ABSTRACT

Background: Available models for designing the structure of specific simulation-based learning (SBL) activities need further analysis. Method: This retrospective study was conducted using independent samples t tests to examine differences in mean clinical nursing judgment development scores between students who completed a nursing program prior to the introduction of an experiential learning theory (ELT)-based simulation design and students who completed the program after the adoption of its use for all scenario-based SBL activities. Results: Results showed a significant increase in clinical nursing judgment at both the beginning and end of a baccalaureate program in which all scenario-based SBL used an ELT design. Conclusion: Consistency with International Nursing Association for Clinical Simulation and Learning standards of best practice and the use of ELT in SBL can improve student outcomes by fostering the development of clinical nursing judgment.

BACKGROUND

SBL experiences should be designed to progressively challenge students so they can develop knowledge, skills, clinical reasoning, and clinical nursing judgment (Ashcraft et al., 2013). Although various theoretical and conceptual frameworks have been used to develop simulation experiences, simulation design in nursing is not adequately theory-based (Rourke, Schmidt, & Garga, 2010). Although the Jeffries model provides a middle-range theory for simulation as a concept and phenomenon, available models for designing the structure of specific SBL activities are in need of further statistical analysis (Adamson, 2016).

In 2014, a theory-based simulation design was developed, merging nursing process with Kolb’s model of experiential learning (1984) and Tanner’s model of clinical judgment in nursing (2006). This experiential learning theory (ELT)-based design for simulation-based learning (SBL) built on the traditional design, which focused on the unfolding scenario and debriefing. To engage students in all phases of experiential learning and all components of the nursing process, a 10-question, computer-based quiz was added to stimulate cognition and a concept-based prebriefing was added to address planning and reasoning. Use of this four-phase ELT-based design resulted in a significant increase in the development of clinical judgment in prelicensure baccalaureate nursing students in their first clinical semester. It was suggested that the design be evaluated further to assess its impact on clinical nursing judgment development in other levels of nursing students (Victor Chmil, Turk, Adamson, & Larew, 2015).

This retrospective study compared two cohorts of prelicensure nursing students engaged in an SBL program that was fully integrated throughout their entire baccalaureate nursing program. Cohort A was engaged in an SBL curriculum in which all scenario-based SBL was designed using ELT, and Cohort B was engaged in an SBL curriculum that did not integrate a theory-based design. Clinical nursing judgment development for each cohort was analyzed and compared.
This study assessed the differences in clinical nursing judgment development in prelicensure baccalaureate nursing students when an ELT design was used for SBL versus when a theory-based design was not used. It was hypothesized that when an ELT design was used for SBL throughout a nursing program, clinical nursing judgment development would be higher in all levels of students.

LITERATURE REVIEW

According to Kolb’s theory (1984), experiential learning is dependent on inclusion of all elements of learning. These four elements are conceptualization, experimentation, experience, and reflection. This experiential process of learning also relies on metacognition, or conscious learning (Flavell, 1979; Kolb, 1984). Awareness of learning and the processes of learning are essential components of clinical nursing judgment or one’s ability to think in terms of nursing process (Tanner, 2006). In the simulation setting, clinical nursing judgment development can be assessed and categorized as beginning, developing, accomplished, and exemplary using the Lasater Clinical Judgment Rubric (LCJR) (Lasater, 2007).

Theories and models used as the basis for SBL should be linked to outcomes (Jeffries, 2016; Lioce et al., 2015). The use of an ELT simulation design for students in their first clinical semester supported the evidence in the current literature by stimulating cognitive, metacognitive, psychomotor, and affective learning. The ELT simulation design provided new evidence that its use delivers a means for improving outcomes, specifically the development of clinical nursing judgment (Victor Chmil et al., 2015).

METHOD

Research Design

A retrospective review of LCJR scores was conducted. Independent samples t-tests were used to examine differences in mean clinical nursing judgment development scores between students who completed the nursing program prior to the introduction of the ELT simulation design and those who completed the program after the adoption of its use for all scenario-based SBL activities. The study was conducted in accordance with the ethical standards of the Institutional Review Board of Passan School of Nursing at Wilkes University. Permissions were obtained to use the school of nursing’s student database. A data entry clerk coded cases within the database prior to analysis by the researcher to ensure confidentiality and anonymity.

Sample

The sample for this study consisted of cases derived from the school of nursing’s database. The traditional baccalaureate nursing curriculum commenced clinical nursing courses in the first semester of students’ sophomore year, consisted of a total of six clinical semesters, and concluded with a capstone course in the final semester of students’ senior year. All cases used in this study represent students who completed the final 3 years of their baccalaureate nursing program within a 3-year time period. Cases in which students who took more than 1 year to complete prerequisite courses prior to entering the first clinical course and students who transferred into the program prior to beginning the first clinical course were included in the study. Cases representing students who took 4 years or longer to complete the six clinical semesters were excluded.

Student participation in SBL is required for all clinical courses within the school of nursing. A total of 102 cases comprised Cohort A. This cohort consisted of students who completed the nursing program using the ELT simulation design for all scenario-based SBL activities in the 3 clinical years of the program. To match group size, 102 cases for Cohort B were chosen randomly from cases representing students who completed the nursing program in the 3 years prior to the implementation of the new design. The total sample of 204 exceeded the required sample size as determined a priori.

