Successful debriefing — Best methods to achieve positive learning outcomes: A literature review

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S U M M A R Y

The past several years have seen a dramatic increase in the use of simulation in nursing education. The process of debriefing, or guided reflection, follows these simulation activities. Although facilitated debriefing is recommended in the simulation literature, very few research articles reported results of the effectiveness of debriefing. A literature search was conducted using PubMed, Academic Search Complete, CINAHL, ERIC, and PsychInfo to identify articles and studies examining simulation and debriefing methods. A limited number of studies were found, that examined traditional faculty facilitated debriefing versus alternate forms of debriefing, debriefing versus no debriefing, and perceptions of debriefing. In most cases, improvement was noted in learners regardless of the debriefing process used. This review is grouped in two sections: (a) studies comparing debriefing strategies and (b) studies examining perceptions of the usefulness of debriefing.

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Introduction

The past several years have seen a dramatic increase in the use of simulation in nursing education. The American Association of Colleges of Nursing (AACN) (2008) has recommended the inclusion of simulation in baccalaureate curricula. High fidelity simulators are used in simulation scenarios in which students participate in the scenario, usually in small groups. The process of debriefing, or guided reflection, follows these scenarios. Educators serve as facilitators and guide students through a discussion of the experience. This provides students with the opportunity to reflect on their actions (Lederman, 1992; Thiagarajan, 1992) and allows them to verbalize their thoughts on the consequences of their actions or lack of actions.

John Dewey first posited the phrase reflective thinking in 1910. Debriefing, or guided reflection, follows the concept of reflective thinking. Donald Schön (1983) further expanded this concept to encompass the reflective practitioner. Reflection-in-action and reflection-on-action, according to Schön, provide learners with the opportunity to consciously review their actions during and after an activity or situation. Sources in the literature recommend facilitated debriefing immediately following simulation (Fanning and Gaba, 2007; Ironside et al., 2009; Jeffries, 2005; Rudolph et al., 2006, 2007). In a concept analysis on debriefing, Dreifuerst (2009) identified active engagement as a defining attribute of debriefing and stated that it is a required component of experiential learning. In 2011, the Board of Directors of the International Nursing Association for Clinical Simulation and Learning (INACSL, 2011) published standards of best practice in simulation education. They indicate that effective debriefing should be facilitated by an individual trained in the debriefing process and who witnessed the simulation activity.

Effective simulation activities require extensive use of an educator’s time, both in the preparation and implementation of the activities (Metcalfe et al., 2007; Nehring and Lashley, 2004; Seropian et al., 2004a,b). The standard practice in simulation activities calls for educators to observe student participation in simulation scenarios followed by facilitated debriefing led by these educators. Most often debriefing lasts longer than the actual simulation scenario. Depending on class size, a single simulation scenario will occupy an educator for at least an entire day. Heavy workloads and the time commitment needed to conduct effective simulations may limit adoption of simulation into nursing programs. Educators need to use their time effectively when conducting simulations. This needed time commitment leads to the question of whether other methods of debriefing should be considered.

Literature Search

In order to further explore options for debriefing, a literature review was conducted using PubMed, Academic Search Complete, CINAHL, ERIC, and PsychInfo to identify articles and studies examining simulation and debriefing methods. Search terms included “simulation”, “debriefing”, and “research” and were narrowed with limits of “meta-analysis”, “randomized controlled trial”, “review”, “comparative study”, and “controlled clinical trial”. Some search terms were combined using the Boolean operator AND. The initial inclusion criteria were as follows: (a) research study with a focus on debriefing, (b) related to nursing students, (c) were English language, and (d) published in the last ten years. Of the 104 abstracts reviewed; only two met the inclusion criteria. Consequently, the search was...
extended to include research studies with medical students and residents. A total of 13 were included in this review.

