Article

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Debriefing in Simulated Critical Care Training with Nursing Students: A Descriptive Cross-Sectional Study

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Abstract: Background: Simulated critical care training, when complemented by structured debriefing that addresses affective, psychosocial, and cognitive domains, provides a solid foundation for developing critical thinking and decision-making skills among nursing students. Structured debriefing serves not only as a mechanism for reflective practice but also as an evidence-based instructional methodology that optimizes experiential learning. This study aims to evaluate the impact of structured debriefing conducted post-simulation, on the acquisition and development of essential nursing competencies in undergraduate students. **Methods**: A descriptive cross-sectional study with a quantitative design was conducted, involving a cohort of 71 fourth-year nursing students enrolled in the curricular unit "Critical Care Nursing". The sample comprised a single class that participated in two high-fidelity clinical simulation sessions, each immediately followed by a structured debriefing session. After each simulation, students completed the Debriefing Assessment Scale Associated with Simulation (EADaS), which evaluates three domains of the debriefing experience: affective, cognitive, and psychosocial. **Results:** Students expressed an overall positive perception of the debriefing sessions. In the first evaluation, the affective dimension received the highest mean score (4.687), despite some variability in individual responses. By the second evaluation, the cognitive dimension attained the highest score (4.668), suggesting an enhanced perception of knowledge integration. Both cognitive and psychosocial dimensions demonstrated marked improvement between the two assessment moments. **Conclusions**: The findings underscore the essential role of structured debriefing in simulated critical care training, particularly in fostering emotional safety, critical reflection, and interpersonal competence. As such, structured debriefing stands out as a vital pedagogical approach in preparing nursing students to become confident, competent, and reflective practitioners, thereby contributing to improved patient safety and care outcomes.

Keywords: critical care; simulation training; debriefing; students; nursing

1. Introduction

Clinical simulation has been increasingly consolidated as a teaching methodology and a relevant pedagogical resource in nursing education, particularly in scenarios involving care for critically ill patients. These situations demand rapid and effective clinical reasoning, wise decision-making, as well as advanced technical and non-technical skills. In this context, debriefing has emerged as essential in the teaching-learning process, providing a structured space for reflection, critical analysis, and consolidation of the knowledge acquired during simulation.

Evidence indicates that the development of simulation scenarios with debriefing significantly contributes to the development of students' technical, emotional, and cognitive competencies. This is achieved by enhancing understanding of individual and group performance and by identifying areas for improvement in a controlled, safe environment that poses no risk to patients [1].

This pedagogical approach has proven to be effective in health education, particularly in nursing, by enabling the recreation of realistic and complex scenarios. It supports active, student-centered learning based on individual and group experiences. In the teacher-student relationship, knowledge transmission and learning are not unidirectional but rather a shared construction of knowledge. Information is conveyed, worked through, organized, and systematized in a way that inspires students to pursue deeper understanding [2]. This perspective is especially relevant in nursing simulation, where debriefing serves as a privileged moment for reconstructing knowledge based on lived experiences.

Debriefing is widely recognized as a central component of simulation experiences and is essential for nursing students to fully comprehend the goals and outcomes of the scenario [3]. In recent years, this pedagogical strategy has gained prominence and broader adoption in nursing education, being identified as a powerful tool for fostering active and meaningful learning [4–6].

The combination of simulation and debriefing thus represents a cornerstone in the academic preparation of nursing students, contributing to the development of both clinical and interpersonal competencies throughout their educational journey [7]. This approach not only enhances teamwork skills but also promotes collaboration and the integration of knowledge from various disciplinary and interdisciplinary fields [4,8].

When conducted in a safe and supportive learning environment, debriefing provides students with the confidence to make mistakes, express doubts about their performance, and reflect on unclear aspects. This reflective experience, coupled with opportunities to repeat nursing interventions and deepen acquired knowledge [9], maximizes learning opportunities and fosters more effective emotional regulation [10].

Debriefing encompasses multiple dimensions: affective, cognitive, and psychosocial [11].

