CE 1.5 ANCC Contact Hour

The Impact of Simulation Prebriefing on Perceptions of Overall Effectiveness, Learning, and Self-Confidence in Nursing Students

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Abstract

AIM The aim of this study was to evaluate the impact of simulation prebriefing on nursing students' perceptions of overall effectiveness, learning, and self-confidence.

BACKGROUND Most research highlights debriefing as the most important component influencing learning outcomes; the focus on prebriefing is limited.

METHOD This quasiexperimental design study compared outcomes among four groups of undergraduate students ($n = 119$) at two schools of nursing: no prebriefing, prebriefing with learning engagement and orientation activities, prebriefing with orientation activities, and prebriefing with learning engagement activities.

RESULTS Perceptions of overall simulation effectiveness, learning, and self-confidence were significantly higher with prebriefing ($p = .000$) compared to no prebriefing. No significant distinction ($p > .05$) was found among the prebriefing activities.

CONCLUSION Findings from this study support the use of learning engagement and orientation activities during prebriefing in order to enhance overall simulation effectiveness.

KEY WORDS Prebriefing – Debriefing – Simulation Effectiveness – Learning Outcomes – Nursing Education

There are three phases to simulation: *before, during,* and *after*. The International Nursing Association for Clinical Simulation and Learning (2011) describes the before phase as *prebriefing*, the during phase as the *simulation scenario*, and the after phase as *debriefing*. Overwhelmingly, research highlights the last phase of simulation, debriefing, as the most important component influencing learning outcomes (Chronister & Brown, 2012; Dreifuerst, 2012; Mariani, Cantrell, Meakim, Prieto, & Dreifuerst, 2013; Reed, Andrews, & Ravert, 2013; Shinnick, Woo, & Evangelista, 2012). Although few studies take into account the prebriefing phase as a potential influential variable to findings (Chronister & Brown, 2012; Dreifuerst, 2012; Mariani et al., 2013; Reed et al., 2013; Shinnick et al., 2012), some evidence exists that prebriefing affects satisfaction, participation, and the overall effectiveness of the simulation experience (Elfrink, Ninniger, Rohig, & Lee, 2009; Nelson & Leighton, 2010).

The purpose of this study was to describe the influence of the prebriefing phase on undergraduate nursing students' perceptions of overall simulation effectiveness, learning, and self-confidence. The study also asked about observational behavioral differences, if any, between students who were given prebriefing compared to students who were not given prebriefing.

The research study is rooted in situated learning theory (SLT), also known as situated cognition theory. SLT considers learning as a social phenomenon rather than the action of an individual assimilating knowledge (Stein, 1998). Lave and Wenger (1991), the founders of SLT, believe that the acquisition of knowledge and skill requires learners to fully participate in their learning environment. This theory is commonly found in nursing education, in particular with the teaching intervention of simulation, due to its focus on participative teaching methods (Holland et al., 2013; Kaakinen & Arwood, 2009; Onda, 2011; Paige & Daley, 2009; Rourke, Schmidt, & Garga, 2010).

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REVIEW OF THE LITERATURE

In the nursing literature, the phenomenon of the before phase of nursing simulation has been identified using multiple labels including *prescenario* (Waxman, 2010), *presimulation* (Bruce et al., 2009; Davis Bye, 2011; Whitman & Backes, 2014), *preparation* (Brewer, 2011), *briefing* (Arafeh, Snyder Hansen, & Nichols, 2010; Husebo, Friberg, Soreide, & Rystedt, 2012; Miller, Riley, Davis, & Hansen, 2008; Titzer, Swenty, & Hoehn, 2012), *orientation* (Beattie, Koroll, & Price, 2010), *preplanning sessions* (Elfrink et al., 2009), *reflection-before-action* (Onda, 2011), and *prebriefing* (Distelhorst & Wyss, 2013; Leighton, 2009; Mason & Lyons, 2013; Murphy, 2013; Sittner, Hertzog, & Ofe Fleck, 2013).

