Comparison Study Between Peer-to-Peer Debriefing and Self-Debriefing Post Virtual Serious Games Among Novice Internationally Educated Nurses and Students

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Abstract

This pilot study explored the efficacy of peer-to-peer debriefing and self-debriefing following Virtual Serious Games (VSGs) on end-of-life care among internationally educated nursing (IEN) students and novice IENs. An experimental pretest-post-test design with random assignment compared the impact of both debriefing methods on self-confidence and satisfaction in learning. With a sample size of 20 participants (n=10 per group), results indicated no statistically significant differences between the two groups, suggesting that both debriefing strategies may offer comparable benefits. Despite the limited sample size, notable effect sizes were observed (d = 0.843, 1.064, 0.791, and 0.614), suggesting potential meaningful differences. This preliminary study highlights the potential for optimizing debriefing approaches, tailoring engagement techniques, feedback mechanisms, and learner support to enhance self-confidence, knowledge retention, and motivation in learning. Future research should explore long-term competency development, best practices for debriefing implementation, and their efficacy in academic and clinical settings with larger, more diverse samples.

Keywords: Internationally educated nurses, virtual serious games, peer-to-peer debriefing, self-debriefing, end-of-life care, self-confidence, learner satisfaction, nursing education

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List of Abbreviations

ALT	Adult Learning Theory
CINAHL	Cumulative Index to Nursing and Allied Health Literature
DASH-SV	Debriefing Assessment for Simulation in Healthcare-Student Version
IEN	Internationally Educated Nurse
INACSL	International Nursing Association of Clinical Simulation and Learning
MEDLINE	Medical Literature Analysis and Retrieval System Online
SCT	Social Cognitive Theory
SDT	Self-Determination Theory
VSG	Virtual Serious Game
WHO	World Health Organization

Chapter One

Introduction

Peer-to-Peer Debriefing Versus Self-Debriefing in Virtual Serious Games

Simulation in healthcare education creates realistic clinical scenarios where learners can safely practice skills without patient risk (Elendu et al., 2024). Virtual serious games (VSG) represent an innovative simulation approach that combines gaming technology with educational objectives to create immersive, interactive learning experiences that can be accessed remotely (Verkuyl et al., 2017). Debriefing involves active reflection that promotes effective retention of knowledge and skills, which elevates understanding and performance in learners (Rudolph, Simon, Raemer, & Eppich, 2008). Simulation plays a vital role in healthcare education; however, the quality of debriefing determines the effectiveness of simulation education (Baliga et al., 2023). Ineffective debriefing can adversely affect learners such as, missed learning opportunities, reinforcement of errors, decreased confidence (Yun & Kang, 2022). VSGs have been identified as a beneficial tool in simulation education, but there is limited research on best practices in debriefing methods to be used post-VSG (Verkuyl et al., 2019). The efficacy of various debriefing methods, like peer debriefing, and self-debriefing, is a topic of interest in various fields, including healthcare education (Kim & De Gagne, 2018; Oikawa et al., 2016).

Background and Problem Statement

Effective Debriefing

Debriefing is recognized as a critical component of simulation education, representing a pivotal stage at which the bulk of learning occurs (Duff et al., 2024). In healthcare education, students have expressed mixed preferences regarding debriefing methods that reveal research gaps. Several investigations have indicated that students perceived instructor-led debriefing as

more effective in identifying errors pertaining to clinical judgment in nursing practice, pinpointing deficiencies in psychomotor skills, and enhancing engagement, comprehension, and satisfaction with the debriefing quality when compared to peer-led debriefing. (Arabi & Kennedy, 2022, Duff et al., 2024; Roh, Kelly, & Ha, 2016). Instructor-led debriefing has been favored by students in healthcare education for certain aspects, such as promoting analytic skills like reasoning, understanding concepts, critical thinking, and transfer of learning (Arabi & Kennedy, 2022). However, some students value the opportunity for self-reflection and receiving feedback from peers (Arabi & Kennedy, 2022). Another proportion of students felt comfortable receiving feedback from peers and reported a preference for a combination of self-debriefing and group debriefing (Arabi & Kennedy, 2022). The efficacy of peer debriefing versus self-debriefing may depend on the specific context and goals of the debriefing process. It is important to note that the efficacy of peer-led debriefing may depend on the learners' ability to reflect on their experiences (Makkink & Dreyer, 2021).

A combination of self-debriefing and group debriefing was found to improve clinical reasoning through reflection (Verkuyl, 2020). Although simulations such as VSGs have demonstrated greater potential in nursing education (Wong et al., 2022), the most efficient debriefing method to maximize learning outcomes remains unclear. Effective debriefing strategies are essential for simulation-based nursing education. Debriefing fosters self-reflection, knowledge retention, and emotional processing, all of which contribute to improved self-confidence and learning satisfaction (Fey & Jenkins, 2015). While peer-to-peer debriefing allows for collaborative learning and shared experiences, it may present challenges for IENs because of cultural and language barriers that impact open discussion and participation (San Miguel & Rogan, 2015). Conversely, self-debriefing promotes independent reflection but may lack the

social reinforcement needed to build confidence in emotionally sensitive care settings (Sanko, 2017).

Self-Confidence and Satisfaction With Debriefing

The efficacy of debriefing strategies in nursing education is a critical area of research, particularly in preparing students to manage complex and emotionally demanding situations such as end-of-life care. End-of-life care is a holistic approach to providing compassionate care for patients with terminal illnesses, focusing on comfort and quality of life in their final stages (Abbaspour & Heydari, 2021). Among IENs, developing self-confidence in palliative care and achieving satisfaction with the learning process are essential for professional competence and successful integration into clinical practice. Palliative care is a specialized medical approach that provides relief from pain and stress for patients with serious illnesses (Radbruch et al., 2020). Self-confidence is a fundamental component of nursing competence because it directly influences decision-making, patient communication, and the ability to manage ethical dilemmas in clinical practice (Bultas, Hassler, Ercole, & Rea, 2014).

In the context of end-of-life care, nurses must navigate sensitive interactions with patients and families, address psychological distress, and provide symptom management—all of which require a strong sense of confidence (Phillips & Jimenez, 2016). Previous research has indicated that simulation-based education can significantly enhance self-confidence by allowing learners to practice in a safe and controlled environment (Cant & Cooper, 2017). However, the role of debriefing in reinforcing this confidence remains underexplored, particularly in diverse learner populations such as IENs. Since IENs often face cultural and language barriers that can impact their confidence levels, understanding how different debriefing methods influence self-efficacy in EOL care is essential (San Miguel & Rogan, 2015).

In addition to self-confidence, satisfaction with debriefing is a key determinant of the overall efficacy of simulation-based education. Debriefing has been recognized as a vital tool for fostering critical thinking, self-reflection, and professional growth (Dreifuerst, 2012). The effectiveness of debriefing is often influenced by its structure and facilitation method—while some studies suggest that instructor-led debriefing is the most effective, others highlight the benefits of self-guided reflection and peer-led discussions (Tutticci, Coyer, Lewis, & Ryan, 2018). Peer-to-peer debriefing encourages collaborative learning, enhances communication skills, and promotes social reinforcement, which can be particularly beneficial for IENs adapting to new professional norms (Fey & Jenkins, 2015). On the contrary, self-debriefing fosters independent learning but may lack the emotional and cognitive validation provided by group discussions, potentially impacting satisfaction and knowledge retention (Sanko, 2017). Despite extensive research on debriefing methodologies in nursing education, an important research gap remains regarding comparing the efficacy of peer-to-peer versus self-debriefing approaches.

Purpose

The purpose of this research proposal is to compare the effectiveness of peer-to-peer debriefing versus self-debriefing approaches following VSG on end-of-life care. Specifically, this study will examine how these debriefing methods impact self-confidence and debriefing satisfaction outcomes among novice IENs who have held nursing licensure in Canada for less than 1 year and IENs who are pursuing education in Canada but do not yet have nursing licensure. This study intends to contribute to the growing body of literature and evidence on efficacious debriefing methods in simulation-based nursing education. The existing literature presents mixed findings: while some studies advocate for structured, instructor-led debriefing as

the gold standard, others argue that peer-led and self-led approaches may offer unique advantages, particularly for diverse learner populations (Dreifuerst, 2012; Tutticci et al., 2018).

The lack of direct, systematic comparisons between these debriefing strategies underscores the need for this study, which aims to provide empirical evidence on their impact on self-confidence and satisfaction among IENs. Given the increasing reliance on virtual simulation in nursing education, particularly in the wake of technological advancements and global healthcare workforce mobility, the findings of this study will contribute to the development of evidence-based debriefing models tailored to the needs of nursing students. By investigating the relationship between the debriefing methods, self-confidence, and satisfaction, this study can inform best practices in nursing education, ultimately enhancing learning outcomes, improving end-of-life care preparedness, and supporting IENs in their transition into the healthcare workforce.

Research Question

How do peer-to-peer debriefing and self-debriefing compare in their efficacy to improve self-confidence and satisfaction in learning about end-of-life patient care among novice IENs who have held nursing licensure in Canada for less than a year and IENs who are pursuing education in Canada but do not yet have nursing licensure, after a VSG of end-of-life care?

Chapter Two

Literature Review

Search Strategy

A literature review was conducted using the following electronic databases: namely Medical Literature Analysis and Retrieval System Online (MEDLINE) Ovid, Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, Google Scholar, and ScienceDirect. The searches also included government websites and other websites for general information and statistics. A librarian assisted in formulating the search strategy (Appendix A). There were no date or country of publication restrictions to broaden the scope of the review, aiming to thoroughly explore nursing students' experiences and perspectives about debriefing strategies. In addition, the references from the selected articles were reviewed. The keywords used in the search strategy were 'nursing', 'students' 'education', 'school', 'program', 'curriculum', 'virtual serious game', 'applied games', 'educational games', 'high-fidelity', 'infotainment', 'digital learning game', 'online learning game', 'artificial learning game', 'gamification', 'interactive learning', 'virtual serious learning', 'simulation applied learning', 'internet', 'virtual reality', 'avatar', 'immersive learning', 'debriefing', 'review', 'discussion', 'synthesis', 'reflection', 'perception', 'IENs', 'internationally educated nursing students', 'self-debriefing', 'group debriefing', 'peer debriefing', 'learning outcome', and 'educational outcome', as single search terms, with modifications, in combination using MeSH terms and Boolean operators applied according to each database. Additionally, a hand-search method was employed to capture any potentially overlooked relevant articles. The selection criteria for articles were peer-reviewed, research studies without restrictions on the design, and publication in English. An extensive keyword selection strategy was used to capture the multifaceted nature

of simulation-based education. Any potential limitations that could arise due to this broad approach, were mitigated by employing a subsequent screening process to select directly relevant studies.

Debriefing

"Debriefing is a vital part of simulation-based education and is defined as a structured, collaborative, and reflective process within the simulation learning activity" (Kuszajewski, 2021, p. 442). Debriefing is a feedback format that enables the process of learning by engaging in active reflection after participating in experiential learning (Oikawa et al., 2016). Debriefing aids in identifying and minimizing the gap between theory and practice in learners (Kuszajewski, 2021). Debriefing allows the active participation of learners (Kim & De Gagne, 2018). An effective debriefing process should cultivate a supportive atmosphere in which students feel comfortable sharing their experiences openly and honestly (Fanning & Gaba, 2007). Some of the perceived threats identified by participants in the debriefing environment were stress, a sense of intimidation, and apprehension about being judged by their instructors and peers (Fanning & Gaba, 2007).

Peer-to-Peer Debriefing

Peer-to-peer debriefing is a reflective learning process in which learners engage in structured discussions with their peers to analyze experiences, identify key takeaways, and enhance knowledge retention without direct instructor facilitation (Cheng et al., 2020).
This collaborative approach allows participants to share insights, provide feedback, and critically evaluate their performance in a supportive environment that often feels less intimidating than instructor-led sessions. Peer-to-peer debriefing involves receiving feedback and reflection from peers. In peer-to-peer debriefing post-simulation, peers provide feedback on participant

performance through objective assessment and subjective reflection (Janesick, 2007; Li, Liu, and Zhou, 2012).

This approach fosters collaborative learning, allowing participants to share insights, provide feedback, and critically evaluate their performance in a supportive environment (Sawyer et al., 2016). When structured with guiding questions or frameworks, peer-led debriefing can be an effective alternative to instructor-led debriefing, ensuring meaningful discussion and reflection (Raemer et al., 2018). By promoting autonomy and active engagement, peer-to-peer debriefing enhances learners' self-efficacy and confidence in clinical decision-making (Gillet et al., 2021). While it has demonstrated benefits in healthcare education, its effectiveness depends on learners' communication skills, self-reflection abilities, and the structure of the debriefing session (Zhang, Lee, Chang, & Lee, 2021).

Self-Debriefing

Self-debriefing is a structured reflective process where learners independently analyze their own performance without external input from peers or instructors (Lapum et al., 2019). Self-debriefing involves reflecting on one's own experiences. Self-debriefing post-simulation allows the participant to analyze and evaluate their own performance through reflections, immediately following the simulation scenario, while the experience was still fresh in their minds (Lapum et al., 2019). Additionally, self-debriefing allows learners to engage in reflection without external influences from peers or instructors (MacKenna et al., 2021). This method also serves as a viable option when facilitated debriefing is impractical (MacKenna et al., 2021).

Effects of Self-Debriefing Overview

A quasi-experimental study noted that combining self-debriefing and instructor-led

debriefing enriched problem-solving skills in acute nursing care simulation scenarios and debriefing satisfaction (Kang & Yu, 2018). The researchers found statistically significant improvements in both the problem-solving process ($t=4.32$, $p < .001$) and debriefing satisfaction ($t=3.19$, $p=.002$) when compared with instructor-led debriefing alone, suggesting a synergistic effect when these methods are combined (Kang & Yu, 2018). A systematic review of seventy studies indicated that instructor-led debriefing may offer potential benefits over self-debriefing; however, it failed to yield consistent results regarding their relative effectiveness (Duff et al., 2024). This review assessed educational and clinical outcomes in health professions, focusing on interventions involving self-led or peer-led debriefing, as opposed to instructor-led debriefing (Duff et al., 2024). The findings of the review varied, with some studies showing no discernible difference between groups, while others suggested enhanced performance with instructor-led debriefing (Duff et al., 2024).

A prospective, controlled, educational cohort intervention study that compared the effectiveness of self-debriefing to instructor-led debriefing in relation to the self-performance and team performance of the learner, came up with statistically significant findings (Oikawa et al., 2016). Self-debriefing delivered higher scores in team-performance assessment when compared to instructor-led debriefing (Oikawa et al., 2016). The team-performance assessment score for self-debriefing was 14.1(SD +/- 2.1) and that of instructor-led debriefing was 12.8 (SD +/- 2.1), with a p-value = 0.001 (Oikawa et al., 2016). Self-performance assessment findings did not elicit any significant difference between self-debriefing or instructor-led debriefing (Oikawa et al., 2016). These findings put forward a promising pathway toward impending research that should be conducted to reveal the full potential of the self-debriefing method (Oikawa et al., 2016).

One of the quasi-experimental studies conducted using a pretest-post-test non-equivalent control group design, to compare student self-briefing to instructor debriefing in nursing simulation also highlighted the effectiveness of combining both these methods to achieve better results or outcomes (Kang & Yu, 2018). A systematic review conducted with a priori methodology revealed that self-debriefing and peer-led debriefing has been noted as cost-effective methods, which could be widely used in the place of instructor-led or video-facilitated instructor debriefing (Levett-Jones & Lapkin, 2014). Self-debriefing was found to be equally effective for developing nontechnical skills like situational awareness, teamwork, and decision-making when compared to instructor-facilitated debriefing (Levett-Jones & Lapkin, 2014). In addition, self-debriefing enabled learners to control the pace of debriefing and assess self-perceived weaknesses (Levett-Jones & Lapkin, 2014). This literature review revealed that there were several studies that focussed on the combined effect of self-debriefing and instructor-led debriefing, compared self-debriefing to instructor-led debriefing, and self-debriefing alone. However, there is a lack of research that directly compares the effects of self-debriefing to peer-to-peer debriefing.