In the affective dimension, the aim of the debriefing session is to provide positive feedback to students after identifying their emotional responses to the stress experienced during simulation [10]. However, students do not always perceive this moment as a stress-inducing phase [12]. For debriefing to be effective, it must take place in an environment free from authoritarian attitudes, using supportive language that values and respects students' expressed emotions [10]. When debriefing focuses solely on errors—exposing the student in front of the group and disregarding the positive aspects of their performance - it may lead to feelings of personal inadequacy and hinder knowledge construction [13].

In the psychosocial dimension, students are encouraged to share feelings, thoughts, and opinions related to the simulation experience [7]. Debriefing should be conducted in a structured manner to support the consolidation of learning [4]. It should be guided with "good judgment" [4] - that is, through objective description of observed behaviors, fostering active student participation and valuing their perspective. At the same time, errors should be addressed as learning opportunities, through critical and constructive analysis that promotes reflective thinking and integration of knowledge across various dimensions [4].

In the cognitive dimension, simulation is a key pedagogical strategy, allowing students to learn in settings that replicate clinical reality with controlled risk. This approach provides a safe environment for developing technical, cognitive, and relational skills, thereby facilitating the transfer of learning into professional practice [14]. Within this simulated context, debriefing plays a central role as a facilitator of learning, promoting critical reflection on actions taken and contributing to knowledge consolidation [14].

2. Materials and Methods

A quantitative, descriptive, and cross-sectional study was conducted with the aim of identifying the impact of structured debriefing, associated with simulated training, on the development of competencies among Nursing students in the area of Critical Care Nursing. For this purpose, the Debriefing Assessment Scale Associated with Simulation (EADaS) by Coutinho et al. (2014) was applied. This scale assesses the impact of structured debriefing in nursing students following simulated training. Initial authorization was requested and obtained from the primary author of the scale, followed by approval from the institution's ethics committee, which was granted favorably.

A sample of 71 nursing students was obtained during simulation sessions in the Curricular Unit of Critical Care Nursing, part of the fourth year of the undergraduate Nursing program.

Inclusion criteria required that participants be enrolled in the aforementioned Curricular Unit, be present during the simulation sessions, and voluntarily consent to participate in the study after being informed about its purpose. Exclusion criteria included students' refusal to participate.

The EADaS was applied at the end of the simulation sessions. Each student participated in a simulation session paired with another student, based on a clinical case related to critical care, with a duration of 20 minutes. This was followed by a 10-minute structured debriefing session, adapted to the students' developmental stage, which required additional time to explore the scenario. After each debriefing session, each student pair was directed to a room where the researcher provided a QR code linking to the EADaS, which was completed anonymously.

The scale consists of 34 items rated on a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." It is structured into three dimensions: Psychosocial Value (13 items), Cognitive Value (9 items), and Affective Value (12 items). Data analysis was performed using IBM SPSS Statistics, version 30. To assess the internal consistency of the different dimensions, Cronbach's Alpha coefficient was used.

The structured debriefing, conducted after the simulation, followed a predefined guide. This included an introduction and contextualization of the case, presentation of the debriefing objectives, eliciting the students' reactions, feelings, and first impressions, and a review of the learning objectives in light of key points from the scenario. At the end, students were asked to summarize the main aspects of the experience, highlighting best practices, areas for improvement, and an action plan.

To ensure that the structured debriefing was conducted in a trusting environment, a preparatory session was held with the instructors of the Curricular Unit. This session provided strategies for effectively leading the debriefing process, addressed any questions, collected suggestions for improvement, and emphasized the pedagogical importance of debriefing to the students.

3. Results

The final sample consisted of 71 nursing students (n), of whom 8.33% were male and 91.67% were female. The average age of participants was 24.79 years.

Table 1. presents the mean scores for each dimension of the EADaS across different time points.

Table 1. Mean Values of Each EADaS Dimension at Different Time Points.

EADaS Dimension		Moment 1 n=71	Moment 2 n=69
Affective Value	M	4,69	4,66
	SD	0,47	0,52
	Min	2,83	2,33
	Max	5,00	5,00
Cognitive Value	M	4,55	4,69
	SD	0,52	0,52
	Min	3,00	2,67
	Max	5,00	5,00
Psychosocial Value	M	4,24	4,41
	SD	0,65	0,67

	Min	2,46	2,38
	Max	5,00	5,00

From Table 1, we observe that the highest minimum score was recorded in the Cognitive dimension (3.00), followed by the Affective dimension (2.83), and lastly the Psychosocial dimension (2.46). This suggests that students perceived debriefing as particularly relevant for the development of cognitive competencies. The maximum score was identical across all three dimensions (5.00).

