Impact of prebriefing on competency performance, clinical judgment and experience in simulation: An experimental study

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ABSTRACT

Background: Prebriefing is the introductory phase of the simulation process, however, little nursing education research is available on this aspect of simulation. Reflection theory and concept mapping informed a model-based structured prebriefing activity to prepare students for meaningful simulation learning.

Objectives: The aim of this study was to examine the intervention of structured prebriefing for its effect on nursing students’ competency performance, clinical judgment and their perceived prebriefing experience.

Design: An experimental group–randomized design was used in this study; the intervention group who received structured prebriefing was compared to the control group.

Setting: The study was conducted at a university school of nursing in Canada.

Participants: Baccalaureate nursing students (N = 76) enrolled in a fourth-year medical-surgical course participated in this study.

Method: Competency performance, clinical judgment, and the perception of the prebriefing experience of those participants receiving structured prebriefing and those receiving traditional prebriefing activities, were compared. The relationship between simulation performance and students’ self-rated prebriefing experience was also examined. Scores from the Creighton Competency Evaluation Instrument and the Prebriefing Experience Scale were analyzed using parametric and non-parametric statistics.

Results: A statistically significant difference was demonstrated between groups for competency performance (p < 0.001), clinical judgment (p < 0.001) and prebriefing experience (p < 0.001). No relationship was found between perception of prebriefing experience and students’ simulation performance.

Conclusion: Theory-based, structured prebriefing can impact nursing student competency performance, clinical judgment and perceptions of prebriefing, and may enhance meaningful simulation learning.

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1. Introduction

Over the last decade, simulation in nursing education has become increasingly prevalent for teaching nursing students a variety of clinical skills. Consequently, nursing research in the area of simulation has grown in an effort to understand, and provide evidence for, the ways in which it is incorporated into pre-licensure programs. Student performances during the simulation scenario phase, anxiety and confidence, and aspects of the debriefing phase have been of primary interest to nursing education researchers (Dreifuerst, 2012; Gaunt, 2013; Mariani and Doolen, 2016). Still, it remains unclear if or how the phases of the simulation process are effective for student clinical learning. In particular, the phase of prebriefing, as the first phase of the simulation process, has been overlooked in nursing research for its role in simulation learning.

Prebriefing, as the introductory phase of the simulation process, is provided to the learner before the simulation scenario begins, and includes: information about the objectives; patient history and current status; learner roles and tasks; time allotment; and an orientation to the simulation equipment and the general environment (Meakim et al., 2013). At this time, the effect of prebriefing on simulation learning, and for enhancing student performance, has not been specifically tested. Therefore, an exploration of how nursing students may be supported during this phase, through additional structured learning and reflective activities, could provide educators with a further understanding of how simulation is used, and greater evidence for simulation pedagogy.

Prebriefing, as structured by concept mapping-type activities and guided reflection, was investigated in this study for its effect on competency performance and clinical judgment. The single intervention of a theory-based, researcher-developed and facilitated prebriefing,
employed in a simulation experience with nursing students, was compared to the simulation experience of a similar group of students who were not exposed to this intervention. Among baccalaureate nursing students, the following research questions were explored:

1) Is there a difference in competency performance and clinical judgment during a clinical simulation scenario between students who participate in a structured prebriefing intervention and those who participate in traditional prebriefing activities?

2) Do students receiving a structured prebriefing intervention perceive the prebriefing experience differently than students receiving traditional prebriefing?

3) For those students who participated in structured and traditional prebriefing activities, what is the relationship between competency performance and the students' perceived prebriefing experience, and between clinical judgment and their perceived prebriefing experience?

The aim of this study was to examine the intervention of a structured prebriefing activity for its effect on students' simulation competency performance, clinical judgment, and their perception of the prebriefing experience.

