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Featured Article

Impact of Training on Use of Debriefing for Meaningful Learning

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KEYWORDS
debriefing;
debriefing training;
assessment of debriefing;
debriefing application;
regulation

Abstract

Background: Because of the significant learning demonstrated through debriefing, regulatory bodies have recommended that all debriefers receive training in a debriefing method. However, it is unknown how this training impacts debriefing implementation with students.

Methods: The Debriefing for Meaningful Learning Inventory was used to measure the application of Debriefing for Meaningful Learning (DML) of 234 debriefers with prelicensure baccalaureate nursing students.

Results: Statistically significant differences were found, based on the type of training received. Debriefing for Meaningful Learning implementation improved with each additional training source.

Conclusions: This study contributes to the understanding of the impact of training on how trained debriefers implement DML during debriefing.

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Despite broad consensus that debriefing is the most significant component of a simulation learning experience (Cheng et al., 2016; Shinnick, Woo, Horwich, & Steadman, 2011), there is little research investigating how best to train a debriefer to implement a debriefing or the best way to test the outcome of that training. This gap exists despite recognition that the knowledge and skills needed to debrief learners are not innate yet are as important to simulation educators as developing scenarios and using simulation equipment (Jeffries, 2016). However, the literature remains devoid of a description of the training needed to prepare competent debriefers.

Debriefing is a teaching and learning method designed to provide debriefers with an interactive process that achieves positive outcomes for learners (INACSL Standards Committee, 2016). Because of the significant learning resulting from debriefing, the National Council of State Boards of Nursing (NCSBN) (Alexander et al., 2015), the International Nursing Association for Clinical Simulation and Learning (INACSL Standards Committee, 2016), and the National League for Nursing (NLN, 2015) have recommended that all debriefers receive formal training in a theoretically derived and evidence-based debriefing method. If a theory-based debriefing method demonstrates positive outcomes when empirically tested in research, it is presumed that similar outcomes can be

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achieved if a trained debriefer implements the method in its original design while debriefing learners.

Debriefing for Meaningful Learning (DML) is a theoretically derived and evidence-based debriefing method that has demonstrated improvement in learners' ability to think like a nurse (Dreifuerst, 2012; Forneris et al., 2015; Mariani, Cantrell, Meakim, Prieto, & Dreifuerst, 2013). Because of this, DML has been widely adopted throughout nursing education. However, little is known about the best way to train debriefers to use DML. In addition, how best to assess a debriefer's consistent application of DML with students remains poorly understood.

Key Points

- DMLES and DMLI are valid measures of DML debriefing behaviors.
- Additional training sessions result in greater DML application.
- Current recommendations for debriefing training are vague and do not identify a benchmark for competence.

Background

Debriefing

Debriefing is a teaching and learning method a debriefer uses to engage learners in a reflective dialogue after a learning experience (Mariani et al., 2013; Neill & Wotton, 2011). The debriefer cultivates open, yet confidential, communication to reconstruct a learning experience and create meaning while also providing feedback (Oriot & Alinier, 2018; Dreifuerst, 2010). During debriefing, a debriefer interacts with learners to collaboratively uncover and examine the thinking and actions of learners that occurred during the learning experience (Dreifuerst, 2015).

As the use of simulation with debriefing has proliferated across nursing education, the rigor of simulation pedagogy has also increased. Jeffries (2005) developed a simulation model to guide the design, implementation, and evaluation of simulation in nursing education, which included debriefing as a key element. This model was later expanded into the NLN Jeffries Simulation Theory (Jeffries, 2016). Debriefing along with performance feedback continues to be a central aspect for positive learner outcomes. The INACSL Standards of Best Practice: Simulation^{SM} supports this and articulates the need for trained debriefers to ensure a quality learning experience (INACSL Standards Committee, 2016).

Debriefing Training

The INACSL debriefing standard specifies that a debriefing session is to follow every simulation learning experience (INACSL Standards Committee, 2016). In addition, debriefers must be subject matter experts who receive formal training in a structured, theoretically derived, and evidence-based debriefing method with subsequent competency assessment of their debriefing skills. The NLN (2015) reiterated this recommendation for formal debriefing training and even recommended extending debriefing beyond the simulation environment throughout nursing curricula.

In response to the positive outcomes of the NCSBN National Simulation Study (NSS), the NCSBN identified guidelines for state Boards of Nursing (BONs) for the use of simulation as clinical nursing education. These guidelines are based on the NSS methodology. The NCSBN recommended that debriefers follow evidence-based literature when debriefing and "utilize a standardized method of debriefing … using a Socratic methodology" (Alexander et al., 2015, p. 41). The NCSBN further recommended that simulation faculty should be prepared to facilitate simulation and debriefing in accordance with the guidelines outlined in the INACSL Standards of Best Practice.