The highest mean score was found in the Affective Dimension (M = 4.69; SD = 0.47), indicating strong emotional engagement with the debriefing process. In contrast, the lowest mean was observed in the Psychosocial Dimension (M = 4.24), which also presented the highest standard deviation (SD = 0.65), suggesting greater variability in student responses in this domain. The Cognitive Dimension had a mean score of 4.55 with a standard deviation of 0.52.

The Cronbach's Alpha coefficient obtained for the three dimensions at both moments was 0.717, indicating an acceptable level of internal consistency.

3.1. Psychosocial Dimension

Among the three dimensions analyzed, the Psychosocial Value dimension presented the lowest average scores. Nevertheless, the mean of all items remained above 3.00 – the midpoint of the Likert scale – indicating a generally positive perception. The item with the lowest mean in both moments was item 16, "Increase my self-confidence" (M1: M=3.83, SD=0.94; M2: M=4.20, SD=1.10). Despite maintaining the lowest average, this item showed an improvement from Moment 1 to Moment 2. The highest mean was observed in item 19, "Enhance teamwork potential," with a score of 4.54 in Moment 1 (SD=0.69) and 4.55 in Moment 2 (SD=0.68), reflecting moderate variability and consistent high valuation by students.

Table 2. Dimension – Psychosocial Value.

EADaS Items		Moment 1	Moment 2
16 – Increase my self-confidence	M	3,83	4,20
	SD	0,94	1,10
	Min	2,00	1,00
	Max	5,00	5,00
17 – Develop leadership skills	M	3,93	4,25
	SD	1,09	0,98
	Min	1,00	1,00
	Max	5,00	5,00
19 – Enhance teamwork potential	M	4,54	4,55
	SD	0,69	0,68
	Min	3,00	3,00
	Max	5,00	5,00
21 – Feel a sense of accomplishment	M	3,92	4,23
	SD	0,95	1,07
	Min	1,00	1,00
	Max	5,00	5,00
22 – Strengthen my initiative in future situations	M	4,31	4,36
	SD	0,87	0,91
	Min	2,00	1,00
	Max	5,00	5,00
23 – Develop the helping relationship	M	4,47	4,52
	SD	0,67	0,78
	Min	2,00	2,00
	Max	5,00	5,00

25 – Strengthen my autonomy to act as a future nurse	M	4,41	4,57
	SD	0,73	0,72
	Min	3,00	2,00
	Max	5,00	5,00
26 – Identify difficulties in my performance	M	4,48	4,55
	SD	0,84	0,78
	Min	1,00	1,00
	Max	5,00	5,00
27 – Promote self-awareness (recognizing one's own emotions)	M	4,38	4,48
	SD	0,80	0,80
	Min	2,00	1,00
	Max	5,00	5,00
28 – Feel that I am at the center of the learning process	M	3,99	4,32
	SD	1,01	0,90
	Min	1,00	1,00
	Max	5,00	5,00
30 – Improve my ability to manage emotions	M	4,14	4,38
	SD	1,03	0,86
	Min	1,00	1,00
	Max	5,00	5,00
32 – Feel proud of being able to correctly perform many interventions	M	4,15	4,35
	SD	0,95	1,00
	Min	1,00	1,00
	Max	5,00	5,00
33 – Feel that the instructor has a genuine interest in my professional development	M	4,52	4,62
	SD	0,73	0,67
	Min	2,00	3,00
	Max	5,00	5,00

