Effect of Structured Pre-briefing on Learner Confidence and Psychological Safety in Simulation-Based Nursing Education: A Pre-Experimental Study at a Tertiary Simulation Centre

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ABSTRACT

Background: Simulation-based education (SBE) has become a cornerstone of contemporary nursing curricula, enabling learners to develop clinical competencies in controlled environments. However, learner anxiety, fear of evaluation, and perceived psychological threat—particularly among novice nursing students—can significantly attenuate the educational benefits of simulation. Psychological safety, conceptualised by Edmondson (1999) as the shared belief that an environment is safe for interpersonal risk-taking, is increasingly recognised as a prerequisite for effective simulation-based learning. Pre-briefing, the preparatory phase preceding simulation, has been proposed as a critical lever for establishing psychological safety and enhancing learner confidence, yet empirical evidence examining its structured implementation remains sparse, particularly in the Indian nursing education context.

Objective: To evaluate the effect of structured pre-briefing on learner confidence and psychological safety among B.Sc. Nursing first-year students participating in simulation-based education at a tertiary simulation centre in South India.

Materials and Methods: A quantitative pre-experimental one-group pre-test post-test design was employed. One hundred seventy-eight B.Sc. Nursing first-year students at Vydehi Advanced Simulation Academy (VASA), Bangalore, were recruited through total enumeration sampling. Learner confidence was assessed using a validated 8-item Learner Confidence Scale (maximum score: 40; CVI = 0.90; $\alpha = 0.86$), and psychological safety was assessed using a validated 20-item Psychological Safety Scale (maximum score: 100; CVI = 0.92; $\alpha = 0.88$). A structured pre-briefing intervention (10–15 minutes) was delivered prior to simulation exposure. Pre- and post-assessment data were analysed using paired t-tests and Cohen's d effect size ($\alpha = 0.05$).

Results: Pre-assessment revealed that 53.9% of students exhibited low confidence and 49.4% perceived low psychological safety. Following structured pre-briefing, high confidence increased from 11.2% to 59.6%, and high psychological safety increased from 14.6% to 65.1%. Mean learner confidence scores improved significantly from 25.10 (± 6.60) to 33.20 (± 5.10) ($t = 12.56$, $p < 0.001$; Cohen's $d = 1.37$; 95% CI: 6.84–9.36). Mean psychological safety scores increased from 73.50 (± 14.80) to 85.20 (± 12.10) ($t = 8.20$, $p < 0.001$; Cohen's $d = 0.87$; 95% CI: 8.90–14.50). Both effect sizes exceeded Cohen's threshold for large effects ($d \geq 0.80$).

Conclusion: Structured pre-briefing significantly enhanced both learner confidence and psychological safety in simulation-based nursing education. The large-to-very-large effect sizes underscore the substantive educational impact of a brief, theoretically grounded pre-briefing protocol. These findings provide compelling evidence for the mandatory integration of structured pre-briefing into simulation programmes of best practices and competency-based education framework.

Keywords: *Structured Pre-briefing; Psychological Safety; Learner Confidence; Simulation-Based Education; Nursing Students; Pre-Experimental Study*

INTRODUCTION

Simulation-based education (SBE) has emerged as one of the most transformative pedagogical innovations in contemporary healthcare education, fundamentally reshaping how nursing students acquire, practise, and consolidate clinical competencies. By creating realistic, immersive clinical scenarios within controlled environments, SBE enables learners to develop technical skills, clinical reasoning, teamwork, and professional communication without risk to patient safety (Cant & Cooper, 2017; Jeffries, 2016). The adoption of SBE has accelerated globally, with the International Nursing Association for Clinical Simulation and Learning (INACSL) establishing comprehensive standards of best practice that now serve as the benchmark for simulation programme design and delivery worldwide (INACSL Standards Committee, 2021).

However, the educational potential of simulation is not automatically realised by merely placing learners in simulated environments. A growing body of evidence reveals a fundamental paradox: the very features that make simulation educationally powerful—realism, clinical complexity, performance visibility, and peer observation—can simultaneously induce significant anxiety, self-consciousness, and emotional distress among learners, particularly those with limited clinical experience (Ganley & Linnard-Palmer, 2012; Nielsen & Harder, 2013). First-year nursing students, who represent the most vulnerable cohort in this regard, frequently enter simulation laboratories harbouring fears of making errors in front of peers, anxiety about being evaluated or judged, uncertainty about expectations, and a general sense of psychological vulnerability that can profoundly inhibit learning (Cato, 2013). This anxiety-learning paradox—wherein the environment designed to promote learning simultaneously generates barriers to it—represents one of the most significant unresolved challenges in simulation education.

The concept of psychological safety provides a critical theoretical lens through which to understand and address this paradox. Amy Edmondson's seminal work (1999) defined psychological safety as a shared belief held by members of a team or group that the environment is safe for interpersonal risk-taking—that one will not be punished, humiliated, or marginalised for speaking up, asking questions, admitting mistakes, or seeking feedback. Originally conceptualised within organisational learning theory, psychological safety has been progressively applied to healthcare education contexts, where its relevance is arguably even more pronounced (Edmondson & Lei, 2014). In simulation-based learning specifically, psychological safety determines whether learners will actively engage with scenarios, openly express clinical reasoning, willingly expose knowledge gaps, and participate meaningfully in debriefing—all of which are essential for deep learning to occur (Rudolph et al., 2014; Turner & Harder, 2018).