The research landscape of self-debriefing presents nuanced and sometimes contradictory results. While numerous studies have examined self-debriefing alone or compared it with instructor-led approaches, there remains a significant gap in research directly comparing self-debriefing to peer-to-peer debriefing methods. While some studies have demonstrated comparable effectiveness to instructor-led debriefing, particularly in developing nontechnical skills such as situational awareness and decision-making, others have revealed significant variability across different contexts and learner populations (Grant et al., 2014; Sawyer et al., 2016; Zhang et al., 2021). The inconsistent findings suggest that self-debriefing success is not

uniform but context dependent. Key variables such as learners' self-reflection skills, prior experience, and specific learning environment appear to mediate the method's effectiveness and efficacy.

Effects of Peer Debriefing Overview

According to Boet et al., 2013; Disler et al., 2013, peer-led debriefing is a versatile cost-effective pedagogical tool that could be used in nursing education by enhancing peer engagement and reducing instructor involvement, especially in nursing schools with larger student cohorts (as cited in Kim & De Gagne, 2018). Differentiated from traditional instructor-led methods, student-to-student feedback provides expanded learning opportunities by facilitating the sharing of information and promoting good communication as indicated by a within-subjects quasi-experimental field study guided by a matched comparison sample and a narrative review, respectively (Donia, O'Neill, & Brutus, 2018; Herrmann-Werner et al., 2017).

In the studies by Donia et al. (2018) and Herrmann-Werner et al. (2017), good communication in student-to-student feedback encompassed clear information exchange, active listening, constructive feedback, and mutual respect. Donia et al. (2018) emphasized structured peer feedback within team settings, enabling students to refine teamwork skills through reflection and peer insights. Herrmann-Werner et al. (2017) highlighted peer-assisted learning, where students engaged in reciprocal teaching and learning, systematically enhancing communication skills. Collectively, both studies underscore that peer interactions foster open dialogue, promote understanding, and create a collaborative learning environment that strengthens communication competencies.

In the context of peer-led debriefing, students were actively communicating and sharing their experience comfortably without the fear of instructor interruption (Kim & De Gagne,

2018). Notably, peer-led debriefing provided a non-threatening or non-evaluative feedback environment that elevated self-confidence in learners and promoted a positive experience (Kim & De Gagne, 2018). The reduced instructor presence was perceived as an advantage, allowing students to feel more comfortable and confident in sharing their experiences (Kim & De Gagne, 2018). According to Kim and De Gagne (2018), students felt more confident in sharing their personal reflections, emotions, and clinical decision-making experiences during peer-led debriefing sessions. By removing the hierarchical instructor-student dynamic, students perceived a lower risk of judgment, allowing them to openly discuss their thought processes, mistakes, and uncertainties (Kim & De Gagne, 2018). This reduced fear of judgment allowed for more open and honest dialogue (Kim & De Gagne, 2018). This paradigm shift enabled deeper self-reflection and peer learning, fostering a supportive learning environment where students could critically analyze their performance and gain insights from one another (Kim & De Gagne, 2018).

A quasi-experimental study revealed that combining peer debriefing and instructor-led debriefing enhanced debriefing assessment and debriefing satisfaction among nursing students (Rueda-Medina et al., 2021). This suggests there may be benefits to a hybrid approach. The mean scores for debriefing satisfaction among the groups were found to be ($M = 8.37$, $SD = 2.24$) in instructor-led debriefing ($M = 8.40$, $SD = 1.74$) in peer debriefing, and ($M = 9.25$, $SD = 1.09$) in combined instructor-led and peer debriefing, with a statistically significant p-value of 0.013 (Rueda-Medina et al., 2021). The mean scores for debriefing assessment among the groups were found to be ($M = 127.49$, $SD = 21.95$) in instructor-led debriefing, ($M = 136.82$, $SD = 21.53$) in peer debriefing, and ($M=138.88$, $SD = 16.26$) in combined instructor-led and peer debriefing, with a statistically significant p-value of 0.002 (Rueda-Medina et al., 2021).

A non-equivalent control group, pre-post design study conducted in a simulation setting identified a statistically significant difference in the outcome of instructor-led debriefing compared to peer-led debriefing (Kim & De Gagne, 2018). The educational outcomes assessed in the study were nursing skills, knowledge, self-confidence, and quality of debriefing amongst instructor-led debriefing and peer-led debriefing (Kim & De Gagne, 2018). Although instructor-led debriefing emerged with significant findings, peer-led debriefing also elicited positive results such as active learner engagement and a comfortable experience (Kim & De Gagne, 2018). The outcomes related to knowledge and self-confidence remained the same in both instructor-led and peer-led debriefing (Kim & De Gagne, 2018). There were also findings, which highlighted that improvement in nursing clinical skills for preoperative care and the quality of debriefing in instructor-led debriefing were superior to peer-led debriefing (Kim & De Gagne, 2018).

The statistical evidence for nursing skills related to preoperative care was p-value <0.001 and that of quality of debriefing was p-value <0.001 (Kim & De Gagne, 2018). There was no statistically significant difference in knowledge (p-value = 0.445) and self-confidence (p-value = 0.686) between the two groups, which highlighted that peer-led debriefing can be effectively used to improve knowledge and self-confidence in learners post simulation (Kim & De Gagne, 2018). A pre-knowledge and post-knowledge test, along with a pre-confidence and post-confidence scale with Likert ratings, were the instruments utilized to obtain data (Kim & De Gagne, 2018). Scores pertaining to knowledge displayed improvement from pre-test to post-test in both groups as follows: the instructor-led group's scores increased from (M = 6.19, SD = 1.09) to (M = 6.62, SD = 0.94), and the peer-led group's scores increased from (M = 6.52, SD = 1.29) to (M = 6.74, SD = 1.18) (Kim & De Gagne, 2018). The scores reflecting self-confidence similarly rose from pre-test to post-test in both groups. Specifically, the instructor-led group

observed an increase from (M = 8.62, SD = 0.99) to (M = 9.40, SD = 0.68), while the peer-led group observed an increase from (M = 8.47, SD = 1.22) to (M = 9.34, SD = 0.93) (Kim & De Gagne, 2018). Thus, this justifies the necessity of future research to explore the effective use of peer-led debriefing in depth (Kim & De Gagne, 2018).

Another non-equivalent control group, the pretest–posttest design study favored instructor-led debriefing when compared to peer-led debriefing (Roh et al., 2016). The outcomes measured in this comparison study were psychomotor skills, satisfaction, and quality of debriefing in nursing students and were found to be noticeably better in instructor-led debriefing (Roh et al., 2016). The mean satisfaction score with the simulation experience among participants in the instructor-led group (M=4.56, SD = 0.39) was notably higher compared to those in the peer-led group (M= 4.24, SD = 0.54) as indicated by the statistics ($t = 2.698$, $p = 0.009$) (Roh et al., 2016). Additionally, within the satisfaction with Simulation Experience Scale, the average score for the "debrief and reflection" factor was significantly greater in the instructor-led group than in the peer-led group ($t = 3.403$, $p = 0.001$) (Roh et al., 2016). Furthermore, there existed a discernible distinction in students' perceptions of debriefing quality as measured by the Debriefing Assessment for Simulation in Healthcare-Student Version (DASH-SV), with the instructor-led debriefing receiving higher mean scores than the peer-led debriefing, a difference that was statistically significant ($t = 4.068$, $p < 0.001$).

On the contrary, an experimental comparison study performed using a convenience sample of 177 nursing students reported that the students in instructor-led debriefing reported lower scores when compared to peer-led debriefing (Rueda-Medina et al., 2021). The discrepancy highlights the need for more research to understand what factors influence the effectiveness of peer-led debriefing. A direct comparison study examining peer-led debriefing

versus self-debriefing could provide valuable insights into the optimal application of these approaches, both individually and in combination, potentially maximizing learning outcomes across different educational contexts. One of the conflicting findings identified in a non-equivalent control group, pre-post design study was that even the peer-led debriefing done by non-trained peers had positive outcomes (Kim & De Gagne, 2018).

A previous study concluded that peer debriefing combined with instructor-led debriefing is an effective strategy that can be used successfully in nursing education (Rueda-Medina et al., 2021). Similarly, a comparison study on peer-led debriefing and self-debriefing can aid in extracting efficacious ways of individually utilizing these strategies and in combination, which could potentially maximize the overall benefits. In line with the discoveries from the literature review on self-debriefing, the broader body of literature on peer-to -peer debriefing encompassed various studies exploring the collective influence of peer-to-peer debriefing and instructor-led debriefing, alongside investigations solely focusing on peer-to-peer debriefing, and comparison of peer-to-peer debriefing with instructor-led debriefing. Nonetheless, there remains a conspicuous gap in research that directly compares the impacts of self-debriefing to peer-to-peer debriefing.

The conflicting research results on peer debriefing illuminate the method's complex nature. While some studies highlight its cost-effectiveness and potential for increased student engagement, others raise concerns about the depth and accuracy of peer-provided feedback. This underscores the importance of considering the specific context and implementation when evaluating peer debriefing. Contextual factors emerge as key determinants of success. For instance, peer debriefing in smaller, more cohesive student groups may yield different results than in larger, less connected cohorts. The training and preparation of peers, interpersonal skills,

and specific simulation scenario can influence the educational value of the debriefing. Contextual factors such as group cohesion, peer preparation level, and simulation complexity significantly impact the efficacy of peer and self-debriefing after VSG.

Strong group cohesion fosters open communication and psychological safety, enhancing reflective learning (Kolbe et al., 2020). Peer debriefing is most effective when facilitators are well-prepared to lead debriefings comparable to faculty-led sessions (Sawyer et al., 2018). Simulation complexity also influences debriefing outcomes, with emotionally intense scenarios requiring structured approaches to support learners (Harder, Lemoine, & Harwood, 2021). For self-debriefing, structured reflection questions help individuals navigate complex simulations effectively (Lapum, Hume, & Yensen, 2018). These factors collectively shape the learning experience, emphasizing the need for well-designed debriefing strategies. In summary, the effectiveness of peer- debriefing depends on a multitude of factors that must be carefully considered and optimized in each educational setting. These nuanced findings suggest that peer debriefing is not a one-size-fits-all approach but a flexible approach that requires careful implementation.

Virtual Serious Games (VSG)

VSG is defined as ‘‘an interactive computer application, with or without significant hardware component, that has a challenging goal, is fun to play and engaging, incorporates some scoring mechanism, and supplies the user with skills, knowledge, and/or attitudes that are useful in reality’’ (Tan et al., 2017, p. 39). VSG has demonstrated its efficacy in promoting teamwork, safe environment, remote access, ability to repeat multiple times and learn effectively without fear, and reduced requirement of physical space for large student groups (Bellotti, Kapralos, Lee, & Moreno-Ger, 2013; Dichev & Dicheva, 2017; Garris, Ahlers, & Driskell, 2002; Landers, 2014;

Wong et al., 2022). These benefits can be categorized into educational advantages (skill development without risk), psychological benefits (reduced anxiety, increased engagement), and practical considerations (space efficiency, remote accessibility) that collectively strengthen the case for VSG implementation (Foronda et al., 2020).

VSGs can be accessed remotely and at any time, providing flexibility for students to engage in learning activities according to their schedules. This accessibility is particularly beneficial for distance learning programs and students with limited access to clinical placements. During the pandemic, VSGs became essential educational tools, with studies reporting that majority of nursing programs increased their use of virtual simulations when in-person clinical experiences were suspended (Fogg et al., 2020). VSGs align with current trends in nursing education, which emphasize the use of technology-enhanced learning approaches to prepare students for increasingly complex healthcare environments. VSG is an innovative teaching modality that addresses the complex and dynamic educational needs of the 21st century healthcare education (Keys et al., 2020, Wong et al., 2022). Specifically, VSGs enhance comprehension of complex clinical concepts like prioritization of care, interprofessional communication, and clinical decision-making through interactive scenarios that mirror real-world challenges while providing immediate feedback (Verkuyl, Romaniuk, Atack, & Mastrilli, 2017).

VSGs provide a safe learning environment in which students can make mistakes and learn from them without posing a risk to patient safety. VSG is accessible, engaging, and self-directed in a nonjudgmental environment (Keys et al., 2020). VSG facilitates learning concepts (Keys et al., 2021). VSG is an effective experiential learning tool in nursing education that provides an interactive learning experience that decreases student anxiety (Atthill, Witmer,

Luctkar-Flude, & Tyerman, 2021; Liu, 2021). Using VSGs to explore sensitive topics, such as end-of-life care, can provide a more ethical approach than involving real patients in educational activities. “Virtual game simulation is a 2D (two-dimensional) virtual computer game which enables students to actively participate in a realistic clinical scenario” (Ordu & Caliskan, 2021, p. 664). This represents just one format within the broader VSG spectrum, which ranges from simple 2D interfaces to fully immersive 3D virtual reality environments that engage multiple sensory systems and learning modalities (Liaw et al., 2018).

While VSGs represent a promising educational technology, they face significant implementation challenges. Research by Koivisto, Niemi, Multisilta, & Elina (2017), identified specific barriers including faculty resistance to technology adoption (reported by 62% of institutions), concerns about simulation fidelity (57%), and technical infrastructure limitations (48%). The technological infrastructure required for effective VSGs extend beyond mere software development. Considerations include ensuring consistent user experience across different devices, managing potential technical barriers for students with limited digital literacy, and creating adaptive systems that accommodate diverse learning styles. Moreover, the ethical design of VSGs demands careful attention to authentically representing clinical scenarios without causing undue psychological stress. The potential for technological glitches or user interface complexities could inadvertently distract from the primary learning objectives.

Impact on Learning Satisfaction and Clinical Confidence

The efficacy of debriefing methods among IENs is closely linked to their satisfaction with learning and confidence in applying new skills in clinical settings. Peer-to-peer debriefing is widely recognized for fostering a sense of psychological safety and collaborative learning, yet cultural norms regarding feedback and discussion may affect how IENs perceive its value

(Newton, Billet, & Ockerby, 2011). In some cultures, openly discussing mistakes in a group setting may be viewed as inappropriate or may create anxiety, potentially limiting IENs willingness to participate actively (Xu, 2010). For example, nurses educated in educational systems with strict hierarchical structures may find peer feedback less authoritative and therefore less valuable than instructor feedback, potentially limiting full engagement in the process (Oikarainen et al., 2018). This hesitation can reduce the efficacy of peer-to-peer debriefing and highlights the need for structured facilitation that encourages inclusivity and cultural sensitivity.

A growing body of research supports a blended debriefing approach that combines self-reflection, structured peer discussions, and faculty guidance to maximize learning outcomes (Tutticci et al., 2018). In high-stake clinical situations such as end-of-life care, where nurses must navigate emotional and ethical challenges, guided debriefing has been shown to improve clinical reasoning and emotional processing (Fey & Jenkins, 2015). Structured debriefing approaches have demonstrated improvements in clinical outcomes (Cheng et al, 2014). Additionally, studies suggest that tailored debriefing strategies for IENs—such as using clear, structured debriefing frameworks with opportunities for individual reflection before group discussion—can enhance both self-confidence and adaptability in new healthcare environments (Sanko, 2017). Future research should explore how integrating culturally responsive debriefing strategies which acknowledge and incorporate the diverse cultural backgrounds, values, beliefs, and experiences of participants into simulation-based education can further support IENs in their transition into diverse nursing settings, ensuring that they feel prepared and confident in delivering patient-centered care.

