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Featured Article

Comparison of Self-Debriefing Alone or in Combination With Group Debrief

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group debrief

Abstract

Background: Self-debrief alone and in combination with group debrief methods has not been well explored. Self-debrief requires self-assessment and reflection by the learner where one's strengths and areas for growth are identified. These skills are critical to the development of reflexive practitioners.

Method: A mixed methods study was conducted to examine debriefing methods. Participants completed a prenatal virtual gaming simulation and then were randomly assigned by lab section to one of three debriefing methods: self-debrief, self-debrief and small-group debrief, self-debrief and large-group debrief. Data were collected regarding two outcomes: prenatal knowledge and the debriefing experience.

Results: All groups made significant knowledge gains. The self-debrief—only participants had the lowest debriefing experience scores. The small- and large-group debriefing after self-debriefing offered many benefits.

Conclusion: Self-debrief after a virtual simulation encourages reflection and self-awareness. Combining self-debrief with a small- or large-group debrief can optimize the learning experience.

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Thirty to fifty percent of clinical courses in some nursing programs are now provided through simulation (Kardong-Edgren,Gore, Waxman & Willhaus, 2018), with recent evidence supporting a 2:1 clinical-to-simulation ratio (Sullivan et al., 2019). These programs, however, are challenged by the logistics, cost, and resource demands of in-person laboratory simulation, and as a result, there has been an increase in the use of virtual gaming simulations (VGSs). VGSs recreate reality on a computer screen, incorporating gaming principles and allowing students to safely practice decision-making in realistic clinical situations. The gaming principles used in VGSs often include dynamic storyline, different pathways, interaction, user control, engagement, and meaningful content (Bălan, Moldoveanu, Moldoveanu, & Morara, 2016). VGSs are ''serious''; their purpose is

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education or training rather than entertainment. Research suggests VGS is an engaging learning tool (Duff, Miller, & Bruce, 2016; Kidd, Knisley, & Morgan, 2012) that promotes clinical reasoning and knowledge acquisition (Irwin & Coutts, 2015; Schaffer Tiffany, Kantack & Anderson, 2016). Despite strong evidence supporting VGS as a useful tool, little is known about the optimal type of debrief after VGS.

Key Points

- Virtual simulation in health care education is increasing; therefore, innovative debriefing options are required.
- Authentic reflection occurs during a self-debrief and learning is extended when followed by a group debrief.
- Small or large in-person group debriefs are both effective after a self-debrief.

Debriefing

Debriefing is a vital component of in-person simulation and involves a facilitated, systematic process of reflection where knowledge gained during the simulation is synthesized and learning occurs (Eppich & Cheng, 2015). Debriefing provides an opportunity for learners to reflect on their actions and identify strengths and areas for improvement (Al Sabei & Lasater, 2016); these skills are essential for the reflective practitioner. Our earlier research (Verkuyl et al., 2017), in addition to other studies (Miller, Farra, & Simon, 2018; Roh & Jang, 2017), has led us to recognize that although game design is clearly important, the actual process of implementing the VGS, particularly the debriefing process, is equally important to achieving learning outcomes.

Although the body of simulation literature supports in-person group debriefing, our understanding of best practices related to other debriefing methods is limited. Research with graduate level students during in-person simulation by Boet et al. (2011) and Oikawa et al. (2016) suggests that there is value in self-debriefing, without a group. These authors reported that self-debriefing encourages self-assessment, an essential skill for health care providers and life-long learning. Verkuyl et al. (2018a) examined self-debriefing after VGS and reported that self-debriefing gave undergraduate students the opportunity to engage in deep reflection without peer influence. Practically, self-debriefing has several advantages; it can take place at any convenient time and it does not require costly institutional and faculty resources. This makes self-debriefing a good fit with virtual simulation, where the learning experience can be an individual one completed outside of the classroom.