Debriefing for Meaningful Learning

DML is a theoretically derived and evidence-based debriefing method that was used in the NCSBN NSS and has been used increasingly in prelicensure nursing education. DML facilitates the deepening of thinking processes through Socratic questioning that guides learners' reflective thinking (Dreifuerst, 2012). The development of clinical reasoning is enhanced in learners by actively engaging in synthesizing, hypothesizing, generalizing, inferring, and questioning. A debriefer guides learners through reflective dialogue to individually expose and analyze thoughts, feelings, and underlying mental frames (Dreifuerst, 2015).

As a method of facilitating reflective thinking, DML was adapted from the Biological Sciences Curriculum Study E5 instructional model, an instructional model used since the early 1900s that originated in math and science (Bybee et al., 2006; Dreifuerst, 2010). The original five phases of the Biological Sciences Curriculum Study 5E instructional model were expanded by Dreifuerst (2010) to include a sixth phase 'extend' that fosters anticipatory thinking: engage, explore, explain, elaborate, evaluate, extend. Throughout these phases, learning becomes an interactive and dynamic process in which learners collaborate with the debriefer to construct new knowledge by building on prior knowledge and experiences. Using Socratic questioning, a debriefer guides students through reflective dialogue to expose the relationships between thinking and actions (Dreifuerst, 2015). This systematic process stimulates learners to self-discover and connect their thinking with decisions and actions they engaged in during the experience and learn to anticipate transferring their learning to future clinical situations.

Although DML has been adopted by many nursing programs, it is not known how debriefers have been trained in DML. In addition, the best method for training debriefers to use DML is unknown, regarding both the type of training and the timing of that training. It is also unknown how debriefers apply DML in their debriefing after training.

Material and Methods

This descriptive study sought to describe the impact of training on how debriefers learn and apply DML in simulation debriefing with prelicensure baccalaureate nursing students. The study addressed the following questions:

(1) Is there a difference in how many behaviors associated with DML debriefers report they consistently apply during simulation debriefing, when they were grouped according to the type of training they received?
(2) What is the impact of the sources of DML debriefing training on the consistent application of DML?

Sample

The sample for this study consisted of 234 nurse educators who were teaching in a baccalaureate nursing program and who reported having received training in debriefing. A priori, a desired sample size of 126 was determined to be needed by a power analysis using G*Power© with $p < .05$, a power of 0.80, and a moderate effect size (Faul, Erdfelder, Lang, & Buchner, 2007). After receiving approval from the Institutional Review Board, a Uniform Resource Locator was posted on the INACSL LinkedIn page and was also emailed to the INACSL membership to recruit debriefers who facilitate simulation debriefing with prelicensure baccalaureate nursing students. Of the 308 respondents who accessed the Uniform Resource Locator, 287 met the inclusion criteria, yielding a final sample of 234 who agreed to participate.

Instrument

The Debriefing for Meaningful Learning Inventory© (DMLI), an instrument designed for this study, was used for self-assessment of a debriefer's application of DML. The DMLI is a subjective measure adapted from the Debriefing for Meaningful Learning Evaluation Scale, a behaviorally anchored rating scale (Bradley & Dreifuerst, 2016). The DMLI demonstrated a good fit for the theoretical model of DML through confirmatory factor analysis; a latent class approach supported a six-class model, corresponding to the six E's of DML (Bradley, 2018). The 52 DMLI items represent debriefing behaviors aligned with the original DML design (Dreifuerst, 2010). These items are scored with ordinal frequency options always, sometimes, and never. The total number of correct items out of 52 comprises the total DMLI sum of scores, which describes how consistently a debriefer applies behaviors consistent with DML.

Method

Participants electronically completed a demographic survey, identified which debriefing method they used, described the source of debriefing training they had received, and completed the DMLI. The 234 participants were divided into two groups according to the type of debriefing method for which they had reported receiving training. Because DML was the debriefing method of interest for this study, one group comprised debriefers who reported they had received training in DML (n = 71), whereas a comparison group included participants who reported they had received training in any other method that was not DML (n = 163), as shown in Table 1. Participants who indicated that DML training was the type of training they had received were asked additional questions to describe the sources of their DML training.