Debriefing Preferences and Challenges Among IENs

IENs enter healthcare systems with diverse educational backgrounds, clinical

experiences, and cultural perspectives, all of which influence their learning preferences during debriefing sessions. Unlike locally trained nurses who may have been introduced to structured simulation-based learning early in their education, IENs may have varied levels of exposure to simulation and debriefing methods (San Miguel & Rogan, 2015). Language barriers can further impact their engagement, as expressing complex clinical reasoning or reflecting on patient care scenarios in a second language may present challenges (Xu, 2010). These linguistic barriers may particularly affect time-sensitive debriefing scenarios, suggesting that allowing additional processing time and providing written debriefing guides in advance could enhance engagement for non-native English speakers. Additionally, cultural differences in learning styles and hierarchical structures in education systems may influence whether IENs feel comfortable participating in open discussions during peer-to-peer debriefing (Newton et al., 2011). Whilst peer-to-peer debriefing has been shown to enhance critical thinking and collaborative learning (Tutticci et al., 2018), IENs from backgrounds where education is traditionally instructor-led may find self-guided discussions less effective, preferring more structured facilitation from educators.

Conversely, self-debriefing may pose additional challenges for IENs who are unfamiliar with independent reflective learning strategies. Studies have suggested that reflective practice is a learned skill, and individuals who have not been exposed to structured self-assessment may struggle with its effectiveness (Sanko, 2017). The effectiveness of self-debriefing tools for IENs might be enhanced through culturally responsive design elements, such as incorporating specific prompts that acknowledge different approaches to healthcare across cultural contexts and explicitly addressing potential cultural barriers to self-critique. Without peer interaction or faculty guidance, IENs may find it difficult to contextualize their experiences, especially in

complex scenarios such as end-of-life care, where ethical, cultural, and emotional dimensions play a significant role (Timmis & Speirs, 2015). Research indicates that structured debriefing with guided questions and faculty involvement improves knowledge retention and self-efficacy (Fey & Jenkins, 2015). Given the additional adjustment period that IENs require when transitioning into new healthcare environments, faculty-led debriefing or blended approaches incorporating self-reflection, peer discussion, and expert guidance may provide more effective learning opportunities (San Miguel & Rogan, 2015).

Despite the growing body of research on debriefing methods in nursing education, an important research gap persists. Though numerous studies have explored instructor-led debriefing, the comparative efficacy of peer-to-peer and self-debriefing remains largely unexplored, particularly among IENs or students. This gap is particularly notable given the increasing global mobility of nursing professionals and the growing diversity within healthcare education programs. Future research should specifically examine how cultural background, and previous educational experiences influence debriefing preferences and outcomes. The existing literature presents a complex landscape of conflicting findings: some studies suggest instructor-led debriefing as superior, while others highlight the potential of peer and self-led approaches (Tutticci et al., 2018; Dreifuerst, 2012). This methodological diversity underscores the urgent need for a direct, comprehensive comparison that can untangle the nuanced dynamics of different debriefing strategies. This study aims to compare the effects of peer-to-peer debriefing versus self-debriefing on the area of self-confidence and satisfaction with debriefing using the Palliative Care Self-Efficacy Scale and Debriefing Experience Scale.

Current Gaps and Challenges

Peer-led debriefing and self-debriefing hold considerable potential for widespread

adoption across nursing education programs due to their cost-effectiveness and the absence of a need for instructors (Roh et al., 2016). Virtual simulation holds a prominent spot in current and future nursing education (Verkuyl et al., 2018), and debriefing is an inevitable part of virtual simulation where critical learning occurs (Verkuyl et al., 2018). While virtual simulation has been well-established as an effective teaching methodology, the optimal approaches to debriefing in virtual environments remain underexplored, creating a significant gap between technological implementation and pedagogical best practices (Cheng et al., 2014). There are significant gaps in exploring debriefing methods other than the traditional in-person debriefing model (Verkuyl et al., 2018). These gaps demand further in-depth investigations into other debriefing methods like self, peer-to-peer, and synchronous virtual debriefing (Verkuyl et al., 2018). There should be future studies to discover and optimize the feedback methods for VSGs (Vugts, Zedlitz, Joosen, & Vrijhoef, 2020).

Studies warrant future research on debriefing modalities and its impact on student learning outcomes (Duff et al., 2024; Verkuyl et al., 2018; Verkuyl et al., 2017). Nonetheless, there is limited direct comparison between peer-debriefing and self-debriefing in healthcare simulations in nursing. Effective debriefing is considered essential for enhancing learning and promoting continuous improvement (Rudolph et al., 2008; Meguerdichian et al., 2022). This gap is particularly problematic given the increasing implementation of VSGs in nursing education and the need to identify scalable, evidence-based debriefing approaches that can accommodate diverse learner populations (Foronda et al., 2020). Understanding which debriefing interventions are most efficacious in enhancing both educational and clinical outcomes within simulation-based education is essential for informing debriefing facilitators (Duff et al., 2024). Research endeavors investigating the direct impact of various debriefing

interventions, explicitly connecting them to outcomes, will serve as valuable assets in refining the delivery of simulation-based education (Duff et al., 2024).

Research has highlighted the need for more comparative and hybrid studies involving various debriefing methods (Verkuyl et al., 2020). The majority of the studies compared instructor-led debriefing to one of either peer-led debriefing or self-debriefing. However, very little research has focused on exploring various outcomes of the efficacy of peer-led debriefing versus self-debriefing. This represents a critical oversight in the literature, as both methods offer distinct advantages in terms of scalability and resource utilization, yet their comparative efficacy for different learning outcomes remains largely unexplored (Grant et al., 2014). A systematic review and meta-analysis highlighted that few studies have attempted to recognize the most effective debriefing method to improve learning outcomes (Lee et al., 2020). Insufficient evidence on identifying an efficacious debriefing method can pose a serious challenge to educators, who struggle to find the right debriefing method to meet the unique needs of their students (Verkuyl et al., 2020).

A scoping review study highlighted the importance of future comparison studies between peer-led debriefing and self-debriefing (Fanning & Gaba, 2007). The advantages or disadvantages of self-debriefing over peer-to-peer debriefing and the vice versa remains unclear (Langendyk, 2006). This ambiguity is particularly problematic when designing educational interventions for diverse student populations, including IENs, who may respond differently to various debriefing approaches based on their prior educational and cultural experiences (Oikarainen et al., 2018). Comparison studies will put forward the benefits, risks, and limitations of self-debriefing and peer debriefing, providing adequate clarity on how to effectively use each method (Verkuyl et al., 2018). Therefore, a comparison study to explore the efficacy of peer-led

debriefing versus self- debriefing, post simulation scenario using a VSG focusing on the outcomes of self-confidence and satisfaction with debriefing, in IEN students and novice IENs will be beneficial. This study will be able to address and minimize some of the existing knowledge gaps in nursing simulation education by comparing the efficacy of self-debriefing to peer-to-peer debriefing post a VSGs simulation.

Theoretical Framework

The current study draws upon three key theories to explore the efficacy of various debriefing methods in virtual serious gaming for nursing education: Social Cognitive Theory (Bandura, 1986), Self-Determination Theory (Deci & Ryan, 2012), and Adult Learning Theory (Knowles, 1984). These theories provide a comprehensive framework for understanding how learners acquire knowledge, develop self-efficacy, and maintain motivation in the context of simulation-based learning. By integrating these perspectives, one can better understand the potential impact of self-debriefing and peer-to-peer debriefing on nursing students' confidence and satisfaction in end-of-life patient care.

Social Cognitive Theory

Social cognitive theory (SCT) by Albert Bandura focuses on the significance of observational learning, modeling, imitation, reciprocal determinism, self-efficacy, outcome expectations, behavioral reinforcement, and cognitive processes (Kim & Baylor, 2006). According to Bandura (as cited in Sukmawati & Mardhatillah Sabillah, 2021, p.438), “the mastery of complex skills and knowledge does not only depend on the process of attention, retention, motor reproduction, and motivation but is also strongly influenced by elements that come from the learner, namely "sense of self-efficacy” and “self-regulatory system.” Bandura's social cognitive theory posits that self-efficacy, which encompasses confidence in one's ability to

perform a particular behavior or skill, is closely tied to key motivational factors such as perseverance, resilience, and adaptability (Andersson, Granat, Brännström, & Sandgren, 2022).

SCT emphasizes the role of observation, modeling, and feedback in learning (Bandura, 1986). Within the context of debriefing, peer-to-peer debriefing facilitates social reinforcement by allowing learners to observe and learn from one another, thereby enhancing self-efficacy and promoting behavioral adaptation (Andersson et al., 2022; Bandura, 1986). In contrast, self-debriefing fosters self-regulation and self-monitoring; however, without external validation, it may lead to misjudgment in assessing one's performance (Bandura, 1986). In the context of Virtual Simulation Games (VSG), SCT provides a framework for understanding how learners acquire skills through immersive experiences and consolidate their learning through structured debriefing (Bandura, 1986; Kim & Baylor, 2006).

According to SCT, individuals learn from observing others (e.g., peers) and their own experiences (Kim & Baylor, 2006). Self-debriefing and peer-to-peer debriefing may provide opportunities for observational learning, where students observe and learn from their peers' experiences and feedback during debriefing sessions as well as learn from self-reflection. Self-debriefing corresponds to self-determination theory by enabling self-directed reflection, evaluation, and learning; thereby promoting autonomy and competence. Peer-to-peer debriefing aligns with self-determination theory by providing learners an opportunity to facilitate collaborative learning and active engagement. Self-debriefing and peer-to-peer debriefing may promote active participation, reflection, and application of knowledge, which is consistent with the principles of adult learning theory.

Self-Determination Theory

Self-determination theory (SDT) by Deci and Ryan highlights the importance of

autonomy, competence, relatedness, intrinsic, and extrinsic motivation in the process of learning (Deci & Ryan, 2012; Ryan & Deci, 2000; Wang et al., 2022). SDT theory elaborates on the learner's engagement with activities, motivation, and satisfaction (Deci & Ryan, 2012; Ryan & Deci, 2000; Wang et al., 2022). In the context of debriefing, peer-to-peer debriefing enhances motivation by providing social validation, fulfilling both relatedness and competence needs, which leads to higher engagement (Deci & Ryan, 2012). Conversely, self-debriefing supports autonomy by allowing learners to independently reflect on their performance, but it may lack relatedness, potentially reducing motivation for those who thrive in social learning environments (Deci & Ryan, 2012; Ryan & Deci, 2000). Within Virtual Simulation Games (VSG), SDT explains how these simulations promote autonomy through independent decision-making, competence through skill mastery, and relatedness through team-based interactions (Deci & Ryan, 2012; Ryan & Deci, 2000; Wang et al., 2022).

Adult Learning Theory

Adult learning theory (ALT), proposed by Knowles, emphasizes that adults learn most effectively through problem-solving and experiential learning (Knowles, 1984). Adult learning theory emphasizes the principles of self-concept, experience, readiness to learn, orientation to learning, motivation, and the need for respect (Clapper, 2010). These principles serve as a guide in developing effective and engaging learning experiences for adult learners (Clapper, 2010). Both peer-debriefing and self-debriefing sessions align with this approach but cater to different learner preferences. Peer debriefing facilitates collaborative learning, allowing learners to engage in discussion and shared problem-solving, while self-debriefing fosters deep individual reflection and personal meaning-making (Sanko, 2017, San Miguel & Rogan, 2015). The effectiveness of each method depends on the learner's experience and level of self-directed learning skills

(Clapper, 2010). Within the context of Virtual Simulation Games (VSG), ALT underscores the importance of self-directed and problem-solving approaches, ensuring that learners engage in realistic, decision-based scenarios that enhance critical thinking and practical application (Clapper, 2010; Knowles, 1984).

Bandura's conceptualization (as cited in Sukmawati & Mardhatillah Sabillah, 2021) emphasizes that mastering skills extend beyond simple attention and reproduction, deeply involving the learner's sense of self-efficacy and self-regulatory systems. This theoretical lens directly aligns with the study's primary measurement tool, the Palliative Care Self-Efficacy Scale (Phillips, Salamonson, & Davidson, 2011), by providing a framework for understanding how confidence in end-of-life patient care skills is developed and enhanced. The Debriefing Experience Scale (Reed, 2012), a key instrument in this research, directly reflects SDT's focus on learner motivation and satisfaction. The Diamond model developed by Rudolph, Raemer, and Simon was used for debriefing post simulation. As the title suggests the Diamond debriefing model is diamond shaped with following phases: namely description phase, analysis phase, and application phase, guided by self-debriefing, peer-to-peer debriefing, and instructor-led debriefing (Jaye, Thomas, & Reedy, 2015). The Diamond debriefing model aligns with Social Cognitive Theory, Self-Determination Theory, and Adult Learning Theory in different ways.

The observational learning, modeling, and feedback components of social cognitive theory are integrated into the Diamond debriefing model (Jaye et al., 2015; Kim & Baylor, 2006). This model also incorporates autonomy, competence, and relatedness from self-determination theory (Deci & Ryan, 2012; Jaye et al., 2015; Ryan & Deci, 2000; Wang et al., 2022). Furthermore, the model is coherent with adult learning theory by acknowledging the implication of self-concept, experience, readiness to learn, and relevance to real-world contexts

(Clapper, 2010; Jaye et al., 2015). The integration of social cognitive theory, self-determination theory, and adult learning theory offers a comprehensive framework for understanding the efficacy of debriefing in virtual serious gaming. These theories elucidate why learners respond differently to peer and self-debriefing and provide evidence-based strategies for optimizing debriefing methods. By tailoring engagement techniques, feedback mechanisms, and learner support, educators can enhance self-efficacy, knowledge retention, and intrinsic motivation among nursing students.

This approach could be particularly valuable in end-of-life care training, where reflective learning and decision-making skills are critical for professional growth and patient-centered care. The theoretical convergence offers a sophisticated approach to understanding the complexities of debriefing in nursing education. It suggests that learning involves a complex interplay of observational learning, self-regulation, motivation, and experiential reflection. By integrating these theoretical perspectives, the research can more deeply explore how different debriefing approaches potentially impact self-confidence and satisfaction in end-of-life patient care learning, ultimately contributing to a more nuanced understanding of simulation-based education methodologies.

