Nurse Education in Practice 19 (2016) 12–18

Contents lists available at ScienceDirect

Nurse Education in Practice

journal homepage: www.elsevier.com/nepr

Original research

High-fidelity simulation: Assessment of student nurses' team achievements of clinical judgment

Karin Hallin, Britt Bäckström, Marie Häggström, Lisbeth Kristiansen*

Department of Nursing Science, Mid Sweden University, Sweden

ARTICLE INFO

Article history:
Received 19 September 2014
Received in revised form
28 January 2016
Accepted 25 March 2016

Keywords:
Clinical skills
HFS
Nursing education
Simulation-based performance
Videotaped scenarios

ABSTRACT

Nursing educators have the challenge of preparing nursing students to handle complex patient care situations in real life, but much remains unknown about the ability to make clinical judgments. In this study, high-fidelity simulation (HFS) was used at a Swedish university to find answers about pre-licensure nursing students' success in clinical judgment in terms of team ability and relationships with theoretical achievements, and personal and scenario circumstances. The matrix Lasater Clinical Judgment Rubric (LCJR) was used to analyze and score the students' ability in teams to notice, interpret and respond to complex care situations. Overall, the results showed the student teams in their first meeting with HFS in a complex care situation achieved low clinical judgment points; most teams were in the stages of Beginning and Developing. For attaining high team achievements the majority of the students in the team should theoretically be "high performance". Being observers and having HFS experience before nursing education was significant too. However, age, health care experience, and assistant nurse degrees were of secondary importance. Further research at universities regionally, nationally, and internationally is needed.

1. Background

Every minute may be a matter of life or death for sudden deteriorating patients, which places great demands on the nurses' clinical judgment and their ability to individually and/or in teams accurately notice, interpret, respond to, and reflect on patient situations. Overall, safe patient care requires theoretically and practically well trained nurses (Tanner, 2006; Lasater, 2007). According to Aiken et al. (2014), an increased emphasis on bachelor's education for nurses could reduce preventable hospital deaths, which requires that educators provide an environment that stimulates nursing students' ability to think like a nurse (Tanner, 2006). Bridging the gap between theory and practice, high-fidelity simulation (HFS) is increasingly used in health care education as a way for nursing students to demonstrate skills without the risk of patients being injured.

1.1. Clinical judgment

There is a growing body of research on how nurses interpret, conclude and act in care situations. The terms *clinical judgment*, *clinical reasoning*, *problem solving*, *decision making*, and *critical thinking* are interchangeably used in nursing literature (Tanner, 2006). The term used in this study, clinical judgment, is defined by Tanner (2006, p.204) as "an interpretation or conclusion about a patient's needs, concerns, or health problems, and/or the decision to take action (or not), use or modify standard approaches, or improvise new ones as deemed appropriate by the patient's response." Clinical judgment is a multidimensional process and is influenced by multiple sources like theoretical knowledge, clinical practice, knowledge of the patient, the clinical context, problem-solving skills and ability to reflect.

In order to assess nursing students' abilities in clinical judgment, few objective observation-based tools are published and described. However, Lasater (2007) has, based on Tanner's(2006) Clinical Judgment Model and the constructs of Noticing, Interpreting, Responding, and Reflecting, developed the Lasater Clinical Judgment Rubric (LCJR), with dimensions on which students can be assessed in a meaningful whole. According to Tanner and Lasater, the model and the rubric are most useful in realistic safe patient

* Corresponding author. Department of Nursing, Mid Sweden University, SE-851 70 Sundsvall, Sweden.
E-mail address: lisbeth.kristiansen@miun.se (L. Kristiansen).

http://dx.doi.org/10.1016/j.nepr.2016.03.010
1471-5953/

environments with HFS. Recently two studies using the LCJR have confirmed its usefulness by comparing nursing students' self-assessment to estimations by faculty (Jensen, 2013), and by assessing nursing students' clinical judgment with a single group repeated-measures design (Yuan et al., 2014).

1.2. Relationships between nursing students' characteristics and achievements in high-fidelity simulation

Few authors have studied relationships between achievements in HFS and nursing students' characteristics (Shearer, 2013), and to date just one study was found to focus on knowledge. Hauber et al. (2010) showed in a group of 15 students that the grade of an adult health course was significantly positively related to the participants' ability to manage the arterial blood pressure and oxygenation status of the patient in a cardiac patient scenario. According to other studies, Ironside et al. (2009) found no significant student characteristics related to safety competence, while Grady et al. (2008) found enhanced training effectiveness for male students.

