

Transforming Teaching of Foundational Nursing Skills to Enhance Clinical Reasoning Development: A Proposed Simulation Based Learning Activity

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Abstract

Over the past decade nurse educators have been called to transform nursing academia in order to better prepare our future nurses for the tremendous changes in the healthcare environment. The advancing medical technology, aging population, nursing shortages and recent COVID pandemic have provided unique challenges that require complex decision-making abilities. The National Council of State Boards of Nursing (NCSBN) has made significant changes in their licensure examination to accommodate the need to assess vital clinical judgment and decision-making skills in entry level graduate nurses. A model to measure clinical judgment was developed by NCSBN in 2019 to assist faculty in evaluating students beyond textbook nursing knowledge to actively perform and evaluate safe, effective clinical decisions. In order for students to fully grasp the clinical judgment process, faculty need to create active learning opportunities that provide patient context so students can cultivate clinical decision-making skills parallel to clinical knowledge. In nursing curricula, students learn fundamental skills in the first year of their education that provide them with a strong foundation to assess and care for thousands of patients. Transforming how these vital nursing skills are taught from solely performing the psychomotor learning domain to incorporating patient specific scenarios can foster development of clinical reasoning and sound clinical judgment in practice. This article outlines the transformation and redesign of teaching clinical skills to first semester nursing students to enhance clinical reasoning development and a proposed future study of assessing student outcomes using a simulation-based approach.

Introduction

Teaching the nursing process has been an integral part of foundational nursing education to establish patient-centered care. The nursing process provides a method for nurses to gather information, analyze the data collected and form a valid conclusion. The underlying key to carry out this critical process is analyzing and solving complex patient specific problems (Hong et al., 2021). This metacognitive practice, essential to high quality patient outcomes is termed clinical reasoning (Mohammadi et al., 2021). A concept analysis of clinical reasoning (CR) by Mohammadi et al. (2021), stated that CR is the core of nursing practice that allows nurses the opportunity to positively impact the quality and safety environment through making valid judgments and evidence-based patient decisions. Tanner (2006) identified that the nursing process does not adequately represent CR and the intricate components that influence it, a vital part of thinking like a nurse. The National Council of State Boards of Nursing Clinical Judgment Measurement Model developed in 2019, highlights the importance of building CR skills in nursing academia for nurses to practice safely and effectively (National Council of State Boards Nursing, 2019). The Clinical Judgment Measurement Model (CJMM) expands on the traditional nursing process by providing additional cognitive actions to generate

the best possible clinical decisions which drive students to think like a nurse. Clinical judgment (CJ) skills should be supported early in undergraduate nursing education to attain the integral professional competence level prior to entering nursing practice (Uppor, 2022). In order for nursing students to understand the depth and breadth of this process, it is imperative that nursing faculty provide meaningful opportunities in the academic environment to understand and apply these CR skills. CR is vital for nurses to not only identify a patient problem, understand the how or the why behind the problem, but to also implement safe and effective outcomes (Bae et al., 2019). Registered nurses use a variety of CR skills in practice, most frequently used skills include assessing accuracy and reliability of patient data (Lee et al., 2016). Assessment is by far the most consequential and fundamental skill in nursing practice and provides the basis for the clinical decision process (Morgan, 2022). Integrating the application of clinical decision making into early nursing education when teaching fundamental nursing skills can provide a solid foundation for enhancing CR development. Tan et al. (2021) suggested that CR should be incorporated into the skills and knowledge of physical assessments to guide in constructing quality nursing problems and actions.

Background

Historically students in undergraduate nursing programs have learned fundamental nursing skills by reading and performing the psychomotor components from a step-by-step checklist. While this is arguably the most effective way to introduce students to each skill, they are missing some of the most important pieces of what nurses do when performing those crucial tasks. In the academic environment it is imperative that students are provided with applied learning experiences that allow them to use their critical thinking and practice like a medical professional. The ability to understand and apply nursing knowledge in each concept and skill mastered is vital to developing competent, high quality baccalaureate prepared nurses.