A variety of prebriefing practices utilized by nursing programs are found in the literature. These include creating a safe and trusting learning environment (Arafeh et al., 2010; Beattie et al., 2010; Miller et al., 2008; Murphy, 2013; Rudolph, Raemer, & Simon, 2014); identifying learning objectives for learners (Arafeh et al., 2010; Beattie et al., 2010; Brewer, 2011; Chunta & Edwards, 2013); reviewing behavior expectations with learners, such as respect and confidentiality (Arafeh et al., 2010; Brewer, 2011; Leighton, 2009); orienting to the manikin and other equipment that will be used in the simulation (Beattie et al., 2010; Christian & Krumwiede, 2013; Chunta & Edwards, 2013; Hinchey, De Maio, Patel, & Cabañas, 2011; Leighton, 2009; Mason & Lyons, 2013; Miller et al., 2008, Murphy, 2013); completing preparation work, such as reviewing knowledge

and skills that will be utilized during the simulation (Brackney & Priode, 2015; Brewer, 2011; Distelhorst & Wyss, 2013; Leighton, 2009; Garrett, MacPhee, & Jackson, 2010; Waxman, 2010); discussing the components of the debriefing following the simulation with the learners (Arafeh et al., 2010; Chunta & Edwards, 2013); discussing with learners the need for suspension of disbelief (Mason & Lyons, 2013; Miller et al., 2008); and discussing and identifying with the learners the roles they will assume during the scenario (Chunta & Edwards, 2013; Miller et al., 2008). Page-Cutrara (2014), in a literature search for the period 2003 to 2014, found 15 articles pertaining to prebriefing, but only one study specifically focused on prebriefing, whereas seven included the prebriefing phase in the abstract.

Elfrink et al. (2009) focused on prebriefing in evaluation research on ways to improve the simulation learning experience for nursing students. Elfrink et al. did not describe how the simulation was conducted but reported on asking learners ($n = 114$) to identify the strengths and weaknesses of the simulation experience; some students felt that their learning was hindered by not knowing where to start or what to do, despite being informed of their roles and the flow of the simulation. Asked to rate the helpfulness of simulation elements from 0 (not helpful at all) to 2 (very helpful), students identified the preplanning sessions as most helpful more frequently than debriefing (34 percent vs. 19 percent).

It is acknowledged that the results of simulation research may be uncertain given that the three phases of simulation are not standardized among simulation programs. However, the need to recommend a standard process of prebriefing and to identify its value on the effectiveness and/or outcomes of simulation drives this research.

METHOD

Design

This study used a descriptive, quasiexperimental, posttest-only design. Participant comments were also obtained and are reported. For the purpose of this study, prebriefing orientation activities included review of simulation learning objectives, scenario roles for the participants, and the equipment used in the simulation. Prebriefing learning engagement involved activities that assisted in the review of content related to the scenario.

Setting

The study took place in the Midwest. Two baccalaureate colleges of nursing chosen for this research were selected based on their well-established, fully accredited programs and experienced simulation programs.

Sample

Inclusion criteria for subjects included being enrolled as a nursing student at one of the selected sites and able to read and comprehend English. The subjects were required to be 18 years of age or older and to have received curricular content related to respiratory distress content in their curricula. Power analysis was completed via a priori sample size calculator. The study was interested in a one-directional relationship among the variables only. Type I error was set at 0.05; power of the test was set at 0.80. The mean effect size is unknown, as prebriefing research is an identified gap in the literature; however, Shin, Park, and Kim (2015) conducted a meta-analysis of 20 studies from 1997 to 2013 to identify effects of simulation in nursing education. The authors' findings and the study's elements were combined to project the study's effect size as medium-large effect (0.65), thus calculating a recommended sample of 120 participants or 30 participants per group.

Exempt status was obtained from the institutional review boards of the participating colleges. Informed consent process of the participants was waived; however, an informational sheet about the study was presented to the participants before the study took place.

Instrument

The Simulation Effectiveness Tool (SET) was chosen to measure students' perceptions of overall simulation effectiveness, learning, and self-confidence. The tool was designed from five simulation evaluation tools from colleges of nursing that participated in the Program for Nursing Curriculum Integration developed by Medical Education Technologies, Inc. (Elfrink Cordi, Leighton, Ryan-Wenger, Doyle, & Ravert, 2012). The SET includes 13 items with a 3-point Likert-scale (do not agree, somewhat agree, strongly agree); higher scores equate to higher perceptions of overall simulation effectiveness. Construct validity of the SET was established through discussions among the creators of the five original tools and simulation faculty at Ohio State University. Internal reliability was identified with a Cronbach's alpha of .93 (Elfrink Cordi et al., 2012). For this study, SET item 13 was changed from *debriefing* to *prebriefing*.