Although facilitated debriefing is recommended in the simulation literature, very few research articles reported results of the effectiveness of debriefing. The majority of these studies examined the effects of simulation and may or may not have identified whether debriefing was conducted following simulation. However, a limited number of studies were found, that examined traditional teacher led debriefing versus alternate forms of debriefing, debriefing versus no debriefing, and perceptions of debriefing. A total of thirteen studies are included in this review. This review is grouped in two sections: (a) studies comparing debriefing strategies and (b) perceptions of the usefulness of debriefing.

The simulation studies in the literature have explored the impact of simulation on different dependent variables using simulation as the independent variable (Brannan and Bezanson, 2008; Brown and Chronister, 2009; Hoffmann et al., 2007; Howard et al., 2010; Ironside et al., 2009). The effect of debriefing on the dependent variables was not measured in any of these studies. A limited number of articles were found, that compared debriefing methods with or without a debriefing group (Boet et al., 2011; Bond et al., 2006; Chronister and Brown, 2012; Grant et al., 2010; Morgan et al., 2005; Savoldelli et al., 2006; Shinnick et al., 2011; Van Heukelom et al., 2010; Welke et al., 2009; Zausig et al., 2009). The results of these studies did not show significant differences between groups that received some form of debriefing.

**Debriefing Research Studies**

*Studies Comparing Debriefing Strategies*

Debriefing can be accomplished through several methods, such as through group discussion with or without the use of videotape of the students’ performances. This first study examines group performance before and after simulation and with and without debriefing. Shinnick et al. (2011) used a two-group, repeated measures experimental design to study prelicensure nursing students (N = 162), examining heart failure knowledge gains after simulation with and without debriefing. Students were randomly assigned to experimental or control groups by sections based on the school they attended on the day of the simulation activity. Three parallel 12-item multiple choice questionnaires were administered at different intervals. The control group (n = 72) completed the pretest questionnaire and the posttest 1 questionnaire 1 h following the pretest. Immediately following posttest 1, the control group participated in a simulation scenario followed by debriefing. Posttest 2 was administered to participants in the control group following the debriefing. The experimental group (n = 90), received the pretest followed by participation in a simulation scenario. Posttest 1 was administered to the experimental group immediately following the simulation. They then participated in a group debriefing followed by Posttest 2. There was no difference in pretest scores between the two groups; however participants in the experimental group had higher scores than participants in the control on posttest 1 and posttest 2. The scores of both experimental and control groups rose significantly after participating in simulation. Investigators concluded that the debriefing following the simulation resulted in significant knowledge gains by participants. The strength of this study was the evidence of outcomes following debriefing.

In another study the effects of two different types of debriefing were compared, oral debriefing or videotape assisted debriefing. Nursing and nurse anesthetist students (N = 40) participated in a pilot study comparing the effectiveness of videotape-facilitated debriefing to oral debriefing following high fidelity simulation. Grant et al. (2010) used a quasi-experimental design in which students in the intervention and control groups participated in two 1-hour simulations during the semester. Students were randomly assigned to roles for simulation. The experimental group participated in debriefing sessions with the addition of the video-taped sessions to assist in the discussion, while the control group participated in oral debriefing following each simulation. Students participated in a third simulation in which they were scored on their performance as a post-test only measure. The experimental group scored slightly higher than the control group; however, there was no significant difference between the total performance scores. Researchers concluded that both debriefing methods were effective and suggested that students should rotate through different roles to further enhance learning.

Another debriefing strategy involved students critiquing their own performance versus having an instructor offering critique. Boet et al. (2011) compared student self-debriefing to instructor debriefing in a prospective, randomized, controlled repeated-measures design with anesthesiology residents (N = 50). Participants were randomized to one of the two groups, and then individually participated in a videotaped high fidelity crisis scenario. Participants in the self-debriefing group observed their performance on their own. They were instructed to observe their performance and note areas in which to improve on their skills. The participants were allowed to fast-forward or rewind the video during the debriefing. Participants in the instructor debriefing group received video assisted feedback from an expert instructor. The time frame for all debriefing sessions was limited to 20 min. Debriefing sessions were immediately followed by a second crisis simulation in which participants were again scored. Significant improvement was found between pre- and posttest scores for all participants regardless of debriefing method used. The researchers concluded that peer debriefing is a viable strategy for nontechnical simulation activities. A strength of this study was the randomized controlled design which allowed control for extraneous variation.

