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Perceptions of simulation-assisted teaching among baccalaureate nursing students in Chinese context: Benefits, process and barriers☆

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ABSTRACT

Aim: To explore the subjective learning experiences of baccalaureate nursing students participating in simulation sessions in a Chinese nursing school.
Method: This was a qualitative descriptive study. We used semi-structured interviews to explore students' perception about simulation-assisted learning. Each interview was audio-taped and transcribed verbatim. Thematic analysis was used to identify the major themes or categories from the transcript and the field notes.
Findings: Only 10 students were needed to achieve theoretical saturation, due to high group homogeneity. Three main themes which were found from the study included 1. Students' positive views of the new educational experience of simulation; 2. Factors currently making simulation less attractive to students; and 3. The teacher's role in insuring a positive learning experience.
Conclusion: Simulation-assisted teaching has been a positive experience for majority nursing students. Further efforts are needed in developing quality simulation-based course curriculum as well as planning and structuring its teaching process. The pedagogy approach requires close collaboration between faculty and students.

Introduction

Simulations are "activities that mimic reality of a clinical environment and are designed to demonstrate procedures, decision-making and critical thinking through techniques such as role-playing and the use of devices such as interactive videos or mannequins" (Jeffries, 2005, p. 97). Simulation was initially used as an educational strategy in the military and aviation industries (Wilford & Doyle, 2006). It has been rapidly gaining popularity in nursing education since the 1980′s (Rystedt & Lindström, 2001). In the current in-patient hospital climate, students have less opportunity to work directly with patients due to safety concerns (Hovancsek, 2007), the high acuity of the illnesses (Castanelli, 2009), relatively short hospital stays, and the movement towards outpatient care (Lane, Slavin, & Ziv, 2001). They do not have opportunities to practice all of their needed skills in clinical settings. Simulation provides unlimited practice opportunities in a safe environment, ultimately fulfilling student learning needs.

Simulation generally starts with the introduction of an unfolding case, in which students are introduced to a particular patient repeatedly at different points in the care continuum within a simulation, throughout a course, or throughout the curriculum. It ends with a debriefing led by the instructor. This helps place the trainees (i.e. students) in a frame of mind that is similar to what they would experience when handling a real clinical case (Gordon, Oriol, & Cooper, 2004). Simulation is utilized to improve students' abilities to integrate multiple care skills, rather than discrete nursing skills (Liu, Chen, & Luo, 2011).

In simulation-assisted learning sessions, students have repeated opportunities to practice different nursing skills from simple to advanced without worrying about making errors and causing harm to the real patients. Their performance can be computerized, allowing students to check, correct errors and make progress easily. In addition to skill training, simulation is also helpful in improving student critical thinking, clinical reasoning, and team working (Cantrell & Delony, 2007; Durham & Alden, 2008; Elfrink, Kirkpatrick, Nininger, & Schubert, 2010). Due to its learning efficacy and efficiency, simulation has replaced part of the clinical practice sessions in some U.S. nursing schools (Nehring, 2008).

Background

Simulation was firstly introduced into Chinese nursing education around the beginning of 90s. Different nursing schools or nursing programs varied in the utilization of simulation as an instruction approach (Zhang, Jiang, & Wang, 2007). In China nursing simulation takes a number of forms such as human patient simulator, computer-assisted instruction, standardized patients. The human patient simulator has different levels of fidelity; generally it has a heartbeat, palpable carotid pulse, blood pressure, spontaneous breathing, and appropriate physiological responses to medications and other treatments.

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Baccalaureate nursing programs in China was discontinued in 1952 and reinstated in 1983 at Tianjin Medical College (currently Tianjin Medical University). The program usually lasts 4–5 years, with the last year on clinical practice. Nursing major courses generally cover two components including theory and clinical section. Lecture remains the primary teaching approach due to heavy course load and faculty shortage.

Most nursing schools rely on adjunct clinical faculty and bedside teaching for improving student clinical competency. Most of them have not received any training about educational strategy. Little attention has been paid to students' critical thinking, decision making and individualized learning needs (Chen, 2008). Promoting high quality nursing education was listed as one major goal on national nursing agenda (MOH, 2005). This demands nursing schools and nurse educators to continue develop innovative teaching strategies to attain the goal (Liu, 2008).

Many Chinese nursing schools have set up simulation labs or simulation centers; and integrate simulation into their course teaching. Hospitals also use simulation to facilitate skill training for new nurses due to concerns about patient safety (Zhang et al., 2007). Simulation helps to engage students in combining learning, thinking and applying knowledge simultaneously (Miller, 2010). Meanwhile students are able to learn how to communicate, coordinate and work in teams (Luo, Zhou, & Huang, 2009; Shui, Yang, & Zhu, 2009).