Procedure

As it is customary to conduct simulation labs in clinical nursing groups, participants were pregrouped by faculty at the selected sites; prerandomization was done for the purpose of time efficiency. The four groups from each college included: Group 1, comparison group (no prebriefing); Group 2, experimental (prebriefing learning engagement and orientation activities); Group 3, experimental

Table 1: Sample Description

	Male	Female	Age, 18-22 years	Age, 23-30 years	Age, 31-49 years	African American	Caucasian
College A, *n* = 55	12 (22%)	43 (78%)	26 (47%)	22 (40%)	7 (13%)	5 (9%)	48 (87%)
College B, *n* = 64	10 (16%)	54 (84%)	53 (83%)	9 (14%)	2 (3%)	14 (22%)	43 (68%)
Overall sample, *n* = 119	22 (18%)	97 (82%)	79 (66%)	31 (26%)	9 (8%)	19 (16%)	91 (77%)

(prebriefing orientation activities only); and Group 4, experimental (prebriefing learning engagement activities only).

The simulation scenario conducted by all groups was a standard respiratory distress scenario. To minimize internal threats to the study, three groups were in another room doing assigned activities not related to the context of the study's scenario while one group was in the simulation lab. After completion of the simulation scenario by each group, the SET was immediately administered and completed by all participants. It was essential that the SET be completed prior to any debriefing to eliminate any internal study threats. The SET had a demographic survey attached to measure equivalency among groups. After completion of the SET, the participants exited the study activities.

- Because of the posttest-only design of the study, Group 1 (no prebriefing) began the simulation scenario upon entering the room.
- Group 2 began with a 20-minute prebriefing session. The session included 5 to 7 minutes of orientation activities (identification of simulation learning objectives, review of participant roles, review of the manikin and equipment). Learning engagement activities, which took 13 to 15 minutes to complete, began with the viewing of a 4-minute respiratory assessment video, followed by completion of a worksheet; they ended with group discussion regarding plans of care for respiratory distress clients. The researcher created a trusting learning environment by ensuring students that this was a practice environment where it was safe to ask questions and practice their newly acquired skills without being reprimanded or graded on simulation performance. After the standard scenario was conducted, participants completed the SET and exited the study.
- Group 3 (prebriefing learning engagement activities only) began with a 13- to 15-minute prebriefing session. Learner engagement activities were the same as Group 2 learner engagement activities. After the standard respiratory distress scenario was conducted, participants completed the SET and exited the study.
- Group 4 (prebriefing orientation activities only) began with a 5- to 7-minute prebriefing session. Orientation activities were the same as Group 2 orientation activities. After the standard scenario was conducted, participants completed the SET and exited the study.

Data Analysis

Data were collected in IBM SPSS 23 software. Descriptive statistics were used to report frequency and mean for participants' gender, age, race, hospital work experience status, and simulation experiences to determine homogeneity of groups. Central tendencies, including median and standard deviation of the 13 SET items, were also analyzed and reported. An ANOVA was utilized to determine if there was significance among the groups.

RESULTS

The SET internal reliability for this study was measured at Cronbach's alpha of .90, which is comparable to Elfrink Cordi et al.'s (2012) previously measured internal reliability of .93. Table 1 displays the demographics of the subjects. The Pearson's chi-square goodness-of-fit test demonstrated that the variables of gender (p = .706), race (p = .376), work experience (p = .469), and simulation experience (p = .471) were normally distributed among the groups.

Table 2 displays each group's averaged total SET score, mean learning score, and mean confidence score. Significant differences were found in participant perceptions between prebriefing (learning engagement activities and orientation tasks) compared to no prebriefing. Perceptions of overall simulation effectiveness were significantly higher (p = .000) with the use of prebriefing activities compared to no prebriefing. Perceptions of overall learning were significantly higher (p = .000) with the use of prebriefing activities compared to no prebriefing. Perceptions of overall confidence were significantly higher (p = .000) with the use of prebriefing activities compared to no prebriefing. However, post hoc tests revealed that there were no significant differences among learning engagement activities or orientation tasks regarding value by students (Table 3).

