School of Nursing, Midwifery, and Paramedicine

Using Simulation to Evaluate Discharge Communication: The Relationship between Realism, Presence, and Student Learning Outcomes

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Declaration

To the best of my knowledge and belief, this study contains no material previously published by any other person except where due acknowledgment has been made. This study contains no material, which has been accepted for the award of any other degree or diploma in any university.

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Sharon MacLean

Date: 20th May 2020

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Abstract

Introduction: This study investigated if the use of simulation-based education (SBE) improved the communication discharge practices of undergraduate nursing students. Effective communication has been identified as a skill to improve patient outcomes and decrease clinical errors. Unplanned hospital readmissions within one to five days of discharge are considered an adverse event associated with failures in the discharge planning process. Early hospital readmission can be avoided through improved discharge planning and communication. Nurses need to ensure that all patient-related information is delivered accurately and effectively to patients or caregivers at the time of discharge from hospital.

When healthcare professionals and patients discuss discharge care planning, the patient retains only a limited amount of the information provided. Education using SBE offers an opportunity to practice discharge communication skills such as the teach-back method. The clinical context for communication skills training (CST) in this study was discharging a patient from a hospital with type two diabetes mellitus (T2DM). An estimated 422 million people globally and 1.7 million people in Australia have been diagnosed with T2DM. Patients with this chronic condition often have high readmission rates and poor health outcomes post-discharge.

The overall goal of SBE is to prepare nursing graduates for clinical practice. To engage learners in the simulation, scenarios need to replicate conditions from a clinical setting. Working with simulated patients (SPs) is one way to optimise this realism. A high level of realism allows the student to suspend their disbelief and be present in the simulation. The use of video-assisted reflection as part of the debriefing process has also been recommended to improve SBE learning outcomes.

Aims and Objectives: This study addresses two aims: "Can undergraduate nursing students discharge practices be improved by SBE communication skills training?" and "Can improving the quality of the student experience during SBE influence learning outcomes?" The first objective was to explore the effectiveness of SP training approaches and requirements of SPs to be consistent in role portrayal and student evaluation. Second, to identify if communicating risk factors and applying the teach-back method during discharge improved student-learning outcomes. The final objective of this study was to develop and implement an integrated conceptual model of presence in SBE to explore how students' perceptions of realism and presence during the simulation, and their ability to

reflect on their performance, contribute to learning outcomes in discharge communication skills.

Research methodology and method: A realist evaluation methodology for SBE was employed. A realist evaluation is positioned between positivism and constructivism and was considered appropriate to answer the research questions within this study. A mixed-method design was utilised. In phase one, an integrated literature review investigated and synthesised published quantitative and qualitative evidence relating to the use of SPs in communication skills training. Additionally, an evaluation of SP training was undertaken to ensure standardisation of SP performance, evaluation and feedback consistency. Tools used to measure teaching faculty, and SPs evaluation of discharge related information included an Interpersonal Communication Assessment Scale (ICAS) and the Quality Discharge Teaching Scale (QDTS).

In phase two of the study, a quasi-experimental control group design was applied. Students demonstrated their discharge skills with SPs in three randomly assigned groups – control, information-risk factors, and interaction teach-back. The students completed the simulation over 12 months (three one-week blocks) from January 2016 until January 2017. Each week consisted of two three-hour sessions per day, with an average of four students in each session. On completion of the simulation activity, each student privately viewed an audio-visual (AV) recording of his or her session before attending a group debriefing. The collection of quantitative data from students, SPs, and teaching faculty, was conducted after each simulation. Instruments included the Interpersonal Communication Assessment Scale (ICAS), Quality Discharge Teaching Scale (QDTS), Simulation Design Scale (SDS), and the Concept of Presence Scale (COP). Analysis of quantitative data in phase one and two of the study was performed using SPSS (22.0). In phase two, qualitative data from both debriefing groups and individual interviews were collected. Thematic and content analysis was performed on the qualitative data.

Participants: A total of (n=141) second and third-year undergraduate nursing students participated in the study. Eight simulated patients, four teaching faculty and a sub-sample of 42 students were involved in data collection in phase one. All 141 undergraduate nursing students participated in phase two of the study.

Results and findings: The study results are presented in five published papers. In publication one, an integrated literature review of SBE found that working with SPs was limited to complex clinical contexts. Inadequacies in the application and reporting of

research methods were identified. Working with SPs in a broader clinical context and with increased methodological rigour was suggested.

In publication two, the effectiveness of SP training was examined using inter-rater reliability to compare SP ratings with teaching faculty. Results indicated that after completing the simulation training, SPs were able to discriminate between high and low-level performance benchmarks and provide reliable evaluations of student skills that were consistent with teaching faculty. This result demonstrated that comprehensive training of SPs ensured that they were able to accurately portray the scenario, deliver a consistent learning experience and provide task-specific feedback for the students.

An evaluation of the two training interventions to improve student nurses' communication skills at discharge was reported in publication three. Independent group MANOVAS were conducted to compare student performance across the intervention groups using both the QDTS content and delivery subscales as dependent variables. Analysis of student, SP and teaching faculty ratings showed that incremental improvements in student communication skills were achieved in both the information and interaction groups compared to the control group. This finding indicates that providing students with both information- and interaction-based communication skills training can improve student discharge practice.

Publication four presented results of a qualitative study examining students' thoughts about their experience and learning in the simulation and use of video-assisted reflection as part of the debriefing. Thematic analysis of responses during group debriefing sessions identified six themes: realism, non-verbal communication, verbal communication skills, and reflective learning. Students showed a high level of self-awareness, reporting that the simulation and self-reflection experience helped them to gain a greater understanding of verbal and non-verbal communication skills. Students reflected on the importance of engaging with patients and considered their post-discharge needs and well-being as part of the discharge process. The results of the content analysis were presented in two-word clouds. Students' thoughts and feelings about the experience showed a collective shift from negative, anxiety evoking expectations before the simulation, to positive feelings of confidence and a sense of achievement after.

Publication five applied a newly developed integrated conceptual model of presence in SBE to examine the relationship between realism, presence and student learning outcomes. As the primary analysis method, hierarchical multiple regression was conducted on the quantitative data and thematic analysis of the qualitative data. A positive,

fully mediated relationship between realism, presence, and discharge communication skills was found. Students' perceptions of realism and presence in the simulation were not impacted by the communication interventions but varied between individuals within the study groups, indicating that characteristics of the students were influencing both their perceptions of realism and level of engagement. The realism of the simulation experience provided students with the opportunity to reflect on their performance, knowledge and capacity to transfer skills into clinical practice.

Conclusion: This study applied an integrated conceptual model of presence in SBE to examine undergraduate nursing students' discharge practices when working with SPs. The study has provided several unique findings to address gaps in the healthcare simulation literature with a focus on SP training, simulation design, and debriefing procedures in CST. While both information- and interaction-based communication strategies were found to improve undergraduate nursing students' discharge practices, the study findings highlight that having the opportunity to work with SPs in a realistic simulated environment improved students' engagement in their learning experience. By allowing students to review their performance before the debriefing, students were able to reflect on their communication skills as novice practitioners. Enhancing realism to improve student engagement and presence was found to be an essential component of SBE. Further research to examine how individual factors influence nursing students' perceived realism and sense of presence during SBE is required. Also, measuring patient outcomes in clinical settings remains a challenge for future researchers evaluating the efficacy of SBE.

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List of Abbreviations

ASSH	Australian Society for Simulation in Health Care
CASP	Critical Appraisal Skills Program
CST	Communication Skills Training
INASCL	International Nursing Association for Clinical Simulation and Learning
NHET-Sim	National Health Education and Training in Simulation
NLN/JEFFRIES	National League for Nursing Jeffries Simulation Theory
NSQHS	National Safety and Quality Health Service
SBE	Simulation-Based Education
SESAM	The Society in Europe for Simulation Applied to Medicine
SP	Simulated Patient
SPs	Simulated Patients
SSH	Society for Simulation in Healthcare
TJC	The Joint Commission
T2DM	Type Two Diabetes Mellitus
TSR	Translational Research
UK	United Kingdom
USA	United States of America
WHO	World Health Organization
VD	Verbal Debriefing
VAD	Video-Assisted Debriefing
VR	Virtual Reality

Glossary of Terms

Conceptual Fidelity	In healthcare simulation, ensures that all elements of the scenario realistically relate to each other so that the case makes sense as a whole to the student(s) (Choi et al., 2017).
Debriefing	A formal, collaborative, reflective process within the simulation learning activity. To encourage students' reflective thinking and provide feedback about their performance while various aspects of the completed simulation are discussed (INACSL, 2016).
Evidence-based	The conscientious use of current best evidence in making decisions about patient care (edglossary.org/evidence-based).
Facilitator	An individual who is involved in the implementation and delivery of simulation activities (SSIH, 2017).
Feedback	A return of information about a result or the returned portion of a process (Merriam Webster Dictionary, 2017).
Fidelity	Fidelity is believability or the degree to which a simulated experience approaches reality. (INASCL, 2011).
Immersion	Describes the level to which the student becomes involved in the simulation; a high degree of immersion indicates that the student is treating the simulation as if it was a real-life (or very close to real-life) event (SSH, 2017).
Mannequin	A life-sized human simulator representing a patient for healthcare simulation and education (Palaganas, Maxworthy, Epps, & Mancini, 2015).
Modality	A term used to refer to the type(s) of simulation being used as part of the simulation activity, for example, task trainers, mannequin based, standardised/simulated patients, computer-based, virtual reality, and hybrid
Non-Technical Skills	In the healthcare field, the skills of communication, (patient-provider, team) leadership, teamwork, situational awareness, decision-making, resource management, safe practice, adverse event minimisation/mitigation, and professionalism; also known as behavioural skills or teamwork skills (ASSH, 2017).
Nursing Presence	Definitions in nursing refer to presence as a state of being with a patient with the added dimensions of sensitivity to human needs, as well as the dimensions of a therapeutic relationship (Parse, 2002).
Physical Fidelity	A level of realism associated with a particular simulation activity. The degree to which the simulation looks, sounds, and feels like the actual task (INASCL, 2015).

