Comparative analysis of nursing students' reflection levels before and after debriefing in simulation training in South Korea: qualitative analysis design

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Purpose: To measure the level of reflection, this study analyzes diaries written by third-year nursing students before and after the debriefing stage in simulation training. A qualitative study using diary entries from 15 nursing students to explore reflection depth. **Methods:** Students engaged in simulation training and the debriefing stage, documenting their reflections in diaries. Before and after debriefing, reflections were rated from Level 1 (reflectivity) to Level 7 (theoretical reflectivity). **Results:** The total number of reflection levels rose significantly from 545 to 829 post-debriefing, enhancing higher-order reflection. The shift signifies a move from superficial to deep reflection, highlighting debriefing's role in fostering critical thinking. **Conclusion:** The findings underscore the critical role of debriefing in enhancing reflective thinking in nursing education. There is a demonstrated need for further research into the specific elements of debriefing that are most effective at promoting deep reflection. Future studies should conduct comparative analyses of different debriefing methods and approaches across various educational settings. This research could lay the foundation for designing more effective debriefing strategies that foster critical thinking and improve learning outcomes in nursing education.

Keywords: Cognitive reflection; Simulation training; Students; Nursing

INTRODUCTION

Simulation training has become indispensable to modern nursing education, offering a unique blend of theoretical and practical learning. It provides a controlled environment where nursing students can apply theoretical knowledge to real-world scenarios, effectively bridging the gap between classroom learning and clinical practice. This approach facilitates the acquisition of essential clinical skills and fosters critical thinking and decision-making abilities, which are crucial for nursing professionals. The emphasis on simulation training underscores the evolving nature of nursing education, which increasingly prioritizes experiential learning methods to prepare students for the complexities of healthcare settings.

The structure of simulation training is meticulously designed to encompass three main stages: pre-briefing, scenario, and debriefing, each contributing uniquely to the learning experience. According to Reime et al. [1], simulation training is crucial in enhancing the connection between theoretical knowledge and its application in clinical practice, thus ensuring that nursing students are well-prepared for their roles in healthcare settings. The debriefing stage, highlighted by Shinnick et al. [2] as the cornerstone of the simulation experience, offers a critical reflection period where students analyze their performance, integrate theoretical knowledge with

practical experience, and identify areas for improvement. This stage is instrumental in developing students' clinical reasoning and judgment capabilities.

Debriefing sessions utilize structured frameworks such as Description, Analysis, Application (DAA), Gather, Analyze, Summarize, Promoting Excellence and Reflective Learning in Simulation, Debriefing for Meaningful Learning, and the 3D Model of Debriefing. These frameworks facilitate a comprehensive analysis of the simulation experience, encouraging a profound reflection on actions, decisions, and outcomes. Fanning and Gaba [3] have shown that such structured approaches to debriefing significantly enhance students' learning experiences by promoting critical thinking, self-assessment, and collaborative learning.

Despite the proven benefits of simulation training, there is an ongoing debate regarding the most effective debriefing methods and their impact on learning outcomes. Lee et al. [4] suggest that learning outcomes can vary significantly depending on the debriefing approach, indicating a need for further research to optimize debriefing strategies.

Integrating student-led debriefings introduces a dynamic aspect to simulation training, emphasizing peer feedback and collective learning. Boet et al. [5] argue that student-led debriefings promote team competency and enable a more thorough review of performance, leading to improved clinical outcomes.

Moreover, Kang and Yu [6] have identified the combination of student-led and educator-led debriefings as a superior method for enhancing problem-solving skills and debriefing satisfaction, underscoring the importance of flexibility and adaptability in debriefing practices.

Reflective writing, such as journals, during debriefing sessions, has contributed positively to developing problem identification, analysis, and solution-finding abilities [7,8]. However, Niu et al. [9] reported that nursing students engage in superficial reflection, underscoring the need for strategies promoting more profound reflective practices.

To address these challenges, this study explores the effectiveness of self-reflection before formal debriefing sessions. It compares with traditional educator-led debriefing to ascertain whether self-reflection alone can promote sufficiently deep reflective practices among nursing students. This research seeks to understand the added value of guided debriefing sessions and to develop foundational data for enhancing self-reflective practices.

