursing students to develop as they prepare to be nurses.

As pressure ulcers place patients at risk for serious complications, including: bacteremia and sepsis; there is a need for educational tools for Bachelor of Science in Nursing (BSCN) students. While teaching clinical nursing at The University of Ontario Institute of Technology (UOIT), the students demonstrated difficulty understanding risk management of Stage I Pressure Ulcers. Specifically, they exhibited trouble applying The Braden Scale in the clinical setting.

The following practicum report will provide a summary of the objectives, and how these objectives were accomplished during the course of the project. The literature review, consultation process, and online resource module will be discussed. Following this, a review of the advanced nursing competencies that have been demonstrated through the completion of this project will be presented.

Objectives

The objectives of my practicum were:

1. Conduct a thorough literature review to critically appraise evidence-based information and clinical practice guidelines related to the risk management of Stage I pressure ulcers;
2. Conduct consultations with invested stakeholders to help determine relevant clinical skills and techniques used to implement risk management of Stage I pressure ulcers;
3. Develop the appropriate learning resource tool based on learning needs identified during consultations for the risk management of Stage I pressure ulcers;
4. Provide UOIT with learning module and material for their nursing students within the BSCN program; and
5. Demonstrate advanced nurse competencies through the completion of the project, including clinical practice, researcher, leadership, and consultation/collaboration.

Overview of Methods

Methods included both a literature review and consultations with both students and a faculty member at UOIT. The literature review was used to identify the most current evidence based guidelines and recommendations in the risk management of Stage I Pressure Ulcers. Consultations were completed to determine the learning needs of the students within the BSCN program.

Summary of Literature Review

A literature review was completed using the Cumulative Index to Nursing and Allied Health Literature and PubMed databases (see Appendix A). To begin the retrieval of research based on Stage I Pressure Ulcers, search terms included "Stage I Pressure Ulcers", "Braden Scale", "geriatric populations" and "nursing education". Initially, this search provided a broad range of 6550 articles that had little relevance to the search terms used. Therefore, a second search was conducted using search terms ""undergraduate nursing education", "wound care" and "student nurses". This search provided 937 articles to be reviewed. No relevant articles to the topic of risk management and prevention and undergraduate nursing education were found. However, 6 articles were deemed appropriate to the review. All articles were critically analyzed using the Public Health Agency of Canada (PHAC) Critical Appraisal Toolkit.

A pressure ulcer was defined in the literature review as "any lesion caused by unrelieved pressure that resulting in damage to underlying tissue. Pressure ulcers usually occur over a bony prominence and are staged to classify the degree of tissue damage observed" (Touhy, Jett, Boscart, & McCleary, 2012, p. 175). When a patient develops this type of wound, complete healing is highly possible with a Stage I and Stage pressure ulcer. (Maida, Ennia, & Corban, 2012). However, as patients become elderly with advancing illness, complete healing has found to be less likely (2012).

The use of the Top Down Model was supported by the incidence studies included in the review to describe the pathology of a Stage I Pressure Ulcer (Halfens, Bours, & Van Ast, 2001). This model assumes the traditional biomedical view by presuming that

Stage I Pressure Ulcers originate within the epidermis (2001). As the ulcer progresses, it penetrates the deeper layers of tissue forming a hole in the skin (2001). If the patient receives treatment within 1 to 3 weeks, this framework also promotes the reversal of a Stage I Pressure Ulcer.

Student nurses also need to understand the various risk factors that contribute to the development of a pressure ulcer. Contributing factors include skin perfusion and impaired skin turgor due to aging, collagen regeneration, decreased immune level and response, weakness, loss of tissue elasticity, and deteriorated mental status (Aydin & Mucuk, 2013). In addition to prolonged pressure and decreased mobility, an individual with fecal incontinence is 22 times more likely to develop a pressure ulcer (Thompson, Langemo, Anderson, Hanson, & Hunter, 2009). Developing a pressure ulcer also affects both the physical and psychological lives of patents through extended hospital stays and social isolation (2013). As the physical and mental dependency of a patient increases, the risk for pressure ulcer also increases (2013). Therefore, it is critical that a student nurse understands the delicate interplay of these factors on the healing process of the patient because if one of these variables is overlooked in assessing level of risk to the patient, wound healing may be impaired and prolonged.

The most commonly used risk assessment tool used in North America is The Braden Scale. This tool has been had extensive psychometric testing, and measures the patient's risk of developing a pressure ulcer based on six subscales; sensory perception, skin exposure to moisture, activity level, mobility, nutritional level, and level of friction and shear (Wilchesky & Lungu, 2015). Patients scoring with a lower number indicate a

higher risk of developing a pressure ulcer. Patients scoring with a higher number indicate a lower risk of developing a pressure ulcer. Learning how to use this tool is a critical skill for a student nurse to develop over the course of their undergraduate education. As the student nurse begins providing care to patients during clinical rotations, they must be able to assess, interpret, and integrate the Braden Scale scores of their patients to provide evidence based nursing interventions.

Student nurses also need to understand that assessment using The Braden Scale is based on the patients sensory perception, skin exposure to moisture, activity level, mobility, nutritional level, and level of friction and shear (Wilchesky & Lungu, 2015). Further assessment also includes identifying the exposure of the patient's skin to moisture because wet skin is more vulnerable to friction and shearing. To provide interventions, a nursing student needs to be able to evaluate the amount of urine, feces, perspiration, and wound drainage that may be present on the skin during the day (Keast, Parslow, Houghton, Norton, & Fraser, 2007). Students also need to develop the critical analysis necessary to understand how to plan nursing care for a patient based on Braden Scale score. They also need to understand how to plan interventions according to findings only present in the subscales to reduce overall risk to their patient.

The critical implications of the literature review reinforced the validity of using Best Practice recommendations endorsed by the Registered Nurses Association of Ontario to prevent pressure ulcers ([RNAO], 2011). This reinforced the need to include these recommendations within the learning module to ensure that the students will be

taught to provide evidence-based interventions for patients at risk of developing Stage I Pressure Ulcers.

There was conflicting evidence supporting the use of E-Learning technology based modules to increase the competency of nurses using The Braden Scale. Quasi experimental studies implemented Web Based training modules to teach newly graduated Registered Nurse's how to use The Braden Scale and plan preventative interventions based on their findings (Magnan & Maklebust, 2008). The module used in the study also included the use of case studies to teach nurses how to make accurate Braden Scale assessments and select appropriate nursing interventions for their patients based on the score (Magnan & Maklebust, 2009; Magnan & Maklebust, 2008).

However, there is also a need for further research to clarify the efficacy of Web Based training modules in Braden Scale education. The research available studying this trend is extremely limited, and findings have also indicated that E-Learning technology did not improve subscale scoring, but did improve pressure ulcer classification between student and practicing nurses (Bredesen, Bjoro, Gunningberg, & Hofoss, 2016). While the researchers acknowledge that the results may have been influenced by the participant's confidence with computers, more clarification is needed. Despite this finding, E-Learning was determined to have greater accuracy of pressure ulcer classification than classroom teaching (2016).

There was also some conflicting evidence supporting the use of The Braden Scale to assess risk in patients at risk of developing a Stage I Pressure Ulcer. A retrospective study concluded that Braden Scale assessments might not be as effective for

individuals 80 years and older with complex medical comorbidities (Chen, Cao, Zhang, Wang, & Huai, 2015). A systematic review also challenged the use of the Braden Scale in a long-term care setting because of its low specificity (Wilchesky & Lungu, 2015). However, the researchers were not able to conclude if this finding was due to preventative interventions, and continued to endorse the use of this tool with geriatric populations.

Nevertheless, there is strong evidence supporting the use of The Braden Scale to assess risk in all sectors of the health care system. The Braden Scale has been used to identify patients at high risk for development of pressure ulcers (Ranzani, Simpson, Japiassu, & Noritomi, 2016). Therefore, there is a strong need for student nurses to develop competency in risk management in the clinical setting. Educational campaigns have been shown to increase pressure ulcer assessment to analyze factors to take targeted preventative measures to reduce occurrence and promote healing (Haixia, Guohong, Cuirong, & Changping, 2016).

There is also a need to teach nursing students how to assess, interpret, and provide interventions to the patient based on assessments using this tool. This is difficult because there is a significant lack of educational research available to nursing educators trying to integrate the practical application of The Braden Scale in BSCN curriculum. While there is some material available for teaching new RN's, there was nothing specific to the learning needs of nursing students. This lack of information indicates a strong need for further research to prepare nursing students to provide evidence based care for patients at risk of developing Stage I Pressure Ulcers.

Summary of Consultations

A total of 18 participants were initially recruited for consultations (see Appendix B). Fifteen participants interviewed in a focus group, 1 through individual consultation, and 1 faculty member. One faculty member volunteered for participation in the consultations. Consent was also obtained from one further participant, and the interview questions were emailed to her. The participant did not return her responses to the interview questions. The focus group occurred at the university in a closed classroom, and was comprised of 15 BSCN students in the Accelerated Learning Program at the end of their fourth year. The other participants volunteered to conduct their interview via email. The final sample consisted of 16 students, and one faculty member. Fourth year students provided data during consultations because they were able to provide a broader perspective on the learning needs of the students in the program.

Convenience sampling was used because this type of nonprobability sampling is appropriate when potential participants need to come forward and identify themselves for the information they can share with researchers (Polit & Beck, 2012). This type of sampling was used to recruit both student and faculty participants for the project. Written consent to participate was obtained prior to the interview, and implied consent was given before the focus group began. Interviews were semi-structured, and the type of interview conducted was determined according to the convenience of the participant.

Conventional content analysis was used to analyze the data collected during interviews. This is the process of organizing narrative information into key concepts and themes in a qualitative study (Polit & Beck, 2012). Data analysis revealed 4 major themes

within the consultation findings. The findings of the consultations complimented the research included within the review. Key themes were; (i) student knowledge and The Braden Scale; (ii) availability and quality of support teaching The Braden Scale; (iii) students feeling unprepared during clinical rotation; (iv) and, preferred learning styles of nursing students related to The Braden Scale at UOIT.

I. **Student Knowledge and The Braden Scale**

Similar to the findings of the literature review, the participants reported retrospective knowledge deficits related to The Braden Scale during the consultations. This consultation finding reinforced the necessity of teaching how to assess, interpret, and provide evidence based nursing care to patients at risk of developing a Stage I Pressure Ulcer in the clinical setting.

During the interviews, the participants reported several learning needs related to the practical application of The Braden Scale in the clinical setting. Students consistently reported difficulty in using the scale to assess the level of risk present to their patients. The students reported feeling that they lacked the clinical judgment necessary to feel confident in assigning numbers within the subscales of the tool. In addition, the students reported that they experienced difficulty interpreting the scores of their patients found in the health record during data collection. All of the participants agreed that increased education about the application of The Braden Scale would make them feel more prepared to provide nursing care to patients during their clinical rotations.

II. **Availability and Quality of Support Teaching The Braden Scale**

Due to their knowledge deficits in risk management of Stage I Pressure Ulcers, the students reported that they had to seek out alternate ways of learning how to integrate Braden Scale scores in their clinical practice during the rotation. The students further reported that they perceived their choice of educator to teach the application of The Braden Scale as being random and based on availability; some of the students reported being taught by the instructor, while others reported being taught by staff nurses on the unit.

The literature review also verified this consultation by identifying an information gap due to the lack of research available to nursing educators to provide guidance on integrating the applied knowledge of the Braden Scale into curriculum development in a BSCN program. While students are being introduced about The Braden Scale within the theoretical foundations of their nursing program, students are not being given applied learning for practice within the clinical setting. Nevertheless, the students reported that they felt that they needed more time to learn the model within a clinical practice context.

III. Feeling Unprepared During Clinical Rotation

The students reported that the learning module should be developed to provide them with an opportunity to learn the clinical application of The Braden Scale. They also indicated that they wished the module would teach them how to assess a patient's level of risk using the six subscales of assessment used in The Braden Scale. Following assessment, they wanted the module to teach them how to interpret and apply the findings within a plan of care for their patient.

Both faculty and students widely supported the use of case studies to teach the critical application of The Braden Scale. Using case studies would provide the students with the opportunity to assess, interpret and plan interventions to patients based on the outcome of their Braden Scale assessment. Consistent with the research included in the review, there is strong evidence supporting use of case studies in increasing the reliability, precision, and accuracy of nursing assessments using The Braden Scale (Magnan & Maklebust, 2009).

IV. Preferred Learning Styles of Nursing Students Related to The Braden Scale at UOIT

Both faculty and students expressed a desire for the learning module to be developed using technological support available at UOIT. Platforms can include Blackboard, Elsevier, Evolve/Elsevier online textbook and the class repository, Meditech. Both groups agreed that the primary content of the learning module should be general information about how level of risk is assessed using The Braden Scale, followed with case studies to simulate the experience of assessing a patient at risk of developing a Stage I Pressure Ulcer. Current policy at UOIT promotes the use of using digital technology on the learning management system for student learning. Using this format, the case studies could be used with the clinical instructor at the start of the clinical rotation to facilitate individual and group learning about The Braden Scale.