CR, which coincides with the process of CJ, is not a new concept in nursing education. Tanner introduced the research-based model of CJ over a decade ago. This research found that situated patient-centered learning experiences can assist students to think like a nurse and laid the groundwork for improving CR development. Tanner (2006), also highlighted in her research that advancing clinical knowledge through expert coaching and guidance along with engaging in reflection enhances the student's learning experience. Providing the opportunity for students to evaluate and interpret their findings after performing a psychomotor skill translates to the initial steps in the CJMM which are aligned with Tanner's constructs of CJ.

The Next Generation NCLEX (NGN) pre-licensure exam developed by National Council of State Boards of Nursing (NCSBN) provides context for test questions that allow for improved evaluation of CJ in graduate nurses. Introduction of context application when teaching nursing skills early in baccalaureate education can be beneficial to facilitate measuring CR competence

on pre-licensure exams and improve individual NCLEX outcomes. A scaffolded approach to build on higher levels of learning should be considered when creating this type of active learning strategy for first semester students that align with the respective nursing program, level, and course objectives.

The Essentials: Core Competencies for Professional Nursing Education (2021) outlined by American Association of Colleges of Nursing implores the transformation in nursing education to competency-based education in order to facilitate student accountability for their learning. With the advancement of active learning approaches, technology and understanding of student learning styles, changes in education practices are necessary to achieve exceptional academic learning outcomes. The New Essentials states that this approach to learning outlines student performance expectations based on observed behavior and use of various diverse methodologies and formats. Students who are able to demonstrate what they have learned can better grasp learning connections from theory to practice as well as build on their professional identity. This approach allows students to transform nursing theory into realism by making connections to patient context provided in the classroom, laboratory, and in the physical practice setting (AACN, 2021). In response to the charge to create transformative learning opportunities in professional nursing education, a review of literature was conducted to support the redesign of how foundational nursing skills are mastered in an applied learning environment.

Literature Review

The review of literature consisted of clinical reasoning development, the clinical judgment measurement model, teaching nursing skills, nursing assessment and the application to baccalaureate nursing education. The search was intended to explore literature to support CR development specific to teaching foundational nursing skills and physical assessment that reinforce CJ and decision making. Sources used for scholarly articles include: CINAHL (Ebsco), PubMed, Google Scholar, and Missouri Western State University Library. Search terms included: clinical reasoning, clinical judgment, nursing skills, nursing assessment, applied learning, problem-based learning, baccalaureate nursing students.