Grounded in the educational theories of Dewey [10] and

Schön [11] and informed by Jack Mezirow's transformative learning framework, this study employs Mezirow's tool [12] for assessing levels of reflection. Introduced by Mezirow in 1981, the transformative learning theory posits that adult learning is a process of reflecting and transforming pre-existing beliefs. Mezirow's framework includes a classification tool that depicts reflection at several distinct levels, later modified for more streamlined application [13,14]. This tool has proven particularly effective in evaluating the depth of reflection in educational settings, revealing various levels of reflective thinking associated with professional development in nursing [15,16]. By utilizing this framework, the research will measure and analyze the depth of reflection induced by debriefing methods, providing insights into how debriefing can be structured to foster profound reflective thinking and improve educational outcomes.

Accordingly, we aimed to gauge reflection levels by analyzing journals third-year nursing students wrote before and after debriefings in simulation training. It explores the students' reflection level and aims to offer critical data for creating practical simulation training.

Ultimately, this study aims to enhance debriefing practices and promote deeper reflection, preparing nursing students more comprehensively for the complexities of clinical practice, aligning educational strategies with professional needs, and improving patient care through more effective training outcomes.

METHODS

1. Study Design

This study is a qualitative analysis designed to evaluate and compare the levels of reflection among nursing students by examining journals written before and after debriefing sessions in simulation training. This study followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) reporting guidelines [17].

2. Theoretical Framework

This study's theoretical foundation is grounded in Schön's [11] concepts of reflection-in-action and reflection-on-action, along with Mezirow's [15] transformative learning theory. Schön's work provides a lens through which the reflective processes during and after simulation training can be examined, highlighting the importance of reflective practice in professional development. Mezirow's theory further enriches this framework by delineating how critical reflection on experiences can lead to transformative learning, changing individuals' perspectives and understandings. This study utilizes Mezirow's tool for assessing levels of reflectivity to investigate the depth of reflection in nursing students' journals, focusing on how debriefing influences reflective learning.

3. Setting and Participant Recruitment

This study was conducted with third-year nursing students from S University in Seoul. Seventeen participants were initially recruited through social media invitations sent via Kakao Talk, ensuring voluntary participation and accessibility. The recruitment strategy employed a first-come, first-served approach. Eligibility criteria mandated that participants must have completed educational sections on the respiratory system in their health assessment, primary nursing, and pediatric nursing courses. Those who had not fulfill this prerequisite were excluded from the study.

In qualitative research, determining the appropriate sample size is contingent upon various factors, including the research topic, analytical methods, research paradigm, and the specific nature of the study. According to Brantlinger et al. [18], it is crucial to ensure that participants are suitable for the research objectives, representative of the broader population, and effectively recruited to support the study's integrity. Previous research indicates that saturation is typically achieved within a range of participants. Jensen and Joy [16] reported saturation with 15 participants, whereas Silvia et al. [19] identified saturation with 13 participants. Further studies on sample size in qualitative research suggest that 15 to 30 interviews are generally necessary to reach saturation adequately. Based on these precedents and the need to account for potential attrition, this study initially aimed to recruit 15 participants adjusting to 17 to compensate for a projected 10% dropout rate.

Ultimately, 17 participants consented to the study after re-ceiving detailed information through informed consent documents. However, two participants withdrew prior to the start of the study due to health concerns, resulting in a final sample size of 15.

4. Data Collection

Data collection was conducted on March 30, 2024, and a co-researcher was an instructor. All individuals were fully briefed on the study's objectives, methodologies, and their rights within the research context. This briefing emphasized their right to anonymity, safeguarding their personal information, and underscored their freedom to disengage from the study at any point without penalty. Informed consent was meticulously obtained from each participant, affirming their understanding and voluntary agreement to partake in the study. This process was instrumental in upholding the principles of autonomy and respect for the individuals involved, ensuring participants were neither coerced into participation nor remained unaware of the extent of their involvement and rights.

The study was conducted in a child simulation lab at the participants'school, with debriefings in a separate classroom. All simulation exercises were videotaped. As part of the simulation training process, participants completed a reflective journal.

We conducted a separate simulation training for research, not regular classes. Based on a pediatric asthma scenario, the simulation training aimed to foster reflective learning through pre-briefing, scenario, and debriefing phases, lasting hours and 30 minutes. It commenced with a 30-minute orientation to familiarize participants with the scenario and simulation tools. The five teams, which randomly consisted of three people in groups, went through technical practice and discussion for about an hour. The scenario, which took about 10 minutes per team, involved a 7-year-old boy who had a history of asthma and complained of difficulty breathing and came to the emergency room. The focus was on achieving pediatric asthma management goals, such as identifying children's symptoms, comprehensive evaluation, communication, drug administration, and providing psychological support. After self-reflection, each group participated in a debriefing session led by an instructor for about 20 minutes. The instructor-led debriefing method used Socratic questioning to enable students to find their own mistakes. They were then asked to fill out the same reflection journal again to

deepen their reflection and complete the comprehensive training program.