2. Theoretical Foundations

Prebriefing, competency performance, and clinical judgment were examined from the theoretical frameworks of reflective practice and constructivism, and in the context of simulation for student learning. Reflection is embedded through reflection-in-action (Schön, 1987), which may occur during simulation while enacting the scenario, and reflection-on-action (Schön, 1987) which may occur during debriefing while thinking back on actions after the scenario is over. Additionally, reflection-beyond-action (Dreifuerst, 2009) has been described as reflection that extends to post-simulation activities during debriefing. Greenwood (1993) further identified that reflection-before-action could also be useful during activities such as “clinical pre-conference/briefings” (p. 1196). Reflection-before-action, which could occur during the simulation prebriefing phase, necessarily involves a future focus and is anticipatory in nature. Like reflection-beyond action, this could mirror the reality of anticipating and planning care in practice. The entire cycle of reflection, in the context of simulation, is depicted in Fig. 1. As a means to link concepts, and construct and articulate plans for care, concept-map activities (Novak and Gowin, 1984), which are visual prompts used for making sense of information, may be used during prebriefing to augment learning and reflection. In this study, the theoretical frameworks of reflection and constructivism form the basis for a Structured Prebriefing Model (Fig. 2), which links students’ prior knowledge and clinical learning experiences, reflection-before-action, and concept mapping, for a meaningful simulation learning experience. A structured prebriefing phase may potentiate the development of cognitive skills such as clinical judgment.

3. Literature Review

Prebriefing has been conceptually identified in the literature as not only a time for preparing learners for the functional and operational aspects of the simulation scenario and debriefing phases, but “as a time to prepare students for practicing the intentionality of noticing during patient care” (Jeffries, 2014, p. 222). Clear objectives and structured facilitation by expert faculty to support this way of thinking may enhance development of this essential skill in novice learners. For novice nursing students who do not have experience or practice in thinking like a nurse or with the processes of reflection (Tanner, 2006), embedding structures such as those espoused by reflection theorists in a structured prebriefing activity could support metacognition, or thinking about thinking. Concept analyses of prebriefing (Chamberlain, 2015; Page-Cutrara, 2015) and a recent Delphi study (McDermott, 2016) show that prebriefing may be comprised of several activities that involve planning ahead, the use of facilitation strategies, and the conveyance of information.

Because of the limited research available on prebriefing, and despite its recognition as a phase of the simulation process, prebriefing has not been considered for its relationship or role in the development of learner competency during nursing simulation. For the purposes of this study, competence is defined as the:

- ability to observe and gather information, recognize deviations from expected patterns, prioritize data, make sense of data, maintain a professional response demeanor, provide clear communication, execute effective interventions, perform nursing skills correctly, evaluate nursing interventions, and self-reflect for performance improvement within a culture of safety (Hayden et al., 2014, p. 244).

The performance of competency, or competency performance, was considered in this study in the context of learning rather than evaluation. Tanner defined clinical judgment 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” (2006, p. 204). She further described a clinical judgment model for simulation,
involving aspects of noticing, interpreting, responding and reflecting. Few studies have explored clinical judgment in nursing students in relation to simulation design and prebriefing in particular (Chmil et al., 2015). Therefore, understanding how a structured prebriefing format may support nursing student competency performance and clinical judgment would assist in filling the gaps identified in the simulation literature.

4. Method

This study, conducted at a large university school of nursing in Canada, used an experimental, group-randomized design, with structured prebriefing as the single intervention. A large convenience sample of 379 students, from both the fall (seventh) and winter (sixth) semester who were already enrolled in a section of the 4th year medical-surgical course, was targeted by this study. This population was of interest because of the requirements for these students to perform competently at the course level, and to develop clinical judgment skills during the upper years of the program. Groups of participants were randomized based on the section of the course in which they were enrolled. The two sections of the course in each semester were randomly assigned, via coin toss, to either the experimental or control group. All students in this targeted course met the same academic program requirements and could read, speak and write in English. There were no exclusion criteria. With institutional review board approval, consent to participate and simulation sign-up in pairs were completed. The members of the research team were not involved in teaching the course.

In the fall semester, from a total of 157 students enrolled in two sections of the medical-surgical course, 38 consented to participate, and 31 completed the study. Recruitment in the winter semester was also conducted, in order to increase the sample size, and targeted a pool of 222 students enrolled in two sections of the medical-surgical course. Of these students, 65 consented to participate, and 45 completed the study. When combined, a total of 76 participants completed the study.