1.3. The use of high-fidelity simulation

High-fidelity patient simulators, mannequins capable of realistic physiological response to learners' action, are useful for effective learning, teaching and evaluation methods in risk-free environments (Lewis et al., 2012; Shearer, 2013). Several studies indicate that students in HFS groups, especially in complex patient care scenarios and team scenarios (Garrett et al., 2011), score significantly higher in clinical performance than students in control groups (Powell-Laney et al., 2012), at least as long as the exercises occur continually (Miller et al., 2012). Also, Kirkman (2013) found that 42 nursing students in a respiratory scenario a significant positive difference in transfer of learning over time. Thus, students are able to transfer knowledge and skills learned from HFS to the traditional clinical setting over time.

Findings recognize that simulation supports students' integration of theory and practice (Hope et al., 2011; Mould et al., 2011). Studies also showed that the majority of nursing students did not meet overall performance expectations when tested in simulated clinical scenarios (Fero et al., 2010; Bogossian et al., 2014); most difficulty related to problem recognition and reporting to the physician (Fero et al., 2010). Bensfield et al. (2012) detected about 25% of a nursing class, some with high grade point averages, did not achieve the end-of-program competencies and required remediation.

1.4. Theoretical framework

According to John Dewey (1964) philosophical and theoretical thoughts, knowledge is based on active learning with problem solving and critical thinking. Dewey coined the concept of "learning by doing" in which theory, action and reflection are woven together. Learning is largely a matter of acquiring information, understanding and skills, and achieving the ability to determine what is relevant in a particular context. Dewey as well as several later researchers (Marton and Booth, 2000; Säljö, 2005) emphasize the importance of communication and interaction between individuals and groups. Knowledge is developed when revealed by the individual himself, either while the action takes place ("reflection-in-action") or at a later time ("reflection-on-action") (Schön, 1987).

Simulation experience is not a guarantee of competence, and simulation seems to have moderate effects for patient-related outcomes (Cook et al., 2011). However, in comparison, with no intervention, technology-enhanced simulation in health profession education is consistently associated with large effects for outcomes of staff knowledge, skills, and behaviors (Cook et al., 2011). Thus, HFS is one of few learning strategies that helps nursing students to fully address the complexity of clinical judgment according to patient problems and events in complex care situations.

1.5. Rationale for the study

During clinical education, nursing students have little experience with a deteriorating patient and therefore don't have much opportunity to practice an intervention. In acute care settings students often are asked to step aside. To compensate for these shortcomings, a high-fidelity simulator, the most advanced model of a human being, can be utilized for training and assessment in a stress-free and safe environment. In such an environment educators can get a clear picture of how soon fully trained nurses will manage complex real-life situations, and how theoretical performance and background factors influence the outcome of a team's work. Such information is needed to direct efforts at improving education and practice.

There is a body of literature that reports knowledge improvement and performance by students in acute HFS care scenarios. However, to our knowledge, no researchers using the matrix LCJR (Lasater, 2007) based on Tanner's Clinical Judgement Model (Tanner, 2006) have studied the relationship between nursing students' team achievements and theoretical and personal characteristics with the aspects of how nurses in teams think and act in complex HFS care situations. HFS was used in a real life environment, for those students the first time during nursing education nine weeks before graduation. The study addressed an important gap and complemented the available literature.

1.6. Aim

The aim of the study was to identify pre-licensure nursing students' ability to make clinical judgments in terms of how they perceive, interpret and act in complex care situations measured in team achievements. A further aim was to investigate possible correlations between team achievements and theoretical performance, personal characteristics and circumstances of the simulation scenarios.

2. Method

2.1. Design

This study is a part of a larger quasi-experimental project entitled "Values and effects of high-fidelity simulation for the development of clinical judgment." A descriptive design was chosen for this study, becoming "the control group" in future studies of the project. The model underlying the project is Tanner's (2006) Clinical Judgment Model with the aspects of how nurses think and act in complex care situations. The model is a synthesis of nearly 200 studies and describes the clinical assessment as a process in four phases: Noticing, Interpreting, Responding, and Reflecting. Based on Tanner's Model, Lasater (2007) conceptualized this in Laster's Clinical Judgement Rubric (LCJR), which also contained four constructs reflected in eleven dimensions of nursing students' ability to perform clinically: to notice, interpret, respond, and reflect. Pilot studies were carried out in Spring (2012), which confirmed that the study design was relevant.

2.2. Data collection

The data collection included videotaped simulation scenarios, a