Psychological Fidelity	The degree of perceived realism, including psychological factors such as emotions, beliefs, and self-awareness of students in simulation scenarios (Choi et al., 2017).
Psychological Safety	A feeling (explicit or implicit) within a simulation-based activity that students are comfortable participating in, speaking up, sharing thoughts, and asking for help as needed without concern for retribution or embarrassment (Edmondson et al., 2012).
Pedagogical	Means concerning the methods and theory of teaching (Collins English Dictionary, 2017).
Presence	Presence is a multidimensional state of being in interaction in the real world. Presence is a state of interaction from a person's focus, perception, cognition, engagement, and action (Dunnington, 2014).
Pre-briefing	The time used by teaching faculty, researchers, facilitators, or staff to plan their roles before the simulation; suggested activities in a pre-briefing include an orientation to the equipment, environment, mannequin, roles, time allotment, objectives, and patient situation (INACSL, 2016).
Realism	The ability to impart the suspension of disbelief to the student by creating an environment that mimics that of the student's work environment; realism includes the environment, simulated patient, and activities of the teaching faculty, educators, assessors, and facilitators (INACSL, 2016).
Reflection	Reflection is an active, rigorous and emotional initiative that promoted learning by building new knowledge on experiences (Dewey, 1993).
Reflective Learning	A process to assist students in identifying their knowledge gaps and demonstrating the areas in which they may need further improvement; this reflection requires conscious self-evaluation to deal with unique patient situations (INACSL, 2016).
Reflection-on-action	Reflection-on-action is to analyse an event once the event has passed (Schön, 1983).
Simulationist	An individual who is involved in the design, implementation, and delivery of simulation activities; for example, educators, technologists, operations specialists, technicians.
Simulated Patients	An individual who is trained to portray a real patient to simulate a set of symptoms or problems used for healthcare education, evaluation, and research (INACSL, 2016).
Simulation	A pedagogy using one or more typologies to promote, improve, or validate a student's progression from novice to expert (INACSL, 2016).

Simulation Modality	A term used to refer to the type(s) of simulation being used as part of the simulation activity, for example, task trainers, mannequin-based, standardised/simulated patients, computer-based, virtual reality, and hybrid (SSH, 2017).
Standardised Patient	An individual trained to portray a patient with a specific condition in a realistic, standardised, and repeatable way and where portrayal/presentation varies based only on student performance; this strict standardisation of performance in a simulated session is what can distinguish standardised patients from simulated patients (INACSL, 2016).
Teach-Back	An evidence-based (interactional-based) approach to deliver teaching points and validating comprehension (Caplin & Saunders, 2015).
Teaching Faculty	Teaching faculty teach undergraduate and graduate students in an area of specialisation or several related areas in a university or college setting.
Video-Assisted Debriefing	Video playback or review of key scenes during debriefing (SSH, 2017).
Virtual Presence	Presence in the virtual context has been defined as the subjective sense of "*being there*" (Minsky, 1980, p. 48) and as an "experience of being in one place or environment, even when one is physically situated in another" (Witmer & Singer, 1998, p. 22).
Virtual Reality	An artificial environment, which is experienced through sensory stimuli (such as sights and sounds), provided by a computer and in which one's actions partially determine what happens in the environment (Virtual Reality Society, 2017).
Word Cloud	A word cloud is an image made of words that together resemble a cloudy shape.

Publications and Statement of Contributions from others

This study contains published works, all of which have been co-authored. The bibliographical details and descriptions of the works and the contributions of each author are listed below. The publications are documented in order of their placement within the study chapters.

Publication One

Maclean, S., Kelly, M., Geddes, F. & Della, P. (2017). Use of simulated patients to develop communication skills in nursing education: An integrative review. *Nurse Education Today*. 48: pp. 90 98.98.doi:10.10.1016/jnet.2016.09.018.

Sharon MacLean conducted the literature review, developed the framework and drafted the manuscript. Fiona Geddes, Michelle Kelly, and Phillip Della critically reviewed the manuscript.

Publication Two

MacLean, S., Kelly, M., Geddes, F., & Della, P. (2018). Simulated patient training: Using inter-rater reliability to evaluate simulated patient consistency in nursing education. *Nurse Education Today*, 62, 85–90. http://doi.org/10.1016/j.nedt.2017.12.024

Sharon MacLean conducted the literature review, developed the method, performed the analysis and drafted the manuscript. Fiona Geddes assisted with analysis and interpretation. Fiona Geddes, Michelle Kelly, and Phillip Della critically reviewed the manuscript.

Publication Three

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2018). Evaluating Teach-back in Simulation to Improve Discharge communication. *Clinical Simulation in Nursing*. (22),13-21. http://doi: org/10.1016/j.ecns.2018.06.005

Sharon MacLean conducted the literature review, developed the method, conducted the analysis and drafted the manuscript. Fiona Geddes assisted with analysis and interpretation. Fiona Geddes, Michelle Kelly, and Phillip Della critically reviewed the manuscript.

Publication Four

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2019). Video reflection in discharge communication skills training with simulated patients: A qualitative study of nursing students' perceptions. *Clinical Simulation in Nursing*, 28,15-24. http://doi: org.10.1016/j.ecns.2018.12.006

Sharon MacLean conducted the literature review, developed the method, conducted the analysis and drafted the manuscript. Fiona Geddes and Michelle Kelly assisted with data extraction and interpretation. Fiona Geddes, Michelle Kelly, and Phillip Della critically reviewed the manuscript.

Publication Five

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2019). Realism and the concept of presence in simulation: Nursing student perceptions and learning outcomes. *Journal of Nurse Education.*58(6) 330-338. http*://*doi. 10.3928/01484834-20190521-03.

Sharon MacLean conducted the literature review, developed the method, conducted the analysis and drafted the manuscript. Fiona Geddes and Michelle Kelly assisted with data extraction and interpretation. Fiona Geddes, Michelle Kelly, and Phillip Della critically reviewed the manuscript.

Authorship Statements

Publication One

Authorship Statement

Authorship statement for PhD thesis submitted for examinations by Sharon MacLean (09800199)

I, Sharon MacLean, contributed to the all of the data collection, data analysis, drafting of paper and reviewing of the following publication:

Maclean, S. and Kelly, M. and Geddes, F. and Della, P. 2017. Use of simulated patients to develop communication skills in nursing education: An integrative review. *Nurse Education Today*. 48: pp. 90 98.98.doi:10.10.1016/jnet.2016.09.018.

I (Sharon MacLean) wrote the first draft for each paper, all co-authors were involved in data analysis, and reviewing each paper for publication. Sharon MacLean is the first author on each of the publications. The order of authors (second to fourth) was determined by contributions to each publication.

[redacted]

I, as Co-Author, endorse that this level of contribution by the candidate indicated above is appropriate.

Fiona Geddes

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Publication Two

Authorship Statement

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Fiona Geddes [redacted]

Michelle Kelly

Phillip Della

Conference Presentations

Maclean, S., Kelly, M., Geddes, F. & Della, P. (2017). Use of simulated patients to develop communication skills in nursing education: An integrative review. Oral presentation January 2017, Australasian Simulation Congress 2017, Sydney Australia.

MacLean, S., Kelly, M., Geddes, F., & Della, P. (2018). Simulated patient training: Using inter-rater reliability to evaluate simulated patient consistency in nursing education. Oral presentation January 2017, Australasian Simulation Congress, Sydney Australia.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2019). Video reflection in discharge communication skills training with simulated patients. Oral presentation May 2019, Psi Alpha At Large, Harry Perkins Institute of Medical research, Nedlands Australia.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2018). Simulated patient training: Using inter-rater reliability to evaluate simulated patient consistency in nursing education. Poster presentation October 2017, West Australia Simulation in Healthcare Alliance Research Symposium, Perth.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2018). Evaluating Teach-back in Simulation to Improve Discharge communication. Poster presentation, November 2018, Singapore Health Clinical Communication Symposium, Singapore.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2018). Evaluating Teach-back in Simulation to Improve Discharge communication. Poster presentation, March 2018, Mark Liveris Research Student Seminar, Curtin University Perth.