Out of the 13 items within this dimension, only four had means below 4.00 in Moment 1. However, all of these demonstrated an upward trend in Moment 2 – item 16 "Increase my self-confidence" (3.83 – 4.20), item 17 "Develop leadership skills" (3.93 – 4.25), item 21 "Feel a sense of accomplishment" (3.92 – 4.23), and item 28 "Feel that I am at the center of the learning process" (3.99 – 4.32). There was maintenance or slight improvement in the remaining 9 items that already had an average above 4.00. Items 22 "Strengthen my initiative in future situations" (4.31 – 4.36); 23 "Develop the helping relationship" (4.47 – 4.52); and 25 "Strengthen my autonomy to act as a future nurse" (4.41 – 4.57) showed the greatest increases from the first to the second moment. Items 26 "Identify difficulties in my performance" (4.48 – 4.55), 27 "Promote self-awareness" (4.38 – 4.48), and 30 "Improve my ability to manage emotions" (4.14 – 4.38) maintained high averages. Finally, item 33 "Feel that the instructor has a genuine interest in my professional development" showed one of the highest averages in both moments (4.52 – 4.62).

In the analysis of the two assessment moments of the Psychosocial Value dimension, a globally positive evolution in students' perceptions is observed, evidenced by the increase in the means of all analyzed items. The overall mean rose from 4.24 (Moment 1) to 4.41 (Moment 2), which reveals a growing appreciation of this dimension throughout the educational process, particularly in the acquisition of interpersonal and communication skills.

3.2. Cognitive Dimension

In the Cognitive Value dimension, which presents intermediate values among the three categories, the average of the items is consistently above 4 in both moments.

Table 3. Dimension – Cognitive Value.

EADaS Items		Moment 1	Moment 2
1 - Structure my thinking	M	4,35	4,70
	SD	0,70	0,52
	Min	2,00	3,00
	Max	5,00	5,00
3 - Learn more	M	4,62	4,72
	SD	0,64	0,51
	Min	3,00	3,00
	Max	5,00	5,00
4 - Focus on the important aspects of performance	M	4,72	4,71
	SD	0,57	0,57
	Min	2,00	3,00
	Max	5,00	5,00
6 - Reflect on my skills	M	4,65	4,65
	SD	0,54	0,68
	Min	3,00	1,00
	Max	5,00	5,00
7 - Identify priorities in performance	M	4,61	4,67
	SD	0,57	0,68
	Min	3,00	1,00
	Max	5,00	5,00
8 - Better identify the resources to be used in performance	M	4,38	4,57
	SD	0,78	0,74
	Min	1,00	1,00
	Max	5,00	5,00
10 - Deepen specific knowledge related to performance	M	4,44	4,64
	SD	0,77	0,57
	Min	2,00	3,00
	Max	5,00	5,00
12 - Identify aspects I should improve in future performances	M	4,61	4,62
	SD	0,67	0,82
	Min	2,00	1,00
	Max	5,00	5,00
13 - Develop skills for making accurate decisions	M	4,55	4,74
	SD	0,67	0,50
	Min	2,00	3,00
	Max	5,00	5,00

The item with the lowest average in both moments was "1 – Structure my thinking" (4.35) with a standard deviation of (0.70) in moment 1, and the item "8 – Better identify the resources to be used in performance" (4.70), with a standard deviation of (0.74).

The highest average in moment 1 was in the item "4 – Focus on the important aspects of performance" (4.72), standard deviation of (0.57), with little variability (0.01) for moment 2, indicating consistency in this item. In moment 2, the highest average was "13 – Develop skills for making accurate decisions", with an average of (4.74), and a standard deviation of (0.50).

In the analysis of both assessment moments of the Cognitive Value dimension, a positive evolution is observed in both moments, with the exception of item 4. The overall average went from 4.55 (Moment 1) to 4.69 (Moment 2), which reveals a growing appreciation of this dimension regarding the promotion of understanding and structuring of knowledge for decision-making.

3.3. Affective Dimension

In the Affective Value dimension, the items were inverted for statistical analysis purposes, meaning that point 1 on the Likert scale corresponds to the highest value and point 5 to the lowest. In this scale, higher values indicate a lower negative affective impact (i.e., less anxiety, fear, shame, among others).

Table 4. Dimension – Affective Value.