In a study by Bond et al. (2004), cognitive debriefing was compared to a technical knowledge debriefing group following two simulation exercises with emergency medicine residents (N = 62). The technical knowledge debriefing group was provided with additional information on the topics covered in the scenarios and the cognitive debriefing group was provided with detailed descriptions of the concepts used in the scenarios and information on cognitive errors. The debriefings were done using a PowerPoint with audio format and lasted 30 min per debriefing session. Results from a post-test simulation indicated no statistically significant differences in performance between the groups; however, post-survey data indicated that participants preferred the technical debriefing method.

Chronister and Brown (2012) used a comparative crossover design in a study with baccalaureate nursing students (N = 37) to compare the effects of debriefing with verbal feedback only with debriefing using video-assisted verbal discussion. Students were randomly assigned to one of the two groups and participated in a simulation scenario followed by one of the two debriefing methods. A pre-test was administered to students before the simulation activity. One week following the activity, students were administered a parallel exam as a post-test and then participated in a repeat of the same simulation activity. There was no significant difference in overall performance scores between the groups; however, the group that received video-assisted debriefing had significant increase in response times for the second simulation compared to the group that received the verbal debrief only. Post-test knowledge scores decreased in the video-assisted debriefing group and increased in the verbal debrief only group. Analysis with a two-tailed t-test indicated a statistically significant difference between pre- and post-test scores for the verbal debrief only group.

Simulation debriefing was compared to home study and no debriefing in a prospective, randomized, controlled study by Morgan et al. (2009). Practicing anesthesiologists (N = 58) were randomly assigned to one of the three groups: high-fidelity simulation debriefing led by an experienced facilitator, a home study program, or no educational intervention (control group). The debriefing intervention consisted of a standardized PowerPoint presentation and one-on-one debriefing with a facilitator. The home study program consisted of peer-
reviewed articles outlining the causes of human error in medicine. The control group received no intervention. All groups participated in simulation exercises for pre- and post-test performance measures. Participants returned for post-test simulation six to nine months after the pre-test. Performance assessment tools were used to evaluate participants. Results showed an overall improvement in all groups and no significant differences between the groups. Researchers concluded that simulation training has a positive effect on performance.

The efficacy of oral and videotape-assisted feedback was the focus of a prospective, randomized, controlled, three-arm, repeated-measures design with anesthesia residents (n = 42). Savoldelli et al. (2006) compared the two types of debriefing against a control group with no debriefing. The control group received no debriefing following the pretest scenario. Those in the oral feedback group received feedback on their performance during a debriefing with a facilitator. Participants in the video-assisted oral feedback group watched their performance in the pretest scenario during their debriefing session. Pre- and posttest performance scores were not significant in the control group; however, both the oral and video-assisted debriefing groups demonstrated significant improvement in scores. Results indicated no difference between the groups that received debriefing. However, differences did exist between the group who did not receive debriefing and the groups who did. A conclusion from the study was that debriefing improved student performance.

Traditional personalized video-assisted oral debriefing was compared to a standardized computer-based multimedia debriefing in a study by Welke et al. (2009). Multimedia debriefing encompassed an audiovisual presentation using text, audio voice-over, and digital videos. Participants in this group individually viewed the presentation at their own pace. Investigators used a prospective randomized design with two treatment groups with anesthesia residents (N = 30). The study consisted of a pretest simulation followed by one of the two debriefing interventions, a posttest simulation immediately following debriefing, and a third simulation five weeks later to assess retention. Performance scores from both groups indicated significant improvement from pretest to posttest, posttest to retention, and posttest to retention. The study demonstrated that debriefing influences knowledge gains from simulation as well as stimulating retention of materials.