The intimate relationship between psychological safety and learner confidence further amplifies the educational stakes. Learner confidence—defined as an individual's self-perceived capability to perform effectively in a given learning context—is both a predictor and an outcome of successful simulation experiences (Bambini et al., 2009). Bandura's Self-Efficacy Theory (1977) posits that confidence (self-efficacy) is shaped by mastery experiences, vicarious learning, social persuasion, and physiological-emotional states. In simulation environments where psychological safety is compromised, the anxiety and fear experienced by learners constitute negative physiological-emotional states that directly undermine self-efficacy development. Conversely, when psychological safety is established, learners feel liberated to take risks, attempt procedures, and engage in clinical decision-making—activities that generate the mastery experiences essential for confidence-building. This bidirectional relationship between psychological safety and confidence creates a self-reinforcing cycle that can be either virtuous or vicious, depending on the learning environment's affective climate.

It is within this theoretical context that pre-briefing—the preparatory phase preceding simulation exposure—has gained recognition as a pivotal educational strategy. Pre-briefing, as defined by the INACSL Standards of Best Practice (2021), encompasses the activities and information sharing that orient participants to the simulation experience, establish norms of engagement, and prepare learners cognitively and emotionally for the learning encounter. While some form of orientation typically precedes most simulation sessions, structured pre-briefing represents a deliberate, evidence-informed, and systematically designed approach that extends far beyond logistical orientation to address the psychological, emotional, and relational dimensions of learner preparation (Page-Cutrara, 2014).

Rudolph, Raemer, and Simon (2014) articulated the concept of the "Safe Container"—a psychological framework within which learners feel sufficiently protected to engage in the vulnerable acts of practising, making mistakes, and receiving feedback. The Safe Container is established through explicit communication of several key elements: the fiction contract (acknowledging the artificial nature of simulation while committing to treat it as real); assurance that the purpose is learning rather than evaluation; confidentiality agreements; norms of mutual respect; and transparent articulation of expectations and objectives. Structured pre-briefing operationalises the Safe Container concept by systematically addressing each of these elements before simulation begins, thereby creating the conditions under which psychological safety can flourish.

Page-Cutrara (2014, 2015) provided foundational empirical evidence for the importance of pre-briefing, developing a conceptual framework that positioned pre-briefing as a critical but under-researched phase of the simulation process. Her work demonstrated that pre-briefing activities directly influenced learner anxiety levels, engagement quality, and subsequent debriefing effectiveness. Chamberlain (2015) further documented that deliberate pre-briefing strategies emphasising non-judgmental norms and confidentiality significantly enhanced perceived psychological safety among nursing students. Turner and Harder (2018), in their integrative review of pre-briefing in simulation-based education, concluded that while theoretical support for structured pre-briefing is robust, empirical evidence—particularly from controlled studies examining measurable outcomes such as confidence and psychological safety—remains limited and methodologically heterogeneous.

The evidence gap is particularly acute in the Indian nursing education context. The Indian Nursing Council's (INC) revised competency-based curriculum (2021) has mandated the integration of simulation across undergraduate nursing programmes, catalysing the establishment of simulation centres at nursing institutions nationwide. However, this rapid expansion has often prioritised hardware acquisition (manikins, task trainers, simulation suites) over pedagogical process design—including structured pre-briefing protocols. Anecdotal evidence and emerging reports from Indian simulation centres suggest that pre-briefing, when conducted at all, tends to be informal, unstandardized, and focused primarily on logistical orientation rather than psychological preparation. This pedagogical gap is concerning, as Indian nursing students—who frequently navigate hierarchical educational cultures, language barriers, and limited prior exposure to active learning methodologies—may be particularly susceptible to simulation-related anxiety and may therefore derive disproportionate benefit from structured pre-briefing interventions.

Against this backdrop—the established theoretical importance of psychological safety (Edmondson, 1999), the Safe Container framework for simulation (Rudolph et al., 2014), the documented impact of pre-briefing on learner preparation (Page-Cutrara, 2014, 2015), the identified paucity of empirical evidence particularly from Indian institutional contexts (Turner & Harder, 2018), and the curricular imperative from the Indian Nursing Council (2021)—the present study was conceptualised. The study aimed to evaluate the effect of a structured pre-briefing intervention, grounded in the Safe Container framework, on both learner confidence and psychological safety among B.Sc. Nursing first-year students at Vydehi Advanced Simulation Academy (VASA), a tertiary simulation centre in Bangalore, South India.

By simultaneously measuring both confidence and psychological safety—and by reporting effect sizes alongside traditional significance testing—the study seeks to provide methodologically rigorous evidence that can inform the standardisation of pre-briefing protocols across Indian simulation centres and contribute to the growing international evidence base for this critical yet under-researched component of simulation pedagogy.

OBJECTIVES OF THE STUDY

1. To assess pre-assessment levels of learner confidence and psychological safety among B.Sc. Nursing first-year students prior to structured pre-briefing.
2. To assess post-assessment levels of learner confidence and psychological safety following the structured pre-briefing intervention.
3. To evaluate the effectiveness of structured pre-briefing by comparing pre- and post-assessment scores using paired t-tests.

RESEARCH HYPOTHESES

H_1: There will be a statistically significant increase in learner confidence scores following structured pre-briefing ($p < 0.05$).