Chapter Three

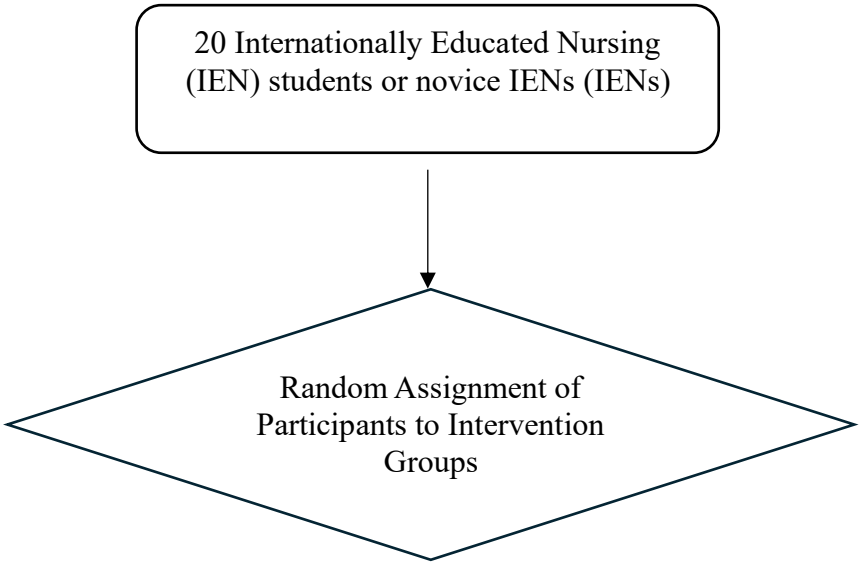
Methodology

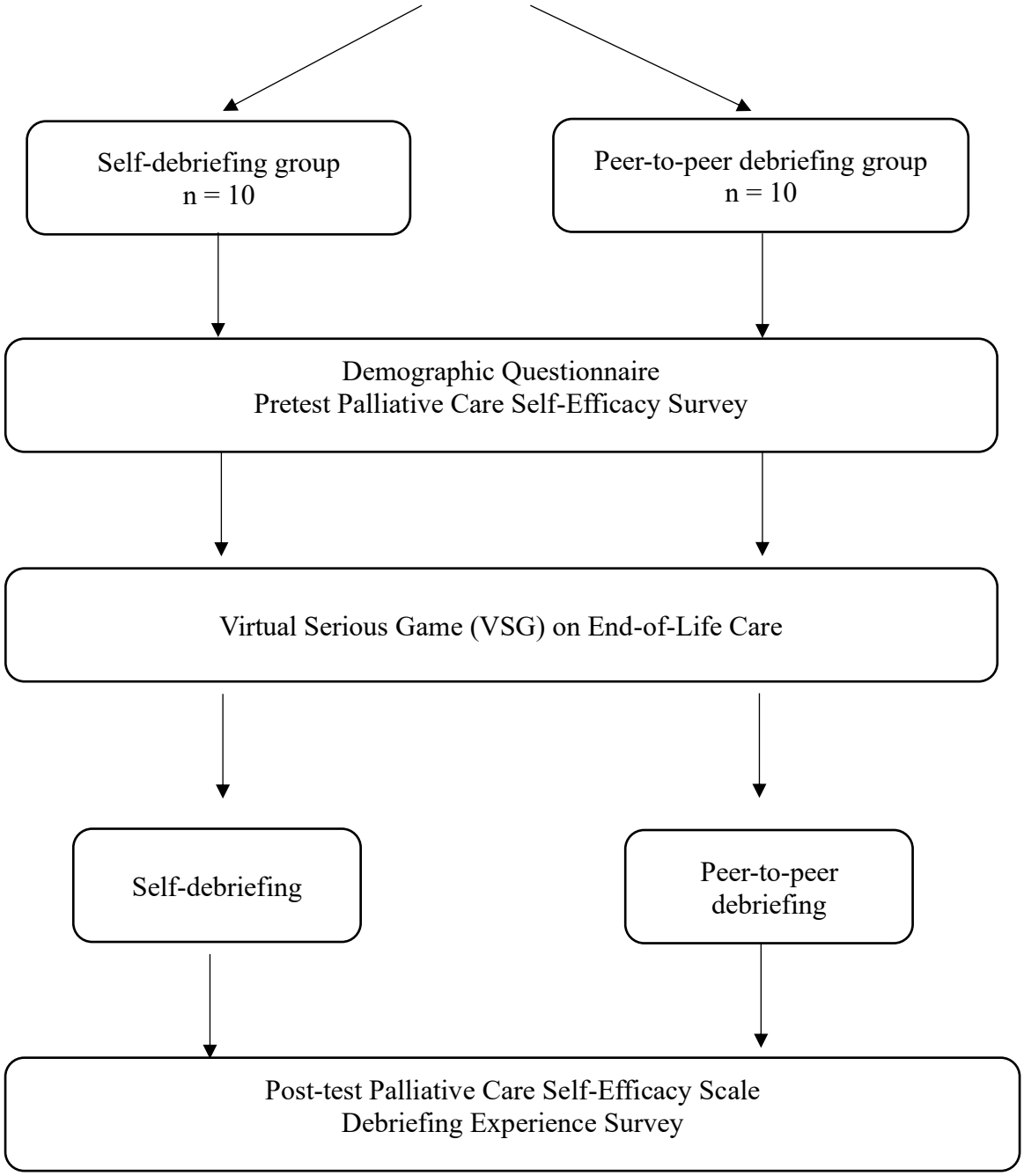
Research Design

An experimental pretest-post-test study design with two intervention groups, peer-to-peer debriefing and self-debriefing, was used. There was no control group, but random assignment to intervention groups was followed. The independent variables were two different types of debriefing methods: self-debriefing and peer-to-peer debriefing. The dependent variables were learner's self-confidence and learner's satisfaction with debriefing. Experimental designs are the most appropriate study design for testing cause-and-effect relationships (Polit & Beck, 2017). Because experimental design allows the researcher to control the experimental intervention (Polit & Beck, 2017). "Experimental designs are considered the "gold standard" for intervention studies because they yield the highest quality evidence regarding the effects of an intervention" (Polit & Beck, 2017, p. 230-231). Pretest post-test experimental designs provide evidence for causal relationships between interventions and outcomes and inform the development of effective interventions in research (LoBiondo-Wood & Haber, 2013).

Figure 1

Research Design





Sample and Setting

Participants were recruited from a pool of IEN students and novice IENs who had held nursing licensure in Canada for less than 1 year. Patricia Benner defines a novice nurse as an

individual with little to no clinical experience who relies on theoretical knowledge and strict guidelines to perform tasks (Benner, 1984). They lack the ability to apply critical thinking in complex situations and depend on rules and structured instructions to guide their practice (Benner, 1984). Novice nurses often struggle with adapting to real-world clinical scenarios due to their limited exposure to hands-on patient care (Benner, 1984). The required sample size was estimated using the statistical software G*power 3.1 (Faul, Erdfelder, Buchner & Lang, 2009). A significance level of 0.05, power of 0.80, and medium effect size of 0.5 were used to calculate the sample size. The initial sample size was calculated using G*Power 3.1 statistical software (Faul et al., 2009). Based on standard parameters in educational research and recent debriefing studies (Cheng et al., 2014; Lee et al., 2020), the calculation used a significance level (α) of 0.05, statistical power (1-β) of 0.80, and an anticipated medium effect size (Cohen's d) of 0.5. These parameters align with the effect sizes reported in recent systematic reviews of debriefing methods, which found effect sizes ranging from 0.44 to 0.59 (Cheng et al., 2014; Duff et al., 2024).

The calculation indicated a required sample size of 51 participants per group for adequate statistical power in a full-scale study. However, as this was conceptualized as a pilot study, a smaller sample size of 10 participants per group was selected, accounting for a potential 10% dropout rate. This smaller sample size aligns with established pilot study recommendations, which suggest that 10-30 participants per group is sufficient for preliminary investigations (Hertzog, 2008; Lancaster, Dodd, & Williamson, 2004; Verkuyl et al., 2018). The primary purpose of pilot studies is not to test hypotheses with statistical significance but rather to assess practicability, refine procedures, and generate effect size estimates to inform subsequent larger trials (Leon, Davis, & Kraemer, 2011; Thabane et al., 2010). This preliminary investigation will

generate insights and test hypotheses before conducting large scale research.

A non-probability convenience sample (N) of 20 IEN students and novice IENs were recruited with 10(n) participants in each group. Non-probability sampling is feasible and is preferred in nursing research (LoBiondo-Wood & Haber, 2013). Convenience sample allows easy access to the target population for recruitment. Though convenience sample can be a disadvantage in terms of generalizability, the effective use of inclusion and exclusion criteria can provide a representative sample and the external validity of the findings (LoBiondo-Wood & Haber, 2013).

The inclusion criteria for the study are as follows:

1. Novice IENs who hold nursing licensure in Canada and IENs who are pursuing education in Canada but do not yet have nursing licensure
2. IEN students or novice IENs who have basic proficiency in using computers and online platforms.
3. IEN students or novice IENs who provide informed consent to participate in the study.
4. IEN students or novice IENs who are willing to engage in VSGs depicting end-of-life care scenarios and subsequent debriefing sessions.

The exclusion criteria are as follows:

1. Nursing students or novice nurses who are not IENs
2. IEN students or novice IENs who lack basic computer and online proficiency platforms, which may impede their ability to engage effectively with VSGs.
3. IEN students or novice IENs who are unwilling to provide informed consent to participate in the study.

4. IEN students or novice IENs who have previously participated in similar debriefing interventions related to end-of-life care or palliative care, as prior exposure may influence their responses and outcomes.

Moreover, the participants were randomly assigned to each intervention group, which guaranteed an equal chance for each participant being assigned to either of the two intervention groups: self-debriefing or peer-to-peer debriefing. Participant ID numbers were selected from a hat without looking or prior knowledge of the numbers, ensuring a truly random assignment process. Random assignment of participants to the intervention group can improve the validity of the study, enhancing the comparability of the study at baseline, minimizing or controlling the potential effects of confounding variables and strengthening the casual interference under study (LoBiondo-Wood & Haber, 2013; Polit & Beck, 2017). A convenience sample followed by random assignment can complement the study design with rigor and validity (LoBiondo-Wood & Haber, 2013; Polit & Beck, 2017). The findings of this study can serve as a groundwork for future research with larger and more diverse samples for further exploration and validation.

IEN students or novice IENs contribute to a significant proportion of current and future graduate nurses in Ontario. In 2023, the College of Nurses of Ontario (CNO) registered over 12,000 new nurses, with IENs comprising 5,125 of these registrations—a substantial increase from previous years (Kawartha 411, 2023). Additionally, IENs accounted for 22% of newly licensed nurses in Ontario in 2022, reflecting their growing contribution to the province's healthcare system (Canadian Institute for Health Information, 2022). This upward trend underscores the critical role of IENs in Ontario. IENs will benefit from this opportunity by practicing and gaining self-confidence in managing similar sensitive situations in real-life clinical settings. Moreover, VSGs provide a safe and controlled environment for learners to

practice and proceed with decision-making and interventions without the fear of any risks to the patient (Keys et al., 2020). VSG presents the students with the opportunity to repeatedly practice and experience the scenario multiple times, facilitating enhanced learning outcomes (Keys et al., 2021).

Instruments

The demographic data of all participants will be collected using a demographic questionnaire (see Appendix B) (age, gender, past education, gaming, and simulation experience….). All participants will complete a pretest on palliative care self-efficacy (see Appendix C) with a 12–item Likert scale with a point grade ranging from 1 to 4. The participants will then engage in a VSG on end-of-life care, followed by a debriefing session. Diamond debriefing model (see Appendix D) was used for the debriefing session. Participants in the first intervention group was subjected to self-debriefing alone. Participants in the second intervention group will be subjected to peer-to-peer debriefing alone. Both intervention groups used the same set of questions that outline the Diamond debriefing model (see Appendix D). After completing the debriefing session, participants from each intervention group completed a posttest on palliative care self-efficacy (see Appendix E) with a 12–item Likert scale with a point grade ranging from 1 to 4 and debriefing experience questionnaire (see Appendix F) with a 14–item Likert scale with a point grade ranging from 1 to 5. Permission will be obtained from the authors to use and revise items in the scale to fit the purpose of the research.

Palliative Care Self-Efficacy Scale

Palliative Care Self-Efficacy scale has good validity and reliability, with a Cronbach's alpha of the scale and subscales ranging from 0.87 to 0.92 (Phillips et al., 2011). A Cronbach's alpha of 0.92 denotes high internal consistency and homogeneity for the scale (Phillips et al.,

2011). The 12-item scale has 6 items that relates to psychosocial support and other 6 items related to symptom management (Phillips et al., 2011). The participants rated their self-efficacy on a 4-point Likert scale as follows: (1) need further basic instruction; (2) confident to perform with close supervision/coaching; (3) confident to perform with minimal consultation; or (4) confident to perform independently (Phillips et al., 2011).

Diamond Debriefing Model

Diamond debriefing models comprise three phases: namely description, analysis, and application (Jaye et al., 2015). This model was found to be suitable for new members to practice their debriefing skills (Jaye et al., 2015). Diamond debriefing model was found to be an easy-to-apply double-sided model: the first side is the scaffold, and the second side is the theoretical background (Sahin & Basak, 2021). Additionally, Diamond emerged as an equally beneficial model for both learners and educators (Jaye et al., 2015). "As a cognitive scaffold for novice facilitators, Diamond gives an easy and pedagogically sound structure to follow, with specific prompts to use in the moment" (Jaye et al., 2015, p. 175).

Debriefing Experience Scale

Debriefing Experience Scale was used to determine participant satisfaction with different debriefing methods. Debriefing Experience Scale has proven to be an effective tool for investigating debriefing experience in nursing students (Reed, 2012). The scale measures the student experience and the importance of that experience to students, with a Cronbach's alpha of 0.93 and 0.91, respectively (Reed, 2012).

End-of-Life Care Scenario

There is an increasing need for palliative care globally. Approximately 40 million people around the world are estimated to require palliative care every year (World Health Organization,

2018). Elderly population above the age of 60 years is expected to be double by 12% to 22% between 2015 and 2050 (World Health Organization, 2022). Elderly population aged 65 years and older is expected to increase from 18.5% in 2021 to 23.1% in 2043 and 25.9% in 2068 (Statistics Canada, 2022). This will account for more than 1 in 4 people will be aged 65 and older by the year 2068 (Statistics Canada, 2022). There is a growing need for palliative care and nurses comfortable in providing end-of-life care (Bolt et al., 2021; Evenblij et al., 2019; Harasym et al., 2020). Nurses play a crucial role in delivering quality palliative care (Evenblij et al., 2019; Negarandeh, Mardani Hamooleh, & Rezaee, 2015).

End-of-life care is a critical aspect of nursing practice, and preparing nursing students to effectively manage end-of-life situations is essential for providing high-quality care to patients and their families (Dehghani, Barkhordari-Sharifabad, Sedaghati-Kasbakhi, & Fallahzadeh, 2020; Evenblij et al., 2019). However, research has shown that there is a significant lack in the preparation of nurses to provide adequate palliative care (Nambayan, 2018). There are limited opportunities for nursing students to receive the required exposure to end-of-life care situations (Graham & Emerson, 2022). Nursing students must be prepared to navigate the complex ethical dilemmas that arise in end-of-life care (Andersson et al., 2022). Engaging students in end-of-life care scenarios allows them to explore these ethical issues in a safe and controlled environment, paving the path for delivering quality end-of-life care nursing (Hold, Ward, & Blake, 2014).

Ethical Considerations

This study adhered to ethical standards to safeguard the rights and well-being of the participating internationally educated nursing students and novice IENs. A written informed consent was obtained from each participant, outlining the purpose, procedures, potential risks, and benefits of the study. Voluntary participation was emphasized, and

participants had the right to withdraw from the study at any stage without facing any negative consequences. Participants were provided with a unique identification number to be used instead of a participant name in the data collected. Participants were assured of confidentiality, and all collected data were anonymized to prevent the identification of individuals. Data will be stored securely in accordance with data protection regulations: password-protected computers and any hard copy data stored in a locked filing cabinet at York university library. Only authorized members of the research team will have access to the data. All electronic data will be password-protected and printed data will be kept in a locked cabinet for 7 years after the anticipated last action. The printed information will be destroyed by shredding and electronic files will be permanently deleted. The debriefing was completed in a setting that is psychologically safe, conducive to learning, and upholds confidentiality, trust, and open communication (INACSL Standards Committee, 2021).

VSG safeguards the psychological safety of participants to a greater extend by minimizing the fear of judgment or repercussions (Keys et al., 2020). Moreover, VSG meets many of the recommendations put forward by research to reduce simulation anxiety, like limited observers, positive peer support, safe learning environment, self- reflection, clarity in pre-briefing, feedback directed at preventing future errors and facilitating nonjudgmental environment (Yockey & Henry, 2019). A protocol was established for referring participants to counseling services if they experienced emotional or psychological distress during or after the simulation. The participants were provided with contact information to access the virtual or in-person student counseling support services available. Additionally, a link with information to the publicly accessible counseling services and support was included in the research invitation flyer. Other measures in place to ensure the psychological safety of the participants included

establishing clear expectations, facilitating open communication, promoting constructive feedback, and a nonjudgmental environment. The contact information of the researcher was available to the participants on the consent form (see Appendix H), if any questions or concerns arose. Institutional Review Board approval for the study was obtained from York University.

Data Collection

A convenience sample of 20 participants were recruited from IEN students and novice IENs. An email was forwarded to the undergraduate nursing program director to initiate the recruitment of IEN students. The participation invitation letter (see Appendix G) was distributed to the IEN students at York University and to novice IENs who have held Canadian nursing licensure for less than 1 year through York University Alumni. The invitation letter included information about the research, contact information of the researcher, online link to informed consent, and online link to a demographic questionnaire. Informed consent was obtained from all participants who were interested to participate in the study. The last four digits of the phone number of participants was used as participant ID. The participant IDs were randomly drawn one at a time from a hat without looking, and the process was continued until all the participants were randomly assigned to the 2 intervention groups: self-debriefing and peer-to-peer debriefing.