The control group (n = 34) received the traditional prebriefing activity, which included an orientation to the equipment, environment, mannequin, roles, time allotment, objectives, and patient situation as outlined by the International Nursing Association for Clinical Simulation and Learning document (Meakim et al., 2013), as the standard convention used in simulations at the university site where the study occurred. A structured prebriefing received by the experimental group (n = 42) on the other hand, included these traditional prebriefing activities, and also incorporated aspects of the Structured Prebriefing Model (Fig. 2) through the use of a prebriefing worksheet and facilitated reflection. The worksheet used language consistent with clinical judgment (noticing, interpreting, responding and reflecting, as cited in Tanner, 2006), and posed questions relating to attributes of prebriefing (considering the scenario, perceiving meaning, and anticipating a plan, as cited in Page-Cutrara, 2015). Facilitation, by the principal investigator as interventionist, involved prompts for the participants using the worksheet. Prompting included questions such as, “Based on what you know so far about this patient scenario, what possible interpretations may be made as to what is happening?” and “If you anticipate that plan of care, what can you see happening as a result?” Prebriefing phases for the experimental and control groups were timed at no >30 min. All participants engaged in a 15 min standardized clinical scenario for a chest pain management of a post-operative client; they were to plan, prioritize and evaluate the client’s care.

Once the scenario was finished, the participants and the interventionists debriefed the simulation for approximately 15 min, using the same format for both groups. Coffee gift cards were provided to participants. This concluded the intervention, data collection and participant activity.

5. Instruments

Two instruments were used to collect data. The Creighton Competency Evaluation Instrument (CCEI) (Hayden et al., 2014) and this instrument’s Clinical Judgment subscale (CCEI-CJ) were used to assess the participants’ simulation activities. The Prebriefing Experience Scale (PES) was used to assess participants’ perceptions of the prebriefing phase. The participant scores from the experimental group on these measurement were compared to those scores from the control group.

The CCEI (Hayden et al., 2014) is a quantitative instrument used to evaluate students’ competency performance during either a simulated or a live clinical experience. It is a 23-item dichotomous scale divided into four competency subscales of Assessment, Communication, Clinical Judgment (CCEI-CJ) and Patient Safety, with acceptable content and inter-rater reliability, validity and usability results; Cronbach’s alpha was = 0.90 when used to score various levels of simulation performance (Hayden et al., 2014). During the simulation scenario, competency performance was rated separately for all participants, by the interventionist, using the CCEI tool (Hayden et al., 2014). This instrument’s subscale (CCEI-CJ) was also used to measure clinical judgment.

Prebriefing experience was measured using the Prebriefing Experience Scale (PES), a minor adaptation of Reed’s Debriefing Experience Scale (Reed, 2012). The PES, with four categories of Analyzing Thoughts and Feelings, Learning and Making Connections, Facilitator Skill in Conducting the Prebriefing, and Appropriate Facilitator Guidance, has 20 items for response on a 5-point Likert-type scale that range from strongly agree to strongly disagree. A pilot study, conducted prior to this intervention study, demonstrated internal consistency reliability with Cronbach’s alpha of the overall PES scale as 0.94. Although it is recognized that the student experience has been over-studied in simulation research (Kardong-Edgren et al., 2010), students’ specific experiences with prebriefing have not been documented. For both groups, data was collected using the PES immediately after all participants completed the prebriefing activity and before they engaged in the scenario. The PES included an area for participants to write comments about their experience; this was an optional activity, and no question prompts were provided.
6. Data Analysis

IBM SPSS Version 22.0 Premium software was used for the quantitative analyses. A sample size of 128, determined in an a priori power analysis (\( p = 0.05 \), power 80%, medium effect size of \( d = 0.5 \)) was not met; post hoc power analyses were conducted for each analysis. Preliminary analyses included the assessment of normality and homogeneity, to determine congruence with underlying assumptions and the selection of inferential statistical tests. Bootstrapping techniques were used to increase the robustness of the analyses. Demographic data included: gender, age, and number of previous simulation experiences. A significance level of <0.05 was used for all analyses.

To address the first research question, an independent samples t-test was used to compare the mean total CCEI scores between the experimental group exposed to structured prebriefing, and the control group, which received the traditional prebriefing. Because data was collected from different participants in both the fall/seventh and winter/sixth semesters, and because length of enrollment in a program may be a potential influence on differences in competency performance, an additional analysis was conducted. An ANCOVA was used to examine the CCEI scores between the experimental and control groups, while controlling for the covariate of semester of enrollment. A Mann-Whitney U test was used to compare the distribution of scores on the Clinical Judgment subscale (CCEI-CJ) of the CCEI, between the experimental group exposed to structured prebriefing, and the control group, which received the traditional prebriefing. An ANCOVA was also used to control for the covariate of semester.

For the second research question, a Mann-Whitney U test was used to compare the distribution of PES scores between the experimental group and the control group. Lastly, to address the third research question, a Spearman’s rho correlation coefficient was employed to examine the relationship between the experimental and control groups’ CCEI scores and the PES scores; the analysis was repeated with clinical judgment scores (CCEI-CJ) and PES scores.