H_2: There will be a statistically significant increase in psychological safety scores following structured pre-briefing ($p < 0.05$).

MATERIALS AND METHODS

Research Approach and Design

A quantitative research approach with a pre-experimental one-group pre-test post-test design was employed. This design was selected as it permits within-subject evaluation of an educational intervention where each participant serves as their own control, facilitating direct comparison of learner confidence and psychological safety before and after the pre-briefing intervention (Polit & Beck, 2017).

Study Setting

The study was conducted at Vydehi Advanced Simulation Academy (VASA), a state-of-the-art tertiary simulation centre situated within Vydehi Campus, EPIP Area, Whitefield, Bangalore, Karnataka, India. VASA is equipped with dedicated simulation suites featuring high-fidelity and low-fidelity manikins, a comprehensive array of task trainers, standardised patient rooms, multimedia-enabled classrooms, and purpose-designed debriefing rooms with audio-visual recording capabilities. The centre provides simulation-based education to nursing, medical, and allied health sciences students affiliated with Vydehi Institute of Medical Sciences and Research Centre and Vydehi Institute of Nursing Sciences. The selection of VASA as the study setting was

deliberate, as it afforded a standardised simulation environment conducive to the controlled delivery of the pre-briefing intervention.

Study Population and Sampling

The study population comprised all B.Sc. Nursing first-year students enrolled at Vydehi Institute of Nursing Sciences for the academic year 2024–2025. Total enumeration sampling was employed, wherein all eligible students in the cohort were invited to participate. A total of 178 students met the inclusion criteria and consented to participation, constituting the final study sample.

Inclusion criteria: (a) B.Sc. Nursing first-year students enrolled at Vydehi Institute of Nursing Sciences; (b) students scheduled to participate in simulation-based learning sessions during the study period; (c) students who provided informed written consent.

Exclusion criteria: (a) Students absent on the day of data collection; (b) students who declined to participate; (c) students with prior experience in simulation-based education at other institutions.

Data Collection Instruments

Two validated structured questionnaires were employed to measure the two outcome variables:

(i) Learner Confidence Scale: A purpose-designed 8-item instrument assessing learner confidence across dimensions of: self-perceived readiness for simulation participation, confidence in performing clinical procedures, comfort with making decisions under observation, confidence in communicating with team members, willingness to ask questions, perceived ability to manage clinical scenarios, comfort with the simulation environment, and overall preparedness for the learning experience. Each item was rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), yielding a total possible score range of 8–40. Scores were categorised as: Low Confidence (≤ 20), Moderate Confidence (21–30), and High Confidence (31–40). Content validity was established through expert review by a panel of six experts (simulation educators, nursing faculty, and psychometricians), yielding a Scale-level Content Validity Index (S-CVI/Ave) of 0.90. Reliability was confirmed through a pilot study with 20 nursing students (not included in the main sample), yielding Cronbach's $\alpha = 0.86$.

(ii) Psychological Safety Scale: A 20-item instrument Psychological Safety construct and contextualised for simulation-based learning environments. Items assessed dimensions including: perceived freedom to express opinions, comfort in admitting mistakes, freedom from fear of embarrassment, trust in facilitator non-judgmental stance, belief that errors are learning opportunities, perception of mutual respect among peers, confidence in confidentiality maintenance, comfort in seeking help, perceived fairness of the learning environment, and overall sense of emotional safety. Each item was rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), yielding a total possible score range of 20–100. Scores were categorised as: Low Psychological Safety (≤ 50), Moderate Psychological Safety (51–75), and High Psychological Safety (76–100). Reliability was established through (Cronbach's $\alpha = 0.88$) which was confirmed through the pilot study.

Description of the Structured Pre-briefing Intervention

The structured pre-briefing intervention was a 10–15 minute, standardised, facilitator-led session designed in alignment with the intervention was delivered by trained simulation instructors immediately before each simulation session and comprised five sequentially organised components:

Component 1 – Orientation to the Simulation Environment (2–3 minutes): Students were given a brief physical orientation to the simulation suite, including the location and function of equipment, manikin capabilities and limitations, monitoring systems, and available clinical supplies. This component addressed the logistical unfamiliarity that contributes to initial anxiety.

Component 2 – Articulation of Learning Objectives and Expectations (2–3 minutes): The facilitator clearly communicated the specific learning objectives for the simulation session, the expected learning outcomes, and the scope of clinical activities to be performed. This transparency was designed to reduce uncertainty and provide cognitive scaffolding for the subsequent experience.

Component 3 – Clarification of Roles and Responsibilities (2 minutes): Learner roles within the simulation scenario (primary nurse, secondary nurse, observer, documentor) were explicitly assigned and explained. Role clarity has been identified as a key determinant of learner comfort and active participation in simulation (Watts et al., 2021).

Component 4 – Establishment of the Fiction Contract and Psychological Safety Norms (2–3 minutes): The facilitator explicitly communicated: (a) the fiction contract—acknowledging that the simulation is not real but committing to engage with it as though it were; (b) the learning-over-evaluation principle—emphasising that the purpose was learning, not performance assessment, and that no grades or evaluations were attached to the experience; (c) the confidentiality agreement—establishing that what happens in the simulation room stays in the simulation room; (d) norms of mutual respect—requesting that all participants treat one another with respect, refrain from judgmental comments, and support each other's learning; and (e) the normalisation of error—explicitly stating that mistakes are expected, welcomed, and constitute valuable learning opportunities.