Chapter 1 Introduction

1.1 Chapter Overview

This introductory chapter provides a brief outline of the background and clinical context of the study, including the purpose and significance, study aims, questions, and a summary of the theoretical frameworks. In this study, a realist evaluation paradigm and a two-phase quasi-experimental mixed-methods approach were utilised. In the final sections of this chapter, a study schema and a list of publications are presented.

There are several terms utilised in simulation-based education (SBE) that are primarily the result of the different purposes and settings to which healthcare simulation is applied. The Society for Simulation in Healthcare dictionary features a collection of definitions and terms currently used in healthcare SBE to provide clarity for simulationists in teaching, education, assessment, and research. A participant in SBE is a person who engages in a simulation activity to gain knowledge or skills in either a healthcare institution, university, or college setting. The setting for this study was in a university where the participants were undergraduate nursing students. In keeping with standard conventions, the term participant will only be used in the research method chapter. Participants in the study will be referred to as nursing students, and the nurse educators as teaching faculty/and or facilitators.

1.2 Setting the Scene

Over the past 150 years, nursing education has undergone significant changes. Florence Nightingale introduced an early education model, where nurses developed their skills under the supervision of physicians in hospitals (McDonald, 2017). At the turn of the 20th century, nurses advocated for formal training and instruction with the first registered training institution established in the United Kingdom (UK) in 1919 (McGann, Crowther, & Dougall, 2009). With progress in medical science and the lack of pedagogy in Nightingales model, it was recommended that nursing education be conducted in colleges and universities (McGann, Crowther, & Dougall, 2009). Eventually, nursing becoming an academic discipline in its own right, with a degree qualification in higher education established in 1960 (McGann, Crowther, & Dougall, 2009).

The University of Edinburgh opened its first diploma course in nursing in 1956 (Jasper, 1996), paving the way for evidence-based practice, nursing guidelines, research,

and specialisation in nursing fields. Rapid changes occurred in the 1990s with the advancement of technology and the emergence of the World Wide Web, offering greater flexibility for learning (Jasper, 1996). During the 2000s, SBE came to the forefront of nursing education to address some of the theory to practice gaps in nursing curricula (Jeffries, 2012). Simulation-based education is a pedagogy promoting experiential learning that supports the integration of theoretical knowledge into clinical practice (Kneebone and Nestel, 2014). In simulation-based education, real-world clinical situations are replicated to help nursing students optimise, apply, and embed their learning. Simulation-based education offers students the opportunity to develop a wide range of clinical, psychomotor, and communication skills and, more importantly, to reflect on their practice in a structured and supportive learning environment (Levett-Jones & Lapkin, 2014).

Today's healthcare graduates are faced with the reality of demanding, multifaceted workplaces that require them to have well-developed critical thinking, decision making, and communication skills, in addition to their clinical skill competencies (Kneebone & Nestel, 2014). Teaching faculty have a responsibility to prepare new graduate nurses for the demands of clinical care by helping them to develop the knowledge and skills necessary to transition into their registered nurse role (Seaton et al., 2019). Quality education for nursing students is also imperative if teaching faculty is to prepare graduates for practice and reduce potential errors in the clinical setting (Seaton et al.). The limited empirical evidence available has led to inconsistent application of teaching communication skills in undergraduate nursing (Piscotty, Grobbel & Tzeng, 2011).

Within the context of this study, communication skills are defined as an interaction in which each sender becomes a receiver and vice versa, with particular attention to active listening, speaking clearly, and reducing patients' misunderstanding of information (Kaplonyi et al., 2017). Kaplonyi et at. state that while the use of SBE has increased in healthcare education, the majority of research has been published in the use of mannequin-based simulation to educate students in clinical skills. Despite the positive results found in SBE, there is limited evidence to support overall best practice in teaching communication skills in nursing. In particular, little research describes or evaluates the incorporation of simulated patients (SPs) in communication skills training (CST) for nurses.

1.3 The Communication for Safety Context

Effective communication is critical to ensure patient safety. Nearly 66% of all errors in health care are attributed to ineffective communication (World Health Organization, [WHO], 2017). Communication breakdowns have been cited in the literature as a root cause in almost all sentinel events (The Joint Commission [TJC], (2014). Conflicting roles, hierarchy, workloads, inadequate documentation, and poor teamwork can lead to communication failures that influence patient safety and health outcomes (TJC, 2014). The WHO recognised the need to promote patient safety and assembled a framework to develop global norms and standards, promote evidence-based practice, and support further research in this area (WHO, 2017). The international patient safety guidelines highlight the need for all health care workers to have knowledge and skills, including improving communication practices to promote patient safety (International Society for Quality in Health Care [ISQUAS], 2018). Members of health care teams must know how to communicate and share information in a timely and orderly manner (Kornburger et al., 2013).

In Australia, the National Safety and Quality Health Service (NSQHS) governs clinical standards, including a core standard targeting communicating for safety in health care, such as care transitions (NSQHS, 2017). The ability to discharge a patient with substantial health needs is considered a non-technical communication skill (Piscotty, Grobbel & Tzeng, 2011). Universities that implement CST utilising the NSQHS clinical standards into their program are in a unique position to educate student nurses for all aspects of clinical practice, including patient discharge.

When healthcare professionals and patients discuss plans of care at discharge, it is estimated that only 40% of the information provided is retained by the patient. Information provided is often being miscommunicated or not delivered effectively. Poor communication at discharge contributes to poor patient outcomes including medication errors and hospital readmissions (Kornburger et al., 2013). The unplanned readmissions rate is defined as the percentage of readmissions to the same hospital within 28-days (Zhou et al., 2018). In Australia, a recent retrospective cohort study by Zhou et al. stated that more than 50% of readmissions were identified as five-day readmission and potentially avoidable. Cosidine et al. (2018) proposed that unplanned hospital admissions within one to five days of hospital discharge be considered an adverse event as it's often associated with an inadequate discharge process.

As the demand for patients to be discharged promptly from hospital increases, so do the risks for patients re-presenting to hospital emergency departments within 28-days. Having an awareness of the leading readmission risk factors can inform the type of care and decisions to be made with health care professionals and family/ caregivers (Eby et al., 2015). Readmission risk factors include poor health literacy (patients not remembering or understanding topics addressed during discharge education), health system failures (shorter length of hospital stays, inadequate discharge and post-discharge supports), and social determinants of health (income, transport, and social support) (Eby et al.). A recent study by Eby et al. (2015) identified predictors that further contribute to early readmission. These include patients over 65 years of age, male gender, multiple co-morbidities, and differences in health-seeking behaviours. As these risk factors are often associated with poor communication and health literacy, interventions to improve discharge planning has been shown to decrease readmission rates (Eby et al.).

Discharge planning is recognised internationally as the process that promotes patient safety post-discharge from an acute care setting back into primary care or home (Kornburger et al., 2013). Regardless of the destination, the patient or the next health care professional needs to have the capacity and information to manage the person's health care needs (Kornburger et al.). Issues explored in discharge literature typically include early discharge, complicated health care instructions, and the impact of poor health literacy (Weiss & Maloney, 2008). The complexity of hospital discharge has increased over time as patients are discharged earlier, have more co-morbidities, and higher acuity requiring more complex home care instructions (Kornburger et al.). Patients with low health literacy skills (Peter et al., 2015) and chronic health conditions such as heart failure, asthma, or diabetes often have poorer health outcomes post-discharge, including high readmission rates. While discharge is an everyday occurrence, educating undergraduate nurses on how to deliver complicated health care instructions is a challenging task. In this study, the clinical context for the simulation scenario is discharging a patient over 65-years of age with type two diabetes mellitus (T2DM). The patient requires a change in medication from tablets to an injection.

1.4 Type 2 Diabetes Mellitus

A recent study by Donihi (2017) provided practical, evidence-based recommendations for transitioning hospitalised patients who have been diagnosed with T2DM. An estimated 422 million people globally and 1.7 million people in Australia have

been diagnosed with T2DM. The number of people with T2DM globally has risen from 108 million in 2008 to 422 million in 2017 (WHO, 2018). The progression of T2DM damages the heart, blood vessels, eyes, kidneys, and nerves. The World health organisation aims to support patients with T2DM by providing guidelines, building awareness, and providing dietary and medication education.