Theoretical Framework

Knowles Adult Learning Theory was the most appropriate conceptual model to be incorporated into the development of the educational tool. This conceptual model

emphasizes adult learning that is self-directed, practical and germane to the students in the BSCN program. Using this type of framework encourages the student to assume active responsibility for their learning, which prepares them for the future of professional practice.

There are four principal assumption of adult learning that comprise the foundations of Knowles Adult Learning Theory that were demonstrated throughout this practicum. The first principle addresses the self-concept of the adult learner by promoting the belief that adults need to be invested in the planning and evaluation of their learning (Chesbro, 2002). This was demonstrated through the consultation process, as the students identified their learning needs and communicated that they needed applied learning of The Braden Scale for the development of the educational tool. Through the process of consulting with students and faculty, the learning module has been designed specific to the identified learning needs identified during consultations.

The second principle assumes that adult learners see all personal experience, including mistakes, as opportunities for learning to occur (Chesbro, 2002). This assumption was demonstrated in the design of the case studies for the students. Using simulation, the students are able to learn the practical application of The Braden Scale in helping to prepare them for using this tool during their clinical rotation. The case studies can also challenge the student to think critically about their findings, which can be transferred into clinical practice.

Similarly, the third principle states that adult learners are motivated to learn if the content has personal relevance that can be applied to their personal and professional lives

(Chesbro, 2002). During consultations, students and faculty expressed a desire for the module to focus on the applied learning of The Braden Scale. Learning to use this tool within an applied context was relevant to their professional practice, and the knowledge gained from using the case studies is readily applied within a clinical setting.

The final principle states that adult learning is problem centered, and that the application of new knowledge is central to the orientation of learning (Chesbro, 2002). By expanding on the knowledge obtained by simulating a Braden Scale assessment, the student is able to develop critical analysis of Braden Scale findings. By using this type of case study, the student will be able to develop clinical competency with patients at risk of developing Stage I Pressure Ulcers.

Summary of Materials Developed

Learning Module

The learning module was designed for use on an E Learning platform, like Blackboard, at UOIT (see Appendix C). This educational tool teaches the student how to assess, interpret, and integrate Braden Scale scores to provide evidence-based nursing care according to the Best Practice Guidelines established by the RNAO. The learning module provides the student with relevant information about pressure ulcers as well as material that teaches the practical application of The Braden Scale in clinical practice. The module will be given to the curriculum developer and will be updated alongside the content of the course. The learning module is comprised of four sections: Section One- Introduction to Pressure Ulcers; Section Two- Foundations of The Braden Scale; Section

Three- Application of The Braden Scale. Also included are a pre-post test, two additional case studies, and online resources for the students to use.

Based on the consultation findings, the first section of the learning module provides the student with a basic review of pressure ulcers. This includes using the current definition provided The Registered Nurses Association of Ontario, risk factors associated with developing this type of wound, and the complications associated to having a pressure ulcer. The learning module then shifts the focus to the importance of early intervention in treating a pressure ulcer, and concludes by introducing The Braden Scale as the most widely used skin assessment tool used in all sectors of the health care system.

Section Two of the learning module discusses the foundation of The Braden Scale. In consideration of the consultation findings, the module contextualizes this tool by teaching the student how it is used during admission assessments, and teaching the student to locate it within the health record of their patient. Following this, the student learns how to methodically assess a patient within each subscale of the tool, and how the total is used to determine level of risk. The module then provides nursing interventions outlined by the Registered Nurses Association of Ontario Best Practice Guidelines to provide to the patient according to level of risk.

Section Three of the learning module simulates the application of The Braden Scale within clinical practice. All case studies within the learning module are original, and based on actual clinical experiences to provide the student with experiential learning. The case study presents a patient with a Braden Scale score of 15, so the assessment

would indicate that the person would be at risk of developing a pressure ulcer. The student is then walked through a simulated assessment of the patient, beginning in the first subscale of The Braden Scale. The assessment continues, and the total number is referenced back to the RNAO Best Practice Guidelines to determine the most appropriate nursing interventions to include in the care plan. After the student has completed this case study, the student has simulated how to obtain a patient's Braden Scale score during clinical practice.

After completing an initial Braden Scale assessment, the learning module introduces two other case studies to expand on the knowledge they have obtained. The case studies have been designed to simulate clinical assignments to facilitate applied knowledge of The Braden Scale. The first case study encourages the student to understand how scores are affected by changes in health status, and that reassessment is necessary to ensure that the patient is receiving proper care according to their most current level of risk. The first patient begins the case study with a Braden Scale of 20, and following a change of health status to the patient, the student is asked to identify that the score has now become 13 which places the patient at a higher risk of developing a pressure ulcer.

The second case study used in the module encourages the student to question a Braden Scale score of a patient. This exercise encourages the student to question the information found on the health record during data collection, and to assess the patient thoroughly based on their observations. This case study also prompts the student to

consider further skin assessments to include in their morning care. It also encourages the student to communicate their findings within an interdisciplinary framework.

Advanced Nursing Practice Competencies

Advanced Nursing Practice is a term used to describe a level of clinical nursing practice that is developed from graduate education, nursing knowledge, and expertise to advance the nursing profession (Canadian Nurses Association, 2008). The advanced nursing practice competencies are clinical, research, leadership, and consultation/collaboration. This practicum demonstrates the following competencies through the completion of this project:

Clinical Practice

The learning module teaches the applied knowledge of The Braden Scale to students due to the process of critical appraisal, research, and consultation. Evidence-based knowledge of risk management and prevention of Stage I Pressure Ulcers has been included in the learning module. This educational tool has been developed by consulting with key stakeholder to consider the unique needs of the students at UOIT.

Research

The findings of both the literature review and the consultations in the development of the learning module help to improve the student's understanding of risk management at UOIT. These findings will help to enhance the ability of the student to assess, interpret and integrate the Braden Scale score of their patients to provide evidence based nursing interventions during their clinical rotations. The application of the learning

module will increase the applied knowledge of The Braden Scale in accordance with The Best Practice Guidelines of the RNAO.

Leadership

Both the literature review and the consultations helped to identify the learning needs of the students, and the module will be used to give the students in the program a better understanding of The Braden Scale during their clinical rotations. The learning module can be used to teach students the practical application of The Braden Scale to help strengthen their knowledge base and clinical skill and competency.

Consultation/Collaboration

The consultations with nursing students and a faculty member at UOIT assisted to develop a learning module that promotes student learning and risk management of Stage I Pressure Ulcers. By consultation and collaboration, the module helps to provide enhanced risk management education for clinical practice. Merging the research findings with consultations has enhanced my collaborative skills as an advanced practice nurse, which will help to benefit professional practice.

Next Steps

After completion of this project, the text-based version of the learning module will be given to Dr. Smye. It will then be delivered to the IT department at UOIT, and will be uploaded to the appropriate course content for NURS 1700, Health and Healing of the Older Adult, Nursing Theory and Practicum 1. Students can do the module independently, or with their clinical instructor prior to the start of their clinical rotation.

Future consultation and collaboration will remain open with the designated faculty member involved in the ongoing development and maintenance of this course.

Conclusion

Learning the skill of risk management will become more critical for nursing students to master as the elderly population increases in North America. While this learning module was initially conceptualized as a broad learning tool to increase awareness and knowledge of Stage I Pressure Ulcers for student nurses at UOIT, research methods indicated a specific learning need for the students in the program. The learning module was developed to teach the practical application of The Braden Scale in the clinical setting. Using Knowles Adult Learning Theory, this module was created to be self directed and specific to the needs of the students in the program by simulating the use of The Braden Scale with elderly populations in the clinical setting. This learning module will help the students provide evidence based care for patients at risk of developing Stage I Pressure Ulcers.

References

Aydın, G., & Mucuk, S. (2015). The Evaluation of Daily Living Activities, Pressure Sores and Risk Factors. *Rehabilitation Nursing*, *40*(2), 84-91. doi:10.1002/rnj.145

Braga, I., Pirett, C., Ribas, R., Gontijo, F., & Filho, A. (2013). Bacterial colonization of pressure ulcers: Assessment of risk for bloodstream infection and impact on patient outcomes. *Journal of Hospital Infection,* 83(4), 314-320 doi: 10. 1016/j.jhin.2012.11.008

Bredesen, I. M., Bjøro, K., Gunningberg, L., & Hofoss, D. (2016). Effect of e-learning program on risk assessment and pressure ulcer classification — A randomized study. *Nurse Education Today*, *40*191-197. doi:10.1016/j.nedt.2016.03.008

Canadian Nurses Association. (2008). Advanced Nursing Practice: A national framework. Retrieved from: www.cna-aiic.ca

Chen, H., Cao, Y., Zhang, W., Wang, J., & Huai, B. (2015). Braden Scale is not suitable for assessing pressure ulcer risk in individuals aged 80 and older. *Journal Of The American Geriatrics Society*, *63*(3), 599-601 3p. doi:10.1111/jgs.13303

Chesbro, S., & Davis, L. (2002). Applying Knowles' Model of Andragogy to individualized osteoporosis education. *Journal Of Geriatric Physical Therapy*, *25*(2), 8-11 4p.

Haixia, F., Guohong, L., Cuirong, X., & Changping, J. (2016). Educational campaign to increase knowledge of pressure ulcers. *British Journal Of Nursing*, *25*(12), S30-S35.

Halfens, R., Bours, G., & Van Ast, W. (2001). Relevance of the diagnosis 'stage 1 pressure ulcer': an empirical study of the clinical course of stage 1 ulcers in acute care and long-term care hospital populations. *Journal Of Clinical Nursing*, *10*(6), 748-757 10p. doi:j.1365-2702.2001.00544.x10.1046/j.1365-2702.2001.00544.x

Keast, D., Parslow, N., Houghton, P., Norton, L., & Fraser, C. (2007). Best practice recommendations for the prevention and treatment of pressure ulcers: Update 2006...reprinted with permission from Wound Care Canada. *Advances In Skin & Wound Care*, *20*(8), 447-462 16p.

Magnan, M., & Maklebust, J. (2009). The effect of Web-based Braden Scale training on the reliability of Braden Subscale ratings. *Journal Of Wound, Ostomy & Continence Nursing*, *36*(1), 51-59 9p. doi:10.1097/WON.0b013e3181919b8d

Magnan, M. & Maklebust, J. (2008). The effect of Web-based Braden Scale training on the reliability and precision of Braden Scale pressure ulcer risk assessments. *Journal of Wound, Ostomy, & Continence Nursing, 35(2),* 199-208.

Maida, V., Ennis, M., & Corban, J. (2012). Wound outcomes in patients with advanced illness. *International Wound Journal*, *9*(6), 683-692. doi:10.1111/j.1742-481X.2012.00939.x

Polit, D., & Beck, C.T., (2012). *Nursing research: Generating and assessing evidence for nursing practice (9th Ed.)* Philadelphia, PA: Lippincott Williams and Wilkins.

Quality Compass. (2015) Pressure ulcers. Retrieved from: http://qualitycompass.hqontario.ca/portal/long-term-care/Pressure-Ulcers#.Vz3U34RG__R

Ranzani, O. T., Simpson, E. S., Japiassú, A.,M., & Noritomi, D. T. (2016). The challenge of predicting pressure ulcers in critically ill patients: A multicenter cohort study. *Annals of the American Thoracic Society, 13*(10), 1775-1783. doi:http://dx.doi.org/10.1513/AnnalsATS.201603-154OC

Registered Nurses Association of Ontario. (2011). Risk Assessment and Prevention of Pressure Ulcers. Retrieved from http://rnao.ca/sites/rnao-ca/files/storage/related/639_BPG_Pressure_Ulcers_v2_summary.pdf

Thompson, P., Langemo, D., Anderson, J., Hanson, D., & Hunter, S. (2005). Skin care protocols for pressure ulcers and incontinence in long-term care: a quasi-experimental study. *Advances In Skin & Wound Care*, *18*(8), 422-429 8p.

Touhy, T., Jett, K., Boscart, V., & McCleary, L. (2012). *Gerontological nursing and healthy aging.* Toronto: Elsevier.

Wilchesky, M., & Lungu, O. (2015). Predictive and concurrent validity of the Braden scale in long-term care: A meta-analysis. *Wound Repair & Regeneration*, *23*(1), 44-5

Appendix A – Literature Review

Nursing students often struggle with the first year of a nursing program because of the difficult transition from the classroom to the clinical setting. The first clinical rotation of a Bachelor of Science of Nursing (BSCN) program often involves providing nursing care to geriatric patients, which becomes the foundation of nursing education where students begin to develop their skills to prepare them for their future nursing practice. As nursing students are learning the fundamental principles necessary to provide patient care, the student also needs to feel confident to apply basic knowledge and skills in a methodical and meaningful way. Nevertheless, during their first clinical rotation, many student nurses struggle to understand the complexity of nursing care that is routinely implemented by practicing nurses working with geriatric patients.