Component 5 – Invitation for Questions and Emotional Check-in (1–2 minutes): The concluding component provided an open forum for learners to ask questions, express concerns, or seek clarification. The facilitator modelled approachability and non-judgment, setting the affective tone for the simulation encounter.

The standardisation of the pre-briefing protocol was ensured through a structured facilitator guide and a pre-briefing checklist developed by the research team. All simulation instructors delivering the pre-briefing underwent a 30-minute standardisation training session to ensure fidelity of implementation.

Data Collection Procedure

The study was conducted during scheduled simulation sessions across the academic term. The data collection followed a standardised sequence: (a) administration of the Learner Confidence Scale and Psychological Safety Scale as pre-assessment measures immediately before the pre-briefing (approximately 10 minutes); (b) delivery of the structured pre-briefing intervention (10–15 minutes); (c) conduct of the scheduled simulation session; and (d) administration of the same instruments as post-assessment measures immediately following the simulation session to capture the combined effect of the pre-briefing in establishing the conditions under which the simulation experience unfolded. It is important to note that the post-assessment captured the cumulative effect of the structured pre-briefing on how students experienced the entire simulation encounter—reflecting the theoretical proposition that pre-briefing establishes the psychological foundation upon which the simulation learning experience is built (Rudolph et al., 2014).

Ethical Considerations

Informed written consent was obtained from all participants following explanation of the study's purpose, procedures, voluntary nature, and right to withdraw without penalty. Participant anonymity was maintained through coded data entry, and all data were stored securely with access restricted to the research team.

Statistical Analysis

Data were analysed using descriptive and inferential statistics. Descriptive statistics (frequency, percentage, mean, standard deviation) characterised the sample and summarised outcome scores. Paired (dependent samples) t-tests compared pre- and post-assessment mean scores for both outcome variables. The 95% confidence intervals for mean differences were calculated. The level of significance was set a priori at $\alpha = 0.05$.

RESULTS

Section I: Sociodemographic Profile of Participants

Table 1. *Frequency and Percentage Distribution of Sociodemographic Variables (N = 178)*

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	60	33.71
	Female	118	66.29
Age (years)	17	3	1.69
	18	97	54.49
	19	57	32.02
	20	17	9.55
	21–22	4	2.25
Type of Family	Nuclear	146	82.02
	Joint	32	17.98
Place of Residence	Urban	102	57.30
	Rural	76	42.70
Prior Simulation Experience	None	178	100.00

The demographic profile reveals a predominantly female cohort (66.29%), with a modal age of 18 years (54.49%). The majority belonged to nuclear families (82.02%) and urban backgrounds (57.30%). Critically, none of the participants (100%) had any prior

experience with simulation-based education, confirming that the entire cohort was simulation-naïve—a characteristic that heightens the relevance of pre-briefing as a preparatory strategy and enhances the internal validity of the pre-post comparison.

Section II: Learner Confidence – Pre- and Post-Assessment

Table 2. *Comparison of Pre-Assessment and Post-Assessment Distribution of Learner Confidence Levels (N = 178)*

Confidence Category	Pre n (%)	Post n (%)	Absolute Change	Direction
Low Confidence	96 (53.9)	18 (10.1)	**−43.8%**	Decrease
Moderate Confidence	62 (34.8)	54 (30.3)	−4.5%	Decrease
High Confidence	20 (11.2)	106 (59.6)	**+48.4%**	Increase

Note. Low Confidence: ≤20; Moderate Confidence: 21–30; High Confidence: 31–40 (maximum score = 40).

Pre-assessment findings revealed that over half of the participants (53.9%) exhibited low confidence, with only 11.2% demonstrating high confidence before the intervention. Following structured pre-briefing and subsequent simulation participation, a dramatic redistribution occurred: the proportion with high confidence surged from 11.2% to 59.6% (+48.4 percentage points), while low confidence plummeted from 53.9% to 10.1% (−43.8 percentage points). This shift represents a near-complete inversion of the confidence distribution, indicating the transformative impact of structured pre-briefing on learner readiness.

Section III: Psychological Safety – Pre- and Post-Assessment

Table 3. *Comparison of Pre-Assessment and Post-Assessment Distribution of Psychological Safety Levels (N = 178)*

Psychological Safety Category	Pre n (%)	Post n (%)	Absolute Change	Direction
Low	88 (49.4)	14 (7.9)	**−41.5%**	Decrease
Moderate	64 (36.0)	48 (27.0)	−9.0%	Decrease
High	26 (14.6)	116 (65.1)	**+50.5%**	Increase

Note. Low: ≤50; Moderate: 51–75; High: 76–100 (maximum score = 100).

The psychological safety assessment revealed an equally striking pattern. Nearly half of the participants (49.4%) perceived low psychological safety before the intervention, with only 14.6% reporting high psychological safety. Post-assessment demonstrated a remarkable transformation: high psychological safety increased from 14.6% to 65.1% (+50.5 percentage points), while low psychological safety decreased from 49.4% to 7.9% (−41.5 percentage points). The magnitude of this shift indicates that structured pre-briefing effectively established the conditions of trust, respect, and emotional safety that Edmondson (1999) identified as essential for productive learning in group settings.

