

Utilization of the Nursing Process to Foster Clinical Reasoning During a Simulation Experience

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Abstract

Nursing practice includes complex reasoning and multifaceted decision making with minimal standardized guidance in how to evaluate this phenomenon among nursing students. Learning outcomes related to the clinical reasoning process among novice baccalaureate nursing students during a simulation experience were evaluated. Nursing process records were utilized to evaluate and foster the development of clinical reasoning in a high-fidelity medical-surgical simulation experience. Students were unable to describe and process pertinent patient information appropriately prior to the simulation experience. Students' ability to identify pertinent patient cues and plan appropriate patient care improved following the simulation. The learning activity afforded a structured opportunity to identify cues, prioritize the proper course of nursing interventions, and engage in collaboration among peers. The simulation experience provides faculty insight into the students' clinical reasoning processes, while providing students with a clear framework for successfully accomplishing learning outcomes.

Keywords

clinical reasoning, critical thinking, simulation, undergraduate, nursing students, nursing education, clinical judgment

The demands of contemporary nursing practice necessitate clinical reasoning and decision making at a level never before experienced within the profession (del Bueno, 2005; Shinnick, Woo, & Mentis, 2011). Nurses are viewed as independent practitioners with increased autonomy while caring for increasingly complex and acutely ill patients. Furthermore, current mandates regarding quality improvement and patient safety domains demand that even entry-level nurses must be proficient in accurate assessment and implementation of timely, evidenced-based, and patient-centered interventions.

Nursing practice includes multifaceted reasoning and complex decision making with minimal standardized guidance in how to evaluate this process among nursing students. A common thread within nursing programs includes patient-care planning utilizing the nursing process. Therefore, providing students with scripted simulation scenarios integrating multiple diagnoses and varying patient presentations facilitates the development of clinical reasoning via utilization of the nursing process. This learning activity involved pre- and post-simulation nursing process activities evaluating students' ability to organize pertinent patient data and implement appropriate clinical care while utilizing simulation as an integral method of instruction. Students' pre- and post-simulation nursing process records were reviewed for accurate assessment, appropriate care planning, and implementation of interventions.

Background

Clinical reasoning is an essential component to “thinking like a nurse,” as is critical, creative, scientific, and formal criterial reasoning (Benner, Sutphen, Leonard, & Day, 2010). Appropriate clinical reasoning skills are essential to competence in nursing. Current practice requires that even new graduates must be prepared to make difficult decisions for patients with multisystem dysfunction (Banning, 2008; Lasater, 2007; Levett-Jones et al., 2010). The term *clinical reasoning* is often used interchangeably with critical thinking and clinical judgment in the literature. Clinical reasoning is defined as “the cognitive processes and strategies that nurses use to understand the significance of patient data, to identify and diagnose actual or potential patient problems, to make clinical decisions to assist in problem resolution, and to achieve positive patient outcomes” (Fonteyn & Ritter, 2008, p. 236). Even when provided with the same information and the same set of circumstances, researchers have reported that clinical reasoning among experienced nurses varies (Sedgwick, Grigg, & Dersch, 2014).

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Therefore, nursing students require education for recognizing relevant patient cues and understanding how to make connections between accurate assessment and patient outcomes via utilization of the nursing process (Benner, 2001). A nurse's approach to critical thinking and reasoning is believed to affect the accuracy of the nursing diagnosis. Thus, it is directly linked to influencing patient care and outcomes (Paans, Sermeus, Nieweg, Krijnen, & van der Schans, 2012). The development of critical thinking skills is multifaceted and encompasses several parameters of metacognitive self-awareness. These include the ability to adapt to complex and varied situations, application of theory to practice, self-motivation and enterprising behaviors, working effectively with other members of the patient-care team to accomplish group tasks, strategic thinking, and appropriate assessment of one's strengths and weaknesses (Conley, 2012).

The interplay between critical thinking and clinical reasoning informs a student's clinical judgment. Faculty facilitation of the development of student's critical thinking skills is guided by American Nurses Association (ANA) practice standards, The Joint Commission Standards, Quality and Safety Education for Nurses competencies, and Institute of Medicine competencies. According to Alfaro-LeFevre (2013), components of reasoning within the clinical setting include the following:

- Diagnostic reasoning (applying nursing process to determine, prevent, and manage patient problems)
- Problem solving, decision making, and judgment
- Patient, caregiver, and community safety and welfare
- Patient- and family-centered care
- Moral and ethical reasoning
- Applying evidence-based practice
- Teamwork and collaboration
- Clinical teaching and learning
- Using and creating electronic medical data (informatics)
- Self-improvement, stress management
- Quality improvement (improving outcomes and care delivery systems).