Table 1 Type of Debriefing Training

Debriefing Method	*N* (%)
Debriefing for Meaningful Learning	71 (30%)
Debriefing with good judgment	43 (16%)
NLN* 3 phase process	33 (12%)
Gather-analyze-summarize	18 (7%)
3D model	11 (4%)
Outcome-present-state model	0 (0%)
Other	73 (27%)
Combination of methods	24
PEARLS	17
Plus-delta and advocacy-inquiry	5
Self-developed method	5
Chamberlain prepared model	3
DEEP	3
Tanner clinical judgment model	2
Alpha, delta, gamma	2
School/program developed model	2
Unknown	2
Beard model	1
INACSL standards of debriefing	1
MedSim design	1
MSR	1
None	1
Pivec model	1
Reflection questions	1
Talking with students	1

Note. DEEP = Debriefing Engaged Experienced Practitioners; INACSL = International Nursing Association for Clinical Simulation and Learning; MSR = Israel Center for Medical Simulation; 3D = Defusing, discovering, and deepening; PEARLS = Promoting Excellence and Reflective Learning in Simulation.
* National League for Nursing.

Data Analysis

Statistical Package for Social Scientists, version 22 (IBM Corp, 2013), was used for data management and generation of statistics. Survey response data were exported for data cleaning; missing responses were accounted for by listwise deletion because item response was not forced (McKnight, McKnight, Sidani, & Figueredo, 2007). The ordinal frequency options of always, sometimes, and never were converted to integers and calculated to determine the total DMLI sum of scores, with 52 as the highest possible score. Descriptive statistics were used to summarize the demographic and DMLI data. Inferential statistics using one-way analysis of variance (ANOVA) were used to compare differences in mean DMLI sums when grouped by types of training. Initial analyses were conducted to ensure there was no violation of the assumptions of normality and homogeneity. The effect sizes were calculated to evaluate the findings. Results were considered statistically significant if the *p*-value was less than .05.

Results

The first research question was answered using descriptive statistics and ANOVA. The amount of variance was compared between the dependent variable, which was the DMLI sum, and the independent variable, which was the type of debriefing training received (DML training or training in another debriefing method). Mean DMLI sum differences between groups were computed with alpha set at 0.05. Eta squared was computed to determine effect size, and post hoc tests were conducted if there was a statistically significant difference. Levene's Test of Equality of Variances was used to check the assumption that the variances of the two groups were not significantly different, although ANOVA is robust to moderate departures from the homogeneity of variance assumption.

The data showed there were a statistically significant difference in mean DMLI sums of scores between the DML trained group and the non-DML trained group. The DML trained group demonstrated a higher number of items consistent with DML behaviors ($M = 34.31$, $SD = 6.360$) than the non-DML trained group ($M = 31.90$, $SD = 5.475$). A one-way ANOVA was performed to compare the amount of variance of mean DMLI scores between groups. Levene's Test for Equality of Variances was conducted before analysis, showing that group variances could be treated as equal, $F(1,232) = 1.267$, $p = .262$. The mean DMLI sums were statistically significantly different between groups, $F(1, 232) = 8.655$, $p = .004$, $n^2 = 0.036$. The mean increase (2.408) from the non-DML trained group to the DML trained group (2.408, 95% CI [0.795, 4.021]) was also statistically significant ($p = .004$). Pairwise comparisons revealed that the mean increase from the non-DML trained group ($M = 31.90$, $SD = 5.475$) to the DML group ($M = 34.31$, $SD = 6.360$) was statistically significant ($p = .004$).

The second research question was answered using descriptive statistics to describe the impact of the sources of DML debriefing training on a debriefer's application of the method. The highest mean DMLI sum was demonstrated by participants who had received training for the NCSBN for participation in the NSS ($M = 38.75$, $SD = 2.630$, n = 4). The second highest mean DMLI sum was demonstrated by participants who had received training at a DML workshop or conference ($M = 36.57$, $SD = 6.621$, n = 35), followed closely by those who reported attending a train-the-trainer DML training ($M = 36.56$, $SD = 6.224$, n = 18). The lowest mean DMLI sum was demonstrated among those who reported training solely through reading one DML article ($M = 31.00$, $SD = 5.099$, n = 5).