In this study, the debriefing reflective journal for the asthma child scenario simulation practice utilized the DAA method. This involved:

Description Stage: Questions like 'What was the situation of the subject?', 'What was my best performance aspect?', 'What was the most challenging aspect for me?', 'How do I evaluate my overall performance in patient care?' to capture the scenario context.

Analysis Stage: Queries such as 'What did I identify as the patient's primary issue?', 'Which nursing action did I prioritize to address this issue?', 'Was this nursing action carried out?', 'If the action was performed, were the results verified?', 'What was the basis for this verification?', 'If the nursing action was not performed, what were the reasons?', 'Were there any additional nursing problems identified apart from the primary issue?' to encourage critical thinking.

Application Stage: Prompts like 'How can I apply what I learned today to real-life situations?', 'What was the most important lesson I learned today?', 'What was the most memorable thing from today's learning?' to foster practical application of knowledge.

A total of 13 open-ended questions facilitated deep reflection across these stages.

Mezirow's seven levels of reflectivity [12] were employed to assess the depth of reflection achieved, enhancing understanding of the learning process (Table 1).

5. Data Analysis

The research team is comprised of two experienced professionals. The first author has conducted qualitative research on multiple occasions and has four years of experience in delivering simulation training. The co-researcher has undergone formal training in qualitative research methods during a doctoral program and has over five years of experience in conducting simulation training.

The data analysis methodology involved a participant pool of 15 individuals. Each reflective journal was initially read to identify the general thematic content before employing Mezirow's seven levels of reflectivity to discern the depth of reflection achieved within each entry. This process was repeated to ensure no levels of reflection were overlooked, with identified reflection levels and corresponding statements being systematically tabulated. A frequency analysis was then conducted to ascertain the distribution of reflection levels across the journals. The analysis process was collaboratively executed by two researchers, who engaged in comparative discussions of themes, categories, and codes to reach a consensus on the reflection levels observed.

6. Rigor and Reflexivity

To uphold the rigor and reflexivity in this study, several methodological strategies were employed. Firstly, The Consolidated Criteria for Reporting Qualitative Research (COREQ) [17] guided the transparency and comprehensiveness in reporting research procedures, findings, and interpretations. This framework ensured that all aspects of the study were documented in a manner that allowed for reproducibility and scrutiny, contributing to the study's credibility.

In addition, a systematic approach to data collection and analysis was meticulously followed to enhance the study's

Table 1. Mezirow's Seven Level of Reflectivity

Levels of consciousness	
Level 1 (reflectivity)	This refers to students' awareness of a specific perception, behavior, habit, experience and ability to describe it.
Level 2 (affective reflectivity)	This represents students' ability to recognize and express their feelings or those of others.
Level 3 (discriminant reflectivity)	This refers to students' ability to evaluate processes of decision-making, planning or evaluation of activities undertaken during the training period.
Level 4 (judgmental reflectivity)	Students are aware of expressing evaluation judgments subjective in nature that can influence practical actions.
Levels of critical consciousness	
Level 5 (conceptual reflectivity)	This represents the ability to recognize the need for improving their skills.
Level 6 (psychic reflectivity)	Students recognize that they tend to express rash judgments on other people based on limited information.
Level 7 (theoretical reflectivity)	This includes several elements: awareness that routine or certain fixed practices may not be the proper response in a specific situation; learning following a specific event; a change of perspective, since students follow the perspective that best suits to the situation.

reliability and validity. This involved employing Mezirow's seven stages of reflection for a structured and consistent analysis of reflective journals, supported by frequency analysis to quantify the levels of reflection observed. Two researchers independently analyzed the data to ensure accuracy and objectivity in data interpretation. This independent analysis facilitated identifying and mitigating potential biases, with subsequent discussions held to reach aconsensus on the themes, categories, and codes derived from the data.