Simulation experiences provide a setting in which nursing students verbally practice the appropriate nursing care of patients and families in specific clinical situations. Educators who utilize simulation are able to highlight the students' points of growth and meaning within a patient scenario, while shielding the student in the safety of a virtual clinical environment. Simulations allow nursing students to function in the role of a nurse via the application of evidence-based knowledge, implementation of clinical reasoning and judgment, and the development of skilled knowhow (Benner et al., 2010). Objective evidence of the student's ability to transfer theoretical knowledge and incorporate into clinical practice is crucial. This transference of skill-based knowledge can be evaluated via nursing process records, which

utilize the development of nursing diagnoses and formulation of a plan of care.

Simulation Experience

To expand the body of literature linking simulation experiences of first-year student nurses to the development of critical thinking knowledge and clinical reasoning through application of appropriate utilization of the nursing process, a simulation learning activity was implemented. This article describes and discusses the benefits of utilizing simulation for fostering clinical reasoning. The evaluation of the learning activity included a comparison of pre- and post-simulation clinical reasoning assignments (nursing process records/nursing care plans) of sophomore undergraduate baccalaureate nursing students. Nursing faculty facilitating the simulation experience evaluated assignments.

Patient-care planning required students to gather all known subjective and objective patient information, highlight the abnormal findings, and analyze the data. Then, through critical reasoning, the student group arrived at a consensus on the patient's priority problem and formulated what they postulated as the appropriate nursing diagnosis. The students could then discuss and record the patient's treatment goals and the nursing interventions required to evaluate their own performance and ensure that the patient's treatment goals were met. The nursing process record assignment required students to document the rationale for choosing nursing interventions and allowed the faculty a window into the students' clinical reasoning and decision-making processes.

Thirty-six second-semester sophomore baccalaureate nursing students participated in the simulation as a required activity toward completion of their medical-surgical practicum rotation. The simulation experience utilized for this learning activity was designed to facilitate the transition of nursing theory to clinical practice. Each simulation experience, including preparation, interactive simulation, and debriefing, occurred in the department of nursing simulation lab. The duration of experience was approximately 4 hr.

The nursing program implements simulation as a component of the students' required practicum hours. Pre- and post-nursing process record assignments were completed as the written assignment component of the simulation experience and were collected for review. Simulation was a non-graded assignment. Performance in the simulation experience had no effect on the students' final clinical course grade.

Pre-Briefing

Students were provided with learning objectives for the experience and a post-operative patient case study, which included a history and physical to review in preparation of the simulation experience (see Appendix A). They were also instructed to review theoretical content in the course text

related to post-operative nursing care. Prior to entering the simulated patient's room, students received a brief overview of the simulation day. Students were provided with a nursing process record and were asked to utilize the nursing process and the case study to complete the nursing process record (see Appendix B). Students completed the nursing process record as a group of four. These de-identified nursing process records were collected and marked "pre." Students were then brought to the simulated patient's room where they participated in the planned simulation scenario.

Debriefing

Debriefing immediately followed the completion of the simulation scenario. Students were directed to an adjoining classroom where they were asked to complete a new nursing process record marked "post." Students were not allowed to access any reference materials for the assignment. They were instructed to collaborate and complete the care plan based upon their collective simulation experiences. The faculty then collected the "post" nursing process record, and simulation debriefing occurred.

Results

Nursing process records were utilized to assess the evolution of clinical reasoning prior to and following exposure to a high-fidelity post-operative simulation experience. The nursing process record reflects the components of the clinical reasoning model (Hoffman, 2007), which details the thinking strategies of both novice and experienced nurses during realistic patient-care scenarios, and has been utilized in studies measuring the development of clinical reasoning (Levett-Jones et al., 2010).