EADaS Items		Moment 1	Moment 2
2 - Be ashamed in front of colleagues because of my mistakes	M	4,83	4,81
	SD	0,53	0,60
	Min	2,00	2,00
	Max	5,00	5,00
5 - Become very anxious/stressed	M	4,27	4,47
	SD	1,10	0,96
	Min	1,00	2,00
	Max	5,00	5,00
9 - Feel humiliated in front of others	M	4,86	4,86
	SD	0,54	0,62
	Min	2,00	1,00
	Max	5,00	5,00
11 - Panic just thinking about having to act again in a similar situation	M	4,42	4,49
	SD	1,00	1,07
	Min	1,00	1,00
	Max	5,00	5,00
14 - Create conflicts in the group	M	4,85	4,90
	SD	0,67	0,50
	Min	1,00	1,00
	Max	5,00	5,00
15 - Not want to participate in any more simulations	M	4,73	4,77
	SD	0,86	0,67
	Min	1,00	2,00
	Max	5,00	5,00
18 - Feel misunderstood	M	4,86	4,77
	SD	0,52	0,69
	Min	2,00	2,00
	Max	5,00	5,00
20 - Feel disrespected	M	4,97	4,90
	SD	0,27	0,46
	Min	4,00	2,00
	Max	5,00	5,00
24 - Feel it was a waste of time	M	4,92	4,74
	SD	0,37	0,87
	Min	3,00	1,00
	Max	5,00	5,00
29 - Be afraid to act in similar future situations	M	4,42	4,43
	SD	1,13	1,08
	Min	1,00	1,00
	Max	5,00	5,00
31 - Block my reasoning	M	4,63	4,61
	SD	0,80	0,94
	Min	2,00	1,00
	Max	5,00	5,00

	M	4,48	4,20
34 - Scramble my ideas regarding performance	SD	1,12	1,50
	Min	1,00	1,00
	Max	5,00	5,00

The item with the lowest mean was "5 - Become very anxious/stressed" (4.27) with a standard deviation of (1.10), while the highest value was (4.97) for the item "20 - Feel disrespected", with a standard deviation of (0.27), in Moment 1. In Moment 2, the item "34 - Scramble my ideas regarding performance" had the lowest mean (4.20), with a standard deviation of (1.50), having undergone a negative variation (0.28) between moments. The item that showed the greatest increase was "5 - Become very anxious/stressed" (0.20).

This is the dimension with the highest average values among the three dimensions. In the analysis of the two evaluation moments of the Affective Value dimension, there is a slight decrease in the overall mean, although the values remain high, indicating that the students felt safe and respected throughout the training process.

4. Discussion

Based on the data collected, it is possible to reflect on the impact of this pedagogical strategy on the teaching-learning process, particularly regarding the development of clinical, cognitive, emotional, and interpersonal competencies. The analysis of the results enables the identification of convergences with existing literature, highlighting areas valued by students and demonstrating the potential of *debriefing* as a tool that fosters reflective and safe learning.

In this context, the three dimensions assessed – (4.1.) cognitive, (4.2.) psychosocial, and (4.3.) affective – proved essential for understanding the scope of structured debriefing in Nursing education.

4.1. Cognitive Dimension

During debriefing, students are encouraged to express their thoughts and feelings, share doubts, uncertainties, and limitations in their ability to act, as well as self-assess their actions, decisions, communications, and attitudes. This process allows them to learn not only from their own experiences but also from those of their peers [4].

In this study, the cognitive dimension showed the greatest positive evolution, with the highest average score (from 4.55 to 4.69). The item "supporting the student in focusing on the most important aspects of performance" stood out with the highest mean. This contributes to a positive impact on the acquisition of decision-making and action-prioritization skills, promoting reflective learning and the opportunity to develop multiple competencies [4,6].

Debriefing was identified as a privileged moment for expanding learning, allowing students to reflect on relevant aspects of their performance during simulation and identify areas for future improvement. These elements, which scored highly in this dimension, are described in the literature as key to bridging the gap between past learning and future situations, improving the transfer of experiences from simulation to practice [10]. It also enables students to reflect on their performance, focusing on strengths and areas for improvement, particularly in critical domains such as safety and quality of care [7,9,15].