While 72% of patients take oral medication(s) to manage their T2DM, due to poor glycemic control, patients are more frequently being discharged home with insulin and non-insulin injectable medication (Donihi, 2017). Donihi (2017) recommends that all medication changes need to be communicated to the patient during the discharge process, and healthcare professionals need to provide clear verbal and written instructions to patients to maximise self-management. Assessing patient's health literacy, current knowledge, family support, and cognitive ability during a hospital admission will allow health professionals and carers sufficient time to address concerns early on, reducing the risk of readmission after discharge. Patients with low health literacy often rely on verbal instructions rather than written information. They may have difficulty comprehending and recalling discharge information (The Australian Commission on Safety and Quality in Health Care, 2014). Incorporating a few simple techniques such as asking open-ended questions, limiting medical terminology, asking patients to recall information, or to teach-back information are effective evidence-based communication strategies at discharge to reduce hospital readmission rates (Kornburger et al., 2013).

The communication problems identified in all transitions of care can be complicated. Patient discharge is a crucial part of care transition as it hinges on a patient's readiness to leave the facility and their capacity to manage at home or in a care facility (Lau et al., 2016). Ensuring a patient's health needs are communicated and meet before discharge from the hospital sets the stage for successful management. In a recent review, Tobiano et al. (2019) found that patients' understanding of discharge information and the ability of the healthcare professionals to share information accurately were essential parts of a successful discharge transition. The accurate sharing of information was seen to increase the patient's sense of responsibility (Tobiano et al.).

Patient discharge from a linguistic point of view is typically conducted as a monologic structure centred on the person giving the information (Lau et al., 2016). In clinical practice, patient discharge often focuses on the nurse conveying information, with the limited time taken or effort made to ensure that the patient or family members comprehend the details provided (Maloney & Weiss, 2008). Since the 1960s, sociologists, and discourse

analysts have established that informational content needs to have an interactive component for an effective communication event to occur (Garfinkel, 1967). The complexity of patient discharge demands both an information-based and interactional part to be effective. The informational dimension of communication involves how health care providers organise and express clinical information. How health care providers interact and engage with patients constitutes the interactional dimension (Eggins & Slade, 2012). Teach-back is an interactional method of communicating to ensure that patients understand what they need to know about their health care needs (Caplin & Saunders, 2015).

1.5 Teach-Back

Teach-back is an evidence-based method for delivering information and validating patients' understanding of the information they have been given (Caplin & Saunders, 2015). Teach-back is recommended by the Agency for Healthcare Quality Research (2015), National Quality Forum (2009), and TJC (2014). The teach-back method is a four-stage comprehensive, interaction-based strategy, which can be used by nurses to ensure that patients understand discharge instructions (Kornburger et al., 2013). In stage one, health care providers tailor the patient's education by explaining the information required. In stage two the health care provider evaluates the patients understanding of the information. The third stage offers the healthcare provider with an opportunity to clarify any information or misunderstood concepts. In the final stage, complete understanding by the patient is required, or stages one-three are repeated (Caplin & Saunders, 2015).

Research suggests that when patients repeat information in their own words, retention of knowledge is increased (Kornburger et al., 2013; Peter et al., 2015; Weiss & Maloney, 2008). The teach-back method encourages nurses to check their patients' understanding in a non-shaming way. By asking patients to explain in their own words what they need to know or do, nurses can identify how well they have communicated information, and have the opportunity to check, re-explain and check again (Peter et al., 2015).

Preparing patients for discharge has become more demanding as hospital lengths of stay have shortened, and patients are sent home with more complex issues. Recently, the effectiveness of teach-back at discharge was trialled in the United States of America (USA) in an emergency department (Wasak, Mitchell, Ren, & Fennimore, 2018). It was recognised that half of the prescription opioid overdose occurrences treated in the emergency department were unintentional. Consequently, teach-back was implemented by the nursing staff at discharge, so patients had a clear understanding of how to take their

pain relief medication. The results indicated that 72% of patients, including those who had been taking opioid medication for years, had learned something new about their medication regime (Wasak et al., 2018).

Teach-back has been employed as a communication strategy in several recent studies including improving self-care in postmenopausal women in Iran (Bahri et al., 2018), self-care in patients with heart failure (Dalir et al., 2016), and self- management in kidney transplant recipients (Mollazadeh et al., 2018). Teach-back has also be used to reduce readmission in paediatric readmissions and improve patient-centred communication in paediatric primary care (Badacewski et al., 2017; Shermont et al., 2016). Teach-back is also utilised during patient hand-off/over in oncology units (Callaway et al., 2019), and during patient discharge when transitioning from a healthcare facility (Kornburger et al., 2013; Slater, Huang & Dalawari, 2017). In Australia, teach-back has recently been evaluated in an Australian national telephone helpline (Morony et al., 2018). Morony et al. found that nurses working on the helpline felt that the information they were conveying was coming across accurately when they used teach-back, which was helping to ensure comprehension of the information delivered. Only one article has highlighted the use of teach-back in simulation (Mangold, 2016).

Mangold (2016) utilised the teach-back method to clarify and confirm patient knowledge while working with SPs. A simulation centre in the USA gave registered nurses who care for kidney transplant patients an opportunity to practice their teach-back method. Positive outcomes included patient satisfaction, knowledge retention, improved confidence, and a decrease in kidney-transplant 30-day readmission rate (Mangold, 2016). To date, teach-back has not been published in SBE for undergraduate nursing students. More specifically, no study has examined working with SPs to replicate the discharge of a T2DM patient managing a medication change. Teach-back is used in this study as an interactional method of CST.

1.6 Simulation Context

The goal of SBE aligns with nursing education – that is to graduate nursing students for clinical practice so that they can provide high quality and safe patient care (Guinea et al., 2019). With a global plan to improve patient safety, designing and implementing simulation scenarios that are realistic and have relevance to the clinical setting have the potential in many ways to contribute to nursing education and improve patient safety outcomes. To date SBE has been used to educate nurses to manage a range of safety-related issues, including the correct administration of medications (Mariani, Ross, Paparella, & Allen, 2017), recognising

patient deterioration (Endacott et al.,2012), and conducting complex conversations with families and patients (Potter et al., 2017). In SBE, theories and frameworks are recommended to design, implement and evaluate the learning experience (Jeffries, 2015). Scenarios should be authentic, validated (Choi et al., 2017), and designed to optimise realism to better engage students within the learning experience (Dunnington, 2015).

1.7 Realism

Realism is "the ability to impart the suspension of disbelief to the student by creating an environment that mimics that of the work environment. Realism includes the environment, simulated patients, and activities of the teaching faculty, educators, assessors, and facilitators" (Society for Simulation in Healthcare, 2020, p.30). To be able to learn from and interact in SBE, the simulation should be as realistic as possible. Three aspects of fidelity are noted to promote realism: (1) physical, (2) conceptual, and (3) psychological (Paige & Morin, 2013).

Physical fidelity refers to how well the simulation elements are identified and includes visual, tactile, auditory, and olfactory cues. Primarily the physical aspect concerns the stimuli in the simulation, capturing the attention of the student as it would happen in the real world. The physical fidelity can include the equipment, type of mannequin, and technology used. Across the physical dimension, the level can range from high to low, based on the variety of resources and equipment available (Choi et al., 2017; Paige & Morin, 2013). Conceptual fidelity is the degree to which the simulation proceeds in a believable manner, such as the speed and focus of the stimuli. Psychological fidelity refers to how easily students can perceive the simulation as realistic (Choi et al., 2017). For example, psychological fidelity can be enhanced by the scope and detail of the scenario, how real to life the situational cues and supporting resources are, or how appropriate responses from an SP or mannequin are (Choi et al., 2017; Paige & Morin, 2013).

The level of physical, conceptual and psychological fidelity are all essential to develop communication skills. Meaningfully connecting the three theoretical concepts, in real-time, is an important part of the learning process (Paige & Morin, 2013). Psychological fidelity is generally considered a requirement for translating learning to clinical practice (Choi et al., 2017). As the three concepts combine to produce a perception of realism for a student, each individual perceives this concept uniquely. In summary, realism is the students' perception of the simulation, and fidelity is what teaching faculty

provide to enhance the realism to facilitate a greater sense of presence and engagement for the student (Choi et al., 2017).

1.8 Presence

Presence derives from the Latin word, *praesetia* – meaning, "to be present with others" (Harper, 1991) and has been documented in nursing literature as the state of "being" with a patient in a nurse-patient relationship (Parse, 1998). Presence has been identified as having attributes of engagement, attentiveness, immersion, therapeutic agency, and connection (Parse, 1998). In virtual reality (VR) environments presence is the feeling that you are actually *in* the virtual world. Witmer & Singer (1998) propose that having a sense of presence will assist the student to feel engaged and react to the stimuli as if they are in the real world. In VR presence has been shown to have a positive influence on learning outcomes and task performance (Witmer & Singer, 1998).

In SBE, the importance of presence has only recently been raised and examined by Dunnington (2015). Presence in simulation has been contextualised as both "being there" in the environment (experiencing and perceiving the health situation in an active sense), and "being with" (experiencing and perceiving the health care situation in a more psychosocial, interactional sense) (Dunnington, 2015). To date, only two studies have examined "presence" in health care simulation. Dieckman et al. (2003) surveyed six anesthesiologists participating in clinical simulation scenarios. Presence was found to be influenced by group dynamics, emotional responses, and anticipation. More recently, Dunnington (2015) developed a theoretical framework "The Centricity of Presence" to support the instructional design and pedagogy in simulation.