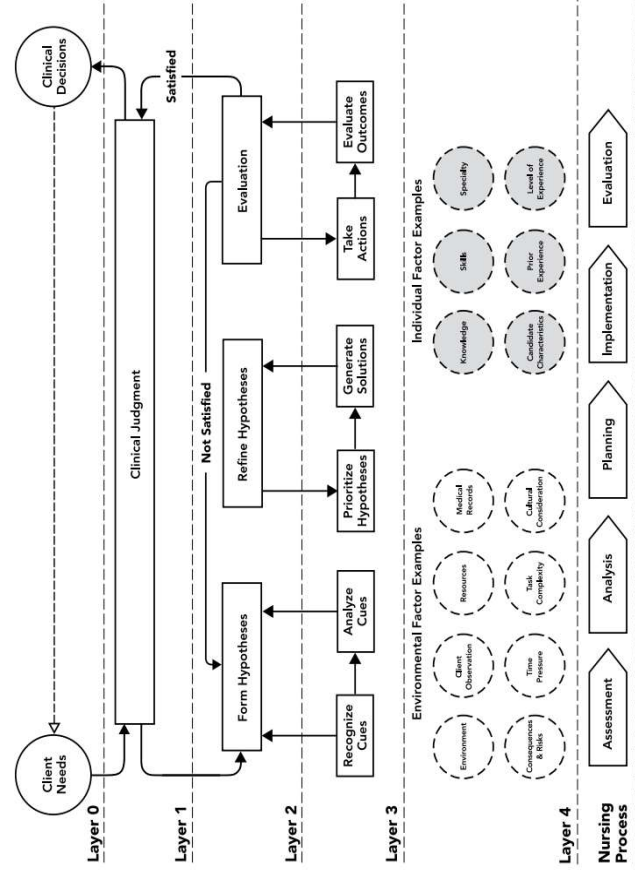
Theoretical Framework

The rapidly changing healthcare environment presents unique obstacles for new nurses to care for complex patients in often short-staffed facilities nationwide. With this in mind, it is imperative that nurse educators rise to the challenge to adequately prepare our future nurses to make safe, competent clinical decisions. Focusing on providing students with evidence-based practice examples in education is not sufficient enough to equip them with the tools they need to care for patients in this evolving healthcare paradigm. Rather than passively delivering clinical knowledge to learners, educators should shift their focus on building a constructivist approach to clinical decision making within

the nursing context. Benner (2022) identified that novice nurses lack the experience and background needed to respond to clinical situations. In order to build clinical reasoning skills, educators need to provide situated meaningful learning experiences that allow thinking in action opportunities. Hosseinzadeh et al. (2022) recommended prioritization of utilizing innovative educational CR strategies in nursing curriculum so that nurses are better prepared for practice. Qualitative data found in that study suggested creating active learning environments for nursing students that allow for managing complex and critical situations that in turn build clinical decision-making skills. Educators should incorporate an appropriate learning framework for inexperienced students who are learning how to think like a nurse. Tanner's research-based model of clinical judgment in nursing is a salient foundation for CR development in novice student nurses in conjunction with the Clinical Judgment Measurement Model (CJMM) framework.

Clinical Judgment Model

A variety of educational frameworks have been utilized by educators to enhance entry level nursing students' development of clinical reasoning skills. Tanner's research-based model of clinical judgment is one of the most widely used in academia, as well as the Dual Process Reasoning Theory which focuses on analytical and intuitive thinking to form clinical decisions. These integral frameworks were the basis of the CJMM created by NCSBN. According to the NCSBN, the CJMM was not intended to replace but rather incorporate core educational frameworks to serve as a model for evaluation of students' CJ on the NGN and to guide educators in their own assessments of students' CJ. NCSBN recommendations for integrating their model is concentrated on decision making situated within context-specific conditions with the understanding that nurses utilize prior knowledge and skills when organizing data. Dickinson et al. (2019) stated "development of foundational knowledge, skills, and abilities needed by nurses to independently evaluate complex information and situations to make appropriate clinical decisions requires pre-license programs to incorporate a decision-making framework into their curricula" (p.73). Using the CJMM as a framework for evaluating the teaching of foundational nursing skills will better prepare students for clinical practice and enhance clinical decision making. The various layers of the CJMM represent clinical decision making in action as a nurse forms a CJ based on the client's needs. Novice nurses' development of learning to think in practice is represented by going through the various layers to process data and reprocess information as needed, specifically in the cognitive operations in layer 3 of the CJMM shown in Figure 1 (NCSBN, 2019). This produces accurate collection and interpretation of data to form valid clinical decisions.



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Figure 1. *The NCSBN Clinical Judgment Measurement Model*

Note: Adapted from National Council of State Boards of Nursing, Inc. (2023, May 10).

Clinical judgment measurement model. Next Generation NCLEX.

<https://www.nclex.com/clinical-judgment-measurement-model.page>. Reprinted with permission from NCSBN.

Clinical Reasoning Skills Redesign Application

It is essential for educators to provide multiple opportunities to practice cognitive, affective and psychomotor skill sets in order to develop CR in clinical education (Jessee, 2018). The commitment to effectively develop CR in clinical coursework that encompasses all learning domains motivated the transformative redesign of the how skills are practiced in a BSN first semester clinical nursing course. The program's simulation laboratory director and holistic assessment course professor identified areas to improve CR development during first semester laboratory experiences. Student feedback received during semesterly forums and course evaluations indicated that learning assessments in a classroom environment was not always conducive to the application of unexpected patient findings in their clinical practice and on nursing exams. Wong and Kowitlawakul (2020), found simulations, case studies, clinical experiences, and guidance from clinical instructors were key educational elements that stimulated critical thinking and CR in nursing students. After researching methods to enhance CR, the disconnect between theory and practice in the fundamentals clinical course was bridged by incorporating situated patient scenarios to the skill evaluation processes in the laboratory. This would allow for the student to practice skills they have learned and make connections to real practice with a specific patient scenario much like a simulation environment. A systematic review by Macauley et al (2017), found strong evidence that simulation has a profound impact on clinical decision making, CR, and critical