In a study with anesthesiologists (N = 42), Zausig et al. (2009) examined the differences between debriefing with regard to nontechnical skills (NTS) plus medical management (MM) and debriefing with MM. Nontechnical skills are described as cognitive and interpersonal skills and medical management skills encompass the management of patient care in clinical situations. The NTS + MM group (intervention) participated in a 3 1/2 hour debriefing session, while the MM group (control) participated in a 2 1/2 hour debriefing session. There were no statistically significant differences in improvement in the performance between the two groups. Based on these findings investigators decided that more than one training session was needed for performance improvement. Table 1 summarizes these studies.

**Table 1**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Sample</th>
<th>Research design</th>
<th>Debriefing strategies</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boet et al. (2011)</td>
<td>N = 50 anesthesia residents</td>
<td>Prospective, randomized, controlled</td>
<td>Student self-debriefing and instructor debriefing</td>
<td>Significant improvement in posttest scores in both groups. No significant difference between groups.</td>
</tr>
<tr>
<td>Bond et al. (2004)</td>
<td>N = 62 emergency medicine residents</td>
<td>Qualitative</td>
<td>Cognitive debriefing and technical knowledge debriefing</td>
<td>No significant differences between groups; however, post-survey analysis revealed participants’ preference for technical debriefing.</td>
</tr>
<tr>
<td>Chronister and Brown</td>
<td>N = 37 nursing students</td>
<td>Comparative crossover design</td>
<td>Verbal debriefing and video-assisted verbal debriefing</td>
<td>Participants in the video-assisted group had faster response times for several skills, while knowledge retention scores were significantly higher in the verbal debriefing group. Performance scores were slightly higher in the experimental group; however no significant differences were noted between groups. Both debriefing methods were effective.</td>
</tr>
<tr>
<td>Grant et al. (2010)</td>
<td>N = 40 nurse and nurse anesthetist students</td>
<td>Quasi-experimental design</td>
<td>Oral debriefing and videotape assisted debriefing</td>
<td>No significant difference between groups on performance posttest. Participants in both debriefing groups had significant improvement in performance scores compared to the no debriefing group. There was no significant difference between the groups who received debriefing.</td>
</tr>
<tr>
<td>Morgan et al. (2009)</td>
<td>N = 58 anesthetists</td>
<td>Prospective, randomized controlled design</td>
<td>Debriefing, home study, and no debriefing</td>
<td>No significant difference between groups on performance posttest. No significant difference between groups on performance posttest.</td>
</tr>
<tr>
<td>Savoldelli et al. (2006)</td>
<td>N = 42 anesthesia residents</td>
<td>Prospective, randomized, controlled, three-arm, repeated-measures design</td>
<td>Oral feedback debriefing, video-assisted debriefing, and no debriefing</td>
<td>No difference in posttest scores between the groups. Participants in experimental group scored higher than participants in control group for posttest 1 and posttest 2. Results indicated significant improvement following debriefing. No significant difference between both groups on performance from pretest to posttest and retention.</td>
</tr>
<tr>
<td>Shinnick et al. (2011)</td>
<td>N = 162 prelicensure nursing students</td>
<td>Two-group repeated measures experimental design</td>
<td>Group performance before and after simulation, with and without debriefing</td>
<td>No significant difference in performance between the two groups. No significant difference in performance between the two groups.</td>
</tr>
<tr>
<td>Welke et al. (2009)</td>
<td>N = 30 anesthesia residents</td>
<td>Prospective randomized design</td>
<td>Video-assisted oral debriefing and standardized computer-based multimedia debriefing</td>
<td>No significant difference between both groups on performance from pretest to posttest and retention.</td>
</tr>
<tr>
<td>Zausig et al. (2009)</td>
<td>N = 42 anesthesiologists</td>
<td>Not indicated</td>
<td>Debriefing on nontechnical skills with medical management and debriefing on medical management only</td>
<td>No significant difference in performance between the two groups.</td>
</tr>
</tbody>
</table>

**Studies Examining Student Perceptions of Debriefing**

Four studies (Cantrell, 2008; Gordon and Buckley, 2009; Bond et al., 2004; Van Heukelom et al., 2010) examined student perceptions about the value of the debriefing process. Each of these studies used descriptive designs.