Participants in the DML trained group reported receiving multiple sources of DML training (n = 56). There were four commonly reported combinations of sources of training, each of which included DML workshop or conference attendance as one of the sources, as reported in Table 2. Each combination demonstrated increasing mean DMLI sums with each additional source of training as demonstrated in Table 3. DML workshop or conference attendance combined with reading one DML article resulted in a higher mean score ($M = 38.00$, $SD = 6.97$, n = 24) than DML workshop or conference attendance alone ($M = 36.57$, $SD = 6.621$, n = 35). DML workshop

Table 2 DMLI Sum by Source of DML Training

Source of Training	*N*	*M*	*SD*	*SE*
Read one article	5	31.00	5.099	2.280
Watched a colleague use DML	36	34.31	6.360	.755
Read more than one article	46	35.63	6.482	.956
Train-the-trainer session	18	36.56	6.224	1.467
DML workshop/conference	58	36.57	6.621	1.119
NCSBN training for NSS	4	38.75	2.630	1.014

Note. DML = Debriefing for Meaningful Learning; DMLI = Debriefing for Meaningful Learning Inventory; NCSBN = National Council of State Boards of Nursing; NSS = National Simulation Study.

Table 3 DMLI Sum by Combined Sources of Training

Training	*N*	*M*	*SD*	*SE*
DML workshop/conference and read more than one article	24	38.00	6.97	1.93
DML workshop/conference and watched a colleague use DML	15	38.53	8.62	3.07
DML workshop/conference and watched a colleague use DML and read more than one article	12	40.67	8.14	2.35
DML workshop/conference and read more than one article and watched a colleague use DML and attended a train-the-trainer session	5	41.80	7.19	3.22

Note. DML = Debriefing for Meaningful Learning.

or conference attendance combined with watching a colleague use yielded yet a higher mean DMLI sum ($M = 38.53$, $SD = 8.62$, n = 15). DML workshop or conference attendance combined with both watching a colleague and reading more than one DML article resulted in an even higher mean DMLI sum ($M = 40.67$, $SD = 8.14$, n = 12). The addition of a fourth source of training, attending a train-the-trainer session, resulted in the highest mean score of the combined sources of training ($M = 41.80$, $SD = 7.19$, n = 5).

Discussion

The data used to answer the first research question indicated there was a difference in how many DML behaviors debriefers reported applying in debriefing, according to whether they had received training in DML or in another method. As was expected, participants trained in DML engaged in more DML behaviors than participants trained in another debriefing method. The range of DMLI sum of scores for the DML group was 22 to 52, whereas the range of DMLI sum of scores for the non-DML group was 17 to 42.

It is of concern that despite receiving DML training, the DML trained debriefers indicated that as a group, only 34 of the 52 DMLI behaviors (65%) were consistently applied. Comparatively, as a group, those not trained in DML consistently applied 32 behaviors (62%). Although the difference was statistically significant, further research is warranted to expand understanding of the similar scores between the two groups trained in different debriefing methods. Nonetheless, these low DMLI scores are alarming for simulation education. This means that trained educators with advanced degrees scored lower than what are acceptable passing scores for prelicensure nursing students. If debriefing training becomes further regulated by state BONs, these scores suggest a need to identify a clear benchmark for an acceptable level of debriefing skills.

The second research question sought to describe the impact of DML training on consistent DML application during debriefing. The data demonstrated that there were differences in mean DMLI sums according to the sources of DML training received. Within the DML trained group, it is interesting to note the similarity in scores by those who reported training in a DML workshop or conference ($M = 36.57$, $SD = 6.621$) or attending a train-the-trainer session ($M = 36.56$, $SD = 6.224$). This similarity has implications regarding program resource allocation. In the current climate of budgetary restraints, nursing programs must carefully consider faculty development funding. Because there was very little difference in DML application between these two training sources, this could suggest that it may be more cost effective for one faculty to attend a workshop and achieve competence and then train others within their nursing program.

While neither the dose, timing, nor repetition of training were variables of investigation, these findings suggest that repeated exposure to DML opportunities resulted in increased application of DML behaviors. When used singularly, each training source resulted in 60.8% to 71.7% application of DML behaviors. Adding multiple training sources increased application from 75.5% to 82.0%. The increasing scores with each additional training source align with reports of increased retention as a result of increasing amounts of brief deliberate practice (Oermann et al., 2011, 2014; Vadnais et al., 2012), and distributed learning experiences (Raman et al., 2010). This finding is further supported by Ebbinghaus (1913) seminal research on forgetting, which indicates that forgetting is impacted by how information was learned and how frequently the information was reviewed.

Participants trained for the NCSBN NSS reported applying the highest number of DML behaviors. The NSS training included initial DML instruction with repeated DML learning experiences, evaluation of competence throughout the study duration, and remediation as necessary (Jeffries, Dreifuerst, Kardong-Edgren, & Hayden, 2015). The NCSBN then developed simulation guidelines based on the NSS methodology (Alexander et al., 2015). It is also important to note that the NSS ended two years before the time the participants of this present study completed the DMLI, indicating there was no loss of knowledge or skills retention. It is possible that their dispersed learning experiences promoted a deeper processing of DML application.