thinking in students in health professions. Furthermore, it was evident that the more repetitions in a simulation environment created more considerable outcomes. Therefore, the more opportunities students can apply CR skills in a controlled environment the more advantageous the growth. Results from Byrmoen et al. (2022) found that scaffolded learning activities in clinical and didactic courses that focus on enhancing students' learning of physical assessment skills can lead to more confident registered nurses and improve safety in a variety of health care contexts. This type of simulation-based learning may be categorized as a low to mid fidelity in nature, however newer research has pointed out that having higher fidelity simulators does not always equate to higher learning outcomes (Tun et al., 2015). Instructional methods utilizing a patient vignette along with clinical simulation have been found to be an effective tool to develop CR in health care providers (Carvalho et al., 2017). A patient vignette or scenario provides contextual cues for learners to recognize and then interpret potential hypotheses. This strategy is comparable to problem-based learning, a student-centered approach that has shown to enhance problem solving skills essential to form accurate clinical judgments (Sayyah et al., 2017). Problem-based learning in nursing education has been an effective way to develop critical thinking and CR through presenting a patient problem in an active learning environment (Wosinski et al., 2018). Hong et al. (2021) stated that using realistic cases in nursing curricula could also improve nursing student's ability to problem solve. In this type of format, students are able to work through specific patient cues and come to a conclusion about what steps are necessary to take next. In order to further develop CR around the patient specific scenario, debriefing questions that allow students to reflect on their findings and make connections between theory and practice are an integral part of the applied learning experience. Students that are given the opportunity to reflect on their performance are able to gauge the progression towards meeting learning outcomes and acquisition of competencies required for practice (AACN Essentials). According to the International Nursing Association for Clinical Simulation and Learning (INACSL) an evaluation plan of the learner's simulation experience is essential for best practice standards as well as pilot testing prior to full implementation.

Materials and Methods

This section will outline the proposed plan to implement a pilot of the simulation-based activity that incorporates patient specific context when practicing foundational nursing skills in the first semester of a baccalaureate nursing program. Consideration of the most recent INACSL standards for clinical simulation were observed to implement best practice experiences and generate the highest quality outcomes. The International Nursing Association for Clinical Simulation and Learning states that a needs assessment is the "foundational evidence" for the need of any simulation-based experience (INACSL, 2021). INACSL defines 4 "required elements" to complete a quality needs assessment which includes a thorough analysis of need, an examination of

knowledge, skills, and attitudes, and utilizing the results to create objectives to enhance classroom learning and improve quality and safety (INACSL 2021). A needs assessment guided the objectives and type of simulation-based learning techniques that were incorporated into the skills activity evaluation in the clinical practicum course found in Table 1.