7. Results

The overall participant sample was representative of the student population enrolled in the nursing program. The majority of participants were female (92%; \( n = 70 \)). Participants ranged in age from 20 to 49 years, with an average age of 26.0 years (SD = 6.8). The demographics were represented similarly in both the experimental and control groups. Summaries of the descriptive data and the results for the CCEI, which was used to measure competency performance and clinical judgment, and the PES, which was used to measure perceived prebriefing experience, are available in Tables 1 and 2.

7.1. Competency Performance

The CCEI scores for the experimental group were significantly different \( t(57.5) = −7.70, p < 0.001 \) from the control group, with a large effect, \( d = 1.8 \). Post hoc power was estimated at 1.0 (\( \alpha = 0.05 \)). There was a significant effect of group membership on the CCEI scores, \( F(1,73) = 59.9, p < 0.001 \), partial \( \eta^2 = 0.45 \), when controlling for the effect of semester. The large effect size was noted (partial \( \eta^2 = 0.45 \)). In this instance, structured prebriefing strongly affected competency performance of participants during the scenario.

7.2. Clinical Judgment

Clinical judgment scores were significantly greater for the experimental group who received structured prebriefing than for the control group \( U = 128.5, Z = −6.2, p < 0.001 \). In an analysis using ANCOVA to control for the covariate of semester, there was a significant effect of group membership on the CCEI-CJ scores, \( F(1,73) = 74.0, p < 0.001 \), partial \( \eta^2 = 0.50 \), when controlling for the effect of semester. A large effect size was noted (partial \( \eta^2 = 0.50 \)). Observed power was 1.0 (\( \alpha = 0.05 \)). However, for these scores, homogeneity of regression was violated. Therefore, where preliminary analyses demonstrated statistically insignificant differences between semesters on mean clinical judgment scores \( t(74) = 0.26, p = 0.79 \), and while a large statistical difference was evident in clinical judgment between the experimental and the control groups, semester may have had a medium effect (partial \( \eta^2 = 0.06 \)) on the participants’ clinical judgment, in this study. In this specific instance, differences between the groups’ clinical judgment may have been additionally influenced by the effect of the semester in which they were enrolled in the program.

7.3. Perceptions of Prebriefing Experience

The perception of the prebriefing experience was shown to be greater for the experimental group who received structured prebriefing than for the control group \( U = 281.0, Z = −4.54, p < 0.001 \). Therefore, a large statistically significant difference was evident in the higher scoring of the perceived prebriefing experience by the experimental group that received the structured prebriefing, compared to the control group that received a traditional prebriefing.

The PES instrument included an area for participants to write short written comments on the prebriefing experience, if they wished. Although comments were not required, 38% of participants in the experimental group offered feedback, compared with 15% of participants in the control group. All comments from both groups were positively framed.

7.4. Competency Performance, Clinical Judgment and Prebriefing Experience

The relationships between competency performance and the students’ perceived prebriefing experience, and between clinical judgment and their perceived prebriefing experience during simulation, were examined using correlation analyses. Non-significant within-group correlations of the PES scores with the experimental group CCEI scores (\( r_s = 0.09, p = 0.56 \)) and CCEI-CJ scores (\( r_s = 0.10, p = 0.54 \)), and

Table 1
Results by Group for Creighton Competency Evaluation Instrument and Subscales.

<table>
<thead>
<tr>
<th>Instrument/subscales</th>
<th>Total sample (( N = 76 ))</th>
<th>Experimental (structured) (( n = 42 ))</th>
<th>Control (traditional) (( n = 34 ))</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>95% (CI-L, CI-U)</td>
<td>M</td>
</tr>
<tr>
<td>CCEI (23 items)</td>
<td>71.2</td>
<td>14.3</td>
<td>(68.0, 74.5)</td>
<td>79.9</td>
</tr>
<tr>
<td>CCEI-assessment (3 subscale items)</td>
<td>71.0</td>
<td>30.0</td>
<td>(64.4, 77.7)</td>
<td>83.3</td>
</tr>
<tr>
<td>CCEI-communication (5 subscale items)</td>
<td>68.9</td>
<td>16.5</td>
<td>(65.2, 72.7)</td>
<td>72.9</td>
</tr>
<tr>
<td>CCEI-clinical judgment (CCEI-CJ) (9 subscale items)</td>
<td>77.2</td>
<td>18.6</td>
<td>(72.9, 81.4)</td>
<td>89.1</td>
</tr>
<tr>
<td>CCEI-patient safety (6 subscale items)</td>
<td>63.4</td>
<td>21.4</td>
<td>(58.5, 68.3)</td>
<td>69.8</td>
</tr>
</tbody>
</table>

