

Human patient simulation versus case study: Which teaching strategy is more effective in teaching nursing care for the hypoglycemic patient?^{1,2,3,4}

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Abstract

With the ever-increasing safety concerns presented in a health care setting, it is imperative that nursing students are prepared for the demand of utilizing the skill of critical thinking while providing care to patients experiencing hypoglycemia. Nurse educators strive to implement different teaching strategies to promote critical thinking skills. The purpose of the study was to evaluate the effectiveness of two teaching strategies: human patient simulation (HPS) and a single case study during diabetes education. In addition, the study was used to validate the inclusion of HPS in the authors' nursing program curriculum. A quasi-experimental, two-group pretest and posttest design was utilized to evaluate these teaching strategies. Faculty also completed an objective clinical evaluation, which evaluated students' clinical reasoning, and all students completed a postsurvey evaluating the teaching strategies. Study results indicated the pretest average scores for both groups were identical. The posttest results for the case study group were slightly higher than the simulation group results. On the clinical evaluation tool, the simulation group scored much greater than the case study group. Both results were statistically significant. The postlesson survey results were greater overall for the simulation group on all statements. All students agreed or strongly agreed that simulation was effective. According to the student test results and clinical evaluations, both teaching strategies are beneficial in nursing education; moreover, the student surveys and comments validated the addition of simulation as a valuable teaching strategy. As a result of this research, HPS was formally implemented into the nursing curriculum.

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² The first and second study results were presented in a poster format at International Nursing Association for Clinical Simulation and Learning annual international conference on June 21, 2012 in San Antonio, TX.

³ The first year study results were presented in a poster format at the National Organization of Associate Degree Nursing Annual 2011 Convention in a poster presentation format on November 5, 2011 in Chicago, IL.

⁴ The first year study results were presented in a podium presentation at the Ohio Association of Two Year Colleges annual regional conference on October 21, 2011.

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1. Introduction

Nurse educators are challenged to prepare students for safe practice in a complex health care environment (Todd, Manz, Hawkins, Parsons, & Hercinger, 2008). Educators strive to use multiple teaching strategies to provide students with the critical thinking skills needed to provide safe, effective patient care. Traditionally, case studies have been used successfully as a teaching strategy to promote students' learning and enhance their clinical decision-making skills (Howard, Ross, Mitchell, & Nelson, 2010). However, human patient simulation (HPS) is becoming increasingly popular as a teaching strategy within the nursing clinical laboratory setting (Cant and Cooper, 2009).

Recent technological advances enable HPS to duplicate scenarios that nursing students are likely to encounter in clinical practice and offer them the opportunity to safely practice decision-making skills in a controlled environment (Howard et al., 2010). An important benefit of using simulation in nursing education is to expose students to high-risk, low-occurrence critical events so that they can practice in a safe environment prior to working with real patients. This opportunity has the potential to increase patient safety and decrease nurse error and patient harm (Howard et al., 2010).

Many health care educators have described the use of HPS as a successful teaching strategy (Rourke, Schmidt, & Graga, 2010). Simulated experiences with HPS provide students the opportunity to engage in critical thinking and clinical decision making. Student engagement with HPS adds a learning dimension not found in traditional didactic teaching methods that normally involve passive learning and emphasize rote memorization, resulting in less retention (Haskvitz & Koop, 2004).

Although HPS has been shown to be effective for several topics, there is limited research on critical thinking and hypoglycemia scenarios. In addition, there is limited research that compares the effectiveness of teaching strategies such as HPS and case studies. Thus, the authors decided to compare these teaching methodologies when teaching the care of the hypoglycemic patient. Diabetes mellitus content is taught in the first year of the associate degree program where the authors teach. Diabetes education encompasses an enormous amount of information and can be difficult to teach.

2. Literature review

Diabetes affects 8.3% of the population in the United States. According to the American Diabetes Association (2012), as many as one in three American adults could have diabetes by 2050. In 2012, diagnosed diabetes costs were estimated to be \$245 billion, which was a 41% increase over a 5-year period. Medical expenses for people with diabetes are 2.3 times higher than for people without diabetes (American Diabetes Association, 2012). Therefore, it is

critical for nursing programs to effectively prepare nursing students to properly care for patients with diabetes and recognize and treat acute complications of diabetes.

Howard et al. (2010) conducted a comparative analysis of HPS and interactive case studies (ICS) looking at learning outcomes and student perceptions. The research was a quantitative, quasi-experimental, two-group pretest and post-test design. The content that was covered in their HPS and ICS was care of the patient with acute coronary syndrome and care of the patient with ischemic stroke. Their sample included 49 senior nursing students, which consisted of 13 baccalaureate students, 13 accelerated baccalaureate students, and 23 diploma students. Students from each program were randomly assigned to either the HPS group or ICS group.

Howard et al. (2010) found that the HPS group's mean posttest score was significantly higher ($p \leq .05$) than the ICS group. Responses to the Simulation and Case Study Evaluation Survey indicated that students in the HPS group agreed significantly more than did the students in the ICS group with the statements: helped to stimulate critical thinking; was a valuable learning experience; knowledge gained can be transferred to the clinical setting; should be included in our undergraduate education; helped me better understand concepts; experienced nervousness during the educational intervention, because of the nursing intervention I will be less nervous in the clinical setting when providing care to similar patients; and can be a substitute for clinical experiences in the hospital. The survey used a Likert scale which ranged from 1 to 4, with 1 representing *strongly disagree* to 4 *strongly agree*.

Sarver, Senczakowicz, and Slovensky (2010) developed simulation scenarios for an adolescent patient with diabetic ketoacidosis at varying levels of the acute complication for pediatric nursing education purposes. Sarver et al. (2010) chose diabetes ketoacidosis because diabetes mellitus is the most commonly occurring endocrine disorder affecting the pediatric population. Specifically, diabetes ketoacidosis requires prompt recognition and intervention. In addition, they felt it could provide a much needed template or starting point for educators who desire to introduce simulation as a teaching and learning strategy in pediatric nursing courses, where clinical learning opportunities with actual clients may be limited.

According to Sarver et al. (2010), "several research studies focused on assessing the efficacy of simulation found that students realized significant gains in both cognitive and psychomotor development as a result of participating in situations that employed low fidelity" (p. 579). In addition, simulation can be a way to bridge the gap between nursing school and real-life nursing (Sarver et al. (2010).

3. Research question

The question that guided the study was: Which teaching strategy is more effective in teaching nursing care for the hypoglycemic patient?

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