In addition, debriefing of participants occurred, and open-ended questions related to student actions during the simulation were presented. The student responses on their post-simulation care plan assignment guided the debriefing session. Written forms of debriefing and reflection, such as care plan assignments, allowed nursing students to process their simulation experience and provided the instructor insight into the students' cognitive learning (Park et al., 2013). Jeffries (2012) discusses how guided reflection, when incorporated into simulation, promotes the self-awareness required for the development of clinical judgment, thus fostering quality patient care. Furthermore, post-simulation debriefing and reflection, where select patient responses that occurred during the simulation are reviewed, allow for discussion of the natural progression of nursing actions and their potential adverse effects.

As a way to evaluate the nursing process records, faculty utilized an evaluative table consisting of elements of the care planning process as described by Carpenito-Moyet (2010). In addition, clinical reasoning was identified subjectively using the clinical reasoning model (Levett-Jones et al., 2010). Variability in interpretation of the students' nursing

process records was eliminated as only one faculty member evaluated the assignments. Correlation of the components of the clinical reasoning model and the students' nursing care plans are outlined in Table 1.

When evaluating the assignments, there were notable differences between the pre- and post-simulation nursing process records. Pre-simulation nursing process records reflected a lack of relevant patient cues. Relevant patient cues are necessary to anticipate potential outcomes and negative sequelae. Faculty observed that the highest patient priority was identified incorrectly among patient cues, leading to the development of an inappropriate course of nursing action. Nearly half of the students demonstrated correct correlation of selected patient outcome criteria or goals relevant to the patient's actual nursing needs. Approximately one third of students correctly processed assessment information and identified pertinent patient cues and relevant clinical identifiers. Identification of relevant patient cues would have led to a more optimal course of nursing actions.

Post-simulation nursing process records revealed significant improvement with selection of patient outcome criteria or goals and their correlation and relevance to the patient's actual health needs. All students were able to achieve this objective upon completion of the simulation. Following the simulation experience, students' ability to process assessment information and identify pertinent patient cues and relevant clinical identifiers increased. The post-simulation nursing process records demonstrate that simulation was an integral component to the refinement of the students' ability to translate theory to practice through clinical reasoning. The simulation experience has the potential to provide students with a clear framework for successfully accomplishing learning outcomes related to the nursing process.

Discussion

Students' exposure to simulation is vital to foster clinical reasoning and facilitate the development of critical thinking skills in nursing. The pre-simulation nursing process records identified a relevant learning need in nursing education. Through the participation in a simulation experience, students engaged in active learning and could immediately verbalize understanding of knowledge deficits related to identifying relevant patient cues and the ability to anticipate various potential outcomes for the patient. Nursing students had the opportunity to immediately remediate through post-simulation nursing process records. Faculty provided guidance and constructive feedback in a safe and controlled learning environment. The simulation experience provides the opportunity to develop and refine students' utilization of the nursing process.

Limitations

Limitations include that the simulation was implemented by the same faculty member, in the same simulation scenario,

Table 1. A Conceptualization of the Clinical Reasoning Process With Descriptors and the Nursing Care Plan.

Clinical reasoning (Levett-Jones et al., 2010)	Nursing care plan
Consider the patient situation	Assessment
<ul style="list-style-type: none"> • <i>Describe</i> or list facts, context, objects, or people 	
Collect cues/information	Assessment
<ul style="list-style-type: none"> • <i>Review</i> current information • <i>Gather</i> new information • <i>Recall</i> knowledge 	
Process information	Assessment Diagnosis
<ul style="list-style-type: none"> • <i>Interpret</i>: Analyze data to come to an understanding of signs or symptoms • <i>Discriminate</i>: Distinguish relevant from irrelevant information • <i>Relate</i>: Discover new relationships or patterns; cluster cues together to identify relationships between them • <i>Infer</i>: Make deductions or form opinions that follow logically by interpreting subjective and objective cues; consider alternatives and consequences • <i>Match</i> current situation to past situations • <i>Predict</i> an outcome 	
Identify problems/issues	Diagnosis
<ul style="list-style-type: none"> • <i>Synthesize</i> facts and inferences to make a definitive diagnosis of patient's problem 	
Establish goal/s	Planning
<ul style="list-style-type: none"> • <i>Describe</i> what you want to happen, a desired outcome, a time frame 	
Take action	Implementation
<ul style="list-style-type: none"> • <i>Select</i> a course of action between different alternatives available 	
Evaluate outcomes	Evaluation
<ul style="list-style-type: none"> • <i>Evaluate</i> the effectiveness of outcomes and actions 	
Reflect on process and new learning	Evaluation
<ul style="list-style-type: none"> • <i>Contemplate</i> what you have learned from this process and what you have done differently 	

and at the same university with a small sample, over the course of one semester. In addition, the sample consisted of primarily Caucasian female nursing students. Therefore, generalizability of the findings may be limited. The evaluation of the nursing process records was potentially strengthened because only one faculty member reviewed them. However, the evaluation was subjective in nature, therefore bias may have existed.