M: mean; SD: standard deviation; CI-L: confidence interval-lower; CI-U: confidence interval-upper.
* Unadjusted bivariate analysis using t-testing for differences between groups (\( p < 0.05 \) indicated statistical significance).
non-significant correlations of the PES scores with the control group CCEI scores ($r_s = -0.18, p = 0.32$) and CCEI-CJ scores ($r_s = -0.32, p = 0.07$) were shown. Post hoc analyses revealed that the results with a small effect were underpowered. In this study, it was evident that competency performance and clinical judgment were not significantly related to students’ perceived prebriefing experiences.

8. Discussion

Prebriefing has not been described extensively in the literature (Husebo et al., 2012; Page-Cutrara, 2014). The findings from this study are therefore important for two reasons. Firstly, this study describes a theoretically-based model of structured prebriefing that is consistent with current nursing simulation frameworks for promoting reflection and meaningful learning. Secondly, this study’s findings support model-based structured prebriefing activities for significant improvements in competency performance and clinical judgment, as outcomes of simulation, and on students’ perceptions of their prebriefing experience.

Current literature is supportive of the links between competency performance and structured prebriefing. Preparatory exercises involving prioritization and preparation for caring for the simulated patient were evident in studies where competency or simulation performance were assessed (Bogossian et al., 2014; Potter and Allen, 2012); however, prebriefing activities had not been expressly evaluated for their relationship to competency performance.

This study’s structured prebriefing activity was not designed for the interventionist to provide participants with answers, or to tell them which actions should be undertaken during the simulation. Activities were geared to support reflection-before-action and use of the reflective cycle (Fig. 1), and to facilitate a concept map-type worksheet, based on the Structured Prebriefing Model (Fig. 2). Learner identification of appropriate plans for simulated patient care, with guidance from a simulated cycle (Fig. 1), and to facilitate a concept map-type worksheet, based on the Structured Prebriefing Model (Fig. 2). Learner identification of appropriate plans for simulation preparation (Benner et al., 2009), has been evaluated in the literature in studies that have included various approaches for preparing students for simulation; again, however, a specific association between prebriefing and clinical judgment had not been examined. Those simulation studies that have demonstrated improved clinical judgment have incorporated different approaches to prebriefing, such as verbally articulating thought processes, expert modeling, and written preparatory materials (Johnson et al., 2012; Sharoff, 2012). The suggested association between group membership and semester, for clinical judgment scores, may further indicate the complexity of such skill development; clinical judgment is known to develop over time and across the trajectory of a nursing program (Benner et al., 2009).

Although participant perceptions of simulation are over-utilized in simulation research (Kardong-Edgren et al., 2010), the prebriefing experience data provides preliminary information on how students value learning frameworks during prebriefing, which was previously undocumented. The results of this study align with other literature documenting learner preferences for simulation. Nursing students value simulation learning strategies such as guided reflection (Smith and Roehrs, 2009) and concept mapping exercises (Decker et al., 2010).

No statistically significant relationship between competency performance or clinical judgment and perceived prebriefing experiences was observed. The general incongruence between participants’ positive self-assessment of their perceived learning experience and their scored performance during the scenario may be explained by the possibility of increased satisfaction in general, with any prebriefing or similar supportive simulation design component (Smith and Roehrs, 2009). Such incongruence between self-perceptions of learning and actual performance outcomes has been documented in the nursing simulation literature (Bambini et al., 2009). These results illustrate the identified challenges in education and research of an overreliance on student ratings as indicators of learning.