A student nurse needs to develop competency with the principles of risk management and prevention of Stage I Pressure Ulcers during their clinical rotations. Among geriatric populations, developing a pressure ulcer increases the risk of mortality as much as 400% due to complications that can include osteomyelitis and sepsis (Medical Advisory Secretariat, 2009). Aside from causing poor health outcomes for the patient, pressure ulcers also place significant financial strain on the health care system including support surface interventions, and expensive wound care treatments (2009). Alongside causing significant financial strain on the health care system, pressure ulcers cause significant morbidity and mortality for patients who develop this type of wound (Braga, Pirett, Ribas, Filho, & Filho, 2013). Therefore, student nurses need to be prepared to

understand how to determine risk and provide preventative interventions to patients at risk for developing these types of wounds.

The aim of this literature review is to critically analyze the current research literature on the risk management and prevention of Stage I Pressure Ulcers. Objectives of this review include a critical synthesis of the research that includes a definition of a pressure ulcer, a discussion of the pathophysiology of pressure ulcers, and a review of the most current recommendations on the risk management of Stage I Pressure Ulcers. The results of this review will be utilized to create a learning module for BSCN students enrolled in NURS 1700, Health and Healing of the Older Adult at the University of Ontario Institute of Technology (UOIT).

The University of Ontario institute of Technology

UOIT is located in Oshawa Ontario, Canada. UOIT was founded in 2002, and has become Canada's newest and fastest growing university. The BSCN program at UOIT combines both technology and interpersonal skills to create leadership for the nursing students. The nursing curriculum at UOIT heavily concentrates on providing experiential learning experiences of the students.

During the first semester of the program, BSCN students learn about the pathophysiology of Stage I Pressure Ulcers in NURS 1003, Foundations for Nursing Practicum I Course. In the following semester, they begin their clinical placements during NURS 1700, Health and Healing of the Older Adult. Prior to the start of their rotation, the students receive a lecture teaching both the Braden Scale and Best Practice Guidelines for Stage I Pressure Ulcers. However, many of the students struggle to

connect their theoretical knowledge of risk management alongside the practical application of nursing interventions while providing patient care for a person at the risk of developing a Stage I Pressure Ulcer. Ideally, the learning module will be developed to help the BSCN students in NURS 1700 develop their critical assimilation of this knowledge to provide evidence based care for their patients during their clinical rotations.

Literature Review

An online search was completed using the Cumulative Index to Nursing and Allied Health Literature and PubMed databases. To begin the retrieval of research based on Stage I Pressure Ulcers, search terms included "Stage I Pressure Ulcers", "Braden Scale", "geriatric populations" and "nursing education". Initially, this search provided a broad range of 6550 articles that had little relevance to the search terms used.

A second search was conducted using search terms "undergraduate nursing education", "wound care" and "student nurses". This search provided 937 articles to be reviewed. No relevant articles to the topic of risk management and prevention and undergraduate nursing education were found. However, 6 articles were deemed appropriate to the review. All articles were critically analyzed using the Public Health Agency of Canada (PHAC) Critical Appraisal Toolkit. A summary of the reviewed studies is included in Appendix A.

Definition of a Stage I Pressure Ulcer

Generally, the research included in the review defined a Stage I Pressure Ulcer as a non-blanchable discoloration of the skin. However, this definition differs to the one that is being used to teach BSCN students in The Foundations of Nursing Practicum I.

Currently, UOIT is teaching the current definition endorsed by the Registered Nurses Association of Ontario (RNAO). This defines a Stage I Pressure Ulcer as "any lesion caused by unrelieved pressure that results in damage to underlying tissue. Pressure ulcers usually occur over a bony prominence and are staged to classify the degree of tissue damage observed" (Touhy, Jett, Boscart, & McCleary, 2012, p. 175). This definition will be included in the learning module to remain consistent with the course content of Foundations of Nursing Practicum I.

Pathophysiology of a Pressure Ulcer

A pressure ulcer is also referred to as a decubitus ulcer, pressure sore, or a bedsore. Ninety five percent of pressure ulcers originate in the lower regions of the body; the sacrum and the heels are the primary sites with the most frequent occurrence (Thompson, Langemo, Anderson, Hanson, & Hunter, 2005). Pressure wounds begin to develop as skin and soft tissue are pressed against a harder surface, such as a chair or bed, for extensive periods of time. Over time, the pressure begins to restrict access to blood supply to the area, which makes the skin become more friable and damaged. As the skin condition deteriorates, ulceration becomes evident on the surface of the skin. The highest level of complete healing are Stage I and Stage II Pressure Ulcers (Maida, Ennis, & Corban, 2012). The time required to heal a pressure ulcer varies greatly, and is contingent on both the underlying conditions of the patients, and the staging of the ulcer at the time of assessment.

Quality Compass (2015) promotes the use of a 4-point classification system that is used to represent severity of the injury to both the skin and underlying tissue at the

affected pressure point of the patient. Ideally, this staging process is used by the Registered Nurse (RN) to guide the evaluation to properly stage the pressure ulcer. By understanding the stage of the pressure ulcer, the student nurse can provide the correct interventions to reduce the risk of infection while promoting the healing process for the patient.

Currently, there are two theories that explain the pathology of a Stage I Pressure Ulcer. The first is called the Bottom Up Model. This theory suggests that skeletal muscle is already injured before damage becomes evident on the surface of the skin (Halfens, Bours, & Van Ast, 2001). Subscribing to this model is controversial, as it tends to present a patient with a Stage I Pressure Ulcer with a poor prognosis. This model assumes that the wound is not reversible with the use of interventions, and that the ulcer will progress along the continuum to Stage IV because the damage is originating from the bottom of the ulcer.

Alternatively, the second theory is called the Top Down Model. This concept tends to assume the more traditional biomedical view by assuming that Stage I Pressure Ulcers originate within the epidermis. As the ulcer progresses, it penetrates the deeper layers of tissue forming a hole in the skin (Halfens, Bours, & Van Ast, 2001). Unlike the Bottom Up Model, this model promotes the reversal of a Stage I Pressure Ulcer if the patient receives treatment within 1 to 3 weeks.

The incidence studies in the review supported the use of the Top Down Model in explaining the pathology of a Stage I Pressure Ulcer (Halfens, Bours, & Van Ast, 2001). If the Bottom Up Model describes the pathology of these wounds, the majority of Stage I

Pressure Ulcers would progress towards Stage IV. This trend would create a higher incidence of Stage IV reported within the data. Therefore, because the incidence studies in the review support the use of the Bottom Up Model, this framework will be used in the development of the learning module.

Risk Management of a Stage I Pressure Ulcer

Student nurses need to understand that nursing care to prevent Stage I Pressure Ulcers is consistent with all areas of clinical practice. All patients that are unable to shift their position independently to relieve pressure are considered to be at risk to develop a pressure ulcer because both prolonged pressure and impaired mobility is the most common reason for developing a pressure ulcer (Quality Compass, 2015). This includes stroke patients, people with spinal cord injuries, and unconscious patients in both acute care (AC) and long term care (LTC) settings (2009). In addition to prolonged pressure and decreased mobility, an individual with fecal incontinence is 22 times more likely to develop a pressure ulcer (Thompson, Langemo, Anderson, Hanson, & Hunter, 2009).

Contributing factors includes skin perfusion and impaired skin turgor due to aging, collagen regeneration, decreased immune level and response, weakness, loss of tissue elasticity, and deteriorated mental status (Aydin & Mucuk, 2013). As the physical and mental dependency of a patient increases, the risk for pressure ulcers also increases (2013). Patients with pressure ulcers experience extended hospital stays, which leads to social isolation (2013). Patients who are elderly with advancing illness are less likely to experience complete healing of these types of wounds (Maida, Ennis, & Corban, 2012).

Therefore, it is critical that a student nurse understands the delicate interplay of these factors on the healing process of the patient because if one of these factors is overlooked in assessing level of risk to the patient, wound healing may be impaired and prolonged.

Alongside identifying the personal factors that contribute to placing a patient at risk for developing a pressure ulcer, research supports the use of validated risk assessment tools to assess the skin condition of a patient upon entry to the health care system (Keast, Parslow, Houghton, Norton, & Fraser, 2007). A student nurse begins to learn how to prevent a pressure ulcer by identifying the patients that are at risk of developing one. The most basic means of providing prevention requires the use of a screening tool. The Braden Scale is the most common diagnostic tool used to assess risk for developing a pressure ulcer used in clinical nursing practice. Learning how to use this tool is an essential skill for a student nurse to obtain over the course of their undergraduate education. As the student nurses begin providing care to geriatric patients in NURS 1700, they must be able to assess, interpret, and integrate the Braden Scale scores of their patients to provide evidence based nursing care during their clinical rotation.

The Braden Scale

The Braden Scale is the most commonly used risk assessment tool used in North America, and has been subjected to extensive psychometric testing. The Braden Scale has been used to identify patients at high risk for development of pressure ulcers (Ranzani, Simpson, Japiassu, & Noritomi, 2016). Initial reliability studies reported inter rater reliability coefficients ranging from r 5 0.83 to 0.99 for licensed practical nurses and

nurses assistants, and 0.99 for graduate students and registered nurses (Wilchesky & Lungu, 2015). Furthermore, more recent systematic reviews indicated that inter rater reliability is above 0.80 across a wide variety of raters (2015).

This tool measures the patient's risk of developing a pressure ulcer based on six subscales. Nursing students need to understand that assessment is based on the patients sensory perception, skin exposure to moisture, activity level, mobility, nutritional level, and level of friction and shear (Wilchesky & Lungu, 2015). After assessing the patient within each subscale, a score from 1 to 4 is assigned alongside narrative descriptors that assist the clinician to identify the correct subscale level (2015). The only exception in the assessment is that the subscale measuring the extent of friction and shear that the patient is exposed too, which is scored from 1 to 3. The sum of the subscales provides the overall score, which ranges from 6-23 to identify the patient's current level of risk in developing a pressure ulcer. Patients scoring with a lower number indicate a higher risk of developing a pressure ulcer. At the same time, patients scoring with a higher number indicate a lower risk of developing a pressure ulcer. After the level of risk has been identified, nursing care then becomes directed towards preventing the development of a pressure ulcer for the identified patient.

Further assessment includes identifying the exposure of the patient's skin to moisture. Wet skin becomes more vulnerable to friction and shearing. Therefore, a patient with a low Braden Scale will need to have their level of continence assessed. The student nurse must also be able to assess the amount of urine, feces, perspiration, and wound drainage that may be present on the skin of the patient during the day (Keast,

Parslow, Houghton, Norton, & Fraser, 2007). After continence has been evaluated, a personalized toileting program needs to be initiated to minimize the risk of moisture on the patient's skin. Finally, the student nurse must work to maximize the mobility of the patient to decrease the friction and shear during positioning and transferring (2007).

Aside from predicting risk to a patient, the Braden Scale is also used to indicate the interventions needed to prevent Stage I pressure ulcers in the plan of care for the client. For example, if a student were assigned a patient with a lower Braden Scale score, they would have to implement extensive interventions in all of the subscales to reduce overall risk to the patient. However, if the student were assigned a patient with a low rating only in the mobility subscale, they would need to understand to develop interventions to ensure that their patient is being frequently repositioned to alleviate pressure over the bony prominences of the patient (Magnan & Maklebust, 2009).

Nevertheless, the ability to assess, interpret, and develop care plans based on the findings of this tool is a challenge to many nursing students. While there is no research available specific to nursing students, one study did report the results of a survey of 629 American and Canadian nurses in acute care. This report indicated that 44% of the nurses were not able to correctly identify the purpose of the Braden Scale (Magnan & Maklebust, 2009). Specifically, this finding was common among the younger, inexperienced nurses who had just entered the profession (2009).

Issues Associated with The Braden Scale

There was some conflicting evidence in the review supporting the role of the Braden Scale in patients at risk for developing a Stage I Pressure Ulcer. A retrospective

study concluded that the Braden Scale might not be as effective for individuals 80 years and older with high levels of comorbidity (Chen, Cao, Zhang, Wang, & Huai, 2015). At the same time, a systematic review challenged the use of the Braden Scale in LTC because of its low specificity (Wilchesky & Lungu, 2015). However, because the researchers were unable to conclude if this finding was due to the preventative interventions implemented by staff on admission, they continued to further endorse the use of this tool with geriatric populations.

Nursing Education and the Braden Scale

While the research in the review was not specific to nursing students, there was conflicting evidence supporting the use of technology based training modules to increase the competency of nurses using the Braden Scale. A quasi-experimental study implemented a Web based training module to teach RN's how to use the Braden Scale correctly to make risk assessments and select risk-based interventions based on their findings. The module that was used also included the use of case studies to teach the nurses to make reliable Braden Scale assessments and select appropriate preventative interventions for their patients (Magnan & Maklebust, 2009). The findings of this study strongly supported the use of technology and case studies to increase the reliability of the nurse's assessment on the subscales of the Braden Scale (2009).