Simulation has been used in a number of nursing courses, including critical care nursing, adult nursing, obstetric nursing, peri-operative and surgical nursing (Zhang, Xu, & Sun, 2010; Wei et al., 2008). Simulation-assisted teaching has shown a variety of benefits for nursing students in China (Wang & Wang, 2007). These include increased motivation to learn, improved clinical competency and knowledge base (Liu, 2009; Luo et al., 2009). Simulation also helps the transfer of theoretical knowledge into clinical settings (Xu, Zhao, & Zhang, 2009; Zhao, Wen, & Li, 2009). Majority nursing students have expressed satisfaction with simulation-assisted learning (Wang et al., 2009). Simulation has also been helpful in improving skill retention and student self-confidence.

Students participating in simulation-assisted learning were less likely to make errors in clinical setting than those who did not participate (Li & Guo, 2010). Most simulation-assisted teaching required students to make nursing assessments on simulated patients, identify nursing problems as well as develop individualized nursing care plan. Hence simulation-assisted learning was likely to help students develop patient-centered care values (Yuan, Jiang, & Jiu, 2009).

Almost all nursing simulation studies conducted in Chinese setting were quantitative and centered on the teaching outcome of simulation. Few have been done on student learning experience. It is necessary to initiate a study to investigate students' own perceptions about simulation-assisted teaching using qualitative approach. The study results would be helpful to understand the simulation-learning process from students' perspective, help design quality simulation-teaching plans, as well as develop student-centered simulation course curriculum.

Theoretical framework

Experiential learning theory (ELT) was utilized to guide the study design, data collection and data interpretation. Experiential learning is learner-focused with educators acting as facilitators of learning (Kolb & Lewis, 1986). Students learn most effectively when the learning environment combines relevant components of psychomotor, cognitive, and affective knowledge (Kolb, 1984). ELT has the broadest application among simulation researchers and practitioners due to its appropriateness for teaching (Kolb, 1984). According to the theory, *learning* is a process to create knowledge through the transformation of experience.

Kolb (1984) describes the process of experiential learning as cyclic and involving four stages. The first stage begins with an event of *concrete experience*, the actual experience of performing an action and the "here and now" experience in which the learner engages. The word "doing" explains the phase of concrete experience. It precipitates a search for similar events that are compared and contrasted; the second stage is *reflective observation*, in which the learners are able to understand the effects of their actions under the circumstances provided in the learning activity. Accordingly, the learner is able to transfer knowledge and repeat the performance under the same conditions (Kolb, 1984). In the third stage, the learner engages in abstract conceptualizations that allow the learner to make generalizations about his or her actions. It can be summarized by the word "thinking". The hallmark of this stage is that the learner is able to generalize actions and effects to a wide range of conditions beyond those present in the learning process. The fourth stage—*active experimentation*—occurs when the learners start to apply the resulting schema in new circumstances to evaluate its usefulness. Whenever new situations are encountered, the learner must apply prior knowledge and continue to refine his or her performance. Applying knowledge to novel situations leads to new concrete experiences, thus beginning the cycle of experiential learning again. ELT provides an understanding of how a learner transforms an educational experience into knowledge and skill (Rourke, Schmidt, & Garga, 2010).

Methods

Sample and setting

We did the study in a nursing school located in central region of China, part of a top-ranked university under Chinese Ministry of Education. As is typical for qualitative studies, sample size could not determined in advance. Instead, eligible participants were continuously enrolled in the sample until major themes or categories as identified from content analysis of the interviews had reached theoretical saturation (that is, no new themes were being identified). Each interview took about 30–35 min and was taken in either a school office or in students' residential area. Field notes were written during and after the interview so that self-reflections of the researcher could be recorded. Eligibility criteria for the participants were full-time baccalaureate nursing students; and those who had participated in simulation-assisted learning for at least one academic semester.

Simulation-assisted teaching

In the school, the course Nursing Planning and Implementation I and II replaced traditional nursing courses such as Med-Surgical Nursing and Maternal-Newborn Nursing. The theory part of the course was offered in the classroom; clinical section was offered in the forms of clinical practicum and simulation. Simulation had replaced 20% of the clinical time. The entire class was divided into small groups containing 6–8 students. Each faculty was required to work with one or two groups of students in the clinical setting or simulation lab.

All simulation sessions were done in the simulation lab of the school. Each session lasted two hours. Simulation-assisted teaching procedure included three phases:

(1) Pre-simulation: students were given the 3–5 learning objectives, which was needed to be completed in a two-hour session. The objectives were specific and attainable, which were set according to students' knowledge base and comprehensive level. Each student group was given one simulation scenario, and they needed to prepare for the simulation sessions. The preparation included aspects such as figuring out team-working plan and nursing-care plan for the case.
(2) Simulation: Students worked together in the simulation lab; and each one of them had a role to play in the session. Usually two students worked as nurses, one as the patient. One of the students played a family member if necessary. The rest students of the group were observers.
(3) Debriefing: After the completion of the simulation scenario,

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