Other studies with in-person simulation debriefing suggest that small groups (2-10 students) are very effective, more so than larger (up to 50) groups (Adamson, 2015; Partin, Payne, & Slemmons, 2011). Tosterud, Hall-Lord, Petzäll, and Hedelin (2014) noted in a rich, qualitative study that debriefing in groups, both large and small, can be stressful, as it can invoke a fear of failure and some students may become embarrassed when sharing their reflections in front of their peers. Students in small groups, however, reported less fear; they felt like they were part of a team with shared responsibility for problem solving. Tosterud et al.'s research also indicated that the debriefing dynamic was different in large groups where students acted as they would in class, asking questions with the teacher answering them. The researchers found that the larger the group, the more passive the students and the greater the fear of exposure. Interestingly, in spite of these limitations, the large group debriefing process offered an important advantage: simulation decisions had to be articulated and defended in a challenging environment and students felt that experience prepared them for their role as future registered nurses, an experience they did not receive in the small group (Tosterud et al., 2014).

Waznonis conducted a rigorous mixed methods debriefing study and reported that large class sizes with "too many students and too little time" presented debriefing challenges for the educator (2015, p.116). However, there is ambiguity related to what constitutes too large a group. The optimal size for a debriefing group remains unclear (Roh & Jang, 2017), particularly after VGS where students have more control of their experience and receive both formative and summative reports on their decisions. Further research is needed, as small-group debriefing is a very resource-demanding activity (Tosterud et al., 2014) and the current context results in larger debrief group sizes being used (Waznonis, 2015). In addition, the unique virtual simulation environment calls forth the need to reconsider the nature of best practices in debriefing (Lapum et al., 2018).

The purpose of this study was to examine the impact of three different debriefing methods (self-debrief only, self-debrief followed by a small-group debrief, and self-debrief followed by a large-group debrief) on nursing students' knowledge and debriefing experience after playing a VGS.

Methods

A sequential mixed methods study was conducted. The quantitative component included a pretest posttest quasiexperimental design with a control and two intervention groups (Figure). The study also included a qualitative component, with focus groups to deepen our understanding of the quantitative data (Wisdom & Creswell, 2013); results from that component of the study are beyond the scope of this article and will be reported elsewhere.

Theoretical Framework

The framework used in this study was the 3D (defusing, discovery, and deepening) model of debriefing (Zigmont, Kappus, & Sudikoff, 2011). This model proposes that

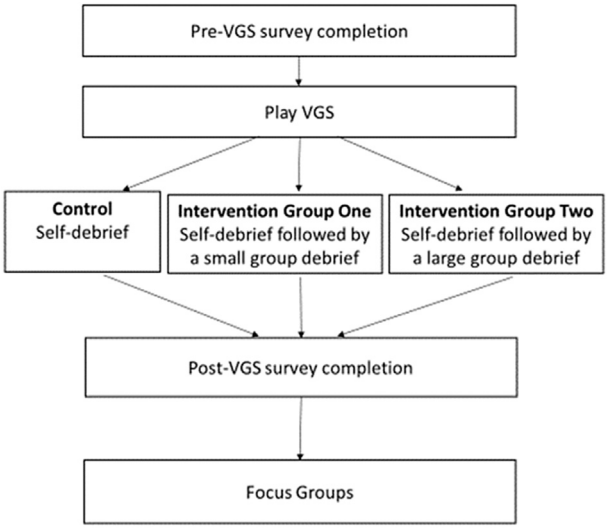

Figure Study design.

during the debriefing process, students reflect on their learning experience, identifying processes that influenced their decisions or actions. These reflections act as a scaffold to creating new mental models for future practice. The 3D model was used because it helps students identify knowledge gaps and identify any new learning after a simulation. This model was used to guide the development of debriefing questions for the debriefing sessions.