Student perceptions of debriefing were examined in a study by Cantrell (2008). Senior nursing students (N = 11) participated in three simulation activities followed by teacher facilitated debriefing sessions immediately after each activity. The simulation sessions were videotaped to be used in qualitative focus group sessions conducted two weeks following the third simulation. Findings from the focus groups indicated that students preferred to participate in debriefing immediately following simulation because the activity was fresh in their memory and that the method of debriefing was not as important as the timing.
A descriptive design was used in a study by Gordon and Buckley (2009) with medical–surgical graduate nurses (N = 50). Participants took part in high fidelity immersive simulations followed by educator facilitated debriefing and completed questionnaires before and after the simulation to rate their perceived ability and confidence in caring for patients. These students reported increased confidence in their ability to care for an unstable patient. Ninety-four percent (n = 48) of the participants identified facilitated debriefing as the most beneficial part of the simulation experience. No objective measures were studied. Researchers indicated that simulation increased students’ confidence and self-perception of improvement of skills.

In a qualitative study with emergency medicine residents (N = 15), Bond et al. (2004) developed an educational intervention in which each of the residents participated in a simulation scenario designed to lead participants to errors. The scenario was followed by 5 min of debriefing with a facilitator. For the remainder of the debriefing session, participants viewed a 45-minute PowerPoint presentation on succinylcholine and information regarding specific and general errors associated with the scenario. One of the themes that emerged was that feedback was desired following the experience. The investigators concluded that the teaching methods used in the study were appropriate for teaching upper level medical residents.

Self-evaluations were used in a study by Van Heukelom et al. (2010) to measure student perceptions regarding the degree of self-confidence they perceived following simulation and two different debriefing methods. Post-simulation debriefing was compared to in-simulation debriefing in a retrospective pre–post design with third year medical students (N = 161). These students were randomly assigned to the post-simulation debriefing group or the in-simulation debriefing group. Participants were oriented to the simulation and debriefing methods prior to the start of the simulation activities and participated in two simulation scenarios. In the in-simulation scenarios, the simulation was stopped any time a participant made an error or failed to act at a critical time and the facilitator would inform the participants of the correct actions required in the situation. In the post-simulation scenarios, participants were allowed to make errors during the activity. They were not provided with any instruction during the scenario and learned of their errors during the debriefing session following the scenario. Following the sessions, participants completed anonymous surveys of self-reported confidence in their abilities and rated the effectiveness of the facilitators and method of debriefing. Participants in both groups indicated significantly higher posttest scores on self-reported confidence items. The post-simulation group scores regarding the effectiveness and timing of debriefing were significantly higher than the scores of the in-simulation group. Table 2 summarizes these findings.

**Discussion**

The lack of significant research on debriefing in the nursing literature led to the expansion of the literature search and review to include healthcare professions education. In spite of this, the numbers of articles that met the inclusion criteria were small in comparison to the numbers of articles on simulation in general. The limited number of research articles in healthcare education substantiates the need for additional research on the topic of debriefing.