According to Dunnington (2015) presence is "A state of being that is fundamental to the students' learning experience in simulation and also may mediate on learning outcomes" (Dunnington, 2015. p 279). The determinants of presence include the factors relating to simulation design, the individual student, and the group. Simulation design characteristics include modality, fidelity, realism, problem-solving and debriefing/reflection, the pace, and stimuli, and finally, the focus of the scenario. Individual factors are variations that are unique to each student. Among these are personality traits, openness to new experiences, extrovert or introvert characteristics, motivation, and the students' emotional response. Previous experience and the dynamic of the group structure may also influence the students' sense of presence. Dunnington (2015) argues that it is vital

to understand how factors such as realism and presence influence learning outcomes and to develop scenarios that have a positive, educative value that translates to clinical practice.

1.9 Purpose of the study

The current need for graduate nurses to be workforce ready requires teaching faculty to be resourceful and comprehensive in their teaching and learning strategies; this is the underlining significance of this study. This study explored and evaluated the effectiveness of providing an educational intervention in communication, using simulation to improve nursing students' discharge practice. To date, minimal studies have measured the impact of informational (patient risk factors) or interactional-based (teach-back) interventions within the context of simulation. The primary purpose of this study seeks to identify processes to improve the quality of the student experience during CST in SBE. This study seeks to identify processes to improve the quality and outcomes of the simulation experience by developing an integrated conceptual model of presence in SBE. As a key element of SBE design, the utilisation of SPs in CST and methods for evaluating SP training for role portrayal are explored.

This study examines how the relationship between student's perceptions of realism and presence influences their learning outcomes and how scenario design and briefing practices can optimise student's engagement during and after SBE. This study also investigates the role of self-reflection in SBE. Allowing students to view and reflect on their performance in private is a strategy proposed to promote greater insight, self-confidence, and to increase their ability to evaluate practice performance and decisions making critically.

1.10 Study Aims

The study addressed two aims: "Can undergraduate nursing students discharge practices be improved by CST in SBE?" and "Can improving the quality of the simulation planning and delivery enhance the student's experience and influence their learning outcomes?" To examine these two main aims the study was divided into two phases. The first phase involved reviewing CST in SBE literature to develop an integrated conceptual model of presence. This phase also explored the effectiveness of SP training approaches and requirements of SPs to be consistent in role portrayal during SBE. The second phase involved the evaluation of the CST interventions and model testing. This phase of the study initially explored how communicating risk factors and applying the teach-back method during discharge could improve student-learning outcomes. Model testing involved

exploring how students' perceptions of realism and presence during the simulation, and their ability to reflect on their performance, contribute to learning outcomes in discharge communication skills.

The following research questions were explored in this study:

- **Q1**: What evidence is available to support the use of SPs to develop communication skills in nursing education?
- **Q2**: Does applying an evidence-based simulation framework provide a reliable and valid approach for training simulated patients?
- **Q3**: Does the type of communication intervention provided during discharge simulation training (information-based, or interaction-based) impact student-learning outcomes?
- **Q4**: Does providing time for nursing students to engage in video-assisted reflection before group debriefing enhance their learning outcomes?
- **Q5**: Do nursing students consider the communication skills discharge simulation and the video-assisted reflection process as valuable learning experiences?
- **Q6**: Does modifying design elements of the scenario (clinical risk information and interaction-based guidelines) increase student's perceptions of realism?
- **Q7**: What is the relationship between a student's perceptions of realism, sense of presence and learning outcomes?

1.11 Study Outline

This study brought together a body of original work presented in five publications and five chapters. As outlined in the chapter summary below and Figure 1.1, each publication informs subsequent research, as well as providing a unique contribution to knowledge in the field of SBE.

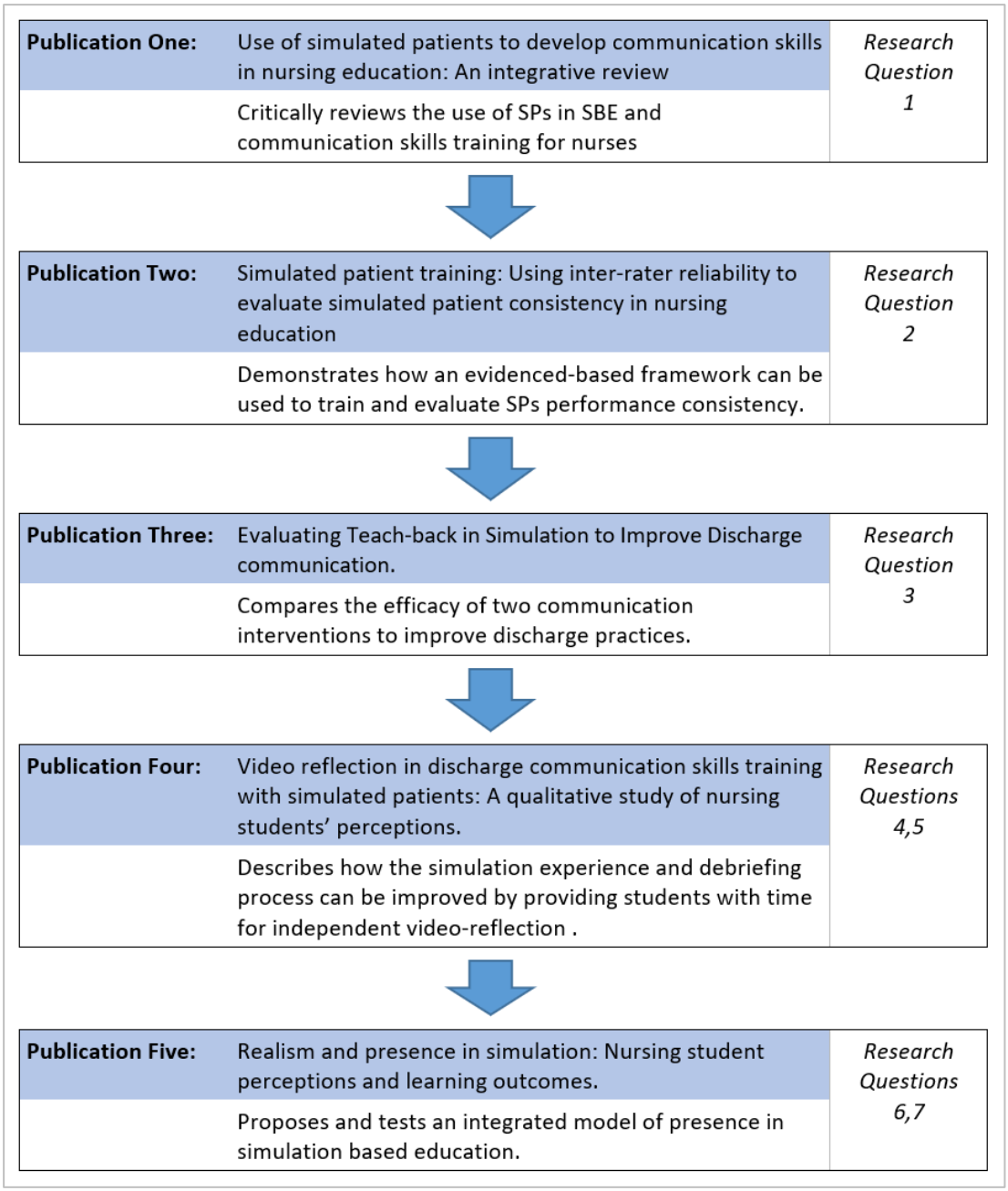

Figure 1.1 Graphical representation of the flow between publications

Chapter Summaries

Chapter One

This introductory chapter provides the background, significance, aims, and study questions and structure for the study.

Chapter Two

The literature review chapter presents an examination of SBE in nursing, including a critique of four conceptual frameworks and the integrated conceptual model of presence in SBE applied in this study (Phase one). A component of this chapter is an integrative literature review of published research related to the use of SPs in CST for nurses.

> Maclean, S., Kelly, M., Geddes, F., & Della, P. (2017). Use of simulated patients to develop communication skills in nursing education: An integrative review. *Nurse Education Today. 48,* 90-98. http://doi.org/10.10.1016/jnet.2016.09.018

The question for this review:

> Q1**:** What evidence is available to support the use of SPs to develop communication skills in nursing education?

The integrative review provided evidence to refine the techniques used in SP training and the reporting of methods in phase one of the study. These methods include adopting an evidence-based approach to SP training and recruitment, the use of validated instruments, and ensuring rigor and transparency in the methods used for data collection and analysis. Each subsequent publication followed the recommended reporting INACSL guidelines for health care simulation research (INACSL, 2016). The use of the standardised reporting guidelines in simulation draws attention to the elements required and improves the quality of simulation publications.