Virtual Gaming Simulation

The prenatal VGS used in this study can be viewed at https://de.ryerson.ca/games/nursing/maternity/. This open-source VGS is currently being used in nursing programs internationally. The VGS design was based on Kolb's (2015) Experiential Learning Model and provides an interactive, experiential online opportunity for students to problem-solve and make decisions in a simulated clinical environment (Verkuyl et al., 2017). The game is constructed using video clips of standardized patients acting their assigned roles in typical clinical situations. Students collect data, make intervention decisions, and receive immediate formative as well as summative feedback in a summary report on the consequences of their decisions. The VGS was designed using traditional simulation features; however, it also includes gaming features such as immersion (learner as the main character) and challenge (participants make decisions and are scored on their decisions). Typically, the VGS takes one hour to play, can be accessed from any computer, tablet, or phone, and allows for repetitive play.

Ethics

This study was approved by the participating college and university's research ethics boards, and students gave informed consent to participate. The group debriefing sessions were conducted in a manner to promote psychological safety and followed the INACSL Standards of Best Practice: Simulation[SM] Debriefing (2016) except criterion 3 because the debriefer was not present during the VGS.

Procedure

Participants were assigned readings and a PowerPoint on prenatal assessment after which they were required to individually play the prenatal VGS, complete their self-debrief and, if allocated to an intervention group, attend their assigned group debrief. The link to the prenatal VGS and the self-debrief document were provided, and students submitted their summary report and completed self-debrief to their faculty within one week. The next week, the students in the intervention groups completed a small- or large-group debrief. The debriefing sessions were led by faculty who were experts in debriefing and content and had completed a two-hour debriefing workshop specifically designed for this study. During the group debriefs, all faculty followed a scripted introduction and asked the same questions based on the 3D model of debriefing (Zigmont et al., 2011).

Debriefing Methods

- Self-debrief: (control group): There was no active educator facilitator. Students self-debriefed individually, anytime, anywhere, responding to a set of debriefing questions based on the 3D model of debriefing. Participants answered the questions using handwritten or electronic format.
- Self-debrief plus small-group debrief (intervention 1): Students followed the same self-debrief process as the control group and then participated in an assigned small group (maximum 12 students) debrief facilitated by an instructor who followed the in-person standards using the same debriefing questions as were asked in the self-debrief. Students were invited to sit facing each other in a circle.
- Self-debrief plus large-group debrief (intervention 2): Students followed the same self-debrief process as the control group and then participated in a large-group (maximum 30 students) debrief facilitated by faculty in a traditional classroom setting.

Students in both intervention groups were asked to come to the debrief with their summary reports, complete self-debrief, and refer to them during the debrief.

Data Collection

A demographic survey, debriefing experience survey (post), and multiple-choice knowledge test (pre-post) were administered. A six-item demographic survey was administered to collect information on age and gender and self-debriefing activities. Students in the small- and large-debrief groups

were also asked to rate the helpfulness of the group debrief on a Likert-type scale and provide comments.

The debriefing experience scale (DES) developed by Reed (2012) was used to measure students' experiences after their assigned debrief. The 20-item scale includes four subscales, three of which were considered appropriate for this study: analyzing thoughts and feelings, learning and making connections, and facilitator skill. The facilitator guidance subscale and two facilitator skill items were not used as these were not applicable to the self-debrief group. The tool was modified and validated by simulation faculty for this study, resulting in 15 items. Students responded using a Likert-type scale ranging from 1 to 5. The tool has been validated and used in recent studies with a Cronbach's alpha of 0.93 (Reed, Andrews, & Ravert, 2013) and 0.85 (Verkuyl et al., 2018b).

The multiple-choice knowledge test on prenatal nursing care was completed before the participants did the VGS and again after their assigned debriefing experience. The test included 11 previously tested items which had been reviewed by former and current year-four students for clarity and validated by faculty with expertise in prenatal care.

Results

The data were analyzed using descriptive and inferential statistics with IBM SPSS version 24.0 (IBM Corp, Armonk, NY). Descriptive statistics were used to analyze demographic data, the DES, and the multiple-choice test items. Dependent *t* tests were used to measure change within groups for the pre− and post−multiple-choice test scores. Because groups were unequal in size and the assumption of equal variances was not met, a Welch *F* test and the Games Howell post hoc test were used to determine the impact of debriefing method on knowledge test scores and the DES scores between groups.