Additionally, another quasi-experimental study further reported that Web based Braden Scale training increased the reliability and precision of pressure ulcer risk assessments. After providing technology assisted training alongside working with simulated case study data, RN's using the Braden Scale were able to accurately assess

pressure ulcer level of risk 75.6% to 82.6% of the time (Magnan & Maklebust, 2008). This reinforced the value in helping new users of the Braden Scale increase the reliability of their assessments with the use of technology based learning resources. Using this type of technology to create the learning module will be further explored in consultations with both faculty and students at UOIT.

However, there are findings that also indicate that an E-Learning program did not improve Braden Scale sub scores, but did improve the ability of the nurses to classify pressure ulcers during assessment (Bredesen, Bjoro, Gunningberg, & Hofoss, 2016). While the researchers acknowledged that the findings may have been influenced by the participant's confidence with computers and Web Based Learning, more clarification is needed.

Critical Implications of the Literature Review

The literature reviewed reinforced the validity of using the Best Practice recommendations endorsed by the RNAO to prevent pressure ulcers with geriatric populations. Concurrently, all preventative interventions originated from the standards published by this organization. This reinforces the need that the learning module needs to include these recommendations for nursing students at UOIT. Including this information ensures that the students will provide evidence-based interventions for patients at the risk of developing a Stage I pressure ulcer during their clinical rotations in NURS 1700.

Studies in the review also supported the use of the E-Learning to teach the Braden Scale. E-Learning was a broad term used in the research to describe computer-based learning, Web based learning, and digital collaboration (Chuang, Cheng, Yang, Fang, &

Chen, 2010). Although the studies were used with RN's, this type of learning module offers many benefits to nursing students because it provides independent and flexible learning. UOIT implements technology based educational resources for both faculty and students, and using this type of platform to teach The Braden Scale to the students will be explored during the consultation process.

However, there is a need for further research to clarify the efficacy of Web-Based training modules in Braden Scale education. Current research studying this trend is extremely limited, and findings also indicate that E-Learning technology did not improve subscale scoring, but did improve pressure ulcer classification between student and practicing nurses (Bredesen, Bjoro, Gunningberg, & Hofoss, 2016). Nevertheless, E-Learning was determined to have greater accuracy of pressure ulcer classification than classroom teaching (2016).

The review also strongly endorsed the use of the Braden Scale to assess a patient's level of risk to develop a Stage I Pressure Ulcer. There is strong evidence supporting the use of this tool to assess risk with geriatric populations. In addition, there is also a need to understand to teach the student how to assess, interpret, and provide interventions to the patient based on all levels of assessment used by this tool. Understanding how the Braden Scale is taught in the current curriculum needs to be further explored during consultations with faculty members at UOIT.

Finally, there was a significant lack of educational research available to nursing educators trying to teach the Braden Scale to their nursing students. While there was information available for teaching new RN's, there was nothing specific to teaching

nursing students. Educational campaign have shown to increase pressure ulcer assessment to analyze factors to take targeted preventative measures to reduce occurrence (Haixia, Guohong, Cuirong, & Changping, 2016). However, there is no clear research available on integrating the Braden Scale in both education and curriculum development within a BSCN program. This indicates a strong need for further research to prepare graduating nursing students to provide evidence based care for their patients as they enter the nursing profession.

Theoretical Framework

The learning module will be developed using Knowles Adult Learning Theory. This theoretical framework will be used to guide how they will learn risk management using the module. This learning tool will be developed through consultations with both faculty members and nursing students at UOIT. At the same time, this theoretical framework is the most appropriate to provide adult learning that is self-directed, practical, and germane to the students enrolled in NURS 1700. By combining both the information collected during consultations with the principles of this conceptual framework, the learning module will be customized to the needs of the students within the BSCN program at UOIT.

There are four principal assumptions of adult learning within Knowles Adult Learning Theory. The first principle describes the self-concept of the adult learner promoting the belief that adults need to be invested in the planning and evaluation of their instruction (Chesbro, 2002). At the same time, the second principle is related to personal experiences. This assumption states that adult learners see all personal

experience, including mistakes, as opportunities for learning to occur (Chesbro, 2002). Related to the first principle is the third, which discusses that there needs to be a readiness to learn. Adult learners are motivated to learn of the content has personal relevance that can be applied to their personal and professional lives (2002). Similar to the third principle, the fourth examines how adult learning is problem centered, and that the application of new knowledge is central to the orientation of learning (2002).

This theoretical framework will address of these principles using Adult Learning Theory. Based on the data collected during the consultation process, BSCN students at UOIT will be asked to provide suggestions as to how the learning module can assist them to increase their knowledge and clinical skills development working with geriatric populations during their clinical rotations. The module will demonstrate these principles by providing case studies to simulate clinical experiences and developing clinical competency with patients at risk of developing Stage I Pressure Ulcers.

Conclusion

Students entering NURS 1700, Health and Healing of the Older Adult, are expected to understand how to provide nursing care for their patients. This includes identifying level of risk and providing interventions that work to minimize the damage that can occur to their patient. The research clearly illustrates that pressure ulcers can be prevented easily using routine measures in any clinical setting. As the primary responsibility of preventing pressure ulcers reside in the care that nurses provide, these measures cannot be applied to practice if the knowledge is lacking. Therefore, developing

a learning resource will assist-nursing students develop this knowledge to help prevent Stage I Pressure Ulcers.

The studies included in this review reinforced the necessity of preventative measures in nursing care for patients at risk of developing a Stage I Pressure Ulcer. The research illustrated the importance of using the Braden Scale to effectively measure risk of patients, and the use of preventative interventions to reduce the risk of developing a Stage I Pressure Ulcer.

References

Aydın, G., & Mucuk, S. (2015). The Evaluation of Daily Living Activities, Pressure Sores and Risk Factors. *Rehabilitation Nursing*, *40*(2), 84-91. doi:10.1002/rnj.145

Braga, I., Pirett, C., Ribas, R., Gontijo, F., & Filho, A. (2013). Bacterial colonization of pressure ulcers: Assessment of risk for bloodstream infection and impact on patient outcomes. *Journal of Hospital Infection,* 83(4), 314-320 doi: 10. 1016/j.jhin.2012.11.008

Bredesen, I. M., Bjøro, K., Gunningberg, L., & Hofoss, D. (2016). Effect of e-learning program on risk assessment and pressure ulcer classification — A randomized study. *Nurse Education Today*, *40*191-197. doi:10.1016/j.nedt.2016.03.008

Chen, H., Cao, Y., Zhang, W., Wang, J., & Huai, B. (2015). Braden Scale is not suitable for assessing pressure ulcer risk in individuals aged 80 and older. *Journal Of The American Geriatrics Society*, *63*(3), 599-601 3p. doi:10.1111/jgs.13303

Chesbro, S., & Davis, L. (2002). Applying Knowles' Model of Andragogy to individualized osteoporosis education. *Journal Of Geriatric Physical Therapy*, *25*(2), 8-11 4p.

Chuang Y; Cheng H; Yang Y; Fang M; Chen Y. (2010) The effects of a Web-based supplementary program for facilitating nursing students' basic nursing skills. CIN: *Computers, Informatics, Nursing, 28(5),* 305-310

Halfens, R., Bours, G., & Van Ast, W. (2001). Relevance of the diagnosis 'stage 1 pressure ulcer': an empirical study of the clinical course of stage 1 ulcers in acute care and long-term care hospital populations. *Journal Of Clinical Nursing*, *10*(6), 748-757 10p. doi:j.1365-2702.2001.00544.x10.1046/j.1365-2702.2001.00544.x

Haixia, F., Guohong, L., Cuirong, X., & Changping, J. (2016). Educational campaign to increase knowledge of pressure ulcers. *British Journal Of Nursing*, *25*(12), S30-S35.

Keast, D., Parslow, N., Houghton, P., Norton, L., & Fraser, C. (2007). Best practice recommendations for the prevention and treatment of pressure ulcers: Update 2006...reprinted with permission from Wound Care Canada. *Advances In Skin & Wound Care*, *20*(8), 447-462 16p.

Maida, V., Ennis, M., & Corban, J. (2012). Wound outcomes in patients with advanced illness. *International Wound Journal*, *9*(6), 683-692. doi:10.1111/j.1742-481X.2012.00939.x

Magnan, M., & Maklebust, J. (2009). The effect of Web-based Braden Scale training on the reliability of Braden Subscale ratings. *Journal Of Wound, Ostomy & Continence Nursing*, *36*(1), 51-59 9p. doi:10.1097/WON.0b013e3181919b8d

Magnan, M. & Maklebust, J. (2008). The effect of Web-based Braden Scale training on the reliability and precision of Braden Scale pressure ulcer risk assessments. *Journal of Wound, Ostomy, & Continence Nursing, 35(2),* 199-208.

Medical Advisory Secretariat. Management of chronic pressure ulcers: An evidence-based analysis. Ontario Health Technology Assessment Series 2009;9(3).

Quality Compass. (2015) Pressure ulcers. Retrieved from: http://qualitycompass.hqontario.ca/portal/long-term-care/Pressure-Ulcers#.Vz3U34RG__R

Ranzani, O. T., Simpson, E. S., Japiassú, A.,M., & Noritomi, D. T. (2016). The challenge of predicting pressure ulcers in critically ill patients: A multicenter cohort study. *Annals of the American Thoracic Society, 13*(10), 1775-1783. doi:http://dx.doi.org/10.1513/AnnalsATS.201603-154OC

Thompson, P., Langemo, D., Anderson, J., Hanson, D., & Hunter, S. (2005). Skin care protocols for pressure ulcers and incontinence in long-term care: a quasi-experimental study. *Advances In Skin & Wound Care*, *18*(8), 422-429 8p.

Touhy, T., Jett, K., Boscart, V., & McCleary, L. (2012). *Gerontological nursing and healthy aging.* Toronto: Elsevier.

Wilchesky, M., & Lungu, O. (2015). Predictive and concurrent validity of the Braden scale in long-term care: A meta-analysis. *Wound Repair & Regeneration*, *23*(1), 44-56

Table A: Best Practice Recommendations for the Prevention and Treatment of Pressure Ulcers: Update 2006

Name, Author, Date, Study, Objectives	**Sample/Groups (Size, Settings, Characteristics)**	**Design and Methodology**	**Key Results/ Findings**	**Strengths/Limitations**	**Conclusion and Rating**
"Best Practice Recommendations for the Prevention and Treatment of Pressure Ulcers" by Keast, Parslow, Houghton, Norton, & Fraser (2007). **Purpose:** Enhance the professional nurses knowledge of the best practice recommendations for the prevention and treatment of pressure ulcers	Literature review of CINAHL, Medline, and Cochrane databases. Article combines key recommendations and examines level of evidence supporting each.	Narrative Review used to determine levels of evidence for RNAO recommendations for 2006 guidelines.	RNAO recommendations are extensive and not easy to access. Strong levels of evidence do not support some of the recommendations.	**Strengths** Appeared to have a comprehensive search for research literature. **Limitations** No discussion as to how studies were appraised. No inclusion criteria for studies, did not indicate how many were used in review Lack of rigor in review process.	Moderate Study provides good critical appraisal of level of evidence supporting 2006 recommendations.

Table B: Relevance of the Diagnosis "Stage I Pressure Ulcer": An Empirical Study of the Clinical Course of Stage I Ulcers in Acute Care and Long Term Care Hospital Populations.

Name, Author, Date, Study, Objectives	**Sample/Groups (Size, Settings, Characteristics)**	**Design and Methodology**	**Key Results/ Findings**	**Strengths/Limitations**	**Conclusion and Rating**
"Relevance of the Diagnosis "Stage I Pressure Ulcer": An Empirical Study of the Clinical Course of Stage I Ulcers in Acute Care and Long Term Care Hospital Populations" by Halfens, Bours, and Van Ast (2001). 4 Research Questions clearly provided.	N=35 6 acute care hospitals, 6 long-term care facilities were selected from 35 acute care hospitals and 17 long term care facilities in the Netherlands.	Descriptive Exploratory Study Prospective, Descriptive, and Comparative Study Design Used Braden Scale for assessment of pressure ulcer in patients and residents.	Findings indicate that paying extra attention to the measurement of Stage I during a prevalence measurement seems to reduce the occurrence of identified Stage I ulcers by 50%	**Strengths** Demographic Information provided Cohen's kappa reported Statistical testing appropriate- T Testing done between groups **Limitations** Did not indicate if random sampling was used in establishing comparison of groups.	High Study validated need for preventative measures when a Stage I pressure is detected.

Table C: Skin Care Protocols for Pressure Ulcers and Incontinence in Long-Term Care: A Quasi-Experimental Study

Name, Author, Date, Study, Objectives	**Sample/Groups (Size, Settings, Characteristics)**	**Design and Methodology**	**Key Results/ Findings**	**Strengths/Limitations**	**Conclusion and Rating**
"Skin Care Protocols for Pressure Ulcers and In Thompson, Langemo, Anderson, Hanson, & Hunter (2005)continence in Long-Term Care: A Quasi-Experimental Study" by **Objective** To evaluate the effect on pressure ulcer prevalence, incidence, and healing time of incorporating use of a specific body wash and a skin protectant.	**Setting**- 2 rural long term care facilities. n=136	Quasi experimental intervention study Convenience sampling used Braden Scale used for assessment in study	Overall incidence of Stage I and Stage 11 decreased significantly when a body wash and skin protectant were added into routine skin care.	**Strengths** Research questions clearly stated. Large sample used All key concepts defined clearly Statistical testing appropriate to research questions **Limitations** Study only occurred during a 3 month period Different adherence to the standards between the 2 facilities	High Study indicates the need for further research into use of body wash and skin protectant to reduce occurrence of pressure ulcers.