Visual Representation of Outcome Distribution Shifts

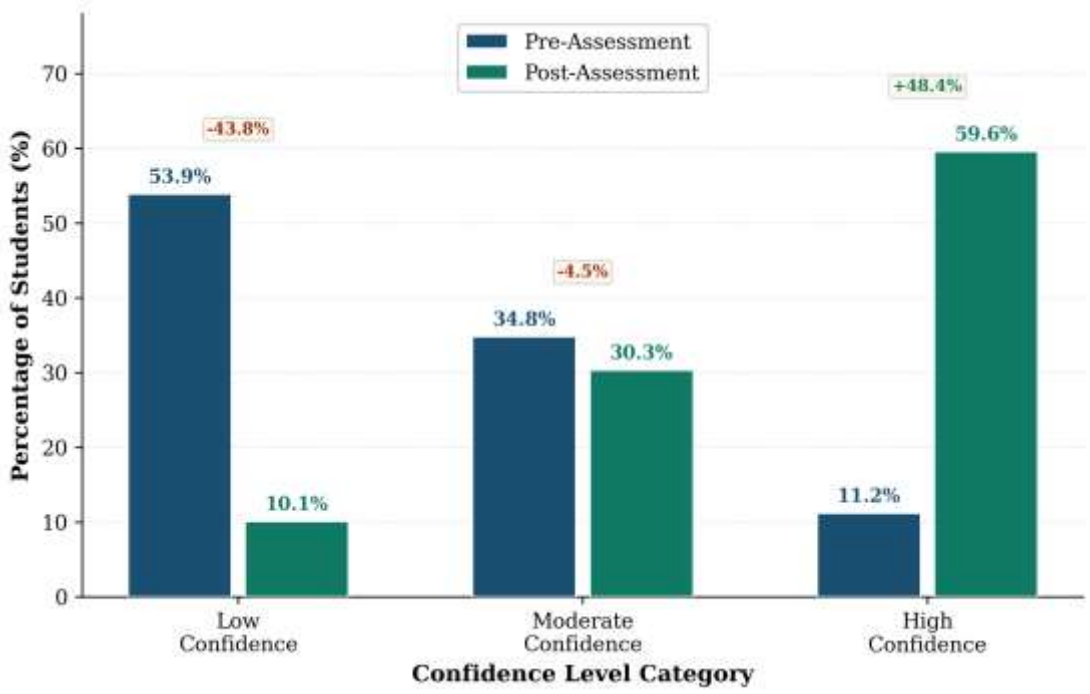

Figure 1. Grouped bar chart comparing pre- and post-assessment learner confidence levels with absolute percentage point change annotations (N = 178).

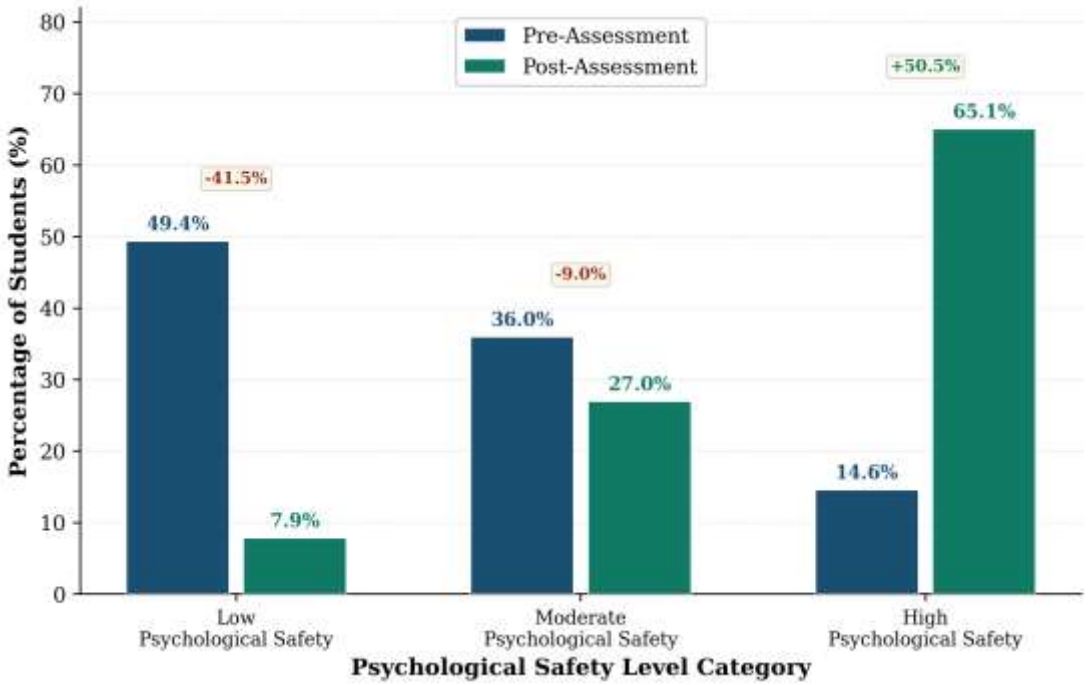

Figure 2. Grouped bar chart comparing pre- and post-assessment psychological safety levels with absolute percentage point change annotations (N = 178).