Chapter Three

Chapter three presents an overview of the methodology and method utilised. The method includes the study design, sampling strategies, instruments, recruitment processes, data collection, data analysis, and ethical issues. As part of phase one and a critical component of this study, publication two is included in this chapter.

MacLean, S., Geddes, F., Kelly, M., & Della, P. (2018). Simulated patient training: Using inter-rater reliability to evaluate simulated patient consistency in nursing education. *Nurse Education Today*, *62*, 85–90. http://doi.org/10.1016/j.nedt.2017.12.024

The question for this study:

Q2**:** Does applying an evidence-based simulation framework provide a reliable and valid approach for training simulated patients?

The purpose of this study was to ensure evidence-based practices were being used for the training of SPs in role portrayal and student feedback. The rigor of the approach applied was intended to ensure the researcher had a valid and reliable method to both facilitate and evaluate student performance.

Chapter Four

Chapter four presents three publications as the discussion and results for phase two of the study. Publication three presents the learning outcomes for students in an informational- and interactional-based training intervention. The interventions were compared against a control group of students receiving the standard discharge education.

Maclean, S., Kelly, M., Geddes, F., & Della, P. (2018). Evaluating Teach-back in Simulation to Improve Discharge communication. *Clinical Simulation in Nursing*. 22, 13-21. http://doi: org/10.1016/j.ecns.2018.06.005

The question for this study:

Q3**:** Does the type of communication intervention provided during discharge simulation training (information-based, or interaction-based) impact student-learning outcomes?

The results of this study are intended to guide the implementation of communication strategies in nursing education and support the use of SPs and SBE to improve communication between nurses and patients.

The fourth publication is the main qualitative study. This publication investigates students' thoughts and feelings about the simulation activity and the use of video-assisted self-reflection as a learning technique in the debriefing process.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2019). Video reflection in discharge communication skills training with simulated patients: A qualitative study of nursing student's perceptions. *Clinical Simulation in Nursing*. 28, 15-24. http://doi: org/10.1016/j.ecns.2018.12.006

The questions for this study:

Q4**:** Does providing time for nursing students to engage in video-assisted reflection prior to group debriefing enhance their learning outcomes?

Q5**:** Do nursing students consider the communication skills discharge simulation and the video-assisted reflection process as valuable learning experiences?

The findings of this study are intended to further our understanding of how working with SPs and using video-assisted reflection impacts students' learning and outcomes. The qualitative approach applied supports the examination of both positive and negative aspects of the simulation and debriefing process, potentially capturing student's concerns, level of self-awareness, confidence, and sense of achievement.

The fifth and final publication is a mixed-methods study designed to examine the relationship between realism and a student's sense of presence during the simulation experience.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2019). Realism and the concept of presence in simulation: Nursing student perceptions and learning outcomes. *Journal of Nurse Education.58(6) 330-338. http://*doi. 10.3928/01484834-20190521-03.

The questions for this study:

Q6**:** Does modifying design elements of the scenario (clinical risk information and interaction-based guidelines) increase student's perceptions of realism?

Q7**:** What is the relationship between a student's perceptions of realism, sense of presence and learning outcomes?

This study seeks to contribute to the existing body of knowledge in simulation literature in two ways. First, by developing and testing an integrated conceptual model of presence in SBE. Secondly, by validating the operationalisation of realism and presence as independent but highly correlated concepts.

Chapter Five

Chapter five presents a synthesis of the overall findings, implications, and recommendations for clinical practice and future research. This evidence contributes to further understanding of simulation pedagogy and CST in undergraduate nursing education. This chapter also includes the strengths and limitations of the study.

1.12 Summary

This introductory chapter has presented the background, aims, and research questions and the structure for this study by publication. The chapter outlines how this study will contribute to nursing education by preparing student nurses to perform patient discharge that will lead to improved patient safety. Researchers have not previously targeted the specific questions addressed in this study. By choosing to disseminate findings in high-ranking nursing education journals, the results will inform teaching faculty of the benefits of working with SPs and how increasing realism can empower students to engage and have a greater sense of presence in the learning environment. The next chapter presents a detailed literature review of critical domains informing this study including; the history of simulation, SBE in nursing, and working with simulated patients. Also, a detailed synthesis of the theoretical frameworks underpinning this study is provided.

Chapter 2 Literature Review

2.1 Chapter Overview

Chapter two begins with a historical background of the emergence of contemporary simulation in healthcare. A critical review of the phases and modes of simulation currently used in nursing education are presented in section 2.3 and 2.4. The chapter includes the first publication in this study, an integrated review of the use of SPs in communication skills training. Publication one and section 2.5 provides an in-depth critique of the benefits and limitations of working with SPs and recommendations for simulation practice, including the need to apply greater theoretical and methodological rigour when undertaking simulation research.

The final section of this chapter describes and critiques four established theories, as they are currently applied in SBE. Based on this critique and to fill a gap in the existing field of knowledge, an integrated conceptual model of presence in SBE is presented in section 2.8. The integrated conceptual model draws together components of these existing theories including design characteristics, realism, presence, debriefing strategies and student learning outcomes.

2.2 The History of Simulation

In recent years, there has been a growing demand for and increased use of simulation to prepare nursing students for clinical practice (Jeffries et al., 2015). The following paragraphs describe some of the historical features that have shaped current SBE. As simulation will soon become the industry standard in nursing education, a look into the past will give readers a broader understanding of how simulation is ideally bridging the gap between theory and clinical practice.

Simulation is defined as "activities that mimic the reality of a clinical environment and is designed to demonstrate procedures, decision-making, and critical thinking through role-play and the use of SPs, interactive videos or mannequins" (Jeffries, 2012, p 97). Role-play is an experiential learning method in which SPs, students, teaching faculty or volunteers improvise to support a simulated scenario (Jeffries, 2015). Simulation has been used in war games since 1811, with today's military continuing to use simulation and virtual simulation to train soldiers in the art of war (Rosen, 2008). The first successful use of industry simulation began in the late 1920s with the development of the Edwin Link Trainer in aviation (Rosen, 2008). In 1934, after several fatal accidents, the army purchased six link

trainers to improve the training of pilots (Rosen, 2008). The early flight simulator was used to train pilots in the use of instruments and gave them the opportunity to fly "blind" or fly with instruments (Aebersold, 2018; Rosen, 2008). Simulation techniques have also been used in high-risk fields where real-world training and testing of both technical and "non-technical" skills is too dangerous and costly (Blackburn & Sadler, 2003; Bradley, 2006).

Simulation in healthcare dates back to the first mannequins, built in 1911. *Mrs Chase* was a mannequin used to teach nurses how to dress and transfer patients (Fletcher, 1995). *Resuscitation Annie* was then created in 1960 to train people in manual chest compressions and expired airway resuscitation. There is evidence in the literature for the use of simulation in anesthesia as early as 1995 (Fletcher, 1995). Since this time, companies such as Laerdal, Medical Education Technologies and CAE-Link Corporation have developed mannequins to address the needs of students, healthcare practitioners and other professionals such as veterinarians (Aebersold, 2016). As simulation continued to grow over the next decade, professional bodies convened to disseminate information and advance the developing field.

The Society for Simulation in Europe Applied to Medicine (SESAM) was established in 1994, and annual conferences have been held since 1998 to discuss and present simulation research. The Association for Standardised Patient Educators was formally established in 2001. This group recognises contributions to the field of SP simulation and education. In 2001, the Society for Simulation in Healthcare was established. In 2006, the society held its first simulation meeting, and the inaugural issue of the journal *Simulation in Healthcare* was released (Rosen, 2008). In 2016, SESAM published its own official journal, expanding the field's capacity to disseminate evidence of how SBE approaches can improve current training practices in healthcare (Advances in Simulation, n.d).

Like other high-risk industries, in healthcare, the focus of SBE research and practice to date has primarily been on developing technical or clinical skills, rather than "non-technical" skills. A considerable body of knowledge in mannequin-based simulation with a medical focus is currently available (Nestel., 2014). Supporting students to learn communication concepts is often a difficult task, and there is a growing demand for evidence to support the use of simulation to improve clinically related communication skills. As the use of SBE in healthcare has evolved rapidly in the past twenty years, the importance of ensuring that each new application of the pedagogy to prepare nursing students for clinical practice and nursing registration is comprehensively evaluated has also increased (Aebersold, 2016). The following section discusses the benefits of simulation in

nursing, with simulation providing the link between theory and clinical practice by allowing students to rehearse and refine communication skills before clinical placements.

2.3 Simulation in Nursing Education

Since the commencement of university-based nursing schools in the 1950s, advancements in supporting technologies in the early 2000s has seen the use and popularity of contemporary simulation in nursing education steadily increase (Nehring & Lashley, 2004). Simulation-based education has the benefit of providing students with a supportive environment in which to practice clinical skills, learn from mistakes, develop confidence and become better prepared for "real" patients in the clinical setting (Nestel & Kneebone, 2010). Within simulation, students can engage in tasks and communicate with a SP or mannequin, in both routine and challenging situations without the fear of mistakes harming their patient (Nestel & Kneebone, 2010).