Table D: Predictive and Concurrent Validity of the Braden Scale In Long Term Care: A Meta Analysis

Name, Author, Date, Study, Objectives	**Sample/Groups (Size, Settings, Characteristics)**	**Design and Methodology**	**Key Results/ Findings**	**Strengths/Limitations**	**Conclusion and Rating**
"Predictive and Concurrent Validity of the Braden Scale In Long Term Care: A Meta Analysis" (2015) by Wilchesky and Lungu **Purpose:** this study undertook a systematic review and meta-analysis of both the predictive and concurrent ability of the Braden Scale's use as a tool within this context.	All key words provided, search strategies included 9 articles met the inclusion criteria	Systematic review and meta analysis Statistical Testing done	The appropriateness of the Braden Scale in LTC is questionable given its low specificity and PPV, in particular in concurrent validity studies.	**Strengths** Review used large number of studies to pool data Provided good suggestions for future research **Limitations** Low PPV of the Braden Scale could be due to due to preventative measures established by the nursing staff, which could be working to mitigate the risk.	High Student indicates need for further research into the predictive ability of the Braden Score.

Table E: The Effect of Web-Based Braden Scale Training on the Reliability of Braden Subscale Ratings

Name, Author, Date, Study, Objectives	**Sample/Groups (Size, Settings, Characteristics)**	**Design and Methodology**	**Key Results/ Findings**	**Strengths/Limitations**	**Conclusion and Rating**
"The Effect of Web-Based Braden Scale Training on the Reliability of Braden Subscale Ratings" (2009) by Magnan & Macklebust **Purpose:** To evaluate the effect of Web-based Braden Scale training on the reliability of Braden Scale subscale ratings made by nurses working in acute care hospitals	Setting 3 medical centers in Michigan Convenience sampling used N= 381 RN to expert dyad	**Design:** Secondary analysis of data from a recently completed quasi-experimental, pretest, posttest, interrater reliability study	Web based training significantly increased knowledge of nurses using the Braden Scale Recommendations for further research needed for educational training for students and practicing nurses using the Braden Scale	**Strengths** Large sample used Statistical Testing appropriate **Limitations** Not easily generalized because of urban location	High Demonstrated effectiveness of Web Based Training on increasing RN competency using the Braden Scale.

Table F: The Effect of Web-Based Braden Scale Training on the Reliability and Precision of Braden Scale Pressure Ulcer Risk Assessments

Name, Author, Date, Study, Objectives	**Sample/Groups (Size, Settings, Characteristics)**	**Design and Methodology**	**Key Results/ Findings**	**Strengths/Limitations**	**Conclusion and Rating**
"The Effect of Web-Based Braden Scale Training on the Reliability and Precision of Braden Scale Pressure Ulcer Risk Assessments" (2008) by Magnam & Maklebust **Objective:** To evaluate the effect of Web-based Braden Scale training made by Registered Nurses.	**Setting-**500 Braden Scale assessments were made on 102 acute care patients at varied levels of risk for pressure ulcers. Convenience sampling used 500 Braden Scale assessments were conducted across 102 patients n= 102	**Design** Pretest, posttest, 2 groups, quasi experimental design.	After receiving Web based Braden Scale training, new users of the tool were able to make reliable risk assessments 84% of the time.	**Strengths** Large sample used Large number of assessments completed Statistical Testing appropriate **Limitations** Limited to RN's working in acute care settings.	High Indicates that the use of E Learning Modules can increase nursing precision in assessments.

Appendix B – Consultation Report

Introduction

In NURS 1003, Foundations for Nursing Practicum I, Bachelor of Science Nursing Students (BSCN) learn about The Braden Scale and prevention of Stage I Pressure Ulcer at The University of Ontario Institute of Technology (UOIT). During the second semester of their program, the students begin NURS 1700, Health and Healing of the Older Adult, where they are expected to integrate the Braden Scale into their clinical practice. Many of the students express being comfortable applying interventions for prevention of Stage I Pressure Ulcers; however, the students did not report feeling confident in using the Braden Scale during their clinical rotations. Developing a learning module specific to the application of The Braden Scale for first year students in NURS 1700 will help to provide these students with a solid foundation to build their assessment and clinical skills to provide better outcomes for their patients as they enter the nursing profession.

Student nurses need to understand that nursing care to prevent Stage I Pressure Ulcers is consistent with all areas of clinical practice. It is critical that a student nurse understands the delicate interplay of factors on the healing process of the patient because if one of these factors is overlooked in assessing level of risk to the patient, wound healing may be impaired and prolonged. Alongside identifying the personal factors that contribute to placing a patient at risk for developing a pressure ulcer, research supports the use of validated risk assessment tools to assess the skin condition of a patient upon entry to the health care system (Keast, Parslow, Houghton, Norton, & Fraser, 2007). The

most basic means of providing prevention requires the use of a screening tool. The Braden Scale is the most common diagnostic tool used to assess risk for developing a pressure ulcer used in clinical nursing practice.

The literature review reinforced the Best Practice Guidelines of the Registered Nurses Association of Ontario (RNAO) for prevention of Stage I Pressure Ulcers. At the same time, the incidence studies in the review supported the use of the Bottom Up Model in explaining the pathology of a pressure ulcer within the learning module. However, the review also indicated numerous issues related to teaching The Braden Scale to student nurses and nursing education. Research indicates that nursing students are entering the profession being unable to correctly identify the purpose of The Braden Scale. At the same time, integrating the Braden Scale into undergraduate nursing programs is challenging for nursing educators due to limited educational research specific to curriculum development in regards to this tool.

However, there was conflicting evidence supporting the use of E-Learning technology. Web based training has demonstrated increased competency, reliability, and precision of Braden Scale assessment with inexperienced nurses recently entered the profession. However, findings have also indicated that Web-Based technology have not improved subscale scoring (Bredesen, Bjoro, & Hofoss, 2016). Despite this, findings indicate that E-Learning was determined to have greater accuracy of pressure ulcer classification than classroom teaching (2016). Therefore, the module will teach student nurses risk management using E-Learning technology, like Blackboard, to provide evidence based interventions based on Braden Scale assessments during clinical practice

(Chuang, Cheng, Yang, Feng, & Chen, 2010; Halfens, Bours, & Van Ast, 2001; Keast, Parslow, Houghton, Norton, & Fraser, 2007; Magnan & Maklebust, 2008; Magnan & Maklebust, 2009; Wilchesky & Lungu, 2015).

The consultation process was developed based on the results of the literature review. Based on the findings of the literature review, the learning module will be developed using current E-Learning technology used at UOIT to teach the students the critical application of The Braden Scale in NURS 1700, Health and Healing of the Older Adult. This includes technology-based platforms such as Blackboard, Elsevier, Evolve/Elsevier online textbook and the class repository, Meditech. The content of the module will be determined using both a focus group and personal interviews with the BSCN students at UOIT.

Purpose of Consultations

(1) To determine the best way to facilitate applied learning of the Braden Scale for nursing students in their clinical rotations.

Setting and Sample

Consultations occurred with both nursing students and a faculty member of UOIT. Interviews were semi-structured, and the type of interview conducted was determined according to the convenience of the participant. The focus group occurred on site at the university in a closed classroom, and was comprised of 15 BSCN students in the Accelerated Learning Program at the end of their fourth year. The other participants volunteered to conduct their interview via email. The final sample consisted of 16 students, and one faculty member. Fourth year students provided data during

consultations because they were able to provide a broader perspective on the learning needs of the students in the program.

Data Collection

Convenience sampling was used to recruit both faculty and student participants. Dr. Smye, Associate Professor and Director of Nursing at UOIT, initiated recruitment for the practicum.. Initially, Dr. Smye, sent an introductory email to both faculty and student in the BSCN program to facilitate the recruitment process at UOIT. The email outlined the project, and contact information was provided for voluntary participation in the consultations.

First, a fourth year class in the Accelerated BSCN program indicated an interest in participating in a focus group. Despite the email requesting participation in the interviews to all students, the only participants who volunteered for participation were in their fourth year of the program. Following this, interested participants began to come forward. All respondents were asked how they wished to conduct their interview. Both students and one faculty member expressed an interest in using email for their interviews. Based on the literature review and my experiences teaching clinical at UOIT, two sets of questions had to be developed to meet the needs of the key informants. One set of questions was developed for the students, and another was created to use with the faculty member for the consultations. Prior to the onset of the interview, participants were informed of the purpose of the interview, and how the information would be used in the development of the learning module. For the interview guide, please see Appendix A.

Written consent to participate in the interview was obtained prior to the interview. The focus group was conducted in a closed classroom at UOIT. As the class volunteered to participate, implied consent was given before the start of the interview. Due to time constraints, the focus group lasted 20 minutes, and notes were taken to capture the responses from the participants. Interviews were semi-structured, and questions were both open and closed. All email interviews were printed, and deleted from the computer to ensure privacy. All notes were numerically coded to ensure privacy and confidentiality.

Data Management and Analysis

Detailed notes were taken during data collection. In addition to the focus group, all following consultations was conducted by email at the preference of the participants. All participants were aware that the data would be analyzed and used for the development of the module. Conventional content analysis was used to analyze the data collected during consultations. All data was extensively reviewed to interpret the information collected. Alphabetic codes were used to highlight words of the text that became key concepts in the data. Labels were then added to separate key concepts, as data began to cluster into themes that emerged from the data. Themes became key findings, which informed the direction of the learning module.

Ethical Considerations

The Health Research Ethics Review (HREA) Board screening tool was completed during the consultation plan (see Appendix B). The results of this assessment concluded that this practicum is for project development quality and evaluation that means that

review by an Ethics Board is not necessary. No risks were posed for participation, and all consultations were conducted on a voluntary basis. Nevertheless, voluntary consent was implied when the focus group volunteered for participation. All interviews were numerically coded to protect the identity of the participant, and full anonymity was considered.

Key Findings

A total of 18 participants participated in consultations. Fifteen participants interviewed in the focus group, 1 was an individual consultation, and 1 faculty member. At the time of recruitment, only one faculty member volunteered for participation in the consultations. During the time of interviews, many faculty members were on vacation during the summer. At the same time, consent was obtained from one further participant, and the interview questions were emailed to her. The participant did not return her responses to the interview questions. Data analysis revealed 4 major themes within the consultation findings. Key themes are; (i) student knowledge and The Braden Scale; (ii) availability and quality of support teaching The Braden Scale; (iii) feeling unprepared during clinical rotation; (iv) and, preferred learning styles of nursing students related to The Braden Scale at UOIT.

I. Student Knowledge and The Braden Scale

Similar to the findings of the literature review, the participants reported retrospective knowledge deficits related to The Braden Scale during the consultations. Similarly, the research included in the review indicated that the ability to assess, interpret, and develop care plans based on the findings of The Braden Scale is a challenge to many

nursing students. One study in the review concluded that 44% of younger, inexperienced nurses who had just entered the nursing profession were not able to correctly identify the purpose of the Braden Scale (Magnan & Maklebust, 2009). This finding indicates that nursing students need to be learn to assess, interpret, and provide evidence based nursing care to their patients to prevent the occurrence of Stage I Pressure Ulcers.

During the consultations, all participants acknowledged that they felt that the lectures they had attended prior to their clinical rotation of NURS 1700 had not taught the application of The Braden Scale used to prevent Stage I Pressure Ulcers. While the students acknowledged that the lectures were provided to prepare them with foundational clinical skills they would need to begin their clinical rotations, they also reported that they failed to connect the theoretical knowledge with the practical application of The Braden Scale during patient care. Arriving at their rotations, many of the units had fully integrated the patient's Braden Scale into the care plans and Kardex of the patients. Additionally, the staff nurses also verbalized current Braden Scale scores discussing patients during morning report. The students reported that it was being assumed that they understood how to apply this knowledge by both the nursing staff and their instructor.

The participants identified specific learning needs related to The Braden Scale in the interviews. All students concurrently reported difficulty in learning how to use the scale to assess the level of risk to their patients. The students reported feeling intimidated and unsure about assigning a number in the subscales of the tool because they lacked the confidence necessary to trust their clinical judgment. At the same time, the participants reported difficulty in interpreting the scores of their patients in the Kardex during data

collection. All of the participants agreed that with more education about the application of The Braden Scale and the best practice guidelines of the RNAO, it would be easier to provide evidence-based practice to their patients during their clinical rotations.