First, each participant completed a pretest on palliative self-care efficacy (see Appendix C). Survey links were sent to all participants. Participants in the self-debriefing group received survey links to version S and participants in the peer-to-peer debriefing group received survey links to version P. Then the participants engaged in the VSG on end-of-life care accessible at the link:https://vlslibrary.ecampusontario.ca/item-details/#/a45623dc-b7ed-403da4def1c50e1173aa?k=palliative%20care&itemTypes=6&itemTypes=12&sortCol=1&increasePopularSearch=true&collections=CVLP%20Collection&collections=VLS%20Collection.

VSG was followed by a debriefing session based on the Diamond debriefing model. A link to the debriefing session was emailed to both intervention groups after the participants had completed the VSG. The educational outcomes assessed in this study were self-confidence and satisfaction with debriefing.

Both intervention groups used the same set of debriefing questions (see Appendix D). Self-debriefing intervention group answered the debriefing questions for themselves using an online form link. Peer-to-peer debriefing was facilitated through an online discussion forum 'Padlet'. The link to the online discussion forum was provided to the peer-to-peer debriefing group. Next, both groups completed a post-test on palliative care self-efficacy (see Appendix E) and debriefing experience questionnaire (see Appendix F). Self-debriefing intervention group received version S questionnaires, and the peer-to-peer debriefing group received version P questionnaires. Informed consent and questionnaires were accessible via the Google Forms link. Online discussion forum was accessible through 'Padlet' link. All the links were emailed to the participants.

Data Analysis

The data were analyzed using IBM SPSS version 24.0 (IBM, Armonk, NY). Descriptive statistics were used to calculate frequencies and percentages for each category of demographic variables providing a clear characterization of the sample and assessing the balance between the intervention groups. Independent t-tests were used to compare mean scores for self-confidence and satisfaction in learning between the peer-to-peer debriefing group and the self-debriefing group after completing the VSG. Paired t-tests were used to compare the pre-test and post-test self-efficacy scores within each group.

This analysis aimed to determine if there were potential differences in outcomes between the two intervention groups, although the pilot nature of the study and the small sample size may limit the power to detect such differences. In addition to reporting p-values, effect sizes (e.g., Cohen's d) were calculated to provide a standardized measure of the magnitude of the differences between groups and the changes within groups. This is particularly informative in a pilot study, where the sample size may be too small to rely solely on statistical significance. In previous research, peer-to-peer debriefing was found to improve problem-solving skills and debriefing satisfaction when compared to instructor-led debriefing (Duff et al., 2024).

Null Hypothesis (H0): There is no significant difference in the mean self-confidence and satisfaction in learning scores between the peer-to-peer debriefing group and the self-debriefing group after completing the VSG on end-of-life care in IEN students or novice IENs.

Alternative Hypothesis (H1): The mean self-confidence and satisfaction in learning scores of the peer-to-peer debriefing group are significantly higher than those of the self-debriefing group after completing the VSG on end-of-life care in internationally educated nursing students or novice IENs.

These hypotheses were treated as exploratory and will require further research with larger sample sizes to confirm the findings. In previous research, peer-to-peer debriefing was found to improve problem-solving skills and debriefing satisfaction when compared to instructor-led debriefing (Duff et al., 2024). This provides a foundation for the current study, which aims to extend these findings by comparing peer-to-peer debriefing with self-debriefing in the context of a VSG on end-of-life care. This data analysis plan uses a combination of descriptive statistics, independent t-tests, paired t-tests, and effect size calculations to provide a comprehensive

approach to evaluating the preliminary effects of the two debriefing methods on self-confidence and satisfaction in learning among internationally educated nursing students or novice IENs.

Chapter Four

Results

The results are presented in three main parts: 1) descriptive statistics of participant demographics, 2) independent t-tests comparing post-intervention outcomes between groups, and 3) paired t-tests examining pre-post changes within each group.

Descriptive Statistics

There was a total of 20 participants. Of the 20 participants, 10 were assigned to the self-debriefing group and 10 to the peer-to-peer debriefing group. A frequency table was completed for the demographic data (Table 1). The majority of participants were female, contributing to 90%, while 10% were male. Additionally, most of the participants fell in the age group 20-29 and 30-39, with fewer participants in the age brackets of 50 and above. 65% of the participants identified themselves as Asian, followed by 25% who identified as Black/African American, and 10% as Caucasian/White. The most common type of nursing program attended by the participants was a Bachelor of Science in nursing, which accounted for 70% of the participants, and the remaining was a Practical nursing program. All participants had previous healthcare experience and had completed clinical placements. Most participants had experience in either self-debriefing or peer-to-peer debriefing and had noted their preferred debriefing method as instructor-led debriefing.

Table 1

Frequency Table

Gender		
	N	%
Yes	2	10.0%
No	18	90.0%
Age		
	N	%

20-29	8	40.0%
30-39	9	45.0%
40-49	2	10.0%
50 and above	1	5.0%

Ethnicity

	N	%
Asian	13	65.0%
Black/African American	5	25.0%
Caucasian/White	2	10.0%

Type of nursing program

	N	%
Bachelor of Science in Nursing	14	70.0%
Practical Nursing	6	30.0%

Clinical placements completed

	N	%
Yes	20	100.0%

Previous healthcare experience

	N	%
Yes	20	100.0%

Experience with peer-to-peer debriefing

	N	%
Yes	11	55.0%
No	9	45.0%

Experience with self-debriefing

	N	%
Yes	15	75.0%
No	5	25.0%

Preferred debriefing method

	N	%
Peer-to-peer debriefing	5	25.0%

Self-debriefing	2	10.0%
Instructor-led debriefing	13	65.0%

Independent t-tests

Independent t-tests were performed to compare outcomes between the two groups: self-debriefing group and peer-to-peer debriefing group. Separate independent t-tests were conducted to compare the two groups palliative self-efficacy and debriefing experience. The first independent t-test (see Table 2) compared post-test self-efficacy scores between the self-debriefing group and the peer-debriefing group. The peer-debriefing group had a mean score of 3.4 (SD = 0.919), while the self-debriefing group had a slightly higher mean score of 3.5 (SD = 0.627) (see Table 6). The results showed no statistically significant difference between the two groups, as indicated by majority of p-values ranging from .123 to .5, which is greater than the commonly accepted significance threshold of 0.05. The t-values ranging from -1.897 to 0, and the degrees of freedom (df) ranges from 14.014 to 18, further support the conclusion that the difference in self-efficacy scores between the groups is not significant (see Table 2).

The next independent t-test (see Table 3) compared the debriefing experience scores between the self-debriefing and peer-debriefing groups. The peer-debriefing group had a mean score of 4.321 (SD = 0.657), while the self-debriefing group had a mean score of 4.25 (SD = 0.545) (see Table 7). The results showed no statistically significant difference between the two groups, as indicated by majority of p-values ranging from .116 to .5, which is greater than the commonly accepted threshold of 0.05. The t-values ranged from 0 to 1.236, and the degrees of freedom (df) from 14.781 to 18 (see Table 3). These results indicate that the two debriefing methods did not significantly differ in their impact on post-intervention self-efficacy or debriefing experience. However, it is important to consider that the lack of statistical significance

could be influenced by factors such as the small sample size, which may limit the power to detect significant differences.

Table 2

Independent t-test between self-debriefing group and peer-to-peer debriefing group on palliative self-efficacy scores

		t	Df	Sig.	One-Sided p	Two-Sided p	Effect Size	CI Lower	CI Upper
Informing people of the support services available	Equal variances assumed	-1.200	18	.067	.123	.246	.745	-1.423	.364
	Equal variances not assumed	-1.200	12.309		.126	.253			
Discussing different environmental options (eg: hospital, home, family)	Equal variances assumed	.000	18	.577	.500	1.000	**.843**	-.877	.877
	Equal variances not assumed	.000	16.399		.500	1.000			
Reacting to and coping with terminal delirium	Equal variances assumed	-1.897	18	.591	**.037**	.074	.707	-1.757	.081
	Equal variances	-1.897	14.014		**.039**	.079			

	not assumed								

Table 3

Independent t-test between self-debriefing group and peer-to-peer debriefing group on debriefing experience scores

		t	df	Sig.	One-Sided p	Two-Sided p	Effect Size	CI Lower	CI Upper
The debriefing environment was physically accommodating	Equal variances assumed	.000	18	.259	.500	1.000	.587	-.877	.877
	Equal variances not assumed	.000	16.303		.500	1.000			
Debriefing addressed my queries from the simulation	Equal variances assumed	.000	18	1.000	.500	1.000	**.632**	-.877	.877
	Equal variances not assumed	.000	18.000		.500	1.000			
I gained increased self-awareness during the debriefing session	Equal variances assumed	.775	18	.036	.224	.449	.577	-.542	1.225
	Equal variances not assumed	.775	14.781		.225	.451			
Debriefing facilitated connections between theory and real-life situations	Equal variances assumed	1.236	18	.394	.116	.232	.543	-.349	1.440
	Equal variances not assumed	1.236	17.841		.116	.232			

Table 6

Independent t-test Palliative self-efficacy scores

Mean-Peer-to-peer debrie-fing group	Mean Self-debrie-fing group	SD Peer-to-peer debriefin g group	SD Self-debriefin g group
3.4	3.5	0.919	0.627

Table 7

Independent t-test Debriefing experience scores

Mean-Peer-to-peer debriefi ng group	Mean Self-debriefi ng group	SD Peer-to-peer debrie fing group	SD Self-debriefi ng group
4.321	4.25	0.657	0.545

Paired t-tests

Paired t-tests were performed to compare the outcomes within each group. Separate paired t-tests were conducted to compare the pre-test and post-test scores of palliative self-efficacy within the self-debriefing and peer-to-peer debriefing groups. The paired t-test was conducted to compare self-efficacy scores before and after the intervention within the self-debriefing group (see Table 4). The mean pretest self-efficacy score was 3.091 (SD = 0.859), and the mean post-test score was 3.5 (SD = 0.627) (see Table 8). The analysis yielded t-values in the range of -3.280 to 0, with degrees of freedom (df) at 9 (see Table 4). Half of the p-values ranged from .005 to .041 ($p < 0.05$) and the rest from .084 to .5 ($p > 0.05$) (see Table 4). While both groups showed some improvement in self-efficacy from pretest to post test, with some statistically significant p-values, the comparisons did not yield significant differences suggesting that a single debriefing session may not be sufficient to substantially impact self-efficacy. However, this could be influenced by the small sample size, which may limit the power to detect significant changes.

Another paired t-test was conducted to compare self-efficacy scores before and after the intervention within the peer-to-peer debriefing group (see Table 5). The mean pretest self-efficacy score was 2.666 (SD = 0.969), and the mean post-test score was 3.35 (SD = 0.919) (see Table 9). The analysis produced t-values ranging from -3 to 0, with 9 degrees of freedom (df) (see Table 5). The majority of p-values ranged from .002 to .033 ($p < 0.05$) (see Table 5). The peer-to-peer debriefing intervention led to a statistically significant improvement in self-efficacy. The improvement is not only statistically significant but also substantial, with a clear increase in mean scores.

Table 4

Paired t-test self-debriefing group

		t	df	One-Sided p	Two-Sided p	Effect Size	CI Lower	CI Upper
Pair 1	Answering patients' questions about the dying process - Posttest Answering patients' questions about the dying process	-2.449	9	**.018**	.037	**1.033**	-1.472	-.046
Pair 2	Supporting the patient or family member when they become upset - Posttest Supporting the patient or family member when they become upset	-2.333	9	**.022**	.045	.949	-1.427	-.017
Pair 3	Informing people of the support services available - Posttest Informing people of	-3.250	9	**.005**	.010	.876	-1.787	-.234

	the support services available							
Pair 7	Reacting to reports of pain from the patient - Posttest Reacting to reports of pain from the patient	-2.236	9	**.026**	.052	.707	-1.390	.006
Pair 8	Reacting to and coping with terminal delirium - Posttest Reacting to and coping with terminal delirium	-3.280	9	**.005**	.010	.675	-1.798	-.240
Pair 9	Reacting to and coping with terminal dyspnea (breathlessness) - Posttest Reacting to and coping with terminal dyspnea (breathlessness)	-.318	9	.379	.758	.994	-.719	.524
Pair 10	Reacting to and coping with nausea / vomiting - Posttest Reacting to and coping with nausea / vomiting	-1.964	9	**.041**	.081	.483	-1.288	.074
Pair 12	Reacting to and coping with limited patient decision-making capacity - Posttest Reacting to and coping with limited patient decision-making capacity	.000	9	.500	1.000	.667	-.620	.620

Table 5

Paired t-test peer-to-peer debriefing group

		t	df	One-Sided p	Two-Sided p	Effect Size	CI Lower	CI Upper
Pair 1	Answering patients' questions about the dying process - Post-test Answering patients' questions about the dying process	-3.000	9	**.007**	.015	1.054	-1.687	-.176
Pair 2	Supporting the patient or family member when they become upset - Post-test Supporting the patient or family member when they become upset	-2.862	9	**.009**	.019	.994	-1.632	-.144
Pair 3	Informing people of the support services available - Post-test Informing people of the support services available	-1.809	9	.052	.104	**1.398**	-1.231	.113
Pair 4	Discussing different environmental options (eg: hospital, home, family) - Post-test Discussing different environmental options (eg:	-2.090	9	**.033**	.066	1.059	-1.335	.043

	hospital, home, family)							
Pair 5	Discussing patient's wishes for after their death - Post-test Discussing patient's wishes for after their death	-2.377	9	**.021**	.041	1.197	-1.444	-.028
Pair 6	Answering queries about the effects of certain medications- Post-test Answering queries about the effects of certain medications	-3.857	9	**.002**	.004	.738	-2.033	-.370
Pair 7	Reacting to reports of pain from the patient - Post-test Reacting to reports of pain from the patient	.000	9	.500	1.000	**1.414**	-.620	.620
Pair 8	Reacting to and coping with terminal delirium - Post-test Reacting to and coping with terminal delirium	-2.212	9	**.027**	.054	1.287	-1.381	.012
Pair 9	Reacting to and coping with terminal dyspnea (breathlessness) - Post-test Reacting to and coping with terminal dyspnea (breathlessness)	-2.689	9	**.012**	.025	.823	-1.564	-.103
Pair 10	Reacting to and coping with	-1.000	9	.172	.343	.949	-.944	.328

	nausea / vomiting - Post-test Reacting to and coping with nausea / vomiting							
Pair 11	Reacting to and coping with reports of constipation - Post-test Reacting to and coping with reports of constipation	.000	9	.500	1.000	.667	-.620	.620
Pair 12	Reacting to and coping with limited patient decision-making capacity - Post-test Reacting to and coping with limited patient decision-making capacity	-2.905	9	**.009**	.017	1.197	-1.649	-.154

Table 8

Paired t-test self-debriefing group

Mean Pretest	Mean Post-test	SD Pretest	SD Post-test
3.091	3.5	0.859	0.627

Table 9

Paired t-test peer-to-peer debriefing group

Mean Pretest	Mean Post-test	SD Pretest	SD Post-test
2.666	3.35	0.969	0.919

Chapter Five

Discussion

This pilot study delved into innovative debriefing approaches for IEN students and novice nurses, examining the impact of self-debriefing and peer-to-peer debriefing. Specifically, the research investigated how these two distinct debriefing methods influenced participants self-confidence and satisfaction following a VSG on end-of-life care. Although both debriefing methods showed promise in supporting learning, neither emerged as significantly superior, underscoring the need for further research to optimize their implementation in nursing education. This finding is valuable as it suggests nursing educators may have flexibility in choosing debriefing methods based on institutional resources and student needs rather than being constrained by a single best approach. Self-confidence was measured using the Palliative Self-efficacy scale, and satisfaction in learning was measured with the Debriefing Experience scale. The Palliative Care Self-Efficacy Scale demonstrates strong validity and reliability, with Cronbach's alpha ranging from 0.87 to 0.92, indicating high internal consistency and homogeneity (Phillips et al., 2011). The Debriefing experience Scale has Cronbach's alpha values ranging from 0.91 to 0.93, indicating high reliability and validity (Reed, 2012).