Implications

The findings of this study are of timely importance for regulatory bodies who are advancing simulation guidelines for nursing programs both nationally and internationally. Currently, there is agreement among the NCSBN, INACSL, and the NLN of the need for training in simulation pedagogy, specifically in a theoretically derived evidence-based debriefing method. However, this broad training recommendation may not be enough. The intent of these recommendations is to prepare simulation educators to debrief learners in a manner that ensures consistent learning outcomes. This study's findings present challenges to the current recommendations. Formally trained debriefers reported a 65% application of DML during debriefing. However, an unexpected variable that demonstrated an increase in consistent DML application was repeated exposure to additional DML training sources. A one-time training does not ensure consistent application of a debriefing method, warranting further study to explore the dose of debriefing training that increases the level of competence. Currently, there is a lack of evidence describing the characteristics of a debriefing training that promotes competence in debriefing. Further research investigating an effective training dose would provide guidance for the type, amount, and frequency of training necessary to develop competent debriefing skills.

Furthermore, a description of competence in debriefing skills has yet to be defined, although competence assessment is recommended after training (INACSL Standards Committee, 2016). Until a minimum level of competence is determined, debriefing training requirements will remain equivocal. In addition, a benchmark cannot be determined without valid instruments that specifically assess behaviors consistent with each debriefing method. Further research is needed to describe the level of debriefing competence necessary to facilitate the desired knowledge outcomes of learners. It remains unknown how debriefing training impacts debriefing competence, and how this ultimately impacts how learners acquire knowledge through simulation debriefing. Given the significance of the learning that occurs in debriefing, it is imperative to ensure the debriefer's ability to foster knowledge acquisition of learners and subsequent application of that knowledge to future clinical situations.

The findings of this study challenge the assumption in academia that when educators use a teaching and learning method, they will apply that method implicitly as trained. In other words, this study raises questions regarding whether faculty adhere to evidence-based teaching practices to prepare students for an evidence-based profession. Because nursing is an evidence-based practice, it would seem inherent that nursing education itself is also evidence-based. Indeed, a tension exists within nursing education between embracing teaching practices based on empirical evidence and teaching practices rationalized with academic freedom. Some argue that academic freedom grants the faculty freedom to make changes at will. It remains unknown if the participants of this study did not report consistently applying DML behaviors because of the type of training, the quality of training, time decay, or simply because they chose not to do it as trained.

Finally, as the integration of debriefing as a teaching and learning method continues to be recommended throughout all aspects of nursing curricula (NLN, 2015), it is even more imperative that faculty are trained to a level of competence to engage learners in this type of reflective thinking. Although recommendations for the use of simulation are a target of interest of state BONs, equivalent recommendations for using reflective thinking models such as debriefing are not commonly required for teachers within clinical and didactic settings. As debriefing is integrated into the broader scope of nursing curricula outside of simulation, careful consideration is needed regarding the training of faculty who will integrate debriefing with students in didactic, clinical, and laboratory courses.

Limitations

There were several limitations identified within this study. The convenience sample may not be representative of all debriefers in nursing education. The INACSL membership was openly recruited, yet there are likely other debriefers who received training not of the membership. Additional debriefers could have provided additional data regarding debriefing training. A second limitation was that the data derived from the self-report nature of the DMLI could have validity challenges, although self-report is used in simulation research (Richardson, Goldsamt, Simmons, Gilmartin, & Jeffries, 2014).

Conclusions

This study provides an initial description of the impact of debriefing training in one debriefing method. This study also contributes a description of the use of a valid instrument used to measure DML debriefing behaviors. Additional exploration of the dose of debriefing training required for positive outcomes for both debriefers and learners would provide further direction as regulatory bodies develop guidelines for simulation debriefing. Further research is also warranted to quantify debriefing behaviors consistent with other debriefing methods used in simulation education.

National and international regulatory bodies have been limited in developing simulation guidelines related to training because there were no valid instruments that assessed the ability of a debriefer to implement a specific theory-based debriefing method. Although training and assessment of competence has been recommended, a measurable description of a competent debriefer has been absent. Without a measurable level of competence in implementing a specific debriefing method, the recommendation for training remains ambiguous. If debriefing is indeed the most important part of a simulation learning experience (Shinnick et al., 2011), then it is important to consider how much more profound the learning would be if all debriefers were required to meet a benchmark for implementing a debriefing method.

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