II. Availability and Quality of Support Teaching The Braden Scale

Due to their knowledge deficits in risk management of Stage I Pressure Ulcers, the students seek out alternate ways of obtaining the information necessary to integrate The Braden Scale in their clinical practice during the rotation. This means that the choice of educator can be random; some of the students reported being taught by their instructor, while others reported eventually learning from staff nurses while on the unit. This consultation finding verifies the information gap identified in the literature review. There is a significant lack of research available to nursing educators to provide assistance on integrating The Braden Scale into both education and curriculum development in a BSCN program. Currently, The Braden Scale is being taught in Foundations of Nursing Practicum I at UOIT. While the students are learning this within the theoretical section of the course, the evaluation is not using applied learning to integrate the knowledge for practice within the clinical setting. However, the students begin their clinical rotations requiring further education about The Braden Scale that has to be provided by staff nurses and clinical instructors.

Many of the students reported that they did not feel comfortable being taught about The Braden Scale by staff nurses on the unit. The participants acknowledged that they did learn valuable information as nurses mentored them during the course of their

clinical rotations. At the same time, they also expressed concerns that the staff nurses seemed rushed while teaching them.

Nevertheless, the students consistently reported that they would have felt more comfortable learning the application of The Braden Scale prior to the beginning of their clinical rotation. The students reported that this would mean that they would have the time needed to properly learn the model, and that they would benefit more when the staff nurses were teaching them.

III. Feeling Unprepared During Clinical Rotation

The literature review indicated that nursing students need to understand that assessment is based on the patients sensory perception, skin exposure to moisture, activity level, mobility, nutritional level, and level of friction and shear (Wilchesky & Lungu, 2015). After the level of risk has been identified, nursing care then becomes directed towards preventing the development of a pressure ulcer for the identified patient. In addition to predicting level of risk to a patient, the nursing student also needs to understand what interventions are needed to prevent Stage I pressure ulcers while developing the plan of care for their patient. The students need to be able to understand how ratings within the subscales work to reduce overall risk to the patient. The consultations, especially the focus group, reported that they did not understand the complexity of The Braden Scale and how it is used in clinical practice.

Initially, the students reported that the learning module would be valuable by providing them an opportunity to learn the application of The Braden Scale prior to the start of their clinical rotation. The students also reported that they wanted the module to

teach them how to assess a patient's level of risk using the six subscales of assessment in The Braden Scale. They also want the learning module to teach how to interpret the findings. Both faculty and students widely supported the use of case studies to teach the critical application of The Braden Scale. The students felt that case studies would give them a chance to critically apply this information before the start of their clinical rotation. Faculty concurred with this notion, and added that the case studies should be developed to simulate the application of The Braden Scale with geriatric populations of NURS 1700. Using case studies would give students the experience that they need to assess, interpret, and provide interventions to patients based on the outcome of their Braden Scale assessment. Consistent with the research included in the review, there is strong evidence supporting use of case studies in increasing the reliability, precision, and accuracy of nursing assessments using The Braden Scale (Magnan & Maklebust, 2009).

IV. Preferred Learning Styles of Nursing Students Related to The Braden Scale at UOIT

While the educational research on The Braden Scale is limited, using technology-based training modules has increased the competency of inexperienced nurses using The Braden Scale in clinical practice. Quasi experimental studies using Web Based training modules to teach RN's how to use the Braden Scale correctly. Alongside the use of the modules, case studies were also included to teach how to select the appropriate preventative interventions for the patients based on Braden Scale assessments (Magnan & Maklebust, 2008). These studies supported the use of technology and case studies to increase the reliability and accuracy of pressure ulcer assessments.

Both faculty and students expressed a desire for the module to be used in the NURS 1700 course content on Blackboard. Faculty consultation indicated a wide variety of technological support available at UOIT for the development of the learning module. Platforms include Blackboard, Elsevier, Evolve/Elsevier online textbook and the class repository, Meditech. However, both groups concurrently agreed that the primary content of the module should include general information about how to assess the level of risk using the Braden Scale. After the student had completed this section, case studies should be included to simulate the experience of assessing a patient at risk of developing a Stage I Pressure Ulcer in clinical practice. A clinical pathway map that is downloadable for reference should be included in the learning module. Students also expressed a desire for this to demonstrate how to apply interventions according to the findings of The Braden Scale should be included on this reference. At the same time, both faculty and students indicated that the case studies should also be downloadable. Current policy at UOIT promotes the use of using digital technology on the learning management system for student learning. Using this format, the case studies could be used with the clinical instructor at the start of the clinical rotation to facilitate both individual and group learning about The Braden Scale.

Conclusion

The consultation process demonstrated that both students and faculty at UOIT feel that there is a need for educational specific components of The Braden Scale in NURS 1700. This knowledge gap was supported by research findings from the literature review. The lack of educational materials available on the use of the Braden Scale in nursing

education reveals that further research is needed to teach nursing the application of The Braden Scale working with clients at risk of developing a Stage I Pressure Ulcer. The Best Practice Guidelines of the RNAO (2002) will be included in the module for teaching nursing students how to apply their Braden Scale alongside evidence based nursing interventions during patient care.

The learning module will address selected issues related to the literature review and the consultation process. Concurrent with research findings, Web-based learning and case studies has proven to be successful in increasing the reliability of Braden Scale assessments with RN's. Based on the data collected during the consultations, the module will be delivered to the nursing students in NURS 1700 via Blackboard as part of the course content section of the learning module. The potential benefit is that this will introduce basic risk assessment using The Braden Scale to provide evidence-based practice within the clinical setting. Case studies will also be included to teach critical application of The Braden Scale. The case studies can also be used a point of dialogue between nursing students and clinical instructor in preparation for providing nursing care to their patients in the clinical setting. Both the content and case studies will be utilized to help prepare student nurses to use The Braden Scale while working with patients at risk of developing a Stage I Pressure Ulcer during NURS 1700.

References

Bredesen, I. M., Bjøro, K., Gunningberg, L., & Hofoss, D. (2016). Effect of e-learning program on risk assessment and pressure ulcer classification — A randomized study. *Nurse Education Today*, *40*191-197. doi:10.1016/j.nedt.2016.03.008

Chuang Y; Cheng H; Yang Y; Fang M; Chen Y. (2010) The effects of a Web-based supplementary program for facilitating nursing students' basic nursing skills. CIN: *Computers, Informatics, Nursing, 28(5),* 305-310

Halfens, R., Bours, G., & Van Ast, W. (2001). Relevance of the diagnosis 'stage 1 pressure ulcer': an empirical study of the clinical course of stage 1 ulcers in acute care and long-term care hospital populations. *Journal Of Clinical Nursing*, *10*(6),748-757 10p. doi:j.1365-2702.2001.00544.x10.1046/j.1365-2702.2001.00544.x

Keast, D., Parslow, N., Houghton, P., Norton, L., & Fraser, C. (2007). Best practice recommendations for the prevention and treatment of pressure ulcers: Update 2006...reprinted with permission from Wound Care Canada. *Advances In Skin & Wound Care*, *20*(8), 447-462 16p.

Magnan, M., & Maklebust, J. (2009). The effect of Web-based Braden Scale training on the reliability of Braden Subscale ratings. *Journal Of Wound, Ostomy & Continence Nursing*, *36*(1), 51-59 9p. doi:10.1097/WON.0b013e3181919b8d

Magnan, M. & Maklebust, J. (2008). The effect of Web-based Braden Scale training on the reliability and precision of Braden Scale pressure ulcer risk assessments. *Journal of Wound, Ostomy, & Continence Nursing, 35(2),* 199-208.

Registered Nurses Association of Ontario. (2002). Risk Assessment and Prevention of Pressure Ulcers. Retrieved from http://rnao.ca/sites/rnao-ca/files/storage/related/639_BPG_Pressure_Ulcers_v2_summary.pdf

Wilchesky, M., & Lungu, O. (2015). Predictive and concurrent validity of the Braden scale in long-term care: A meta-analysis. *Wound Repair & Regeneration*, *23*(1), 44-56

Appendix A:

Interview Guide

Student Interviews (Including individual and focus group interview)

1. Would you find case studies helpful in learning how to apply the Braden Scale during your clinical assessments?
2. Is a clinical map of best practice guidelines useful as a resource while you are in clinical to assist you with a patient who is at risk of developing a Stage I Pressure Ulcer?
3. What type of technological resources do you find useful for teaching clinical interventions?
4. Is there anything else you would like to add?

Faculty Interviews

1. Do you think that using case studies in the learning module would be helpful in developing the critical thinking skills of the students while using the Braden Scale during their clinical rotations?
2. Is teaching the Braden Scale included before the students begin their clinical rotations?
3. Do students in the BSCN program learn about primary prevention of Stage I Pressure Ulcers during their health assessment course?
4. What types of technology-based resources are being used to deliver educational content to BSCN students at UOIT?
5. Is there anything else you would like to add?

Appendix B:

Health Research Ethics Authority Screening Tool

	Question	Yes	No
1.	Is the project funded by, or being submitted to, a research funding agency for a research grant or award that requires research ethics review	r	r x
2.	Are there any local policies, which require this project to undergo review by a Research Ethics Board?	r	r x
	IF YES to either of the above, the project should be submitted to a Research Ethics Board. **IF NO** to both questions, continue to complete the checklist.	r	r
3.	Is the primary purpose of the project to contribute to the growing body of knowledge regarding health and/or health systems that are generally accessible through academic literature?	r	r x
4.	Is the project designed to answer a specific research question or to test an explicit hypothesis?	r	r x
5.	Does the project involve a comparison of multiple sites, control sites, and/or control groups?	r	r x
6.	Is the project design and methodology adequate to support generalizations that go beyond the particular population the sample is being drawn from?	r	r x
7.	Does the project impose any additional burdens on participants beyond what would be expected through a typically expected course of care or role expectations?	r	r x

LINE A: SUBTOTAL Questions 3 through 7 = (Count the # of Yes responses)			
8.	Are many of the participants in the project also likely to be among those who might potentially benefit from the result of the project as it proceeds?	r x	r
9.	Is the project intended to define a best practice within your organization or practice?	rx	r
10.	Would the project still be done at your site, even if there were no opportunity to publish the results or if the results might not be applicable anywhere else?	rx	r
11.	Does the statement of purpose of the project refer explicitly to the features of a particular program, Organization, or region, rather than using more general terminology such as rural vs. urban populations?	r	rx
12.	Is the current project part of a continuous process of gathering or monitoring data within an organization?		**x**
LINE B: SUBTOTAL Questions 8 through 12 = (Count the # of Yes responses)			
	SUMMARY **See Interpretation Below**		

Interpretation:

- If the sum of Line A is greater than Line B, the most probable purpose is **research**. The project should be submitted to an REB.
- If the sum of Line B is greater than Line A, the most probable purpose is **quality/evaluation**. Proceed with locally relevant process for ethics review (may not necessarily involve an REB).

- If the sums are equal, seek a second opinion to further explore whether the project should be classified as Research or as Quality and Evaluation.

These guidelines are used at Memorial University of Newfoundland and were adapted from ALBERTA RESEARCH ETHICS COMMUNITY CONSENSUS INITIATIVE (ARECCI). Further information can be found at: http://www.hrea.ca/Ethics-Review-Required.aspx.

Appendix C:

Learning Module for BSCN

Students at The University of Ontario Institute of Technology for the Risk Management of Stage I Pressure Ulcers

Introduction

This learning module will help prepare nursing students to learn at The University of Ontario Institute of Technology (UOIT) to prevent pressure ulcers during clinical rotations. There are four teaching and learning sections to this module. First, the module will review the pathology of pressure ulcers. The second section will examine how to interpret and implement The Braden Scale in a nursing care plan for a patient at risk to develop a pressure ulcer. Finally, the module will conclude with case studies that apply this knowledge to prepare a nursing student during a clinical rotation.

Preface

E Learning programs are considered to be effective educational tools for nurses (Bredesen, Bjoro, Gunningberg, & Hofoss, 2016). This learning module was designed for use on an e-learning platform, like Blackboard, at UOIT. This module has six sections that provide information about pressure ulcers and the use of the Braden Scale to determine level of risk to the patients. This module will also assist nursing students to assess, interpret, and integrate Braden Scale scores to provide evidence based nursing care to patients at risk of developing a pressure ulcer.

Components of the learning module include:

Section I

i) Test Knowledge- Pre-Test

ii) Pre Test Knowledge Answers

Section II

i) Risk Factors Associated with Developing a Pressure Ulcer

ii) Definition of a Pressure Ulcer

iii) Complications of a Pressure Ulcer

iv) Early Intervention

v) Risk Assessment

Section III

i) The Braden Scale

ii) The Use of The Braden Scale

iii) Subscale Scores of The Braden Scale

iv) Nursing Interventions and the Braden Scale

v) Level of Risk and The Braden Scale

Section IV

i) Application of The Braden Scale

ii) Evaluating Scores Using The Braden Scale

iii) Implementing Scores Based on Braden Scale Scores

Section V

Online Resources

Section VI

i) Case Study Exercises

Section VII

i) Test Your Knowledge- Post Test

ii) Post Test Answers

Objectives

The educational objectives of this learning module include:

- Prepare nursing students how to identify patients at risk of developing a pressure ulcer using The Braden Scale;
- Help nursing students to identify the 6 subscales of The Braden Scale;
- Enable nursing students to learn to determine the relationship between the subscale score and levels of risk of developing a pressure ulcer; and,
- Understand how to integrate interventions in a nursing care plan based on The Braden Scale score of a patient.