Student Comments

Students in Group 1, who had no prebriefing, offered the most written comments. Comments were primarily written as explanations as to why students did not like the simulation and/or ways to improve the simulation for better learning. For example, one student wrote: "I just felt unsure of the situation which made it difficult to take initiative in the task to help the patient." Another wrote: "If we were a little better prepared, I think that more people would have participated in the critical thinking aspect. I felt that some of the students were not sure what was expected of them in the simulation."

Students in Group 2, who had both learning engagement activities and orientation tasks during prebriefing, offered the fewest written comments. Comments verified students' perceptions of learning and the enjoyment they derived related to preparation before the scenario. For example, one student wrote: "Being able to discuss before really helped me feel more prepared for the scenario."

Students in Group 3, which had learning engagement activities only, also offered positive comments that verified their perception of

Asian	Hispanic	Work Experience	No Work Experience	No Simulation Experience	Very Little Simulation Experience	Some Simulation Experience
2 (4%)	0 (0%)	25 (45%)	30 (55%)	40 (73%)	12 (22%)	3 (5%)
3 (5%)	3 (5%)	35 (55%)	29 (45%)	37 (58%)	22 (34%)	5 (8%)
5 (4%)	3 (3%)	60 (55%)	59 (45%)	77 (65%)	34 (29%)	8 (6%)

Table 2: Intervention Group Scores

	Group 1 (No Prebrief), *M* (*SD*)	Group 2 (Learning/Orientation Activities), *M* (*SD*	Group 3 (Orientation Only), *M* (*SD*)	Group 4 (Learning Only), *M* (*SD*)	*df*	*F*	*p*
1. The instructor's questions helped me to think critically.	1.06 (0.639)	1.81 (0.402)	1.67 (0.483)	1.82 (0.395)	3	11.783	.000
2. I feel better prepared to care for real patients.	0.78 (0.808)	1.48 (0.512)	1.19 (0.512)	1.27 (0.456)	3	9.988	.000
3. I developed a better understanding of the pathophysiology of the conditions in the scenario (SCE).	0.78 (0.732)	1.71 (0.463)	1.38 (0.669)	1.64 (0.492)	3	11.937	.000
4. I developed a better understanding of the medications that were in the SCE.	0.33 (0.594)	0.90 (0.831)	0.86 (0.573)	0.91 (0.684)	3	5.411	.002
5. I feel more confident in my decision-making skills.	0.94 (0.802)	1.38 (0.590)	1.29 (0.717)	1.09 (0.526)	3	3.427	.020
6. I am more confident in determining what to tell the health care provider.	0.72 (0.669)	1.14 (0.655)	1.10 (0.831)	1.23 (0.752)	3	3.916	.011
7. My assessment skills improved.	1.06 (0.725)	1.43 (0.507)	1.33 (0.730)	1.41 (0.666)	3	5.204	.002
8. I feel more confident that I will be able to recognize changes in my real patient's condition.	0.94 (0.873)	1.48 (0.680)	1.19 (0.602)	1.50 (0.512)	3	4.199	.007
9. I am able to better predict what changes may occur with my real patients.	0.72 (0.826)	1.48 (0.602)	1.10 (0.625)	1.45 (0.510)	3	6.918	.000
10. Completing the SCE helped me understand classroom information better.	0.83 (0.857)	1.43 (0.598)	1.38 (0.590)	1.55 (0.596)	3	8.869	.000
11. I was challenged in my thinking and decision-making skills.	1.39 (0.698)	1.67 (0.577)	1.43 (0.676)	1.59 (0.503)	3	0.334	.800
12. I learned as much from observing my peers as I did when I was actively involved in caring for the simulated patient.	1.39 (0.698)	1.62 (0.498)	1.48 (0.512)	1.59 (0.590)	3	2.842	.041
13. Prebriefing and group discussion were valuable.	1.39 (0.698)	1.71 (0.463)	1.57 (0.598)	1.82 (0.395)	3	3.526	.017
Overall confidence score (Items 1, 3, 4, 7, 10, 11, 12, 13)	3.87 (2.862)	7.03 (2.195)	7.00 (2.194)	6.13 (2.673)	3	10.38	0.000
Overall learning score (Items 2, 5, 6, 8, 9)	7.87 (3.540)	11.59 (3.179)	12.36 (2.556)	10.69 (3.105)	3	11.585	0.000
Overall simulation effectiveness score	11.73 (5.948)	18.93 (4.407)	17.67 (4.339)	16.378 (5.499)	3	13.752	0.000