Section IV: Inferential Analysis – Effectiveness of Structured Pre-briefing

Table 4. Paired t-Test Comparison of Pre- and Post-Assessment Scores for Learner Confidence and Psychological Safety with Effect Size (N = 178)

Outcome	Max Score	Pre-Assessment Mean ± SD	Post-Assessment Mean ± SD	Mean Diff.	df	t-value	p-value	95% CI	Cohen's d
Learner Confidence	40	25.10 ± 6.60	33.20 ± 5.10	**8.10**	177	**12.56*** **	**<0.001**	[6.84, 9.36]	**1.37**
Psychological Safety	100	73.50 ± 14.80	85.20 ± 12.10	**11.70**	177	**8.20*** **	**<0.001**	[8.90, 14.50]	**0.87**

Note. SD = Standard Deviation; df = Degrees of Freedom; CI = Confidence Interval; ***p < 0.001. Cohen's d benchmarks: small (0.2), medium (0.5), large (0.8), very large (>1.0). Pooled SD: Confidence = 5.90; Psychological Safety = 13.52.

The paired t-test analysis (Table 4) yielded compelling evidence for the effectiveness of the structured pre-briefing intervention across both outcome variables. Learner confidence scores demonstrated a highly significant mean improvement of 8.10 points (from 25.10 ± 6.60 to 33.20 ± 5.10; t = 12.56, df = 177, p < 0.001; 95% CI: 6.84–9.36). The Cohen's d of 1.37 represents a very large effect, indicating that the average participant's post-assessment confidence score exceeded their pre-assessment score by 1.37 pooled standard deviations—an educationally transformative magnitude of change.

Psychological safety scores similarly demonstrated a highly significant improvement of 11.70 points (from 73.50 ± 14.80 to 85.20 ± 12.10; t = 8.20, df = 177, p < 0.001; 95% CI: 8.90–14.50). The Cohen's d of 0.87 constitutes a large effect, exceeding the conventional threshold (d = 0.80) and confirming substantive practical significance. The narrow confidence intervals for both mean differences indicate high precision of the estimated treatment effects.

An important differential finding warrants attention: the effect size for learner confidence (d = 1.37) substantially exceeded that for psychological safety (d = 0.87). This differential may reflect the fact that confidence is a more immediately responsive construct—amenable to rapid modulation through explicit reassurance, role clarity, and uncertainty reduction—whereas

psychological safety, as a deeper relational and trust-based construct, may require more sustained interpersonal experience to fully develop. Nevertheless, the large effect size for psychological safety confirms that even a brief structured pre-briefing meaningfully shifts learners' perceptions of the emotional climate of the learning environment.

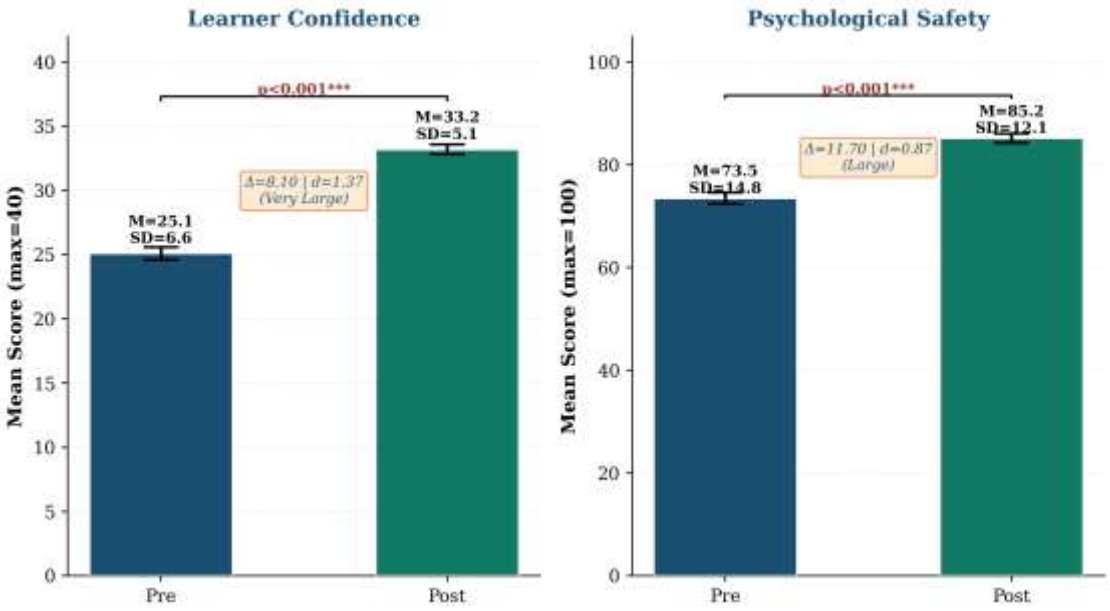

Figure 3. Dual panel comparison of pre- and post-assessment mean scores with standard error bars, significance brackets, and effect size annotations for learner confidence (left) and psychological safety (right).