Students in the first semester BSN cohort have a designated two-hour block of time to practice assigned clinical skills each week of the semester in the nursing simulation laboratory. Traditionally students use a checklist or physical assessment rubric to demonstrate their assigned skill with a laboratory teaching assistant (LTA) who provides verbal formative feedback. This designated time frame for each student allows for building in a low to mid fidelity simulation-based experience to achieve their learning objectives. The LTA's and the simulation laboratory director co-facilitate meeting the objectives of the laboratory block assignments for the clinical course. Students are required to complete one guided practice and one "dress rehearsal" for every skill with an LTA to receive formative feedback prior to summative evaluation by faculty. The use of standardized formatted assignment, termed an activity, was created for each skill or assessment required for the students to complete in the clinical course. Activity assignments are congruent with clear objectives to reduce ambiguity for students and LTA's in attaining the intended simulation-based learning outcomes. Each activity includes pre brief instructions and a concept specific scenario that provides situational patient context. A standardized pre briefing statement is communicated to students to reduce anxiety and welcome questions during the simulation-based learning experience. The pre-brief document outlines the process for assessing the student objectives, as well as providing objectives for the LTA's, critical errors and prompts for the LTA to use based on the individual patient scenario to disclose to the students during the simulation-based activity. It also houses the skill rubric that is assigned for the student to complete with an example communication tool for the LTA to reference during the simulation. The exemplar assessment skill comprises the physical assessment students learn in the holistic assessment course and perform in the introduction to clinical practice practicum lab block. The assessment rubrics were adapted from *Taylor's clinical nursing skills: A nursing process approach* (Lynn, 2019) and modified by department faculty to focus on salient competencies expected of a BSN graduate nurse. Exemplar videos are assigned to students for each clinical skill prior to attending clinical and/or lecture for the prospective concept.

NUR 303 Simulation-Based Needs Assessment	
Underlying cause for concern	- First semester nursing students currently complete assessments during their scheduled lab blocks with LTA Staff. - Students currently only work with well abled students and have a difficult time applying skills learned to the general population with disabilities and disease. - Due to this, students are entering practice with a decreased knowledge in basic assessment skills.
Survey of stakeholders, participants and educators	- During the first semester nursing forum, students have raised concern with feedback for their assessment. Students wish to have a more standardized form of feedback for study purposes. - The educator of this course also notes that students often miss points due to things clearly addressed in the rubric. Additionally, students currently are not able to apply the skills they are learning as they do not have a “scenario”. All assessments are completed on the student’s lab partner who is typically a healthy individual. Students have a difficult time taking the assessment skills learned and applying them to real life scenarios.
Examination of Knowledge Skills and Attitudes (KSA)	- This undergraduate baccalaureate program's objectives are aligned with the Quality and Safety for Education in Nursing (QSEN) Competencies. - Implementing a SBE into this course would allow students to demonstrate the KSA's of Patient Centered Care, Evidence-Based Practice, Safety, and Informatics as defined by QSEN. This would strengthen the course's alignment to the BSN program objectives set forth by this undergraduate nursing program.
Overall Goal/ Broad Objectives	At the completion of the activity, students will be able to: - Demonstrate safe holistic assessment of the head and neck system according to the rubric below. - Utilize clinical reasoning and decision making specific to the provided patient scenario. - Perform effective interpersonal, therapeutic and professional communication throughout and at the completion of assessment using ISBARR form.
Interactive and Innovative Simulation-Based Experience	- Scenario was designed, and standardized, to allow students to apply assessment skills to real life diagnosis for clinical practice. - Having a standardized scenario allows students to practice safety checks.

Table 1. *Simulation-Based Needs Assessment*

Scenarios were created based on the simulation needs assessment and were aligned with program objectives, semester level objectives, and clinical course objectives. During the student's scheduled lab block they will scan a QR code given to them by the LTA. This QR code links to the activity document that entails pre-brief instructions, patient scenario, vital background information and provider orders for completing the assigned skill. The student activity also contains the ISBARR hand-off communication tool used throughout the nursing program. The ISBARR patient hand-off tool is used for students to report their assessment findings to the LTA along with recommendations for the patient to promote analysis of the information and attain the objective of communication in the clinical course. The students will have a different patient scenario for each practice and dress rehearsal, as well as for each concept to prevent repetition and promote subsequent clinical decision-making opportunities. In order to foster student's self-reflection along with developing CR, debriefing questions were created by the faculty using the CJMM to be completed after each activity. Debriefing questions aligned with the CJMM layer 3 can be found in Table 2. The link to the debriefing assignment is conveniently embedded into the activity scenario following the ISBARR example for students to access from their device via Google Forms. The Google Forms format allows for assessment data to be collected efficiently, interpreted, and analyzed by faculty. The students will be required to answer each question in short essay form after every simulation-based activity. The CJMM operation section, evaluate outcomes, was not aligned with a debriefing question due to the inability for students to measure the outcomes of the simulated activity. The responses will then be graded on the depth and thoughtfulness of reflection and the student's CR connections related to the patient scenario. Similarly, to the NGN, these questions are asking for knowledge application specific to a patient case scenario. This allows the student to reflect on the problem specific scenario and work through clinical decision making relevant to their prior learning. This opportunity to form their own clinical decisions is intended to help students close the gap between theory and practice. Student feedback about the simulation-based lab experiences will be collected at the end of semester in a student forum to further guide any changes and evaluate satisfaction with the learning experience.