First-year baccalaureate nursing students taking the course, "Assessment of the Healthy Individual" were invited to participate in the study. The course framework did not permit individual random sampling; however, 14 lab sections were randomly assigned to one of the three study groups. Students were recruited from two sites (college and university) of a collaborative program. A power analysis indicated that 240 students would be needed to have 80% power for detecting a small- to medium-sized effect when using the traditional 0.05 criterion of statistical significance.

Demographic Survey

Two hundred fifty-four students out of a potential sample of 370 (69%) completed the presurveys and postsurveys. Sixty-seven (26.3%) students participated in self-debrief only, 93 (36.6%) in self-debrief plus small-group debrief, and 94 (37%) in self-debrief plus large-group debrief. The majority (207; 81.5%) were female and most (218; 86.5%) were aged 18 years. Most students (199; 78.3%) completed their self-debrief within one hour of doing the VGS. There was no statistically significant difference between the three groups on those variables. The majority (175; 69%) reported taking 10 to 30 minutes to complete the self-debrief; however, there was a statistically significant difference between groups in the amount of time spent on the self-debrief ($p = .000$). Almost 20% (n = 13) of the self-debrief group spent less than ten minutes compared with almost 10% (n = 9) of the small group and 4% (n = 4) of the large group. Most (205; 80.7%) students referred to their VGS individual summary report, generated after completing the VGS, when answering the self-debrief questions. Self-debrief group students were the least likely to use their summary report, although this result was not statistically significant ($p = .454$). Fewer than a quarter (n = 16; 23.8%) of self-debrief students reported using educational resources, whereas 40.8% (n = 38) of the small-group and half (n = 47; 50%) of large-group students did. The difference between the self-debrief and the small and large group regarding resource use was statistically significant ($p = .004$).

Knowledge Test

The result for the internal reliability test, the KR20, was 0.35. All groups made statistically significant gains on their knowledge post-test scores; $p = .000$ (Table 1).

The total mean score for all groups on the preknowledge test was 6.0 (1.8)/11 or 55%, and there was no statistically significant difference between the groups ($p = .99$) (Table 2). The total mean score for all groups on the post-knowledge test was 8.0 (1.3)/11, or 75.4%, again with no statistically significant difference between the groups ($p = .06$).

Debriefing Experience Scale

The Cronbach's alpha for the 15 items on the DES was 0.92, providing further evidence for item reliability. The mean score for all groups on the DES was 64.3/75 (7.8) or 85.7%. The large-group debrief reported the highest DES

Table 1 Comparison of Outcomes Within Groups: Mean (SD)

Group	Preknowledge	Postknowledge	*p* Value
Self-debrief	6.0 (1.7)	8.2 (1.9)	.000*
Self-debrief plus small-group debrief	6.0 (1.9)	8.4 (1.1)	.000*
Self-debrief plus large-group debrief	6.1 (1.7)	8.0 (1.3)	.000*

Note. VGS = virtual gaming simulation.
* $p < .05$ level.

Table 2 Comparison of Outcomes by Debriefing Method Across Groups: Mean (SD)

Outcome Measures	Self-Debrief Only	Self-Debrief Plus Small-Group Debrief	Self-Debrief Plus Large-Group Debrief	*p*
Preknowledge test	6.0 (1.7)	6.0 (1.9)	6.1 (1.7)	.99
Postknowledge test	8.2 (1.9)	8.4 (1.1)	8.0 (1.3)	.99
DES	59.6 (9.6)	65.6 (7.1)	66.5 (6.1)	.000*

Note. DES = debriefing experience scale.
* $p < .05$ level.

score of 66.5 (6.1)/75 or 88.6% closely followed by the small-group debrief with 65.6 (7.1) or 87.4% and the self-debrief group with 59.6 (9.6) or 79.4%. A statistically significant difference was seen between the self-debrief and the small and large groups: (F (2, 146) = 15.0, p = .000 (Table 2). There was no statistically significant difference between the mean scores for the small and large groups (p = .423). Seven of the fifteen survey items scored less than 4.0/5 for the self-debrief group, whereas all items scored 4.0 or more for the small- and large-debrief groups (Table 3).