Simulation has been employed to improve clinical skills (Buckley & Gordon, 2011; Ebbert & Connors, 2014; Reese et al., 2015; Stefanski & Rossler, 2009) and augment learning in high-risk situations such as patient deterioration (Kelly, Forber, Conlon, Roche & Stasa, 2013). Simulation has been used to improve care in mental health settings (Doolen et al., 2014; Kameg et al., 2104) and community contexts (Distelhorst & Wyss, 2013; Hartman, 2018; Yeager & Gotwals, 2010). Simulation has also become the training method of choice for behaviours, such as communication and inter-professional teamwork (Aebersold, 2016). A review by Lewis, Strachan and McKenzie-Smith (2012) indicated that SBE was used successfully to achieve teamwork, situational awareness, clinical decision-making, and handover skills.

In 2003, The International Nursing Association for Clinical Simulation and Learning (INACSL) was created to support nursing SBE. The organisation was formed to distribute evidence-based practice standards for simulation approaches and research. In advancing nursing simulation, best-practice principles have been developed to guide the design, conduct, and evaluation of simulation activities. These principles are essential to mature the science of simulation in nursing and provide a benchmark for teaching faculty and researchers within this field (Adamson & Kardong-Edgren, 2012).

As healthcare education in the university setting continues to be impacted by economic restraints, difficulties securing clinical placements and a heightened priority for patient safety, the need for SBE has become increasingly apparent (Bogossian et al., 2018). Over the past five years, there has been an increase in the demand for SBE, including a change

in nursing education infrastructure, the purchase of equipment, and staff training (Bogossian et al., 2018). In a study of 61 nursing schools in Australia and New Zealand 96% indicated they have simulation embedded in their curriculum. Ninety-two percent of the schools indicated that pre-clinical simulation improved students' learning outcomes during clinical placements and enhanced their clinical competence (Bogossian et al., 2018).

A benefit of using SBE is that it offers students the opportunity to critically think, develop communication skills and make clinical decisions without causing harm to an actual patient (Nestel, 2018). However, SBE is not a fix-all solution and does have some disadvantages. Realistically, no matter how lifelike, simulation is not an actual clinical setting and has associated limitations (Gates, Parr & Hughen, 2012). Economically, in attempting to increase the authenticity of the simulation experience, the cost of creating and maintaining simulation laboratories may be excessive to many nursing schools. The incorporation of SBE into courses is another difficult consideration, in an already heavy nursing programme (Gates, Parr & Hughen, 2012). Stayt (2012) has identified that SBE may not consider the complexity and diversity of individual learning styles and the non-linear nature of learning.

A further limitation raised by Stayt (2012) is the lack of published evidence evaluating the effectiveness of SBE in nursing. In a recent combined systematic review and meta-analysis, La Cerra et al. (2019) found that evidence supporting the efficacy of SBE to date is still inconclusive. Their review showed that when compared with other teaching methods, student's confidence and knowledge does improve after participating in SBE. However, the short-term and long-term impact on clinical outcomes have not been reported (La Cerra et al., 2019). Their meta-analysis also indicated that a high degree of heterogeneity exists in simulation research. La Cerra et al. recommend that further translational approaches in simulation research be undertaken to understand any longer-term gain in student's clinical performance and knowledge. They state that further studies using larger sample sizes, and repeated investigation methods are needed to achieve more homogeneity in the literature to better inform evidence-based guidelines, protocols and procedures (La Cerra et al., 2019).

In summary, while SBE appears to be the logical answer to preparing student nurses for clinical practice, the limitations of SBE need to be acknowledged and evaluated. Hospitals, universities and colleges can then determine if the immediate and long term benefits are worth the investment in funds, time and resources required. In evaluating both the efficacy and cost benefits associated with SBE, the type of SBE undertaken is a key

factor. In adopting the position that SBE is a viable and valued educational approach, the following section examines the critical components of simulation required to optimise student's learning outcomes.

2.4 Simulation Phases

As a pedagogy SBE has three distinct phases: preparation, simulation, and debriefing. The first phase focuses on planning and pre-briefing which is completed before the simulation activity. This phase involves the development of the environment, scenario, facilitator, equipment, and if required the preparation and training of SPs. This phase also includes preparing students through online learning, lecture material, pre-readings and tutorial content (Jeffries, 2015). For students to have a high-quality experience, considerable planning and resource expenditure in the preparatory stage is required. Comprehensive planning to create and maintain a realistic and psychologically safe environment is essential in keeping students motivated and engaged during the actual learning encounter (Weaver, 2012).

In the planning and pre-briefing stages several physical and psychological variables that can influence the level of realism and student engagement need to be taken into consideration. These include the environment, resources, authenticity, student and facilitator motivation, emotions, beliefs, and the degree of openness of the student to learn (INACSL Standards of Best Practice: Simulation ^{SM}, 2016). The preparation phase of simulation experiences has been neglected in the literature, and further understanding of factors that contribute to learning outcomes, simulation design and preparation are warranted (Adamson & Rodgers, 2015).

The next phase consists of students completing the simulation. An essential part of making the student experience positive comes from ensuring the authenticity and appropriate fit of scenarios with modality (Jack et al., 2013). The term realism in simulation is often interchanged with fidelity and is aligned with the modality used (Choi et al., 2017). Modality refers to the simulator itself, which can facilitate different opportunities for learning in a variety of environments (Choi et al., 2017). The choice of modality will influence the level of fidelity achieved in any simulation. The use of SPs, mannequins, task-trainers or virtual patients, set in either a classroom, simulation laboratories or virtual environment changes the modality of the simulation. The modality classification includes low physical dimensions of fidelity, such as role-playing, case studies, and task-trainers that are cost-effective and usually focus on clinical skills (Choi et al., 2017). A medium physical fidelity simulation may involve the use of half body

mannequins in a skills laboratory to demonstrate a disease process or treatment. A high physical fidelity may include a computer-based mannequin or a SP in a simulation laboratory (Jeffries, 2012; Meakin et al., 2013). The simulation may contain alarm sounds, interruptions, background noise, electronic medical records, and smells similar to those found in a hospital setting (Paige & Morin, 2013).

An advantage of working in simulation is creating scenarios that can scaffold across the curriculum (Jack et al., 2013). Initially, nursing students may be introduced to low-risk, clinical situations in classroom-based role play (low modality) before moving to more challenging high-risk scenarios with SPs in a simulation laboratory (high modality). Students do not often have the opportunity to manage high-risk, complex patient care, so simulation allows them to experience and learn how such situations can be managed Simulation can offer students and teaching faculty the opportunity to stop the scenario, reflect upon the actions and responses and start the scenario again (Jack et al., 2013).

The final stage in simulation is debriefing. Reflection and debriefing are considered essential aspects of the learning experience (Webster, 2014). The aim of debriefing is to build on existing knowledge (Wotton et al., 2010), articulate rationales, consolidate learning and aid in skill correction (Lasater, 2007). A debriefing occurs at the end of the simulation and is typically led by a facilitator who should have the appropriate clinical skills and knowledge to care for the patient (Fanning & Gaba, 2007; Wotton et al., 2010). Facilitator guided debriefing is the most commonly used and studied technique (Sawyer et al., 2016).

The INASCL^{SM} (2016) standards of best practice recommend using an evidence-based model for debriefing. There are numerous approaches to debriefing which vary across institutions. The two models for debriefing used in this study included Gather, Analyze and Summarise (GAS) (Phrampus & O'Donnell, 2013) and Schön's reflection model (1983). The GAS model provides a clear structure on how to conduct a debriefing that allows students to gain skills while remaining comfortable in the debriefing process. The GAS model encourages the facilitator to maintain a student-centric environment to acknowledge skill acquisition, recognise gaps in skills and address each student's learning needs (Phrampus & O'Donnell, 2013).

Schön (1983) identified two types of reflective practice that can be applied in simulation using a facilitated conversation structure. He defined "*reflection-on-action* as reflecting on how practice can be developed, changed or improved after an event takes

place, in contrast, *reflection-in-action* is described as reflecting the situation while changes can still be made" (1983, p.2). Reflection-on-action is typically used when debriefing individuals or groups.

As with the simulation itself, technology can play an essential part in the debriefing process. There are two main types of debriefing: verbal debriefing (VD) and video-assisted debriefing (VAD). Verbal debriefing is the process of using traditional discussion or conversation to support learning (Zhang et al., 2019). Video-assisted debriefing is the use of audiovisual capture and review to support learning. Advances in technology have enabled the use of a full simulation laboratory recording system, smartphones or small camcorders (Krogh et al., 2015). In VAD, students are allowed to review, reflect upon, and discuss critical elements of the simulation (Levett-Jones & Lapkin, 2014; Zhang et al., 2019). In a recent systematic review, the overall effectiveness of both VD and VAD was examined (Zhang et al., 2019). Video-assisted debriefing was confirmed as the preferred method and is recommended in simulation practice. Before VAD can be the gold standard in debriefing, further research is required. (Zhang, et a., 2019). This study applied both GAS and Schön's *reflection on action* utilising VAD. This enabled the students to debrief in a time-efficient manner, keeping the discussion on track, while focusing on learning outcomes.