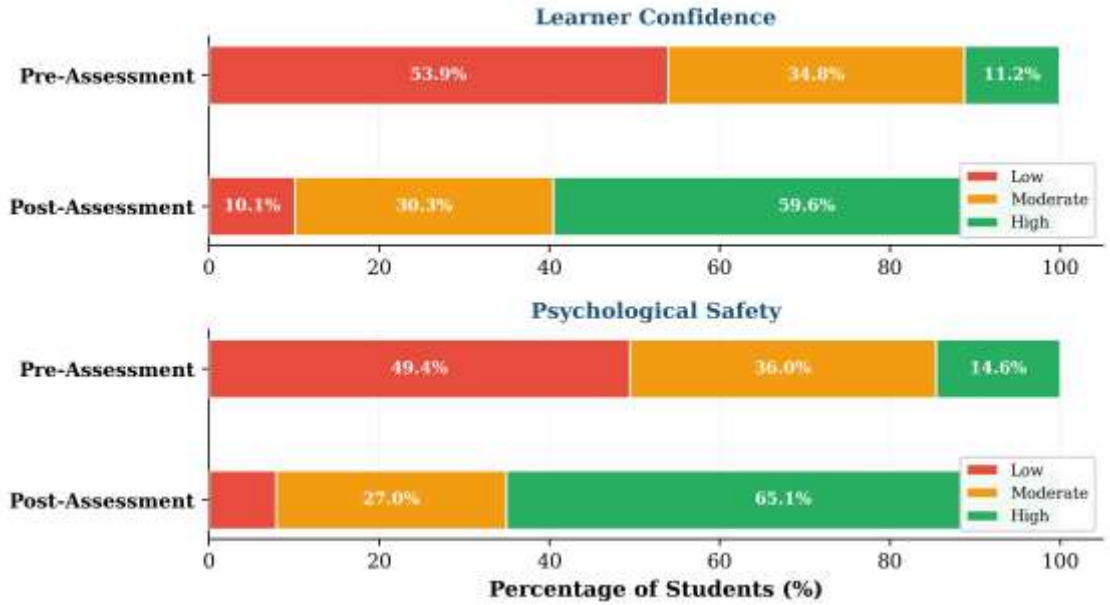

Figure 4. Stacked horizontal bar charts depicting proportional distribution shifts in learner confidence (top panel) and psychological safety (bottom panel) before and after structured pre-briefing.

DISCUSSION

The present study provides robust empirical evidence that structured pre-briefing significantly enhances both learner confidence and psychological safety in simulation-based nursing education. The convergence of highly significant paired t-tests, dramatic categorical redistribution, and large-to-very-large effect sizes collectively constitute a compelling case for the educational value of this brief yet impactful intervention. The following discussion interprets these findings through theoretical, empirical, and practical lenses.

The findings of the present study are strongly supported by existing evidence on structured pre-briefing in simulation-based education. **Rudolph, Raemer, and Simon (2014)** demonstrated that the use of a structured pre-simulation briefing establishing a "safe container" led to improved learner engagement and reduced performance anxiety, as learners felt more secure to participate and make mistakes; this aligns with the present study's finding of a substantial increase in psychological safety (14.6% to 65.1%) and significant mean score improvement ($t = 8.20$, $p < 0.001$). Similarly, **Page-Cutrara (2014, 2015)** reported that students who received structured pre-briefing showed reduced anxiety levels and improved preparedness, with enhanced participation during simulation sessions; this supports the marked rise in learner confidence observed in the current study (mean difference = 8.10; $d = 1.37$). **Chamberlain (2015)**, through concept analysis, identified that explicit communication of confidentiality, respect, and non-evaluative learning during pre-briefing fosters a psychologically safe environment, which is reflected in the drastic reduction in low psychological safety from 49.4% to 7.9% in this study. Furthermore, **Kim, Park, and Shin (2016)**, in a meta-analysis of simulation-based nursing education, reported an overall effect size of 0.94 for learning outcomes, whereas the present study demonstrated an even higher effect size for confidence, indicating that structured pre-briefing alone can produce substantial educational gains. The theoretical basis of these findings is supported by **Edmondson (1999)**, who found that higher psychological safety is associated with increased learning behaviours such as speaking up and error reporting, and by **Bandura (1977)**, whose self-efficacy theory explains that verbal reassurance and clarity of expectations significantly enhance confidence—consistent with the rapid improvement seen post pre-briefing. Additionally, **Turner and Harder (2018)** noted that psychological safety develops through ongoing interpersonal interactions, which may explain why, although significantly improved ($d = 0.87$), its effect size was lower than that of confidence in the present study. Overall, these converging findings confirm that structured pre-briefing is an effective intervention that significantly improves both learner confidence and psychological safety, thereby enhancing the overall simulation learning experience.

The magnitude of the observed effects is noteworthy when compared to published benchmarks. Cant and Cooper (2017) reported large effects for simulation-based nursing education interventions broadly, while Kim et al. (2016) documented a weighted mean d of 0.94 for knowledge outcomes.

The Differential Effect: Confidence Versus Psychological Safety

The differential effect sizes ($d = 1.37$ for confidence vs. $d = 0.87$ for psychological safety) merit specific discussion. This pattern is theoretically coherent and practically informative. Learner confidence, as a primarily intrapersonal construct reflecting self-perceived capability, is amenable to relatively rapid modulation through strategies that reduce uncertainty (objective clarity), enhance familiarity (environment orientation), and provide reassurance (learning-over-evaluation messaging). These are precisely the strategies embedded in the structured pre-briefing protocol.

Psychological safety, by contrast, is a fundamentally interpersonal and relational construct (Edmondson, 1999)—it depends not only on what the facilitator says during pre-briefing but on the subsequent behaviour of peers, the facilitator's actual conduct during simulation, and the collective enactment of the norms established during pre-briefing. The large ($d = 0.87$) but somewhat lower effect size for psychological safety may reflect this relational complexity: while pre-briefing effectively initiates the process of psychological safety establishment, full realisation of this construct may require the ongoing demonstration of its principles throughout the simulation and debriefing process. This interpretation suggests that pre-briefing is a necessary but potentially insufficient condition for maximal psychological safety—a finding with direct implications for facilitator training and behaviour during simulation.