While both groups demonstrated some improvement in self-efficacy from pretest to post-test, the results did not yield statistically significant differences between the groups. However, significant improvements in self-efficacy were observed within each group from pretest to post-test, particularly within the peer-debriefing group. When comparing post-test self-efficacy scores between the two groups, the results showed no significant difference ($p = 0.123$ to 0.5, $t = -1.897$ to 0, $df = 14.014$ to 18). (see Table 2). The self-debriefing group achieved a slightly higher mean score (3.5, SD = 0.627) compared to the peer-to-peer group (3.4, SD = 0.919). (see Table 6).

This lack of significance suggests that neither method was superior in fostering self-efficacy among participants, and both are similarly effective in fostering self-efficacy among participants. Though the self-debriefing group exhibited a marginally higher mean, the difference was not substantial enough to reach statistical significance. This implies that both approaches can be used interchangeably to foster post-simulation self-efficacy. It is worth noting that while statistical significance was not achieved, the practical significance of even modest improvements in self-efficacy should not be overlooked, particularly in a field as emotionally and technically challenging as end-of-life care. Additional research may be necessary to examine whether certain contextual factors, such as participant characteristics and the structure of the debriefing process, influence these outcomes.

The analysis of the debriefing experience also revealed no significant differences between the groups. The peer-to-peer debriefing group reported a mean experience score of 4.321 (SD = 0.657) (see Table 7), while the self-debriefing group scored 4.25 (SD = 0.545) (see Table 7). The independent t-test yielded: p-values of 0.116 to 0.5, t-values of 0 to 1.236 and df of 14.781 to 18. (see Table 3). These results indicate that participants in both groups found their respective debriefing methods efficacious and valuable. This suggests that both peer-to-peer and self-debriefing approaches can provide satisfactory debriefing experiences. The slight difference in mean scores was insufficient to achieve statistical significance. It is worth noting that participants preferred instructor-led debriefing as the ideal method, underscoring the perceived value of guided feedback and structured reflection. (see Table 1). This preference for instructor-led debriefing may reflect participants' cultural backgrounds and educational experiences, where more hierarchical learning approaches might be common. Future implementation could explore

hybrid models that incorporate elements of instructor guidance while maintaining the autonomy and peer learning benefits of the studied approaches.

In the peer-to-peer debriefing group, self-efficacy scores increased from a mean of 2.66 (SD = 0.969) in the pretest to 3.35 (SD = 0.919) (see Table 9) in the post-test. Similarly, the self-debriefing group improved from a mean pretest score of 3.091 (SD = 0.859) to a post-test mean of 3.5 (SD = 0.627) (see Table 8). These findings suggest that while both debriefing methods may have contributed to improved self-efficacy, the magnitude of change was inconclusive. The demographic characteristics of the participants may provide further context for these findings. Most participants were female (90%), aged between 20–39 years, and had previous healthcare experience, which might have contributed to their baseline self-efficacy levels. Additionally, most participants had prior exposure to either self-debriefing or peer-to-peer debriefing. This familiarity with debriefing methods may have moderated the observed changes in self-efficacy and debriefing experience because the interventions were not entirely new to the participants. However, peer-to-peer debriefing group had a lead in statistically significant p-values when compared to self-debriefing group (see Table 5), indicating a meaningful positive impact of the peer-debriefing intervention on participants' self-efficacy.

This pilot study employed a dual statistical approach using both one-sided and two-sided p-values for a balanced assessment. One-sided p-values aligned with the directional hypothesis that peer debriefing would outperform self-debriefing, reflecting theoretical foundations suggesting collaborative reflection enhances learning outcomes (Cho & Abe, 2013; Polit & Beck, 2021). Two-sided p-values provided a more conservative analysis examining effects in either direction. This methodology increased statistical power for detecting anticipated effects while maintaining analytical rigor. The approach acknowledges the exploratory nature of pilot

research-generating preliminary insights while transparently recognizing the limitations of small-scale studies. This strategy ensured hypothesis-aligned interpretation without limiting a comprehensive statistical examination. While p-values are sometimes debated in pilot studies, they serve valuable purposes in this research context (Kistin & Silverstein, 2015; Hertzog, 2008). In this pilot study, p-values were used primarily as exploratory indicators rather than definitive evidence of effects. They helped identify potential trends worth investigating in larger studies and provided one metric among several to describe observed patterns. The emphasis remained on effect sizes and confidence intervals, with p-values serving as supplementary information. This balanced approach acknowledges the limited statistical power of small sample studies while still leveraging all available statistical tools to generate preliminary insights.

Independent t-tests on the post-test palliative self-efficacy survey between the self-debriefing group and peer-debriefing group revealed effect sizes as high as .843, confidence interval lower at -1.423 and confidence interval upper at 0.877 (see Table 2). This is a large effect size, suggesting a substantial difference between the two groups post-test scores. But the confidence intervals do not provide conclusive evidence that the difference between the two groups scores is statistically significant. Independent t-tests on the debriefing survey between the self-debriefing group and peer-debriefing group revealed the highest effect size at .632, confidence interval lower at -.877 and confidence interval upper at 1.440 (see Table 3). The data revealed a medium to large effect size, suggesting meaningful differences between the groups.

The reported effect sizes suggest that both self-debriefing and peer-debriefing had a meaningful impact on participants' self-efficacy, despite the lack of statistical significance. While differences between the groups were not statistically significant, improvements in self-efficacy were substantial, highlighting the potential value of both debriefing methods in enhancing

learners' confidence and competence. The large effect sizes suggest practical significance, reinforcing their relevance in clinical education. The absence of statistically significant differences may indicate the influence of factors such as individual learning preferences or study context. Future research should explore the long-term impact of these debriefing methods on clinical performance. The apparent contradiction between large effect sizes and non-significant p-values underscores the impact of the small sample size on statistical power, reinforcing the preliminary nature of these findings and the need for larger-scale validation studies. Additionally, the wide confidence intervals emphasize the need for large scale studies, considering the pilot nature of the study with small sample size (Hespanhol, Vallio, Costa, & Saragiotto, 2019; Tan & Tan, 2010).

Paired t-tests between palliative self-efficacy pretest and post-test within self-debriefing group revealed effect sizes as high as 1.033, confidence interval lower at -1.787 and confidence interval upper at 0.620 (see Table 4). Although there was a large effect size indicating an improvement within the self-debriefing group, the confidence interval suggested some uncertainty. Paired t-tests between palliative self-efficacy pretest and post-test within peer debriefing group also revealed higher effect sizes at 1.398, confidence interval lower at -2.033, and confidence interval upper at 0.620 (see Table 5). The large effect sizes for pre-post changes ($d = 1.033$ and 1.398) suggest meaningful improvements in self-efficacy within both groups. This implies that while there's a strong effect in magnitude, the data do not provide sufficient evidence to confirm a significant difference at the chosen confidence level.

The wide confidence intervals crossing zero, often seen in small-sample pilot studies, suggest potential avenues for further investigation (Hespanhol et al., 2019; Tan & Tan, 2010). While both groups showed some improvement in self-efficacy from pretest to post test, there was

some uncertainty, suggesting that a single debriefing session may not be sufficient to substantially impact self-efficacy. This finding highlights the potential value of multiple debriefing sessions over time, which may be necessary to produce more pronounced and statistically significant improvements in self-efficacy for end-of-life care competence. Furthermore, the wide confidence intervals, which is typical in pilot studies with small sample warrants future investigation with a larger sample size (Hespanhol et al., 2019; Tan & Tan, 2010).

This study utilized a 95% confidence interval as it is the standard in health sciences and educational research, ensuring a balance between statistical rigor and practical applicability (Hazra, 2017).The 95% confidence interval indicates that if this study were repeated multiple times, 95 out of 100 calculated confidence intervals would contain the true effect size of peer-to-peer debriefing and self-debriefing on self-confidence and satisfaction in learning. The choice of a 95% confidence interval allows for a robust yet interpretable estimation of differences between debriefing methods while minimizing the risks of Type I (false positive) and Type II (false negative) errors (Hazra, 2017). A higher confidence interval (e.g., 99%) would increase certainty but might reduce the ability to detect smaller yet meaningful effects, whereas a lower confidence interval (e.g., 90%) could compromise reliability (Hazra, 2017). By selecting a 95% confidence interval, this study ensured that the findings are precise enough for educational and clinical relevance, supporting evidence-based approaches in nursing education (Fey & Jenkins, 2015).

Confidence intervals for the effect sizes reveal uncertainty in the estimates, where the interval spans both positive and negative values. This suggests that the true effect could range from meaningful improvement to no effect or potential decline. Such statistical instability, likely due to sample size limitations and variability in responses, precludes definitive conclusions about

debriefing efficacy. A confidence interval that includes both positive and negative values indicate insufficient evidence to confirm a significant effect but does not imply deficiency (Hespanhol et al., 2019; Tan & Tan, 2010). The wide confidence intervals observed in this study cross zero, which is common in pilot studies with small samples and this pattern indicates promising directions (Hespanhol et al., 2019; Tan & Tan, 2010). Thus, highlights the need for larger validation studies with larger sample sizes, improved methodologies, and refined measurement tools. Explicitly acknowledging statistical uncertainty prevents misinterpretation and ensures conclusions accurately reflect the intervention's potential impact. Future research should prioritize increasing sample sizes to enhance statistical power and reliability. Small sample sizes increase the risk of Type II errors, where true effects remain undetected. Larger samples reduce random variability, resulting in more precise effect size estimates and narrower confidence intervals, strengthening the ability to draw meaningful conclusions. Additionally, larger samples would improve generalizability and enable subgroup analyses to examine how factors such as prior experience, cultural background, and gender influence self-efficacy outcomes. This will detect meaningful effects, ensuring findings are statistically robust.

Furthermore, end-of-life care training is critical for IEN students and novice IENs, as it influences their self-confidence, satisfaction, and competence in real-world patient care scenarios (Evenblij et al., 2019). Research suggests that debriefing plays a central role in simulation-based education by allowing students to critically reflect on their experiences and enhance learning outcomes (Tutticci et al., 2018). The 95% confidence interval provides a statistically and practically meaningful estimate of how different debriefing methods impact these outcomes (Hazra, 2017). This ensures that nursing educators can make informed decisions about

integrating effective debriefing strategies into VSG simulations, ultimately improving end-of-life patient care training (Sanko, 2017; Timmis & Speirs, 2015).

Several factors could explain the lack of significant differences between self-debriefing and peer-debriefing in this study. First, both methods encourage reflective learning. Second, the participants prior exposure to debriefing methods and individual learning preferences may have influenced the results. Third, the sample size may have been too small to detect subtle differences between the two methods. Finally, the content and complexity of the VSG scenario may have played a role. The findings highlight the potential of VSGs to enhance nursing education by improving decision-making, clinical judgment, and preparedness for complex scenarios like end-of-life care (Vugts et al., 2020; Wong et al., 2022). Integrating VSGs with structured debriefing methods can optimize student engagement and reflective learning (Tan et al., 2017; Vugts et al., 2020; Wong et al., 2022). In practice, VSGs may help nurses develop confidence, critical thinking, and communication skills, ultimately improving patient care.

The findings of this study align with the existing literature, which emphasizes the value of debriefing as an important component in nursing education to enhance self-efficacy and experiential learning (Fegran et al., 2023). Previous research has highlighted the effectiveness of both peer-to-peer and self-debriefing in promoting reflective practice and skill development, often in combination with instructor-led methods (Ha & Song, 2015; Jaffrelot et al., 2024). While this pilot study (n=20) did not find statistically significant differences between the two debriefing approaches, it compliments prior findings that these methods can support learners in identifying strengths and areas for improvement (Kumar & Somerville, 2024). The lack of significant differences may mirror findings in existing studies that suggest similar outcomes across debriefing modalities when appropriately structured (Roh et al., 2016; Oikawa et al., 2016).

However, it is notable that much of the existing literature has focused on Western educational contexts, and this study contributes valuable insights about debriefing approaches specifically for IENs, who may have different learning needs and preferences. These initial findings warrant further investigation with larger samples.

The findings also coincide with Bandura's Social Cognitive Theory (SCT), which emphasizes the role of observation, modeling, and feedback in learning (Bandura, 1986). Peer-to-peer debriefing provided a collaborative learning environment where students reinforced self-efficacy through social reinforcement and shared reflection. This supports the SCT principle that individuals learn through interaction and observation of others, facilitating behavioral adaptation and knowledge retention (Bandura, 1986). Conversely, self-debriefing aligns with SCT's concept of self-regulation, where learners independently assess their performance and adjust their approach accordingly. However, the absence of external validation in self-debriefing may pose challenges, as learners might lack accurate self-assessment, reinforcing the study's findings that neither debriefing method demonstrated clear superiority. The lack of significant differences between methods may suggest that both approaches activate different but complementary SCT mechanisms, with peer debriefing leveraging observational learning and self-debriefing enhancing metacognitive skills.

Additionally, the results reflect key principles of Self-Determination Theory (SDT) and Adult Learning Theory (ALT). SDT posits that motivation is driven by the fulfillment of autonomy, competence, and relatedness needs (Deci & Ryan, 2012). Peer debriefing likely enhanced relatedness by fostering social connections, whereas self-debriefing supported autonomy but might have reduced engagement for learners who preferred collaborative interactions. From an ALT perspective, adult learners benefit from problem-solving and

experiential learning (Knowles, 1984), making both debriefing methods valuable depending on individual learning preferences. The findings of this study suggest that tailoring debriefing approaches to learner needs—integrating both social interaction and self-reflection—could optimize educational outcomes, particularly in complex clinical scenarios such as end-of-life care. For IENs specifically, debriefing approaches that acknowledge and incorporate cultural differences in communication styles and learning preferences may be particularly beneficial to support their transition to new healthcare contexts. Further research is necessary to refine these debriefing strategies and enhance their efficacy in nursing education.

The lack of statistical significance may be attributed to a small sample size, which reduces statistical power and limits the ability to detect true differences. While the sample size of 20 participants was appropriate for this pilot investigation, future research should include 50+ participants per group to determine whether these substantial effect sizes translate to statistically significant outcomes in larger populations. Additionally, variability in participant responses and external factors such as prior clinical experience, stress levels, and motivation could have influenced self-efficacy outcomes. For instance, students with extensive prior experience may report high baseline self-efficacy, leaving little room for measurable improvement, while external stressors may hinder the application of learned concepts. Participant characteristics—such as being IENs, predominantly female, and of Asian descent—could further contribute to response variability and measurement challenges. Cultural norms may influence self-efficacy reporting, with some cultures emphasizing humility and collective success, leading to more conservative self-assessments (Hofstede, 2001; Strachan, Kapur, & Fitzgerald, 2021). Social desirability bias may also affect responses, as participants may report expected rather than actual confidence levels. Furthermore, a short interval between pre- and post-tests may not have allowed

participants sufficient time to integrate and apply newly acquired knowledge and skills, potentially underestimating the intervention's impact. Extending the follow-up period in future studies could provide a more comprehensive assessment of self-efficacy changes.

Furthermore, this study underscores gaps in the literature, as research directly comparing self-debriefing and peer-to-peer debriefing remains limited, reinforcing the need for further exploration of these methods in varied contexts. Future studies with larger, more diverse samples and diverse methodological approaches, such as mixed-methods, longitudinal, ethnographic or observational studies, case studies, Delphi methods, meta-analyses, or systematic reviews may be needed to explore whether these factors play a role in debriefing outcomes. Furthermore, examining the impact of structured guidance and feedback on instructor-led debriefing could provide valuable insights into its perceived superiority over other methods. Future research should explore the long-term impact of VSGs, the influence of demographic factors on learning outcomes, and the effectiveness of hybrid debriefing models to further refine nursing education and training. Additionally, future studies should investigate how cultural factors might influence debriefing preferences and outcomes, particularly given the international backgrounds of participants in this study and the increasingly diverse nursing workforce globally.