Reflexivity was maintained throughout the research process by continually reflecting on the researchers'assumptions, biases, and potential influences on the study's outcomes. This introspective practice was crucial for acknowledging and addressing the subjective elements inherent in qualitative research, thus enhancing the integrity and trustworthiness of the findings.

Overall, applying the COREQ guidelines, a rigorous methodological approach, and a commitment to reflexivity ensured that this study met high standards of quality and transparency. These efforts aimed at provide meaningful insights into the reflective learning processes of nursing students within simulation training, contributing valuable knowledge to the field of nursing education.

7. Findings

1) General characteristics of participants

The study was conducted with 15 third-year nursing stu-

dents at S University in Seoul. The participants had an average age of 22.46 years (standard deviation = 2.12, ranging from 21 to 25 years). The group consisted of 5 male (33.3%) and ten female (66.7%) participants (Tables 2, 3).

Reflection levels for each student were measured before and after the debriefing sessions, with detailed data recorded in Table 3. Before the debriefing, the total number of reflection levels was 545, with individual student number of reflection levels ranging from 19 to 59. After the debriefing, the total number of reflection levels increased to 829, with the number of reflection levels per studentranging from 41 to 72.

The changes in reflection level before and after debriefing can be summarized as follows:

Examining the changes in reflection level before and after debriefing, Level 1 (reflectivity) decreased from 61 points to 35, and following this trend, Level 2 (affective reflectivity) dropped from 12 points to 2, and Level 3 (discriminant reflectivity) saw a reduction from 243 points to 114. In contrast, a notable shift occurred with Level 4 (judgmental reflectivity) increasing from 108 points to 148, Level 5 (conceptual reflectivity) advancing from 20 points to 60, and Level 6 (psychic

Table 2. General characteristics of participants (*N*=15)

Characteristics	Categories	n (%)	M±SD
Age (year)			22.46±2.12
Sex	Male	5 (33.3)	
	Female	10 (66.7)	

M, mean; SD, standard deviation.

Table 3. The total number of reflection levels before and after debriefing in simulation training (*N*=15)

Participants	Level 1		Level 2		Level 3		Level 4		Level 5		Level 6		Level 7		Total	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
1	4	1	0	0	12	6	16	20	5	0	0	6	0	28	37	61
2	1	1	4	0	3	6	28	20	10	0	0	12	0	21	46	60
3	1	1	0	0	9	0	12	12	5	5	18	12	14	42	59	72
4	2	2	0	0	21	6	12	4	0	0	6	36	0	14	41	62
5	4	4	0	0	21	9	8	8	0	15	0	6	0	0	33	42
6	3	2	0	0	27	15	4	8	0	0	0	18	0	7	34	50
7	1	0	2	0	27	9	4	12	0	5	6	12	0	28	40	66
8	9	3	4	2	6	3	0	8	0	15	0	6	0	14	19	51
9	5	3	0	0	18	3	4	16	0	0	0	18	7	14	34	54
10	4	2	0	0	21	12	0	4	0	5	6	6	7	28	38	57
11	9	5	0	0	9	3	0	12	0	5	0	12	7	7	25	44
12	7	4	0	0	12	12	8	8	0	5	0	12	0	0	27	41
13	5	2	0	0	15	12	4	4	0	0	12	12	0	28	36	58
14	3	3	2	0	15	9	4	4	0	0	18	24	0	14	42	54
15	3	2	0	0	27	9	4	8	0	5	0	12	0	21	34	57
Total	61	35	12	2	243	114	108	148	20	60	66	204	35	266	545	829

reflectivity) jumping from 66 points to 204. Finally, Level 7 (theoretical reflectivity) surged from 35 points before debriefing to 266 points after, highlighting the significant impact of debriefing on fostering more profound levels of reflective thinking among students.

The study revealed that after debriefing, there was a noticeable shift in reflection level among participants; reflectivity (Level 1), affective reflectivity (Level 2), and discriminant reflectivity (Level 3) experienced declines, indicating a move away from superficial and emotional reflection towards more analytical and deep-seated introspection, as evidenced by significant increases in judgmental reflectivity (Level 4), conceptual reflectivity (Level 5), psychic reflectivity (Level 6), and theoretical reflectivity (Level 7), highlighting the debriefing process's crucial role in fostering advanced reflective thinking and integrating theoretical knowledge with personal experience.

Specific Examples of Reflection Observed in the Reflection Journals.Students demonstrated various levels of reflection through their reflection journals.