The Pre-briefing–Debriefing Quality Nexus

An important implication of these findings extends beyond pre-briefing itself to its downstream effects on debriefing quality. Debriefing is widely recognised as the most educationally valuable phase of the simulation cycle (Dreifuerst, 2012). However, the quality and depth of debriefing depends critically on learners' willingness to openly discuss their clinical reasoning, acknowledge mistakes, and reflect on performance—all of which require psychological safety. By establishing this psychological safety before the simulation even begins, structured pre-briefing may create a cascade of educational benefits that extend through the entire simulation cycle. Learners who feel psychologically safe during simulation are more likely to take clinical risks, attempt procedures, and make visible decisions—generating richer material for debriefing. They are then more likely to engage in open,

honest, and reflective debriefing discussions—maximising the learning value of the experience. The structured pre-briefing thus serves as the foundational domino in a chain of educational quality.

Implications for Nursing Education and Simulation Practice

The findings carry several actionable implications. First, the demonstrated large-to-very-large effect sizes provide empirical justification for mandating structured pre-briefing as a non-negotiable component of every simulation session—consistent with INACSL Standards (2021) but not yet universally practised. Second, the brief duration of the intervention (10–15 minutes) eliminates the practical barrier of time constraints that simulation centres frequently cite when omitting or abbreviating pre-briefing. Third, the standardised protocol and facilitator checklist developed for this study offer a directly transferable implementation template for other simulation centres. Fourth, the findings align with and provide evidence-based support for the Indian Nursing Council's (2021) competency-based education directive, informing the process design of simulation programmes being established across Indian nursing institutions. Fifth, the differential effects suggest that facilitator development programmes should emphasise sustained psychological safety maintenance throughout the simulation cycle, not merely during pre-briefing.

LIMITATIONS

Several methodological limitations should be acknowledged. First, the pre-experimental one-group design without a randomised control group precludes definitive causal attribution; observed improvements may be partially attributable to the testing effect, Hawthorne effect, maturation, or the simulation experience itself. Disentangling the specific contribution of pre-briefing from the overall simulation experience would require a randomised design comparing structured pre-briefing with a minimal or no pre-briefing control condition. Second, the total enumeration sampling from a single institution limits generalisability to other populations and settings. Third, both outcome measures were self-reported, introducing potential social desirability and response bias. Fourth, the study did not assess the durability of effects—whether the enhanced confidence and psychological safety are maintained over subsequent simulation sessions or require repeated pre-briefing remains unknown. Fifth, the study did not evaluate facilitator fidelity to the pre-briefing protocol through independent observation, relying instead on the facilitator checklist as a process measure. Sixth, while the post-assessment captured the combined effect of pre-briefing and the simulation experience, a post-pre-briefing/pre-simulation measurement point would have permitted isolation of the pre-briefing effect from the simulation effect. Finally, the study did not assess downstream educational outcomes such as debriefing quality, clinical skill performance, or knowledge acquisition, which would strengthen the argument for pre-briefing's educational value through an outcome chain analysis.

CONCLUSION

This study provides robust and multi-layered evidence that structured pre-briefing—a brief (10–15 minute), theoretically grounded, and systematically delivered intervention—significantly enhances both learner confidence and psychological safety in simulation-based nursing education. The convergence of highly significant paired t-tests ($p < 0.001$), dramatic categorical redistributions (high confidence: 11.2% → 59.6%; high psychological safety: 14.6% → 65.1%), and large-to-very-large effect sizes (Cohen's $d = 1.37$ and 0.87) collectively demonstrate both statistical and substantive educational significance.

The findings validate Rudolph et al.'s Safe Container framework, confirm that structured pre-briefing effectively operationalises Edmondson's psychological safety construct in simulation settings, and provide empirical evidence that this brief intervention yields educational effects comparable in magnitude to multi-hour simulation interventions. Given its minimal time requirement, ease of standardisation, and large demonstrated effects, structured pre-briefing should be adopted as a mandatory, non-negotiable component of every simulation session across nursing education programmes—a recommendation consistent with INACSL Standards and the INC's competency-based education framework.

RECOMMENDATIONS

1. Randomised controlled trials comparing structured pre-briefing with minimal/no pre-briefing conditions are needed to establish causal evidence and isolate the pre-briefing effect.

2. Multi-centre studies across diverse institutional and cultural contexts should be conducted to establish generalisability, particularly across varied Indian nursing education settings.

3. Longitudinal studies should assess whether repeated structured pre-briefing produces cumulative effects on confidence and psychological safety across sequential simulation exposures.

4. Future research should incorporate objective behavioural measures of psychological safety (e.g., verbal participation frequency, question-asking behaviour, error disclosure during debriefing) alongside self-report instruments.

5. Mediational analyses exploring the pre-briefing → psychological safety → debriefing quality → learning outcome pathway should be conducted to establish the mechanism chain.

6. Qualitative studies exploring learner perceptions and experiences of structured pre-briefing would provide rich contextual data to complement quantitative findings.

7. All simulation centres should adopt a standardised pre-briefing protocol with facilitator checklists and undergo periodic fidelity assessment to ensure implementation quality.

DECLARATIONS

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