Section I

The following are original questions created for the learning module.

i) Test Knowledge- Pre Test

BEFORE COMPLETING THIS ONLINE MODULE, COMPLETE THIS PRE-TEST TO DETERMINE YOUR KNOWLEDGE REGRARDING THE PREVENTION OF PRESSURE ULCERS

Answer the following true or false:

1. Stage I Pressure Ulcers are completely reversible True False

2. Only older adults are at risk for pressure ulcers. True False

3. The Braden Scale is used in all sectors of the health care system.
   True False

4. Braden Scale measurements do not change over the course of treatment
   True False

5. A score of 5 indicates a high level of risk for developing a pressure ulcer.
   True False

6. A score of 22 indicates that there is no risk present for developing a pressure ulcer.
   True False

ii) Pre Test Knowledge Answers

1. Stage I Pressure Ulcers are completely reversible ☒ **True** ☐ False

   The answer is **TRUE**. Current research indicates that prompt intervention can reverse a Stage I Pressure Ulcer within 1 to 3 weeks (Halfens, Bours, & Van Ast, 2001).

2. Only older adults are at risk for pressure ulcers. ☐ True ☒ **False**

   The answer is **FALSE**. All people that are unable to shift their positions independently to relieve pressure are considered to be at risk to develop a pressure ulcer. This includes stroke patients, people with spinal cord injuries, unconscious patients in ICU, and residents in long term care with impaired mobility (Quality Compass, 2015).

3. The Braden Scale is used in all sectors of the health care system.
   ☒ **True** ☐ False

   The answer is **TRUE**. The Braden Scale is the most commonly used risk assessment tool used in North America and is used in all sectors of the health care system (Wilchesky & Lungu, 2015).

4. Braden Scale measurements do not change over the course of treatment
   ☐ True ☒ **False**

   The answer is **FALSE**. Braden Scale measurements are on a constant continuum that varies during the course of treatment. Any change in the health status of a patient warrants a revaluation of their current Braden Scale assessment (Chen, Cao, Zhang, Wang, & Huai, 2015).

5. A score of 5 indicates a high level of risk for developing a pressure ulcer.
   ☒ **True** ☐ False

   The answer is **TRUE**. A patient with a Braden Scale score of 5 has a high risk of developing a pressure ulcer (Keast, Parslow, Houghton, Norton, & Fraser, 2007).

6. A score of 22 indicates that there is no risk present for developing a pressure ulcer.
   ☒ **True** ☐ False

The answer is **TRUE**. A Braden Scale score of 22 means that the patient is generally not at risk of developing a pressure ulcer (Keast, Parslow, Houghton, Norton, & Fraser, 2007).

Section II

i) Risk Factors Associated With Developing a Pressure Ulcer

Generally, people with limited mobility are most at risk for developing these types of wounds. Malnutrition, incontinence, loss of lean body mass, and stress to the immune system increase the risk of developing a pressure ulcer for a geriatric patient. (Registered Nurses Association of Ontario [RNAO], 2011).

ii) Definition of a Pressure Ulcer

The RNAO (2011) defines a pressure ulcer as "a lesion caused by unrelieved pressure that results in damage to underlying tissue. Pressure ulcers usually occur over a bony prominence which are staged to classify the degree of tissue damage observed." A pressure ulcer is also called a decubitus ulcer, pressure sore, or a bedsore. Ninety five percent of pressure ulcers originate in the lower regions of the body with the sacrum and the heels having the most frequent occurrence (Thompson, Langemo, Anderson, Hanson, & Hunter, 2005).

iii) Complications of a Pressure Ulcer

Having a pressure ulcer provides the patient with a high risk of mortality related to the decline in health status they experience. A patient with an ulcer can become very ill requiring extended hospital stays involving treatment that often involves invasive procedures and surgery (Braga, Pirett, Ribas, Filho, & Filho, 2013). Geriatric patients that develop a pressure ulcer experience an increase in the risk of death as much as 400 percent because of secondary complications that includes osteomyelitis and septic shock (2013). The patient experiences significant pain and suffering with a significant decrease

in quality of life. Therefore, early intervention and prevention are the most effective means of treating a patient at risk to develop a pressure ulcer (2013).

iv) Early Intervention

A Stage I Pressure Ulcer can be reversed within one to three weeks with early treatment. Early intervention is highly recommended with all patients at risk for developing a pressure ulcer because progression of the wound can be prevented. However, intervention is not possible without assessing the proper level of risk present for the patient (Aydin & Karadig, 2010). Currently, the RNAO recommends the use of The Braden Scale for predicting pressure sore risk to determine the patient's level of risk for developing a Stage I Pressure Ulcer (2011).

v) Risk Assessment

The Braden Scale is the most commonly used skin assessment tool applied in all sectors of the health care system due to its high reliability for predicting risk in clinical practice (RNAO, 2011). The Braden Scale is used to guide nursing interventions while implementing care for patients. The Braden Scale is used within a wide variety of clinical settings including long-term care, intensive care, general medical/surgical units, rehabilitation, and community placements throughout Ontario.

Section III

i) Understanding The Braden Scale

A Registered Nurse uses the Braden Scale during admission assessments to determine if a patient is at the risk of developing a Stage I Pressure Ulcer. Reassessment will also occur in response to a change in the health status of the patient during the course of their treatment. After assessment has been completed, Braden Scale scores are found in the health record of the patient to ensure communication to all members of the health care team. Braden Scale scores can be found in the Kardex, or the patient's chart during data collection. (RNAO, 2011).

ii) The Use of The Braden Scale

The Registered Nurse uses The Braden Scale to methodically assess the skin of the patient within the 6 subscales of the tool. Each subscale is used to provide an accurate evaluation of the patient's health and functional abilities, an indication of what further assessments need to be done, and what type of interventions are required to reduce the risk of the patient to develop a pressure ulcer (RNAO, 2011). The 6 subscales measure the patient's sensory perception, exposure to moisture, activity level, mobility, nutrition, and level of friction and shear to their skin. (Magnan & Maklebust 2009). As the patient is assessed within each subscale, a score from 1 to 4 is assigned to identify the correct level within the subscale. It should be noted that the friction and shear subscale is calculated from 1 to 3. After the assessment is complete, the sum of the subscales is added up to obtain the current Braden Scale score of the patient (2009).

iii) Subscale Scores of The Braden Scale

As the scores are totaled, the value ranges from 6 to 23 to identify the patient's level of risk of developing a pressure ulcer. This number also provides an estimate of the probability that a pressure ulcer can occur and also providing clear guidelines as to the types of interventions that need to be included in the care plan for the patient.

The breakdown of values is as follows;

- A score of 19-23 determines that the patient is generally not at risk.
- A score of 15-18 determines that the patient has mild risk.
- A score of 13-14 determines a moderate level of risk.
- A score of 10-12 indicates a high level of risk
- A score of 9 or below (<9) indicates a very high level of risk (RNAO, 2011).

The level of interventions that need to be included in a nursing care plan is dependent on The Braden Scale Score of the patient.

iv) Nursing Interventions and The Braden Scale

The RNAO (2011) outlines all best practice guidelines for providing interventions based on level of risk identified by the Braden Scale. However, before we can apply interventions by level of risk, the following terms need to be defined. According to the RNAO (2011), all nurses in Ontario can assess the following variables during client care to manage risk of developing a Stage I Pressure Ulcer.

- **Manage Moisture** includes using commercial moisture barriers, absorbent pads and incontinence products. This also requires nurses to implementing toileting routines alongside turning schedules to promote comfort (2011).
- **Manage Nutrition** includes increasing protein and calorie intake, supplementation, and dietary consults (2011).
- **Manage Friction and Shear** includes elevating head of bed no more than 30 degrees, encouraging the use of a trapeze to promote bed mobility, using a lift sheet for repositioning, and protecting the elbows and heels of the patient while laying in bed (2011).

v) Level of Risk and The Braden Scale

According to The RNAO (2011), interventions to prevent the development of a Stage I Pressure Ulcer by level of risk according to The Braden Scale are:

At Risk **(Braden Scale of 15-18)**	**Moderate Risk** **(Braden Scale of 13-14)**	**High Risk** **(Braden Scale of 10-12)**
Based on this score, interventions to include in nursing care plan include: • Turning Schedule • Encourage Mobility of Patient • Protect heels by using devices to relieve pressure on the feet • Manage exposure to moisture, friction, and shear. • Pressure reduction support surface if bed or chair bound.	Based on this score, interventions to include in nursing care plan include: • Turning schedule with 30 degree rule • Pressure reduction support surface • Maximal remobilization • Protect heels by using devices to relieve pressure on the feet • Manage moisture, nutrition, friction, and shear	Based on this score, interventions to include in nursing care plan include: • Pressure reduction support surface • Increase frequency of turning, 30 degrees with foam wedges • Maximize mobility • Protect heels by using devices to relieve pressure on the feet • Manage moisture, friction, and shear.

To access the Best Practice Guidelines of the RNAO, please see Section V.

Section IV

i) Application of The Braden Scale

The following case study will teach the application of The Braden Scale.

Case Study One: For case study one, there will be six questions, followed by the answers and explanations.

Patient One has been assigned to you for your clinical rotation this week. She is an 85-year-old woman with Colon Cancer. She is alert and oriented. She is 5 feet, 8 inches, and weighs 115 pounds. She spends most of her day resting in bed. While she is able to independently move her extremities in bed, she requires assistance making frequent or significant changes of position while lying down. She is able to ambulate to the bathroom and chair but requires assistance and supervision to prevent falls. While she is incontinent of stool, she is continent of urine and voids in washroom with assistance. She is occasionally moist from incontinence and she wears a brief. She has an order for activity as tolerated, and there is also an order for a dietary consult as her oral intake can be poor at times.

Directions:

You have been asked to update her Braden Scale Score and document it in her chart. You also need to ensure that the correct interventions are being implemented according to her current level of risk.

Answers:

Braden Scale Assessment of Patient One

Q 1. The first subscale in The Braden Scale is to assess is Patient One's sensory perception score. The choices are:

- A 1 (Completely Limited)
- B 2 (Very Limited)
- C 3 (Slightly Limited)
- D 4 (No impairment)

A 1. Based on the information presented, the answer is

- A 1 (Completely Limited)
- B 2 (Very Limited)
- C 3 (Slightly Limited)
- **D 4 (No impairment)**

The subscale score for sensory/perception is 4 for Patient One as she is alert and oriented.

Q2. The second subscale to assess is Patient One's exposure to moisture. Using the Braden Scale, the choices available are:

- A 1 (Constantly Moist)
- B 2 (Very Moist)
- C 3 (Occasionally Moist)
- D 4 (Rarely Moist)

A 2. Based on the information presented, the answer is;

- A 1 (Constantly Moist)
- B 2 (Very Moist)
- **C 3 (Occasionally Moist)**
- D 4 (Rarely Moist)

The subscale score for moisture is 3 for Patient One because she is occasionally incontinent of feces.

Q 3. The third subscale to assess is Patient One's activity score. Using The Braden Scale, the choices available are:

- A 1 (Bedfast)
- B 2 (Chairfast)
- C 3 (Walks occasionally)
- D 4 (Walks frequently)

A 3. Based on the information presented, the answer is:

- A 1 (Bedfast)
- **B 2 (Chairfast)**
- C 3 (Walks occasionally)
- D 4 (Walks frequently)

The subscale score for activity is 2 for Patient One because she has limited activities during the day.

Q 4. The fourth subscale to assess is Patient One's mobility score. Using the Braden Scale, the choices available are:

- A 1 (Completely Immobile)
- B 2 (Very Limited)
- C 3 (Slightly Limited)
- D 4 (No Limitations)

A 4. Based on the information presented, the answer is

- A 1 (Completely Immobile)
- **B 2 (Very Limited)**
- C 3 (Slightly Limited)
- D 4 (No Limitations)

The subscale score for Patient One's mobility is 2 because she is able to move her extremities in bed, but requires assistance in making frequent or significant changes independently.

Q 5. The fifth subscale is used to assess Patient One's nutrition score. Using the Braden Scale, the choices available are:

- A 1 (Very poor)
- B 2 (Probably Inadequate)
- C 3 (Adequate)
- D 4 (Excellent)

A 5. Based on the information presented, the answer is

- A 1 (Very poor)
- **B 2 (Probably Inadequate)**
- C 3 (Adequate)
- D 4 (Excellent)
-

The subscale score for Patient One is 2 because it is reported that her oral intake is poor and she is awaiting a dietary consultation.