Limitations

The study had a small sample size of 20 participants, with 10 in each group (self-debriefing and peer-to-peer debriefing). The sample was limited to internationally educated nursing students and novice IENs from York University, Toronto, Ontario. These factors can limit the generalizability of the findings and reduce the statistical power to detect significant differences between groups. Increasing the sample size would enhance the statistical power and generalizability of the results. The demographics were homogenous, with the majority of

participants being female, Asian, and age groups between 20-39 (see Table 1). The predominance of female participants and specific ethnic groups also limited the generalizability of the results. Stratified analysis by gender and ethnicity could be employed to examine whether significant differences exist in outcomes across these groups.

Cultural attitudes toward collaboration, hierarchy, and self-reflection can significantly influence learning preferences (Hofstede, 2001; Strachan, Kapur, & Fitzgerald, 2021). For example, students from collectivist cultures (e.g., Asian participants) may value peer-to-peer interactions more than students from individualist cultures, who might prefer self-debriefing, or instructor-led methods (Hofstede, 2001; Strachan et al., 2021). Analyzing qualitative feedback from participants on their debriefing experiences can help uncover culturally driven preferences. Mixed-method studies with diverse samples, incorporating cultural competence into intervention designs may enhance generalizability. Including a diverse group of study participants enables a deeper examination of the differences in the overall effectiveness of a specific intervention (National Academies of Sciences, Engineering, and Medicine et al., 2022)

All participants had prior healthcare experience and had completed clinical placements. Furthermore, most participants had prior experience in self-debriefing or peer-to-peer debriefing. This pre-existing familiarity could have influenced the results, as participants were not completely new to the interventions of self-debriefing and peer-debriefing, potentially reducing the observable impact on self-confidence and satisfaction in learning. Future studies can contextualize the findings by exploring how prior debriefing experience influences baseline self-efficacy and subsequent improvements. This would provide a clearer picture of whether the interventions are inherently efficacious or whether their impact is moderated by participants'

familiarity with debriefing practices. Such insights are vital for refining interventions and tailoring them to different learner profiles.

The participants preference for instructor-led debriefing, as noted in the demographic analysis (see Table 1), may have biased their engagement with self-debriefing or peer-to-peer debriefing. The lack of alignment with their preferred method might have impacted their motivation or perception of the debriefing approaches. Moreover, including a control group with no debriefing or instructor-led debriefing could provide a baseline to better understand the relative efficacy of the interventions. The study did not account for other contextual variables, such as participants workload, and stress levels during the study, or other environmental factors that could have affected their performance or perception of the debriefing methods.

Another limitation of this study is its reliance on self-reported measures of self-confidence and satisfaction. Both the Palliative Self-Efficacy Scale and the Debriefing Experience Scale rely on self-reported data, which can introduce response bias (Phillips et al., 2011; Reed, 2012). Participants may overestimate or underestimate their abilities and experiences due to social desirability bias, recall bias, or personal perceptions rather than actual performance. The potential testing effects from the same tool used for the pretest and post-test can be another limitation. A delayed post-test could be employed to minimize the testing effect, but the time cannot be extended beyond 1 week due to constraints with the study timeline.

The study focused on IEN students or novice IENs, whose prior training and cultural background may have shaped their responses to self-debriefing and peer-to-peer debriefing. Future research should explore whether these findings apply across more diverse nursing student populations, including domestically trained nurses with varying levels of experience. Participants prior experiences with virtual serious gaming (VSG), debriefing, and end-of-life care could have

affected their engagement and perceived learning outcomes. Differences in familiarity with simulation-based learning may have influenced self-confidence and satisfaction scores, highlighting the need for future studies to account for baseline competencies. Incorporating objective performance assessments or observational methods could provide a more comprehensive evaluation of debriefing efficacy.

Ensuring intervention fidelity was a key consideration in this study, particularly in implementing self-debriefing and peer-to-peer debriefing methods. Peer-to-peer debriefing was facilitated through an online discussion forum, which allowed participants to engage in reflective discussions and share insights. However, variability in the depth and quality of these discussions may have influenced learning outcomes. Differences in participants' engagement levels, communication styles, and feedback quality could have affected the efficacy of peer debriefing. Future research should explore strategies to enhance consistency in online debriefing interactions, such as structured discussion prompts or facilitator-guided moderation.

Additionally, while self-debriefing encouraged individual reflection, the extent to which participants engaged critically in the process remains uncertain. Without external validation or peer feedback, some participants may have lacked the necessary structure to fully analyze their experiences. Standardized self-debriefing frameworks or guided reflection tools can improve intervention fidelity and ensure a more uniform debriefing experience among participants. By addressing these fidelity concerns, future studies can refine debriefing approaches to optimize their impact on nursing education, particularly in the context of virtual serious gaming and end-of-life care training. However, this pilot study can serve as a preliminary investigation to inform future research, paving the path for large-scale exploration with diverse samples and control groups. Future studies could mitigate these limitations by recruiting larger, more diverse samples

across multiple institutions, using objective measures of learning outcomes in addition to self-report scales, and employing longitudinal designs to assess the long-term impact of debriefing methods on clinical competence and patient care.

Implications

Nursing Education

Although, the statistical findings were inconclusive, this study offers several practical implications for nursing education. The strong effect sizes, despite non-significant p-values, indicate that both approaches show promise and deserve further refinement and investigation. This study highlights the potential of self-debriefing and peer-to-peer debriefing as alternative or supplementary tools to instructor-led nursing education, fostering reflective learning and self-efficacy among students. Participants' preference for instructor-led debriefing suggests that hybrid models incorporating structured guidance with peer-to-peer or self-directed elements might optimize learning outcomes. Instructor-led debriefing remains the gold standard due to expert guidance, structured reflection, and correction of misconceptions, which promote deeper learning (Roh et al., 2016; Oikawa et al., 2016). However, a hybrid debriefing model, integrating self-debriefing, peer-to-peer debriefing, and instructor-led debriefing, can enhance the learning experience by offering a balance between collaboration, guided self-reflection, and expert oversight (Rueda-Medina et al., 2021; Verkuyl et al., 2020). This balanced approach may be particularly beneficial for internationally educated nursing students who are navigating not only clinical challenges but also cultural and linguistic transitions in their educational journey. Simulation-based learning, including VSGs, provides an innovative approach to complement traditional simulations in nursing education, particularly for complex topics such as palliative and end-of-life care (Sahin & Basak, 2021; Verkuyl et al., 2020).

VSGs offer students an immersive learning experience and may serve as an alternative for pre-simulation preparation, improving their readiness for real-world clinical scenarios (Tan et al., 2017; Wong et al., 2022). This study supports the integration of VSGs in curricula, allowing nursing students to practice decision-making, clinical reasoning, and compassionate communication in a risk-free virtual environment. For internationally educated nursing students specifically, VSGs may provide a valuable opportunity to encounter culturally diverse end-of-life scenarios that they might not experience in standard clinical placements, better preparing them for the multicultural realities of modern healthcare systems. A culturally responsive debriefing frameworks that acknowledge diverse educational backgrounds may enhance engagement and learning transfer. Longitudinal studies should be conducted to evaluate the long-term impact of debriefing methods on self-efficacy, competency, and professional development in nursing education. Future research should also explore how structured self- and peer-debriefing tools such as rubrics and guided reflection prompts can enhance self-directed learning and clinical preparedness.

This research benefits nursing education by identifying efficacious debriefing strategies that enhance self-confidence, critical thinking, and learning satisfaction for both internationally educated and locally trained novice nurses and students. By comparing peer-to-peer and self-debriefing in end-of-life care simulations, the findings can inform best practices for developing emotional resilience, communication skills, and clinical reasoning among all nursing students and novice nurses. Nursing programs could integrate structured self-debriefing prompts and peer feedback opportunities into simulation curricula, with faculty providing training and oversight to ensure the quality and consistency of these activities. Furthermore, the similar efficacy of both debriefing methods offers nursing educators flexibility in resource allocation, potentially

allowing more students to engage in simulation activities with meaningful debriefing even when instructor availability is limited. The comparable efficacy of both debriefing methods suggests that educators can select approaches based on available resources and specific learning contexts rather than assuming one method's superiority. Additionally, as healthcare teams become more diverse, understanding these debriefing method fosters cultural competence and collaboration, thus improving team dynamics and patient care. Overall, this study contributes to advancing simulation-based learning by helping educators tailor debriefing strategies to diverse learners, ensuring a more inclusive and efficacious nursing education system.

Nursing Practice

Self-efficacy is an essential determinant of nursing competence, influencing clinical decision-making, confidence, and quality of patient care (Kim & Baylor, 2006). This study provides insight into the impact of different debriefing methods on students' confidence in their palliative care skills, which is crucial for developing competent nurses in end-of-life and complex care settings. The findings suggest that even modest improvements in self-efficacy through various debriefing approaches may contribute to better preparedness for emotionally challenging clinical scenarios like end-of-life care, where nurses often report feeling underprepared. Instructor-led debriefing aligns clinical reflection with evidence-based practice, ensuring that nursing students receive immediate feedback and guidance and reinforcing clinical competency (Kim & De Gagne, 2018). Structured self- and peer-debriefing can be implemented in clinical settings through checklists, guided reflection prompts, and periodic instructor check-ins to promote continuous professional development and reflective practice.

The study highlights the importance of diverse patient interactions and cultural considerations when conducting debriefing. For example, gender-related empathy and cultural

perceptions of familial responsibility should be considered in debriefing strategies to ensure inclusive, patient-centered nursing care (Hofstede, 2001; Strachan et al., 2021). This cultural awareness is particularly significant when debriefing IENs, who may bring different perspectives on death, dignity, and family involvement that can both enrich and complicate end-of-life care delivery in multicultural settings. Future nursing practice models should integrate competency-based education, where various debriefing methods are utilized based on the learning objectives and clinical competencies required (Vugts et al., 2020). Additionally, healthcare institutions might consider implementing regular peer-debriefing sessions for novice nurses during their transition to practice, providing emotional support while reinforcing critical thinking skills during this challenging career phase. Nursing educators and healthcare institutions should explore cost-effective debriefing strategies that do not compromise learning quality to make professional development more accessible and scalable.

Nursing Research

This pilot study contributes to the growing body of knowledge on debriefing methods and provides a foundation for evidence-based guidelines on the appropriate use of self-debriefing and peer-to-peer debriefing in nursing education. Future research should refine study designs, incorporating larger sample sizes, longitudinal tracking, and additional variables to generate more conclusive findings. Specifically, researchers should consider multi-center studies that include both urban and rural educational settings, as resource constraints and cultural factors may influence the practicability and efficacy of different debriefing approaches across diverse contexts. Further exploration is needed into hybrid debriefing models and the integration of instructor-led debriefing with structured self-debriefing and peer-debriefing tools to determine their collective impact on clinical competency and self-efficacy. This study underscores the need

to investigate potential demographic and cultural biases in debriefing methods, such as the impact of gender and cultural background on self-efficacy and participation in peer discussions. VSGs should be further explored as an assessment tool to examine their efficacy in student engagement, ethical reasoning, and skill competency development.

Additional research should examine the long-term effects of self-debriefing and peer-to-peer debriefing on nursing competency, self-efficacy, and professional growth to ensure that these methods produce clinically competent and confident nursing professionals. Particularly valuable would-be studies tracking IENs from their educational programs through their first years of practice to determine whether alternative debriefing methods influence their professional integration and cultural adaptation to new healthcare systems. This study serves as a stepping stone for future investigations and supporting evidence-based recommendations for integrating cost-effective, scalable debriefing alternatives into nursing education programs. Future research should prioritize (1) understanding the mechanisms through which self-debriefing and peer-to-peer debriefing facilitate learning, (2) identifying best practices for implementing these methods in diverse educational contexts, and (3) evaluating their impact on outcomes such as clinical reasoning, patient safety, and interprofessional collaboration. Developing and validating culturally responsive debriefing frameworks that account for diverse communication styles, learning preferences, and end-of-life perspectives would be a valuable contribution to nursing education research, particularly as the profession becomes increasingly global.

Conclusion

In conclusion, this pilot study is novel, comparing the effects of self-debriefing and peer-to-peer debriefing on the self-confidence and satisfaction in learning among internationally

educated nursing students engaged in end-of-life care virtual simulation. This small pilot study offers preliminary insights into the potential of innovative debriefing strategies for nursing education. Recognizing the inherent limitations of a small-scale investigation, this research was designed to serve as a first step in understanding potential debriefing intervention approaches. The primary objective was to assess the basic viability of our proposed debriefing method, focusing on gathering preliminary insights that could inform future, more comprehensive effectiveness research. While statistical significance was not achieved, the substantial effect sizes ($d = 0.843$ and 1.064) suggest meaningful improvements that warrant further investigation despite the small sample size.

By intentionally constraining the study's scope, the aim was to generate initial evidence about the practicability of the intervention, identify potential challenges, and provide a foundation for subsequent, more extensive investigations. The finding that both debriefing methods produced comparable outcomes is valuable, suggesting that nursing educators may have flexibility in choosing approaches based on available resources without compromising learning quality. This approach allows us to test core methodological assumptions, evaluate initial participant responses, and determine whether the proposed debriefing strategy warrants further exploration. The pilot study serves as a key phase in research, offering an opportunity to probe the potential efficacy of innovative educational strategies while maintaining realistic expectations regarding the depth and generalizability of the findings. Future research should build upon these preliminary findings to develop culturally responsive debriefing frameworks that address the unique needs of internationally educated nursing students navigating both clinical and cultural transitions.

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Appendix A

Search Strategy

Research Question:

How do peer-to-peer debriefing and self-debriefing compare in their efficacy to improve self-confidence, and satisfaction in learning among Internationally Educated Nursing (IEN) students or novice IENs (IENs).

after a VSG simulation on end-of-life care?

Population	Context	Concept	Concept
Internationally Educated Nursing Students/ Nurses	Virtual Serious Game	Debriefing	Peer
KW	KW	KW	KW
Nursing Students Internationally-Educated Nursing-Students Internationally-Educated Nurses Novice Education School Program Curriculum	Virtual Serious Game Simulation Applied games Educational games High-fidelity Infotainment Digital learning game Online learning game Artificial learning game Gamification Interactive learning Virtual serious learning Simulation applied learning Internet Virtual reality Avatars	Debriefing Review Discussion Synthesis Reflection Perception Self N2 (debriefing OR review OR synthesis OR reflection)	
MeSH	MeSH	MeSH	MeSH
(MH "Students, Nursing") OR (MH "Internationally Educated Nursing	(MH "Video Games") OR (MH "Virtual Reality") OR (MH "Avatars") OR (MH	(MH "Reflection") OR (MH "Perception")	(MH "Group Processes") OR (MH "Consensus") OR (MH "Peer Group")

Students, Internationally Educated Nurses, Novice") OR (MH "Students, Nursing, Male") OR (MH "Students, Nursing, Doctoral") OR (MH "Students, Nursing, Associate") OR (MH "Students, Nursing, Graduate") OR (MH "Students, Nursing, Baccalaureate") OR (MH "Students, Nursing, Practical") OR (MH "Students, Nursing, Diploma Programs") OR (MH "Students, Nurse Midwifery") OR (MH "Education, Nursing, Diploma Programs") OR (MH "Schools, Nursing")	"Augmented Reality") OR (MH "Computer Simulation") OR (MH "Education, Non-Traditional") OR (MH "MOOC") OR (MH "Online Education") OR (MH "Gamification")		

Appendix B

Demographic Questionnaire

Participant Information

1. Participant ID/Code :
   - [Last 4 digits of your phone number.]
2. Gender:
   - Male
   - Female
   - Other (please specify): _____
3. Age:
   - Under 20
   - 20-24
   - 25-29
   - 30-34
   - 35-39
   - 40-44
   - 45-49
   - 50-54
   - 55-59
   - 60 or older
4. Ethnicity:
   - Asian
   - Black/African American
   - Caucasian/White
   - Hispanic/Latino
   - Other (please specify): _____

Educational Background

5. Type of Nursing Program:
   - Bachelor of Science in Nursing (BSN)
   - Practical Nursing
   - Other (please specify): _____
6. Clinical Placement Experience:
   - Yes/No
7. Simulation Experience:
   - Yes/No

8. Previous Healthcare Experience:
    - Yes
    - No

Peer-to-Peer Debriefing and Self-Debriefing Experience

9. Experience with Peer-to-Peer Debriefing:
    - Yes
    - No
10. Experience with Self-Debriefing:
    - Yes
    - No
11. Preferred Debriefing Method:
    - Peer-to-Peer
    - Self-Debriefing
    - No Preference

Appendix C

Pretest: Palliative Care Self-Efficacy Scale

Please rate your degree of confidence with the following patient / family interactions and patient management topics, by ticking the relevant box below:

1 -- Need further basic instruction
2 -- Confident to perform with close supervision / coaching
3 -- Confident to perform with minimal consultation
4 -- Confident to perform independently

	Patient/family interactions and clinical management	**1**	**2**	**3**	**4**
1	Answering patients' questions about the dying process				
2	Supporting the patient or family member when they become upset				
3	Informing people of the support services available				
4	Discussing different environmental options (eg: hospital, home, family)				
5	Discussing patient's wishes for after their death				
6	Answering queries about the effects of certain medications				
7	Reacting to reports of pain from the patient				
8	Reacting to and coping with terminal delirium				
9	Reacting to and coping with terminal dyspnea (breathlessness)				
10	Reacting to and coping with nausea / vomiting				
11	Reacting to and coping with reports of constipation				
12	Reacting to and coping with limited patient decision-making capacity				

(Phillips et al., 2011)

Appendix D

Diamond Debriefing Model Questions

1	How did you feel about the virtual serious game experience?
2	Were there any moments that resonated with you or stood out for you in the virtual serious game?
3	What key observations did you make?
4	Did you experience any challenges during the virtual serious game scenario?
5	What were the key takeaways from the virtual serious game scenario?
6	In what ways do you think this virtual serious game learning experience will inform your future practice as a nurse?
7	Do you have any recommendations for enhancing the effectiveness of debriefing?