Table 3: Post hoc Analysis

	Intervention Group (I)	Intervention Group (J)	*M* Difference (I-J)	*SE*	*p*	Lower Bound	Upper Bound
Overall confidence score	Group 1	Group 2	–3.168	0.653	.000	–5.02	–1.31
		Group 3	–.2258	0.638	.008	–4.07	–0.45
		Group 4	–3.133	0.659	.000	–5.00	–1.26
	Group 2	Group 3	0.909	0.643	.574	–0.92	2.73
		Group 4	0.034	0.665	1.000	–1.85	1.92
	Group 3	Group 4	–0.875	0.649	.613	–2.72	0.97
Overall learning score	Group 1	Group 2	–3.720	0.813	.000	–6.03	–1.41
		Group 3	–2.821	0.794	.007	–5.07	–0.57
		Group 4	–4.490	0.821	.000	–6.82	–2.16
	Group 2	Group 3	0.899	0.801	.739	–1.37	3.17
		Group 4	–0.771	0.828	.833	–3.12	1.58
	Group 3	Group 4	–1.670	0.808	.240	–3.963	0.62
Overall simulation effectiveness score	Group 1	Group 2	–7.198	1.334	.000	–10.98	–3.41
		Group 3	–5.048	1.301	.003	–8.74	–1.36
		Group 4	–7.624	1.346	.000	–11.44	–3.81
	Group 2	Group 3	2.150	1.313	.447	–1.58	5.87
		Group 4	–0.426	1.357	.9992	–4.28	3.42
	Group 3	Group 4	–2.576	1.325	.292	–6.34	1.18

Note. Group 1, no prebrief; Group 2, both orientation and learning; Group 3, learning only; Group 4, orientation only.

learning related to prebriefing activities. For example, one student wrote: "I really enjoyed the small-group simulations; going over it first really helped and made me more confident." However, a few students wrote about not having guidance on what to do — something that would have been covered in orientation, which this group did not receive. One student wrote: "I feel the simulation, well really the whole experience, could have been more profitable than it was if we had known a little more about what we were supposed to do and if we were more engaged."

Students in Group 4, which had orientation activities only, had primarily positive comments regarding the simulation experience but noted that learning was missing in the beginning. For example, one student wrote: "It was helpful to know about the patient in debriefing but more info on pathophysiology would be better."

Behavior Observations

It was noted during simulations that groups with the most learning engagement activities had more in-depth dialogue regarding the plan of care and completed tasks according to the given cues. For example, when the assigned group member who took on the role of the RN stated, "We need to start oxygen," the assigned tech would immediately apply the nasal cannula. The other group members voiced their agreement and discussions followed immediately on what to do next.

Group 1, which received no prebriefing, was noted to have limited dialogue. Rather, members of the control group consistently looked to the instructor for guidance. For example, when one group member turned to the instructor and asked, "Should the patient be given oxygen?" the instructor responded that she could not offer any guidance. The student then remained quiet along with the other group members. It was also noted that the majority of the control groups did not have insight into the cues given during the scenario. For example, when a student asked about the oxygen no other group member applied the nasal cannula.

DISCUSSION

The findings of this study support the utilization of prebriefing as rooted in the concepts of SLT. It was evident that groups that received orientation activities or guidance on required actions during the scenario were more apt to listen to given cues and apply tasks accordingly.

Findings from the measurement tool did not identify any significant difference regarding preference for the form of prebriefing — orientation tasks versus learning engagement activities — leading to the assumption that both elements are essential to the learner. It was clear that group dialogue in prebriefing and during the scenario improved the overall simulation process and should be encouraged and facilitated by faculty. Therefore, it is best practice that, before the hands-on scenario begins, learners are provided with a thorough prebriefing that reflects the concepts of SLT utilizing learning engagement and orientation activities.