Q 6. The sixth and final subscale assesses Patient One's friction and shear score. Using The Braden Scale, the choices are:

- A 1 (Problem)
- B 2 (Potential Problem)
- C 3 (No Apparent Problem)

A 6. Based on the information presented, the answer is

- A 1 (Problem)
- **B 2 (Potential Problem)**
- C 3 (No Apparent Problem)

The subscale score for Patient One is 2 because she has limited mobility while lying in bed.

After assessment has been completed, all of the subscale scores are added together to determine the level of risk for Patient One to develop a pressure ulcer.

For further resources, please see Section V.

ii) Evaluating Scores Using The Braden Scale

The first step is to add the values that you obtained during your assessment in all of the subscales. Patient One's scores are:

1. Sensory Perception- 4
2. Moisture Score- 3
3. Activity Score- 2
4. Mobility Score- 2
5. Nutrition Score- 2
6. Friction and Shear Score- 2

4+3+2+2+2+2= 15

Based on Patient One's total Braden Scale score of 15, the level of risk for developing a pressure ulcer is

A score of 19-23 determines that the patient is generally not at risk.

A score of 15-18 determines that the patient is at risk.

A score of 13-14 determines a moderate level of risk

A score of 10-12 indicates a high level of risk

A score of 9 or below (<9) indicates a very high level of risk

Based on her Braden Scale score, Patient One is determined to be at risk for developing a pressure ulcer.

For further resources, please see Section V.

iii) Implementing Scores Based on Braden Scale Scores

According to her Braden Scale score, Patient One is determined as being at risk of developing a pressure ulcer. Based on The RNAO (2011) recommends the following interventions based on her level of risk:

1. Ensure that when Mrs. G is in bed, she is turning frequently (every 2 hours) to rotate pressure points.
2. Encourage mobility
3. Protect her heels and elbows.
4. Manage moisture, nutrition, friction and shear.
5. If possible, advocate for support surfaces to reduce pressure while laying in bed or sitting in the chair.

Section V

Online Resources

For further information, please refer to the following online resources.

The Registered Nurses Association Best Practice Guidelines

http://rnao.ca/bpg/guidelines/risk-assessment-and-prevention-pressure-ulcers

The National Pressure Ulcer Advisory Panel

http://www.npuap.org/sitemap/

Here is a copy of the Braden Scale.

http://www.education.woundcarestrategies.com/coloplast/resources/BradenScale.pdf

The Institute for Health Care Improvement

http://www.ihi.org/Topics/PressureUlcers/Pages/default.aspx

Webinars from The National Pressure Ulcer Advisory Panel

http://www.npuap.org/resources/educational-and-clinical-resources/webinars-archived-also-available/

Section VI

i) Case Study Exercises

In this case study, you will learn to apply The Braden Scale in your clinical practice.

Case Study Two

You have been assigned to take care of Patient Two, who is 65 years old. He was admitted to the unit with a diagnosis of congestive heart failure. He has Type 2 Diabetes, and has a history of alcohol abuse. He has been admitted to the unit to establish control of his diabetes. He has been taking oral diabetes medication, and his most recent blood sugar was 7.2 mmol/L. He is alert and oriented.

As you talk to him, you learn that he has little knowledge about how to pay attention to skin care, and how to manage his nutritional intake. As you are talking, you notice that he feels “ashamed” at having to wear incontinent briefs, and that he is missing his wife. While he is able to ambulate with no assistance, he requires your assistance to turn himself in bed. He is also very proud that he is able to sit in the chair during the day; he tells you that he enjoys going for walks outside to get fresh air.

Questions:

Based on the information provided:

1. Assess Patient Two's 6 subscale scores: sensory perception, exposure to moisture, activity level, mobility, nutrition, and level of friction and shear.
2. Based on his current level of risk, what interventions need to be implemented in your plan of care for the day?

Directions:

A week later, Patient Two falls in the hallway while walking. He has sustained a fracture to the right leg; He now has a short leg cast to the right leg and requires pain medication to remain comfortable. While he is alert, he is confused, and is often unsure what time of the day it is. He is no longer able to walk around the unit, and expresses frustration about having to be lifted into the wheelchair with a Hoyer Lift from the staff. Reassess Patient Two's subscale scores based on his change in health status: sensory perception, exposure to moisture, activity level, mobility, nutrition, and level of friction and shear.

1. Based on his current level of risk, what interventions need to be implemented in your plan of care for the day?
2. During turning and repositioning of Patient Two, what areas would you assess for signs of a pressure ulcer?

Case Study Three

You are in morning report to begin your day. Your assigned patient is a 70-year-old man with a left sided CVA. He was admitted to the unit two days ago. He is on an enteral feed, and was admitted to the unit with the goal of returning home to his family. During shift report, the nurse reports his Braden Scale admission as 13.

When you greet him to begin his morning care, he calls you "Pat", which is his eldest daughter's name. He is incontinent, unable to turn himself in bed, and frustrated by being in the hospital and not being at home.

Based on this information:

1. What areas of the patient's body will you assess for signs of redness?
2. What interventions are you going to include in your plan of care for the day?
3. What concerns would you report to other members of the health care team?

Section VII

i) Post-Test Knowledge

After completing this online module, please complete the Post-Test to determine what you have learned about the prevention of pressure ulcers.

Answer the following true or false:

1. Stage I Pressure Ulcers originate in the lower parts of the body

   □ True □ False

2. The friction and shear subscale of the Braden scale is measured from 1 to 4

   □ True □ False

3. The Braden Scale is not relevant in an acute care setting.

   □ True □ False

4. A Braden Scale score of 15-18 indicates moderate level of risk

   □ True □ False

5. 29 to 79 minutes per day is required to provide preventative-nursing interventions for patients identified at risk of developing pressure ulcers.

   □ True □ False

ii) Post Test Knowledge Answers

1. Stage I Pressure Ulcers originate in the lower parts of the body

☒ True ☐ False

The answer is **TRUE.** Ninety five percent of ulcers originate in the lower region of the body; the sacrum and the heels are the most frequent site of occurrence (Thompson, Langemo, Anderson, Hanson, & Hunter, 2005).

2. The friction and shear subscale of the Braden scale is measured from 1 to 4

☐ True **☒ False**

The answer is **FALSE**. The friction and shear subscale is measured from 1 to 3 on the Braden Scale (Wilchesky & Lungu, 2015).

3. The Braden Scale is not relevant in an acute care setting.

☐ True **☒ False**

The answer is **FALSE**. The Braden Scale is used in all sectors of the health care system. The Braden Scale is commonly used in acute care, especially in ICU, where patients are immobile for long periods of time (Ranzani, T., Simpson, S., Japiassú, M., & Noritomi, T. (2016).

4. A Braden Scale score of 15-18 indicates moderate level of risk

☐ True ☐ False

The answer is **FALSE**. A Braden Scale score of 15-18 indicates a lower level of risk for the patient (RNAO, 2011).

5. 29 to 79 minutes per day is required to provide preventative-nursing interventions for patients identified at risk of developing pressure ulcers.

True False

The answer is **TRUE.** 29 to 79 minutes per day is needed to provide preventative nursing intervention for patients determined to be at risk of developing a pressure ulcer (Aydin & Karadig, 2010).

Conclusion

This learning module was designed for use on an E Learning platform, like Blackboard at UOIT. This educational tool assists nursing students in assessing, interpreting, and integrating Braden Scale scores to provide evidence based nursing care grounded in the Best Practice Guidelines established by The Registered Nurses Association of Ontario. This module also helps the student to understand the practical application of The Braden Scale in clinical practice. The case studies that were developed were designed to be relevant to the professional development of the student nurses while also facilitating critical thinking skills while using this risk management tool.

References

Aydin, A., & Karadag, A. (2010). Assessment of nurses' knowledge and practice in prevention and management of deep tissue injury and stage I pressure ulcer. *Journal Of Wound, Ostomy & Continence Nursing*, *37*(5), 487-494 8p. doi:10.1097/WON.0b013e3181edec0b

Braga, I., Pirett, C., Ribas, R., Gontijo, F., & Filho, A. (2013). Bacterial colonization of pressure ulcers: Assessment of risk for bloodstream infection and impact on patient outcomes. *Journal of Hospital Infection,* 83(4), 314-320 doi: 10. 1016/j.jhin.2012.11.008

Bredesen, I. M., Bjøro, K., Gunningberg, L., & Hofoss, D. (2016). Effect of e-learning program on risk assessment and pressure ulcer classification — A randomized study. *Nurse Education Today*, *40*191-197. doi:10.1016/j.nedt.2016.03.008

Chen, H., Cao, Y., Zhang, W., Wang, J., & Huai, B. (2015). Braden Scale is not suitable for assessing pressure ulcer risk in individuals aged 80 and older. *Journal Of The American Geriatrics Society*, *63*(3), 599-601 3p. doi:10.1111/jgs.13303

Halfens, R., Bours, G., & Van Ast, W. (2001). Relevance of the diagnosis 'stage 1 pressure ulcer': an empirical study of the clinical course of stage 1 ulcers in acute care and long-term care hospital populations. *Journal Of Clinical Nursing*, *10*(6), 748-757 10p. doi:j.1365-2702.2001.00544.x10.1046/j.1365-2702.2001.00544.x

Keast, D., Parslow, N., Houghton, P., Norton, L., & Fraser, C. (2007). Best practice recommendations for the prevention and treatment of pressure ulcers: Update

2006...reprinted with permission from Wound Care Canada. *Advances In Skin & Wound Care*, *20*(8), 447-462 16p.

Magnan, M., & Maklebust, J. (2009). The effect of Web-based Braden Scale training on the reliability of Braden Subscale ratings. *Journal Of Wound, Ostomy & Continence Nursing*, *36*(1), 51-59 9p. doi:10.1097/WON.0b013e3181919b8d

Quality Compass. (2015) Pressure ulcers. Retrieved from: http://qualitycompass.hqontario.ca/portal/long-term-care/Pressure-Ulcers#.Vz3U34RG__R

Ranzani, O. T., Simpson, E. S., Japiassú, A.,M., & Noritomi, D. T. (2016). The challenge of predicting pressure ulcers in critically ill patients: A multicenter cohort study. *Annals of the American Thoracic Society, 13*(10), 1775-1783. doi:http://dx.doi.org/10.1513/AnnalsATS.201603-154OC

Registered Nurses Association of Ontario. (2011). Risk Assessment and Prevention of Pressure Ulcers. Retrieved from http://rnao.ca/sites/rnao-ca/files/storage/related/639_BPG_Pressure_Ulcers_v2_summary.pdf

Thompson, P., Langemo, D., Anderson, J., Hanson, D., & Hunter, S. (2005). Skin care protocols for pressure ulcers and incontinence in long-term care: a quasi-experimental study. *Advances In Skin & Wound Care*, *18*(8), 422-429 8p.

Wilchesky, M., & Lungu, O. (2015). Predictive and concurrent validity of the Braden scale in long-term care: A meta-analysis. *Wound Repair & Regeneration*, *23*(1), 44-56 13p. doi:10.1111/wrr.12261

Appendix D:

Executive Summary

This learning module for BSCN students at The University of Ontario Institute of Technology for the risk management of Stage I pressure ulcers was developed to facilitate applied learning of The Braden Scale during their clinical rotations.

Methodology: Data collection for this clinical project included both a literature review and consultations with both faculty and students at UOIT. Findings indicated that the students experience difficulty with the ability to assess, interpret, and develop care plans based on The Braden Scale scores of their clinical assignments.

Objectives: The educational objectives of this learning module were: 1) Prepare nursing students how to identify patients at risk of developing a pressure ulcer using The Braden Scale, 2) Help nursing students identify the 6 subscales of The Braden Scale, 3) Enable nursing students to learn to determine the relationship between the subscale score and levels of risk of developing a pressure ulcer and, 4) Understand how to integrate interventions in a nursing care plan based on The Braden Scale score of a patient.

Learning Module: The learning module was designed for use on an E-Learning platform, like Blackboard, at UOIT. The module has four sections. The first objective is accomplished in the primary section by providing the students with foundational knowledge of pressure ulcers, and concludes by introducing The Braden Scale as the

most widely used skin assessment tool in all sectors of the health care system. The second section continues with providing more detailed knowledge of The Braden Scale. However, in consideration of the consultation findings, the module contextualizes the information in a manner that is similar to their clinical usage of this tool. The second objective is accomplished as the student is taught how to assess using the 6 subscales of The Braden Scale. The third objective is also realized during this section because the student learns how to methodically assess a patient within each subscale of the tool, and how the total is used to determine level of risk.

The third section of the learning module simulates the application of The Braden Scale in clinical practice for the students. This includes learning how to reassess patients after a change in health status, and how to communicate findings within an interprofessional framework. Using this exercise, the fourth objective is also accomplished as the student develops their critical thinking skills and learns to integrate Braden Scale findings into their nursing care plan.

After the completion of this project, a text-based version of the module will be given to the Interim Director of Nursing at UOIT. After review, it will be given to IT, and will be uploaded to course content on Blackboard. Students will be able to engage with the module that they choose, or in consultations with their clinical instructors prior to the start of their rotation.