Group Debrief Questions

Students in the self-debrief plus small- and large-debrief groups were asked to rate the helpfulness of the written self-debrief before their assigned group debrief. The majority (149; 80.1%) said the self-debrief was very helpful; fewer than 3% said the self-debrief was not helpful. They also rated the helpfulness of the group debrief after the self-debrief; 143 (78.6%) said it was very helpful and 1.2% said it was not helpful.

The survey also included two open-ended items where students in the group debriefing sessions were asked to comment on their experience. Both groups provided similar responses. Most participants indicated that the self-debrief helped them organize their thoughts, which prepared them to engage in the group debrief discussion and actively listen to others. As one participant wrote, the self-debrief helped ''understand how I felt about the experiences before discussing it as a group'' and another participant said, ''my opinions were not confused with that of others.'' The immediacy of the self-debrief was beneficial to a number of participants because their raw feeling and understandings were captured in the moment and bringing their completed self-debrief to the group debrief facilitated recall of decisions and insights. Because of the self-debrief, a participant wrote, they were able ''to listen to others more closely'' in the group debrief. Most participants said the different perspectives shared in the group debrief extended their reflection in the words of one participant, it was an opportunity to ''consider aspects of the virtual game that I didn't consider prior to the group debrief.'' Most participants said that their peers and educators answered their questions in the group debrief and this deepened their knowledge and provided new insights. During the group discussion, participants realized that their thoughts and unanswered questions related to prenatal nursing care were similar to those of their peers.

Table 3 DES Items: All Groups: Mean (SD)

DES Item	Self-Debrief	Small Group	Large Group
Debriefing helped me to analyze my thoughts	4.0 (0.87)	4.3 (0.67)	4.5 (0.60)
Debriefing confirmed the decisions I made in the virtual simulation	3.9 (0.89)	4.2 (0.72)	5.3 (0.58)
The debriefing environment was physically comfortable	4.3 (0.75)	4.2 (0.72)	4.3 (0.63)
Unsettled feelings from the simulation were resolved by debriefing	3.6 (0.87)	4.2 (0.82)	4.4 (0.61)
Debriefing helped me to make connections in my learning	4.1 (0.82)	4.4 (0.72)	4.5 (0.54)
Debriefing was helpful in making sense of the virtual simulation	4.0 (0.96)	4.2 (0.75)	4.4 (0.57)
Debriefing provided me with a learning opportunity	4.1 (0.78)	4.4 (0.64)	4.5 (0.61)
Debriefing helped me to find meaning in the virtual simulation	3.9 (0.91)	4.1 (0.85)	4.3 (0.66)
My questions from the virtual simulation were answered by debriefing	3.5 (0.10)	4.3 (0.83)	4.4 (0.77)
Debriefing helped me become more aware of my role as a nurse	4.2 (0.93)	4.4 (0.69)	4.4 (0.63)
Debriefing helped me to clarify problems	3.7 (0.95)	4.3 (0.68)	4.3 (0.57)
Debriefing helped me to make connections between theory and clinical practice	3.8 (0.97)	4.2 (0.80)	4.3 (0.72)
There was sufficient guidance during the debrief	3.9 (0.88)	4.7 (0.51)	4.5 (0.58)
Debriefing provided a means for me to reflect on my actions during the simulation	4.2 (0.74)	4.5 (0.63)	4.6 (0.49)
I had enough time to debrief thoroughly	4.4 (0.71)	4.7 (0.57)	4.7 (0.47)

Discussion

The findings of this experimental study provide educators with evidence-informed options for debriefing virtual simulations. One important finding was that undergraduate students value and benefit from a self-debrief before a group debrief. Students appreciated the opportunity to collect and analyze their thoughts in the self-debrief before participating in a group debrief; this opportunity is not found in current debriefing practice standards. Study results reflect other authors' findings that completing a self-debrief before attending a group debrief enhanced students' self-awareness and understanding of their learning experience (Lestander, Lehto, & Engström, 2016), and their ability to reflect and transition to the role of nursing student (Andersen, Olsen, Denison, Zerin, & Reekie, 2018). Opportunities for self-assessment are critical for formative assessment where learners measure their actual performance against required standards and identify necessary changes in performance, thereby building foundational skills for lifelong learning (Boet et al., 2011).