Variables and Instruments

Each case included scores for students who were evaluated in the simulation setting using the LCJR. The LCJR has been used to measure clinical nursing judgment development in specific SBL activities within the nursing program since 2009. The LCJR is an interval-level scoring rubric that uses 11 items in which the participant’s clinical nursing judgment development is ranked on a scale ranging from 1 to 4 during performance in a scenario-based SBL experience. The total score ranks the participant’s clinical nursing judgment as beginning (<11), developing (12 to 22), accomplished (23 to 33), or exemplary (34 to 44) (Lasater, 2007). The LCJR has a reported interrater reliability of 0.889 and an internal consistency of 0.974 (Adamson, Gubrud, Sideras, & Lasater, 2012).

Simulation specialists trained in the use of the LCJR served as raters to evaluate clinical nursing judgment development of each participant during both enactment of the scenarios and during the debriefings. These raters had 5 to 7 years of experience in using the LCJR for various simulation scenarios. Interrater agreement analysis for this set of raters showed substantial to almost perfect agreement (.73, .89) using the guidelines established by Landis and Koch (1977).

Data Analysis

All statistics were analyzed using SPSS® version 20.0 software. There were no significant differences in between-group characteristics for age, gender, and ethnicity. There was no significant difference in mean grade point average between cohorts. Independent samples t tests were used with the level of significance set at p < .05.

RESULTS

The mean initial (first clinical semester) LCJR score was significantly higher for Cohort A (M = 27.81, SD = 4.84) than for Cohort B (M = 20.75, SD = 3.96), t = 7.06, p < .001. A large effect size (1.20) with a power of .95 was found using Cohen’s d as modified by Sawilowsky.
The mean final (last clinical semester) LCJR score was significantly higher for Cohort A ($M = 42.72, SD = 3.98$) than for Cohort B ($M = 38.79, SD = 4.62$), $t = 3.93, p < .001$. A large effect size ($91$) with a power of $.95$ was found using Cohen’s $d$.

Descriptive analysis of the data revealed that of the 102 cases in Cohort A, 94% of the cases (96 students) had LCJR scores in the exemplary range at the end of the program. In contrast, only 85% of the cases (89 students) in Cohort B had exemplary scores. A retrospective analysis was performed to examine the differences in LCJR scores from the first simulation of the program and the last simulation of the program. Mean scores for cases representing students who were engaged in SBL using the ELT design for their first simulation experience (Cohort A) demonstrated an “accomplished” phase of clinical nursing judgment development, whereas the mean scores for cases not engaged in a theory-based design (Cohort B) were in the “developing” phase.

Mean scores in the final simulation of the program were analyzed to assess the difference in LCJR scores when an ELT-based design was used for all SBL scenarios in the curriculum. Although the mean score in the final simulation of the program fell in the “exemplary” phase for both groups, the mean LCJR score in the last simulation of the curriculum for cases representing students who were engaged in SBL using the ELT design throughout the program (Cohort A) were significantly higher than those for the cases not engaged in a theory-based design (Cohort B).

Analysis of individual LCJR scores showed that 9% more of the students were able to achieve an exemplary level of clinical nursing judgment at the end of the program when SBL activities were designed using ELT.

**DISCUSSION**

This retrospective study found a significant increase in clinical nursing judgment for nursing students at both the beginning and end of a baccalaureate program in which all scenario-based SBL used an ELT design. This finding is consistent with a previous study that indicated the use of an ELT SBL design resulted in a significant increase in clinical nursing judgment development (Victor Chmil et al., 2015). Although clinical nursing judgment would be expected to develop to an exemplary level by the end of a nursing program, this study suggests that using an ELT simulation design for all scenario-based SBL activities reinforced students’ ability to think in terms of nursing process, thus resulting in a significantly higher level of clinical nursing judgment.

International Nursing Association for Clinical Simulation and Learning (INACSL) standards call attention to the importance of designing SBL using a theoretical framework to achieve best outcomes (Lioce et al., 2015). INACSL also emphasizes the need for measurable outcomes (Sando et al., 2013). Results of this study demonstrate achievement of better outcomes, in this case, clinical nursing judgment development, when an ELT design was used for SBL scenarios.

**LIMITATIONS AND RECOMMENDATIONS**

The findings of this study support the use of ELT in simulation design; however, it is recognized that other variables also may contribute to improved clinical nursing judgment development. Variables that were not controlled in this study included changes in faculty and educational resources such as computer-based learning and total testing systems. This study evaluated only clinical nursing judgment development as an outcome of the use of a theory-based SBL design; it is recommended that other outcomes, such as performance in SBL activities, also be evaluated. This study used ELT to design SBL, and it is recommended that other theory-based designs be evaluated for effect on outcome as well.

In addition, this study examined cases representing only traditional baccalaureate nursing students, and cases were limited to one school of nursing. Future studies should examine the effect of theory-based design in students from associate, diploma, and accelerated nursing programs, as well as in different geographic areas.

**CONCLUSION**

This retrospective analysis found a significant increase in clinical nursing judgment development in students who completed a baccalaureate nursing program in which all SBL used a theory-based, experiential learning design. Results of this study show that consistency with INACSL standards of best practice and use of theory in SBL can improve student outcomes and foster clinical nursing judgment development.

**REFERENCES**


Rourke, L., Schmidt, M., & Garga, N. (2010). Theory-based research of high fidelity simulation use in nursing education: A review of the litera-