(Jaye et al., 2015)

Appendix E

Post-test: Palliative Care Self-Efficacy Scale

Please rate your degree of confidence with the following patient / family interactions and patient management topics, by ticking the relevant box below:

1 -- Need further basic instruction
2 -- Confident to perform with close supervision / coaching
3 -- Confident to perform with minimal consultation
4 -- Confident to perform independently

	Patient/family interactions and clinical management	**1**	**2**	**3**	**4**
1	Answering patients' questions about the dying process				
2	Supporting the patient or family member when they become upset				
3	Informing people of the support services available				
4	Discussing different environmental options (eg: hospital, home, family)				
5	Discussing patient's wishes for after their death				
6	Answering queries about the effects of certain medications				
7	Reacting to reports of pain from the patient				
8	Reacting to and coping with terminal delirium				
9	Reacting to and coping with terminal dyspnea (breathlessness)				
10	Reacting to and coping with nausea / vomiting				
11	Reacting to and coping with reports of constipation				
12	Reacting to and coping with limited patient decision-making capacity				

(Phillips et al., 2011)

Appendix F

Debriefing Experience Scale

1 -- Strongly Disagree
2 -- Disagree
3 -- Neutral
4 -- Agree
5 -- Strongly Agree

		1	2	3	4	5
1	Debriefing assisted me in analyzing my thoughts					
2	The debriefing environment was physically accommodating					
3	Feelings of uneasiness from the VSG simulation were resolved through debriefing					
4	Debriefing aided me in establishing connections in my learning					
5	Debriefing facilitated the processing of the simulation experience					
6	Debriefing presented me with a learning opportunity					
7	Debriefing helped me find significance in the VSG simulation					
8	Debriefing addressed my queries from the simulation					
9	I gained increased self-awareness during the debriefing session					
10	Debriefing assisted in clarifying issues and better understanding of the VSG simulation					
11	Debriefing facilitated connections between theory and real-life situations					
12	Debriefing served as a platform for me to reflect on my actions during the simulation					
13	I had ample time to express my feelings before providing input					
14	I had sufficient time for comprehensive debriefing					

(Reed, 2012)

Appendix G

Research Invitation Flyer

Hello,

You are invited to participate in an exciting research study conducted by Betsy Arunakkalpadam Joseph, a student researcher at York University, as a part of my MScN program. This study aims to investigate the efficacy of peer-to-peer debriefing and self-debriefing in enhancing self-confidence and satisfaction in learning after engaging in a virtual serious game (VSG) simulation on end-of-life care, among Internationally Educated Nursing (IEN) students or novice IENs (IENs) who have held Canadian nursing licensure for less than one year

Study Overview:

- **Title:** Comparing Peer-to-Peer Debriefing and Self-Debriefing in Nursing Education
- **Researcher:** Betsy Arunakkalpadam Joseph, Student Investigator
- **Supervisor:** Eva Peisachovich, PhD
- **Committee member:** Celina Da Silva, PhD

Participation Details:

- **Eligibility:** Internationally educated nursing students or novice IENs who have held Canadian nursing licensure for less than 1 year and who have not previously participated in similar debriefing interventions related to end-of-life care or palliative care.
- **Time Commitment:** An estimated time commitment of less than 1 hour is required to complete the study activities.
- **Study Procedures:** Participants will be asked to complete a pre-test questionnaire, engage in a virtual serious game simulation, engage in debriefing, and then complete a post-test questionnaire and a debriefing experience questionnaire. Participation is entirely voluntary, and all responses will be kept confidential.

Benefits of Participation:

- Gain insights into debriefing methods in nursing education
- Opportunity to experience virtual serious game scenario
- Exposure and experience end-of-life care virtually
- Improve knowledge on palliative care nursing

Your Participation Matters: Your participation is crucial for the success of this study. By sharing your experiences and insights, you will help advance our understanding of efficacious teaching strategies in nursing education.

How to Participate: If you are interested in participating, please complete and submit the informed consent and the demographic questionnaire available at the links given below. Once your completed informed consent and demographic questionnaire is received, the study links will be emailed to the email id that you provided. Please follow the instructions. Your responses will be anonymous, and your confidentiality will be strictly maintained.

Counselling Services
If at any time during the study, you experience any kind of discomfort or uneasiness with the study please feel free to reach out to the following counselling services:

- **Canada.ca**: 1-866-332-2322, available 24/7, staffed by mental health professionals
- **Good2Talk**: 1-866-925-5454, available 24/7, you can also text GOOD2TALKON to 686868
- **CFS Counselling Wellbeing**:-- Available in-person and virtual, info@cfssc.ca , (705) 726-2503, https://cfssc.ca/locations/barrie/

Please see the following counselling services available for York University students:

- **York University Counselling Services**
  Counselling services are available for all York students on both our Keele and Glendon campuses to help students to realize, develop and fulfill their personal potential to maximally benefit from their university experience and manage the challenges of university life. We offer free walk-in counselling services at both campuses as well as **virtual** and **in-person** short-term ongoing counselling options.

  - **Student Counselling, Health & Well-being**
    Email: schw@yorku.ca
    Phone: 416-736-5297
    Location: N110 Bennett Centre for Student Services, Keele Campus
    Hours: Monday to Friday - 9 a.m. to 3 p.m.

  - **Accessibility, Well-Being and Counselling Centre**
    Email: counselling@glendon.yorku.ca
    Phone: 416-487-6709
    Location: Glendon Hall, Room 111A, Glendon Campus
    Hours: Monday to Friday - 9 a.m. to 3 p.m.

  - **Link to more counselling services and resources:**
    https://www.yorku.ca/well-being/resources/students/

Compensation:
Participants who complete all the surveys can enter a draw to win $10 Tim Hortons gift card. A $10 Tim Hortons gift card will go to each of the 5 winners drawn from the pool of participants.

If you are interested to participate, please complete the informed consent, and proceed to demographic questionnaire available at the following links:

Informed Consent Link:

https://docs.google.com/forms/d/e/1FAIpQLSfZ-5_FTsU1-97QeINhME84i7qyvkDtheic0iHLwmmn-q0sLQ/viewform?usp=sf_link

Demographic Questionnaire Link:

https://docs.google.com/forms/d/e/1FAIpQLSdwUIa0BSym5nzUOvwzYY4E7vyJOsYO503LA4I0mrVAfgklSg/viewform?usp=sf_link

If you have any questions or concerns about the study, please feel free to contact Betsy Arunakkalpadam Joseph at betsyaj@my.yorku.ca

Thank you for considering participating in this study. Your contribution is highly valued and appreciated.

Sincerely,
Betsy Arunakkalpadam Joseph, RN, MScN (c)

Appendix H

Informed Consent Form

Date:

Title of Study: Comparison of peer-to-peer debriefing and self-debriefing in nursing education using virtual serious games

Researcher: Betsy Arunakkalpadam Joseph, Student Investigator
Supervisor: Eva Peisachovich, PhD
Committee member: Celina Da Silva, PhD
Institution: York University

Purpose of the Study: The purpose of this study is to compare the impact of peer-to-peer debriefing and self-debriefing in learning among Internationally Educated Nursing (IEN) students or novice IENs after a virtual serious game (VSG) on end-of-life care. Your participation will help us understand which debriefing method is more efficacious in enhancing learning outcomes in nursing education.

Study Procedures: If you agree to participate in this study, you will be randomly assigned to one of two groups: the peer-to-peer debriefing group or the self-debriefing group. Both groups will participate in a virtual simulation activity using serious games depicting nursing scenarios related to end-of-life care. Before the virtual serious game, you will be asked to complete a pre-assessment questionnaire. After completing the VSG and the debriefing session (either peer-to-peer or self-debriefing), you will be asked to complete 2 post-assessment questionnaires. Your participation in this study will take approximately ess than 1 hour.

Benefits of Participation: Your participation in this study may contribute to the advancement of nursing education by providing insights into efficacious debriefing methods for improving learning outcomes among nursing students. Additionally, you will have the opportunity to engage in a virtual simulation activity using serious games, which can enhance your understanding of nursing concepts and skills in a safe and controlled environment. You will also gain knowledge, experience, and exposure to end-of-life care scenario.

Risks and Discomforts: There are minimal risks associated with participating in this study. However, you may experience discomfort or frustration if you find the content of the virtual simulation activity emotionally challenging or if you encounter technical difficulties during the debriefing session. Please inform the research team if you experience any discomfort or if you wish to withdraw from the study at any time.

Confidentiality: Your participation in this study is confidential. Your responses will be anonymized and stored securely in accordance with data protection regulations: password protected computer and locked filing cabinet. Only authorized members of the research team will have access to the data. Your name or any identifying information will not be disclosed in any

publications or presentations resulting from this study. All electronic data will be password protected and printed data will be kept in a locked cabinet for 7 years after the anticipated last action and the printed information will be destroyed by shredding and electronic files will be permanently deleted.

Voluntary Participation and Withdrawal: Participation in this study is voluntary, and you have the right to withdraw at any time without penalty. Your decision to participate or not participate will not affect your academic standing or future opportunities within York University now or in the future. If you choose to withdraw from the study, you may do so by notifying the research team at any time during the study procedures.

Compensation: Participants who complete all the surveys can enter a draw to win $10 Tim Hortons gift card. A $10 Tim Hortons gift card will go to each of the 5 winners drawn from the pool of participants.

Questions and Contact Information: If you have any questions about this study or your participation, please feel free to contact the student investigator, Betsy Arunakkalpadam Joseph, at betsyaj@my.yorku.ca. This research has received ethics review and approval by the Human Participants Review Sub-Committee, York University's Ethics Review Board and conforms to the standards of the Canadian Tri-Council Research Ethics guidelines. If you have any questions about this process, or about your rights as a participant in the study, please contact the Director, Research Ethics in the Office of Research Ethics, 3rd Floor, Kaneff Tower, York University (e-mail ore@yorku.ca).

Legal Rights and Signatures:

I _____, consent to participate in the study: Comparison of peer-to-peer debriefing and self-debriefing in nursing education using virtual serious games conducted by Betsy Arunakkalpadam Joseph. I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Participant's Signature: _____Date: _____

Participant Email: _____

Researcher's Signature: _____*BAJ*_____ Date: _____

Informed Consent Link:
https://docs.google.com/forms/d/e/1FAIpQLSfZ-5_FTsU1-97QeINhME84i7qyvkDtheic0iHLwmmn-q0sLQ/viewform?usp=sf_link

Appendix I

Self-Debriefing Intervention Group Steps

Pretest Self-Efficacy Survey – Version S:

https://docs.google.com/forms/d/e/1FAIpQLSdHg8YmBjhfwhrjp3j_XwhTX6oURKiLtTZGoc5yNjQIsbiFUw/viewform?usp=sf_link

Virtual Serious Game DSpace: End-of-Life Care Link:

URI: https://openlibraryrepo.ecampusontario.ca/jspui/ handle/123456789/1770

Self-Debriefing Questions:

1. How did you feel about the virtual serious game experience?
2. Were there any moments that resonated with you or stood out for you in the virtual serious game?
3. What key observations did you make?
4. Did you experience any challenges during the virtual serious game scenario?
5. What were the key takeaways from the virtual serious game scenario?
6. In what ways do you think this virtual serious game learning experience will
7. inform your future practice as a nurse?
8. Do you have any recommendations for enhancing the effectiveness of debriefing?

Please reflect and answer the above debriefing questions at the following **self-debriefing session link:**

https://docs.google.com/forms/d/e/1FAIpQLSeXbwnYsG-Szkw7kC-47dJHi4SlvV13B_TFHkrO7Xs-dAaC_A/viewform?usp=sf_link

Post-test Self-efficacy survey – Version S

https://docs.google.com/forms/d/e/1FAIpQLSeeO8YbQqnB1sL1AHO7YbQYK8Zd7lCO3dI-xECZ8sLg6zARcg/viewform?usp=sf_link

Debriefing Experience Survey – Version S

https://docs.google.com/forms/d/e/1FAIpQLSf8-1X-StWZMrlzKXPICMTyj4GXTAf_AbR1w5mR8oJsrhpg-Q/viewform?usp=sf_link

Appendix J

Peer-to-Peer-Debriefing Intervention Group Steps

Pretest Self-Efficacy Survey – Version P

https://docs.google.com/forms/d/e/1FAIpQLSetNeZGg_hV71FlhsHO5n3o78KkN_DJ2eLoWI5UPGCDMw7Xqw/viewform?usp=sf_link

Virtual Serious Game DSpace: End-of-Life Care Link:

https://vlslibrary.ecampusontario.ca/itemdetails/#/a45623dcb7ed403da4def1c50e1173aa?k=palliative%20care&itemTypes=6&itemTypes=12&sortCol=1&increasePopularSearch=true&collections=CVLP%20Collection&collections=VLS%20Collection

Peer-to-Peer Debriefing Questions:

1. How did you feel about the virtual serious game experience?
2. Were there any moments that resonated with you or stood out for you in the virtual serious game?
3. What key observations did you make?
4. Did you experience any challenges during the virtual serious game scenario?
5. What were the key takeaways from the virtual serious game scenario?
6. In what ways do you think this virtual serious game learning experience will inform your future practice as a nurse?
7. Do you have any recommendations for enhancing the effectiveness of debriefing?

Online Discussion Forum:

Please reflect, respond, and engage with your peers on the given debriefing questions on the online discussion form available at the following **peer-to-peer debriefing session link:**

https://padlet.com/marybetsy18/peer-to-peer-discussion-debriefing-bonp2j2orablrm7y

Post-test Self-Efficacy Survey – Version P

https://docs.google.com/forms/d/e/1FAIpQLSdddit-hATknxK3QwNqGOW5c54d02PKwCrggyqJtc5OMdyRjA/viewform?usp=sf_link

Debriefing Experience Survey – Version P

https://docs.google.com/forms/d/e/1FAIpQLSdBwWde9b6WI1rzvj-RxVFPCSZWJStSSP-ICUnjQ_nuMgI4-A/viewform?usp=sf_link