Another major finding was that a self-debrief alone leads to a less-satisfactory debriefing experience; this group had significantly lower DES scores than students who went on to group debriefs. It was interesting to note that self-debrief—only students spent the least amount of time on their self-debrief questions and used fewer resources. Because these students were not assigned a group debrief to discuss their experience with their peers or faculty, they may not have been motivated to complete the self-debrief as diligently. In addition, first-year students need more explanation, direction, and support as their self-directed learning behaviours are still developing (Phillips, Turnbull, & He, 2015).

The mean score on the DES was higher for students who participated in either a small- or large-group debrief plus self-debrief compared with those who only self-debriefed. Students who participated in a group debrief, particularly those in the large group, used more resources when playing the VGS and spent more time on their self-debrief. The open-ended items indicated that participants took time to reflect on their decisions during their self-debrief and collected their thoughts before the group discussion. This process helped them articulate their decisions when meeting with their group. These results suggest that anticipating a group debrief may increase student accountability and promote the ability to articulate decision-making. This is important, as Abdullah, Bakar, and Mahbob (2012) found that students were more likely to speak up in groups when they were prepared.

Another finding was that the outcomes for the small- and large-debrief groups were almost identical. The open-ended survey items indicated that both group debriefs offered students the opportunity to hear others' perspectives, build on each other's ideas, reflect on their self-debrief comments, and have their questions answered by faculty. The results indicating that outcomes from the two groups were equal are encouraging as this gives faculty some flexibility regarding debriefing; faculty can allow factors such as time and resources to influence decisions concerning group size without jeopardizing outcomes.

All groups made significant knowledge gains with no differences between groups. That said, group debrief students said their discussion deepened their prenatal knowledge. The knowledge test was designed to capture specific VGS content, whereas the group debrief discussion allowed for varied questions related to prenatal nursing care. This deeper knowledge would not have been captured by the knowledge test.

Nurse educators are increasing the amount of virtual experiences and distance learning in curriculum. These results provide a strong case for an immediate self-debrief after a virtual simulation experience to consolidate student learning, followed by a group debrief to deepen and extend knowledge. In this study, the course layout resulted in the group debrief being completed within two weeks of students completing the prenatal VGS.

Limitations

One limitation was the low KR score of 0.35 for the knowledge test items; however, this is not unusual for a short, teacher-developed test (DiBattista & Kurzawa, 2011). In addition, the questions were specific to this simulation and will not be used beyond this project. Another was that random assignment rather than random sampling was used for practical reasons; there may have been inherent differences in the groups that may have influenced outcomes. As discussed by Lapum et al. (2018), future comparative studies are needed with different levels of students to identify the influence of maturity on debriefing strategies after VGS. In our study, both course faculty and non—course faculty conducted the debrief sessions. Further assessment is needed to determine if sharing is heightened when the debrief is conducted by the student's instructor versus an unfamiliar instructor. In this study, the large group debrief was capped at 30; more research is needed to determine if a larger size group is as effective. The finding that self-debrief plus group debrief is most effective may also apply to other types of simulation, not just virtual; we recommend replicating this study with in-person and other types of simulation.

Conclusion

The results of this project will inform the development of best practice standards for debriefing types and group sizes with virtual simulation and potentially in-person simulation debriefing. These standards can help guide educators in educational and clinical settings to provide learners with

high-quality simulation and debriefing experiences that optimize learning. Findings suggest faculty have some flexibility in their debriefing options, which is important as virtual simulations are increasingly embedded in the curriculum.

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