(1) Level 1 (reflectivity)

Scores decreased from 61 to 35. Pre-debriefing, students described basic situational details such as "The patient had suddenly developed difficulty breathing an hour after playing with friends" (pre-debriefing reflection journal n.5). Post-debriefing, observations became more clinically oriented: "The patient presented with difficulty breathing upon admission, with vital signs showing... blood oxygen saturation at 87% and audible wheezing" (post-debriefing reflection journal n.2).

(2) Level 2 (affective reflectivity)

Scores dropped from 12 to 2. Emotional reactions were noted with students expressing regret about their actions, "I regret not checking the monitor continuously while providing care" (Pre-debriefing reflection journal n.2). This level of reflection evolved into more reflective regret, considering potential real-world implications, "Thinking about how it would have been in a real situation, I feel regretful for not performing the nursing care well" (Post-debriefing reflection journal n.6).

(3) Level 3 (discriminant reflectivity)

Scores reduced from 243 to 114. Students initially evaluated their actions positively, "I think it was good to explain to the patient before performing the nursing actions" (pre-debriefing reflection journal n.1), but this evolved into a more collaborative reflection post-debriefing, highlighting team dynamics: "We quickly divided the roles; one performed the physical examination, and another measured the vital signs" (post-debriefing reflection journal n.6).

(4) Level 4 (judgmental reflectivity)

Scores increased from 108 to 148. Reflections show growth in judgment-related insights, from initial simple improvements, "It would have been better if I had spoken to alleviate the child's anxiety while performing the procedure" (pre-debriefing reflection journal n.2), to more complex clinical decisions post-debriefing, "To ease the patient's breathing, I first put them in a semi-upright position and then provided oxygen and administered the nebulizer" (post-debriefing reflection journal n. 1).

(5) Level 5 (conceptual reflectivity)

Scores advanced from 20 to 60. Students noted the need for deeper learning, "I think additional learning on precautions for each procedure and preparing for unexpected situations is necessary" (pre-debriefing reflection journal n.2), and post-debriefing, they connected this learning to preventing medication errors, "I administered the entire ample of nebulizer medication, but medication errors are dangerous, so I must always check the 5rights before administration" (post-debriefing reflection journal n.11).

(6) Level 6 (psychic reflectivity)

Scores jumped from 66 to 204. Initial self-criticisms like "Feeling pressed for time, I failed to check the patient's oxygen saturation to see if their condition improved" (pre-debriefing reflection journal n.8) turned into lessons learned post-debriefing, "I made a mistake by arbitrarily stopping the oxygen supply during nebulizer administration today; I learned that oxygen delivery and nebulizer administration can co-occur and should not arbitrarily stop the oxygen supply" (post-debriefing reflection journal n.13).

(7) Level 7 (theoretical reflectivity)

Scores surged from 35 to 266. Pre-debriefing insights into the importance of theoretical knowledge, "Seeing the terminology used in actual prescriptions at the hospital made me realize the importance of studying" (pre-debriefing reflection journal n.9), were deepened by prioritizing clinical actions

during emergencies, "In emergencies, it is more important to perform nursing interventions according to priority rather than explaining the purpose and procedure" (post-debriefing reflection journal n.15).

DISCUSSION

The present study analyzes reflection journals written by 15 nursing students during simulation training utilizing a qualitative research methodology, aiming to provide researchers with a nuanced understanding of the changes in levels of reflection before and after the debriefing stages. Grounded in a profound comprehension of Mezirow's Reflective Theory [15], the findings explicitly illustrate how students who reached theoretical reflection (Level 7) reinterpreted their experiences to facilitate new learning. The study evaluates students' reflective capabilities according to Mezirow's levels of reflection, highlighting differences in these capabilities before and after the debriefing stage of simulation training. Notably, most students reached only the initial three levels of reflection before debriefing with the instructor. This finding aligns with Powell's [13] study, which observed that three levels of reflection were prevalent among nurses in their daily work. This outcome is consistent with previous research that analyzed nursing students' reflection journals during clinical practice using a similar tool, which reported that most exhibited levels of reflection at Level 3 or below [19]. An analysis of reflective journals written by 30 nursing students during their community health management practicums revealed that 94% demonstrated reflection at Level 3 or below. However, 22 of these students also achieved higher levels of conceptual and theoretical reflection [20], similar to this study's findings.