The studies in this literature review examined the effectiveness of a variety of debriefing methods used with nurses, nursing and medical students, residents, and anesthesiologists. The majority of these studies used teacher scored performance scales to measure effectiveness of the debriefing interventions while some examined student perceptions regarding debriefing or student confidence following debriefing. Results of these studies indicate that the process of debriefing made a difference although the specific method for debriefing did not influence end performance (Boet et al., 2011; Chronister and Brown, 2012; Morgan et al., 2009; Savoldelli et al., 2006; Shinnick et al., 2011; Welke et al., 2009; Zausig et al., 2009). Overall, all forms of debriefing were effective and results indicated improvement of performance scores and individuals’ self-perception of competence. Significant improvement was noted in individuals who participated in any one of the debriefing activities compared to groups who did not participate in any debriefing (Morgan et al., 2009; Savoldelli et al., 2006). Several of the studies used a prospective experimental design (Boet et al., 2011; Morgan et al., 2009; Savoldelli et al., 2006; Shinnick et al., 2011; Welke et al., 2009) which helped to strengthen the credibility of the findings. Although these studies had small sample sizes, the positive findings provide valuable data to suggest the viability of using different methods of debriefing following simulation.

Debriefing provides a forum for students to reflect on their experiences and learn from their mistakes. As Schön (1983) indicates, reflection-on-action allows learners to reflect on their previous actions, as in simulation, in order to develop as a practitioner and is a framework that can guide the debriefing process. Successful debriefing requires careful planning and the ability of the instructor to facilitate, rather than dominate, the session. Wickers (2010) recommends that for successful debriefing, the learning environment should be staged, trust must be established, expectations and objectives should be clarified with students before simulation, and students should be actively engaged in discussions of patient care. In order to conduct effective debriefing with students, nurse educators need to carefully prepare students for simulation and debriefing and serve as a guide during the process. Educators need to understand the debriefing process, as well as different methods of debriefing, when implementing simulation activities. Continued research on the impact of different methods of debriefing on student learning and outcomes has been recommended by Dreifuerst (2009).

**Table 2**

<table>
<thead>
<tr>
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<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bond et al. (2004)</td>
<td>N = 15 emergency medicine residents</td>
<td>Qualitative study</td>
<td>5 min facilitated debriefing followed by standardized PowerPoint presentation</td>
<td>Main theme was that participants preferred to receive feedback following simulation. Students felt that debriefing immediately following simulation was more important than the method of debriefing.</td>
</tr>
<tr>
<td>Cantrell (2008)</td>
<td>N = 11 senior nursing students</td>
<td>Descriptive study</td>
<td>Verbal debriefing followed by a videotape review of scenario during focus group Faculty facilitated debriefing</td>
<td>Participants’ self-reports of increased confidence in ability to care for an unstable patient and rated debriefing as the most beneficial part of experience. Participants’ self-reported posttest scores indicated increased confidence. The post-simulation group reported significantly higher self-report scores on the effectiveness and timing of debriefing.</td>
</tr>
<tr>
<td>Gordon and Buckley (2009)</td>
<td>N = 48 medical surgical graduate nurses</td>
<td>Not indicated</td>
<td>Faculty facilitated debriefing</td>
<td></td>
</tr>
<tr>
<td>Van Heukelom et al. (2010)</td>
<td>N = 161 third year medical students</td>
<td>Retrospective pre–post design</td>
<td>Post-simulation debriefing and in-simulation debriefing</td>
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</table>

**Conclusion**

The use of simulation has increasingly become a significant part of nursing education. In spite of the vast amounts of money spent on

This technology, extensive research is still needed in this area in order to determine its cost effectiveness and impact in nursing education. The results of the studies that examined debriefing indicate the potential effectiveness of alternate methods of debriefing. The need for additional research comparing different methods of debriefing is clearly evident. Although teacher facilitated debriefing is the recommended and most widely practiced method following simulation, there is no evidence in the literature that it is the only effective method. Alternative methods of debriefing may be viable options in the conduct of simulations. With the high vacancy rate of educators in schools of nursing in the United States (AACN, 2010), nurse educators are continuously challenged to increase efficiency of their time. Because simulation activities require extensive amount of time for educators, alternate methods of debriefing should be explored. Research examining traditional debriefing methods with alternate forms of debriefing will contribute to a growing body of nursing knowledge regarding the effectiveness of simulation and debriefing in nursing education.

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