These findings align with prior studies, in which students perceived debriefing as a central component of the cognitive dimension, associating it with a greater sense of learning. In this context, the identification of areas for improvement was essential for the development of competencies aimed at future decision-making [16]. The simulation experience, coupled with debriefing, represents an opportunity to develop critical thinking, creativity, reasoning, clinical judgment, and decision-making — fundamental competencies for advancing toward excellence in Nursing practice [4,17].

4.2. Psychosocial Dimension

Debriefing, when conducted in a supportive and safe learning environment where students feel comfortable expressing difficulties, making mistakes, and repeating interventions, promotes meaningful learning in self-awareness, stress management, and emotional support [9]. This approach helps reduce negative experiences associated with simulation among Nursing students [10].

Within the psychosocial domain, the most valued aspects were increased self-confidence and the development of leadership skills, along with a sense of accomplishment after simulation practice. These results suggest that the training experience significantly contributed to the development of students' psychosocial competencies, especially in reinforcing confidence, leadership, and a sense of belonging and centrality within the educational process. The observed growth may be attributed to effective pedagogical processes, especially when facilitated by an instructor who serves as a debriefing facilitator [8], enhancing performance and increasing satisfaction with the simulation experience [12].

Findings in the literature corroborate these results, indicating that debriefing positively contributes to decision-making — the item with the highest mean score — and serves as a crucial moment in simulation practice, allowing students to reflect on their performance, analyze and understand what is lacking for skill mastery, thereby fostering critical thinking in action for future decision-making [4,6].

4.3. Affective Dimension

The aim of debriefing is to provide students with positive feedback after identifying emotional responses to *stress* experienced during the simulation [10,12], and it is perceived by students as a non-stressful moment.

For debriefing to be effective, it is essential that instructors use supportive language, avoiding authoritarian attitudes that could harm students' feelings [10]. The instructor should focus on the positive aspects of the simulation performance, avoiding an exclusive focus on errors, which could expose the student in front of peers, leading to feelings of shame and compromising the teaching-learning process [13].

The results confirm the appropriateness of the approach used, as evidenced by the high average scores for statements such as: "Feeling disrespected" (M = 4.97 moment 1), "Feeling that it was a waste of time" (M = 4.92 moment 1), "Creating conflict within the group" (M= 4.90 moment 2), and "Feeling humiliated in front of others" (moment 1 and 2 with M = 4.86). These values suggest that students did not experience these negative emotions during debriefing, reinforcing the importance of a safe and respectful environment.

The success of debriefing is recognized to depend on the facilitator's sensitivity and competence in guiding the discussion to promote reflective thinking. This process, grounded in critical reflection, aims to help students recognize and spontaneously verbalize their difficulties, thereby achieving shared goals between student and instructor: skills acquisition and behavior change [4].

5. Conclusions

The results presented highlight the importance and positive impact of structured debriefing associated with simulated practice in developing Nursing students' competencies. Debriefing is a pivotal moment for fostering critical thinking and reducing anxiety after simulation scenarios.

Balancing the formative values – cognitive, affective, and psychosocial – proved essential for the holistic development of students. Debriefing contributes to building emotional self-awareness, promoting emotional safety. Minor fluctuations in the affective dimension may be attributed to individual experiences or increasing scenario complexity.

Improvement in the perception of cognitive skills such as critical reflection, decision-making, and mental organization reflects the development of knowledge acquisition processes through simulated practice.

The variability in interpersonal relationships, coupled with broader social experiences, showed positive evolution in team cooperation and collaboration – essential in both simulated and real-life practice settings.

The implementation of structured debriefing sessions, integrated with pedagogical strategies aimed at fostering self-confidence, reducing stress, and strengthening interpersonal skills, enhances the impact of educational activities in training competent, safe, and collaborative nurses. This context reinforces the need to integrate reflective practices into Nursing education, valuing teamwork and critical thinking for decision-making as foundational pillars of professional practice.

One limitation of this study was the lack of previous research using the EADaS scale, which restricted direct comparisons with other contexts. However, the scale proved to be a valuable tool for evaluating the effectiveness of post-simulation debriefing sessions, helping to identify areas for improvement and contributing to a deeper understanding of students' perceptions of this pedagogical moment. These findings may serve as a basis for future comparative studies and for the continuous improvement of teaching-learning methodologies in Nursing.

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