Another finding of the study is that students appreciated the time to dialogue and create a patient care plan based on the objectives given for the scenario. Students commented that having time before the scenario and reviewing appropriate assessment, intervention,

and evaluation strategies learned in theory courses assisted with their confidence and engagement level during the hands-on part of the simulation. It is recommended that to improve students' learning and engagement, enough time be allotted for prebriefing principles to occur.

It was also apparent that clearly identified roles and responsibilities during prebriefing improved the overall simulation process. Students need guidance on behavioral expectations during simulation and what is allowed or not allowed among the group during the scenario. It is highly encouraged that student observers take an active role in the simulation and act as "nurse consult" for the identified team leader during the scenario to further encourage group dialogue and the discussion of environmental cues that are essential to SLT.

Students with work experience were often looked upon as leaders of the group, even if they were not appointed the team leading role. Allowing this dialogue to occur encourages teamwork and the selection of appropriate leaders based on individuals' unique resources to meet group needs.

Prebriefing increases students' perceptions of confidence and learning gains as well as overall simulation effectiveness. It is an essential phase to incorporate into the simulation process, as it is a valuable platform that promotes learning.

Limitations

Selection threat was a concern because of the lack of randomization of participants in groups. It is customary for simulation programs in undergraduate nursing schools to provide scenarios in groups, such as preassigned clinical groups, in order to enhance resource utilization and the student learning experience. These customary groups (clinical groups) established by the nursing program served as the groups for this study. To minimize selection threat, each clinical group was randomly assigned to either one of the experimental or comparison groups. Upon crosstab analysis and chi-square analysis, no significant differences were found among the groups; thus, homogeneity of the groups was assumed.

The researcher conducted all simulations in order to preserve treatment fidelity. As potential undue bias was a concern, the researcher made a conscious effort to bracket all prior simulation observations and remain vigilant in adhering to the correlating script assigned to the group.

Another internal threat involved instrumentation. The researcher altered the last item on the SET because it related to debriefing, revising the item to read "Prebriefing and group discussion were valuable." Internal reliability of the SET (with this item removed) measured at Cronbach's alpha of .904, which was similar to the original tool's reliability measurement of .93.

The authors of the SET have recently revised their tool (Leighton, Ravert, Mudra, & Macintosh, 2015) to include items regarding prebriefing and debriefing. It is recommended for future research on simulation effectiveness that researchers utilize this established and reliable tool to determine which phase of the simulation (prebriefing, debriefing, or the actual scenario) is the most valued by learners.

Future Implications

This study's findings support that nursing students value prebriefing. Prebriefing is an essential phase in simulation for student planning and learning through dialogue. The concept of prebriefing can be applied to health care settings other than simulation learning. Nursing practice can include prebriefings before the start of a work shift or difficult case to promote teamwork and learning, in particular for novice nurses.

There are multiple names and various practices regarding prebriefing. In order to promote rigorous research, it is imperative that prebriefing be categorized in a standardized way. The intervention for this study was designed according to a published concept analysis that defines prebriefing as: "An educator designed phase of simulation that is implemented at a designated time prior to the 'hands-on' scenario and includes both orientation tasks and learner engagement activities that will enhance learner satisfaction, participation, and effectiveness of the simulation experience" (Chamberlain, 2015).

CONCLUSION

There is an identified gap in the nursing literature regarding prebriefing and its value to the simulation process. This study examined 119 undergraduate nursing students' perception of prebriefing and its relation to overall simulation effectiveness at two different college of nursing programs. The findings showed significance in that students who participated in prebriefing activities of learning engagement and orientation tasks perceived overall higher simulation effectiveness. However, there was no significant difference regarding which prebriefing element (learning engagement activities or orientation tasks) was valued more.

This finding leads to the assumption that both learning engagement activities and orientation tasks are essential to the participant for overall learning and simulation effectiveness. There is still need to further explore prebriefing to ensure nursing students have an effective simulation experience that promotes self-confidence and learning and that can be transferred to their future nursing practice.

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