Implications

It is incumbent upon nursing faculty to foster students' clinical reasoning skills. The American Association of Colleges of Nursing (AACN) has outlined recommendations for schools of nursing detailing the educational requirements necessary to provide quality patient care (Barton, Armstrong, Prehelm, Gelmon, & Andrus, 2009). Therefore, clinical reasoning must be embedded throughout the nursing curriculum. The simulation experience provides an opportunity to utilize the nursing process and strengthen the link between theory and clinical practice. Faculty must be able to integrate domains of professional practice, such as communication and collaboration, patient-centered care, and best practices. Recommendations for faculty include development and analysis of instrumentation to evaluate the attributes of nursing students' nursing process records and clinical reasoning ability. Schools of nursing should incorporate simulation at every level of nursing

education as a means of facilitating clinical reasoning abilities, thereby potentially improving nursing students' ability to positively affect patient care. Replication of this simulation experience utilizing various scenarios is warranted to further the research base in nursing education and clinical reasoning.

Appendix A

Guidelines for SimLab Experience

- I. Expectations for SimLab are like any other clinical day. See *Policies* in the NUR 207 syllabus. Keep in mind that if you are unable to attend SimLab at your designated time, you will need to inform your professor ahead. Only excused absences will be considered for make-up times.
- II. Dress code: Red scrubs and bring your Personal Digital Assistant (PDA), stethoscope, watch, and name badge.

III. Learning Objectives:

- a. Identify the primary nursing diagnosis
- b. Implement patient safety measures
- c. Evaluate patient assessment information including vital signs
- d. Prioritize and implement physician orders appropriately

Scenario specific:

- i. Demonstrate a focused respiratory assessment
- ii. Verbalize post-operative respiratory complications associated with immobility
- iii. Demonstrate correct teaching of incentive spirometer use

IV. Prior to attending SimLab, the following preparation is required.

- a. Review Chapter 20 in Med-Surg text.
- b. Review *Postoperative Nursing Care on the Surgical Unit*, pp. 943-950 in Wilkinson text (vol. 1).
- c. Be prepared to complete a focused respiratory assessment and related post-operative interventions (see readings).
- d. Print out, sign, and bring the Confidentiality Statement
- e. Print and bring the *Nursing Process Record* (p. 24 in NUR 207 Syllabus)
- f. Review the patient data and complete the written pre-plan upon arrival to simulation (SIM) with your group.

Patient data. Vernon Watkins is a 69-year-old Caucasian male. He presented to the emergency room with complaints of nausea, vomiting, and severe abdominal pain. He was admitted for emergent surgery for a perforated bowel. He had a Hemicolectomy and is 3 days post-op.

Past medical history. Mr. Watkins is a retired postal service worker. He has a history of Diverticulosis, cataracts, and controlled hypertension. He smokes a ½ pack of cigarettes a day, walks 3 miles a day, and enjoys doing yard work.

Current medication orders. D5 1/2 Normal Saline IV @ 80 mL per hour
Oxycodone/acetaminophen (Percocet) 1 to 2 tabs PO every 4 hr prn pain
Cefazolin (Ancef) 1 g IVPB every 4 hr
Hydrochlorothiazide 25 mg PO daily

Appendix B**Nursing Process Record**

Client Initials _____ Age _____ Gender _____ Medical DX _____

- I. Subjective Data (to support nursing diagnosis):
- II. Objective Data (to support nursing diagnosis):
- III. Highest Priority Nursing DX:

A. Why is this the highest priority?

A. Outcome criteria (identify two outcomes)	B. Nursing interventions (at least three for each outcome)	C. Rationale for each nursing intervention (document source)	D. Evaluation of outcomes (identify as expected or observed)
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Andrea Scholl, MSN, RN, teaches medical surgical nursing practicum and simulation at Bradley University. She has been influential in inclusion of ACES and QSEN into the undergraduate nursing program.