Overall, the results of this study support the use of a model-based, structured prebriefing activity in simulation and nursing student education. Identified gaps in the simulation knowledge base included the learning structures used in prebriefing and the relationships to learner outcomes. The results of this study begin to address these identified gaps and have implications for educators in the application of a structure to simulation prebriefing, for developing competency and clinical judgment skills. Prebriefing activities have been discussed in research as potential means for supporting thinking, assessment and how learners respond to cues (Ashley and Stamp, 2014). What this study adds, is that a structured prebriefing, as an extension of traditional prebriefing activities, may contribute to the development of the requirements for learning to be a nurse. Additionally, educators may consider incorporation of innovative teaching-learning approaches during simulation at the learner’s knowledge level. Learners at a novice or advanced beginner level of performance could benefit from structured preparation and guided reflection prior to a simulated clinical experience. These activities may provide the opportunity for stronger development of skills, earlier in the simulation learning process and in the reflective cycle. While educators may hesitate to provide details to students before a simulation, at a novice level and with increased simulation scenario complexity, a facilitated structured prebriefing that guides students to reflect forward and construct knowledge, may have benefits for developing mental models that are required in practice settings.

This study suggests possibilities for a re-conceptualization by educators of how students are prepared in the simulation process. Such preparation may fit with current approaches to simulation that are geared to the level of learner knowledge (Jeffries, 2012), but that require the use of more teaching-oriented strategies by educators during the prebriefing phase, to support students as they learn to think like nurses.

### Table 2

Results by group for prebriefing experience scale and subscales.

<table>
<thead>
<tr>
<th>Instrument/subscales</th>
<th>Total sample (N = 76)</th>
<th>Experimental (structured) (n = 42)</th>
<th>Control (traditional) (n = 34)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>95% (CI-L, CI-U)</td>
</tr>
<tr>
<td>PES (20 items, scored out of 100)</td>
<td>92.2</td>
<td>7.7</td>
<td>(90.4, 93.9)</td>
</tr>
<tr>
<td>PES-ATF (4 subscale items, scored out of 20)</td>
<td>18.1</td>
<td>1.8</td>
<td>(17.7, 18.5)</td>
</tr>
<tr>
<td>PES-LC (8 subscale items, scored out of 40)</td>
<td>36.4</td>
<td>3.6</td>
<td>(35.6, 37.3)</td>
</tr>
<tr>
<td>PES-FS (5 subscale items, scored out of 25)</td>
<td>23.6</td>
<td>1.7</td>
<td>(23.2, 24.0)</td>
</tr>
<tr>
<td>PES-FG (3 subscale items, scored out of 15)</td>
<td>14.1</td>
<td>1.5</td>
<td>(13.7, 14.4)</td>
</tr>
</tbody>
</table>


* Unadjusted independent samples Mann-Whitney U test for differences between groups ($p < 0.05$ indicated statistical significance).
9. Limitations

Sample size was a limitation that may have affected several aspects of the study. A larger, more robust study is warranted to validate these findings. Post hoc power analysis revealed the results were underpowered for comparisons between groups on perceived prebriefing experience and outcomes of competency performance and clinical judgment. The challenge of adding to students' workload with volunteered participation in the study may have affected recruitment and retention. This study examined student participants in the upper years of a 4-year program, and therefore findings may not be generalizable to all levels of nursing students. Additionally, selection bias was a limitation and may have affected the scores of the PES, because volunteer participants may have traits that differ from non-participating students. The principal investigator, as both rater and interventionist, was also a source of potential bias.

Educational research which compares one learning activity to another activity that delivers added opportunities for learning, has been debated for its value; more teaching is assumed to be better than less (Norman, 2014). Hence, the effectiveness of debriefing in simulation learning is considered from a theoretical standpoint, and highlight the need for further work. A similar study with a larger sample of participants at various program levels would provide increased rigor. While the intent in this initial study was for the PES to capture participants' perceptions immediately after experiencing the prebriefing phase, the participants may not have accurately perceived the actual impact of the learning in this phase until after experiencing the simulation scenario. Lastly, the mismatch that was observed between students' self-rated perceptions of prebriefing and their researcher-rated competency performance and clinical judgment, reinforces that future research should not focus on such self-report instruments.

10. Conclusion

Statistically significant differences were evident between the higher-scoring experimental group that was exposed to structured prebriefing, and the control group in competency performance, clinical judgment and perceived prebriefing experiences. No relationships were found between students' self-rated perceived prebriefing experiences and students' actual competency performance or clinical judgment. This study demonstrated the preliminary effectiveness of a model-based, structured prebriefing activity for enhancing competency performance, clinical judgment and students' perception of their prebriefing experience. This study suggests that educators may consider embedding structured prebriefing activities in all levels of nursing programs to improve competency performance and clinical judgment among students. This study provides a foundation for prebriefing research in nursing simulation and describes new knowledge about prebriefing and its possible connections to meaningful learning and cognitive skill development in simulation.

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