CJMM Layer 3 Alignment	Debriefing Short Answer Question
Recognize Cues	Which assessment findings or information in the patient scenario are most concerning and why?
Analyze Cues	What additional assessments or information are needed to establish the significance of your findings?
Prioritize Hypothesis & Generate Solution	Which condition(s) are most likely plausible based on the information you received during your activity?
Take Action	What priority interventions would you recommend for your patient and why?

Table 2. *Debriefing CJMM Questions*

Note. Questions were adapted from the National Council of State Boards Nursing. (2019, Winter). Clinical Judgment Measurement Model. *Next Generation NCLEX News*. Retrieved, March 29, 2023 from https://ncsbn.org/public-files/NGN_Winter19.pdf

Future Study

In order to evaluate CR development, a future study to assess students CR proficiency is planned to validate the effectiveness of the simulation-based activity. Review of recent literature found that many studies used the Lasater Clinical Judgment Rubric (LCJR), framed around Tanner’s Clinical Judgment Model, to assess CJ and CR in nursing students. The categories for measuring CR include; noticing/observing, interpreting data, responding to the data, and reflecting on performance. This rubric requires a collaborative instructor-led objective methodology approach to achieve a high level of reliability, which may not be feasible for this form of lower fidelity activity. A systematic review of The LCJR supported an alternate technique to evaluate complex decision making through having students complete short- answer questions about a case scenario and reflect on their own performance (Clement & Raleigh, 2021). The students short answer CR questions designated for simulation-based activity debriefing would provide subjective data to be used to assess CR development using an evidence-based clinical reasoning rubric like the LCJR in the proposed study. The LCJR tool is very subjective in nature and could have the potential to increase variability in results with this type of activity. In order to reduce subjectivity a key will be developed for the debriefing questionnaire that students complete after each assessment scenario. Each scenario will have a specific priority finding students should identify based on patient information and the cues received during the activity. The data from each debriefing questionnaire would be compared using repeated measures analysis of variance

on SPSS at the end of the semester to evaluate an increase in student clinical decision-making outcomes.

Educators may consider analyzing standardized exam results in areas specific to CR and CJ at the beginning and then end of their programs, if accessible. Assessment Technologies Institute (ATI) provides comprehensive predictors for licensure examinations that could be used to identify an increase in CJ competence or potential gaps that need to be focused on. For example, Analyzing Cues was the lowest scoring area in the Clinical Judgment category on a recent NCLEX outcome report reviewed by the department faculty. ATI comprehensive predictor category Potential for Alterations in Body Systems results was also identified as decreased from the baseline compared to past outcomes. This category entails comparing current client data to baseline client data (e.g., symptoms of illness/disease) a foundational part of developing CR. Utilizing this data that may already be available to educators could be a feasible method to evaluate outcome specific concepts.

Conclusion

It's evident that the need to implement effective CR development opportunities in nursing education is essential to foster successful learners. Students who are beginning nursing school are most often acquiring various skills that they have little to no experience performing on patients with physical alterations of health. Simply performing the psychomotor skills on another student or on a manikin does not provide realistic context to prepare them for real clinical practice. Providing pathophysiological context that builds on their prior learning will allow them to grow their understanding of why fundamental skills and assessments are so vital to their professional development. Educators must take on a transformative approach to how essential nursing concepts are taught in order to strengthen student's CR and CJ development. The ability to apply meaningful components of CR and CJ with the most foundational nursing actions can have a remarkable impact on quality patient outcomes.