The results of this study suggest that debriefing sessions enhance nursing students' capacity for reflective thinking. The study reveals a significant improvement in reflection levels post-debriefing, particularly an increase in more profound levels of reflection (Level 5 and above). This indicates that debriefing with instructors is crucial in enhancing nursing students' reflective thinking abilities. The impact of instructor-student interaction on the level of reflective thinking was also identified as a critical element in the research by Peltier et al. [21]. Thus, the debriefing stage after the simulation training offers an opportunity to improve the quality of education and stimulate students' reflective thinking.

Furthermore, the results highlight the necessity of developing advanced, scenario-specific debriefing questions for self-report sessions, especially in virtual simulation training where direct instructor-led debriefing is impossible. This need arises from observations that students often focus primarily on the technical aspects of their skills during self-reports, which hinders deeper reflection. To address this, educators need to formulate debriefing questions that address technical proficiency and facilitate a comprehensive evaluation of decision-making, critical analysis, and emotional reactions, ensuring meaningful self-reflection even without direct instructor guidance. Previous research has indicated a deficiency in the questioning techniques of instructors intended to elicit reflection [22].

Overall, this research has significant implications for nursing educators in designing the reporting process. It emphasizes the importance of integrating various realistic scenarios into questions to encourage in-depth analysis and reflection on personal experiences, aiding in the development of student's abilities to effectively tackle complex issues in clinical settings. Thus, nursing educators must effectively design and implement the debriefing process to facilitate more profound reflective experiences and learning for students. The study utilizes Mezirow's Reflective Theory to analyze the reflective thinking process of nursing students, providing significant theoretical and practical contributions. The results underscore the importance of educational strategies and interventions in nursing education to enhance reflective thinking and equip educators with specific methodologies to improve students' reflective capabilities. This study emphasizes the directionsfor deep reflection in self-directed and instructor-led methods during the debriefing process. It presents research results showing that improved teaching techniques and strategies can positively impact the development of students' reflective thinking. These findings offer valuable insights for the enhancing and developing nursing education programs.

CONCLUSION

This research explored the evolution of nursing students' reflective thinking before and after debriefing sessions in simulation training, aiming to enhance the efficacy of simulation education. Utilizing Mezirow's levels of reflection, the study demonstrated a significant deepening of students' reflective thinking post-debriefing, underscoring the pivotal role of debriefing in cultivating reflective skills essential for clinical practice.

A primary strength of this research is its detailed application of Mezirow's Reflective Theory to analyze students' reflective journals. This analysis revealed a nuanced understanding of the reflective process and its progression through structured debriefing, with students notably advancing to higher levels of reflection, particularly theoretical reflection (Level 7). This highlights debriefing's critical role in promoting deep learning within nursing education.

The study advocates for integrating structured debriefing into nursing curricula to promote reflective and critical thinking skills actively. It recommends nursing educators develop debriefing questions that encourage deeper reflection and utilize frameworks such as the Debriefing Assessment for Simulation in Healthcare to enhance this process. Additionally, training educators in effective questioning techniques and debriefing strategies is crucial for nurturing higher levels of reflection.

Moreover, this research underscores the necessity of crafting advanced debriefing questions explicitly tailored for scenarios like virtual simulation training, where direct instructor-led debriefing is unavailable. These advanced questions facilitate deep self-reflection independently, addressing the shortcomings of current debriefing practices in online settings and ensuring comprehensive reflective engagement.

In conclusion, this study provides valuable insights into improving reflective thinking in nursing education. The suggested enhancements to debriefing practices, especially for online simulations, are pivotal in ensuring that nursing students are well-equipped with the necessary reflective skills for effective and autonomous clinical practice.

However, the study is limited by its small sample size and the specificity of the educational setting, which may limit the generalizability of the findings. Although the data collection method of debriefing writing allows participants to express their thoughts in a relatively free atmosphere, it is limited to the experiences of students from a single university engaging with a single scenario, potentially excluding various experiences.

Additionally, using self-reported data in reflective journals may introduce biases, as participants might alter their responses based on perceived expectations or social desirability. The study also lacks longitudinal data, which could provide insights into the long-term effects of debriefing on reflective thinking.

Future research should expand the exploration of reflective thinking across a more diverse student population and var-

ied simulation training environments to enhance the applicability of these findings. A mixed-methods approach, triangulating data from self-reported reflective journals, observational data, and interviews, can provide a more comprehensive understanding of the reflective process.

ARTICLE INFORMATION

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