2.5 Simulated Patients

The use of simulated/standardised patients (SPs) in healthcare began in 1993 (Barrows, 1993). Over the past three decades, the terminology describing SPs has been contested and critiqued in the literature. In a recent article by Nestel et al. (2018), a broader heading of *simulated participant* has been forwarded to describe a person who can portray patients, healthcare professionals, family members or at times a simulation confederate. A *simulated participant* may be called upon to standardise their performance as a patient, particularly to ensure consistency in assessment contexts such as during student examinations. For this study SPs are referred to as simulated patients as this was considered best practice when the first two papers were submitted for publication, and accurately describes the role played in the simulation - a patient portraying a specific set of health problems and symptoms.

Simulated patients require coaching and training in their role (Fink et al., 2014). When SPs are trained to reliably and consistently portray health care problems, students can engage with them in a clinically authentic manner. Fink et al. found that when SPs have trained appropriately, experienced physicians were unable to differentiate them from real

patients during physical examinations. The ability of trained SPs to give immediate feedback to students and facilitators is one of the advantages of SPs compared to actual patients (Nestel et al., 2011).

Simulated patients are no longer simply volunteers teaching faculty use in simulation (Nestel et al., 2018). Nestel et al. recognise that through SP participation, a method of learning that informs educational practice has been established. Simulated patients can present the same information repeatedly allowing for large numbers of students to undertake the same learning experience. They can be employed in any learning setting to practice clinical and communication skills in conditions comparable to being with a real patient.

Students often appreciate having the opportunity to learn with SPs as they can verbally respond with random, non-scripted comments and provide valuable feedback (Fink et al., 2014). Simulated patients can demonstrate non-verbal communication behaviours that students would not receive from mannequins, such as making eye contact and facial expressions. Working with SPs also provides students with a valuable opportunity to self-reflect on the quality of communication skills. By practising both routine and difficult conversations with SPs, students can gain the confidence they need to transfer skills learned into their clinical practice (Webster, 2014).

Nestel et al. (2018) argue that there are many benefits to working with SPs in education. There is evidence to show that students who have worked in simulations with SPs show equal or even better skills, compared to those students learning in traditional environments (Kaplonyi et al., 2017). Dearmon et al. (2013) and Ignacio et al. (2015) found that when students engaged with SPs, they felt the experience was meaningful and their self-esteem increased. Students could recognise clinical manifestations, which enhanced their clinical reasoning and decision-making skills. Students where then able to transfer these skills into their clinical practice. Webster (2014) found that students had a greater understanding of the patient's perspective when working with SPs. Jeon and Koh's (2015) meta-analysis found that the main effect on student learning was in the domains of cognitive, affective and psychomotor outcomes.

Working with SPs is not without its challenges. Hart and Chilcote (2016) and Bartlett and Butson (2014) noted several issues when employing SPs for learning. These included the cost of payment to actors and time to recruit and train SPs. For the SP to be realistic, considerable time is required to prepare the SP with specific character traits that relate to a particular patient and disease process. Nestel and Bearman (2014) noted that it is often

difficult to retain and recruit a range of ages and cultures of SPs when implementing an SP program.

A recent study identified those students who undertake SP-based simulation exhibited better knowledge acquisition, specifically in CST (Alssad, Gavuluri, Bhide, Lannen & Maniaci, 2017). Effective communication skills are critical to the nurse-patient relationship and can increase the student's ability to care for patients (Alssad et al., 2017). With an understanding of the time and resources required to recruit and train SPs, this study utilised SPs as a learning strategy to improve student's communication skills. The following section provides an integrative review critiquing and evaluating the use of SPs to enhance nurse-patient communication skills.

2.6 Introduction to Publication One

The following publication is the first in phase one of the study.

Maclean, S., Kelly, M., Geddes, F. & Della, P. (2017). Use of simulated patients to develop communication skills in nursing education: An integrative review. *Nurse Education Today*. 48: pp. 90 98.http//:doi:10.10.1016/jnet.2016.09.018

This publication addresses Question one:

Q1**:** What evidence is available to support the use of SPs to develop communication skills in nursing education?

The aim of this integrative review was to analyse how SPs are used in nursing education to develop communication skills. The second aim was to evaluate the evidence that is available to support the efficacy of using SPs for educating nurses in communication skills and finally to review the SP recruitment and training procedure.

The results of the review show that SPs have effectively contributed to CST in both facilitation and evaluation roles. From the integrated review, specific areas were suggested for improvement. They include using more mixed methods approaches with multiple sites and larger sample sizes to improve the generalizability of the findings and applying greater rigor in the reporting of SP recruitment and training methods. Further research is also required across a broader scope of clinical communication contexts, such as clinical handover and patient discharge.

Findings from this study were submitted to Nurse Education Today. This international peer-reviewed journal publishes research that employs rigorous methodology and theoretical frameworks. The journal publishes the highest quality scholarly contributions reflecting the advancement of educational theory and pedagogy. The journal aligns with this studies objective to improve educational processes and to apply a high standard of work through depth, rigor and originality. Nurse Education Today has an impact factor (IF) of 2.65 (2019).

The article currently has 41 citations by other authors in the following journals.

- *Journal of Clinical Medicine* (IF 5.688, 2019)
- *BMJ Medical Education* (IF 1.870, 2019)
- *Journal of Nursing Education* (IF 1.185, 2019)
- *Nurse Education Today* (IF 2.65, 2019)
- *Artificial Intelligence in Education* (IF 4.483, 2019)
- *Journal of Nursing Education and Perspective* (IF 1.245, 2019)
- *Journal of Occupational Health and Epidemiology* (IF 1.285, 2019)
- *International Journal of Pharmacy Practice* (IF 1.49, 2019)
- *Women and Birth* (IF 2.079, 201)
- *World Views on Evidence-Based Nursing* (IF 2.14, 2019)
- *Journal of the American Psychiatric Nurses Association* (IF 1.595, 2019)
- *Nursing Forum* (IF 1.11, 2019)
- *American Journal of Hospice and Palliative Medicine* (IF 1.655, 2019)
- *Australasian Journal of Educational Technology* (IF Not Listed)
- *Revisto Latino-Americana De Enfermagem* (IF Not Listed)

PUBLICATION ONE:

USE OF SIMULATED PATIENTS TO DEVELOP COMMUNICATION SKILLS IN NURSING EDUCATION: AN INTEGRATIVE REVIEW

(ACCEPTED PRE-PRINT VERSION)

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Review

Use of simulated patients to develop communication skills in nursing education: An integrative review

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Highlights

- SPs can partner with facilitators to enhance nurse's communication skills.
- Comprehensive SP training and recruitment protocols should be employed and reported.
- SPs can be effectively engaged in program facilitation and evaluation roles.

Abstract

Background: Registered nurses are expected to communicate effectively with patients. To improve on this skill education programmes in both hospital and tertiary settings are increasingly turning to simulation modalities when training undergraduate and registered nurses. The roles simulated patients (SPs) assume can vary according to training purposes and approaches.

Aims: The first aim was to analyse how SPs are used in nursing education to develop communication skills. The second aim was to evaluate the evidence that is available to support the efficacy of using SPs for educating nurses in communication skills and finally to review the SP recruitment and training procedure.

Design: An Integrative Review.

Data Sources: A search was conducted on CINAHL, Psych-info, PubMed, Google Scholar, Scopus, and Ovid, Medline, and ProQuest databases. Keywords and inclusion/exclusion criteria were determined and applied to the search strategy.

Review Methods: The integrative review included nineteen studies from 2006-2016. Critical Appraisal Skills Program (CASP) method of evaluation was utilised. Emergent themes were extracted with similar and divergent perspectives.

Results: Analysis identified seven clinical contexts for communication skills training (CST) and two SP roles from the eighteen studies. SPs were either directly involved in the teaching of communication (active role) or used in the evaluation of the effectiveness of a communication skills program (passive role). A majority of studies utilised faculty-designed measurement instruments.

Conclusion: The evidence presented in the 19 articles indicates that the use of SPs to teach nurse-patient communication skills targets more challenging clinical interactions. Engaging SPs in both CST program facilitation and course evaluation provides teaching faculty with a strong foundation to develop further pedagogical and research capacity. Expanding the utilisation of SPs to augment nurses' communication skills and ability to engage with patients in a broader range of clinical contexts with increased methodological rigor is recommended.

Keywords: Simulated patient, standardised patient, communication skills, nursing education, simulation, undergraduate nursing students, registered nurses.

Background

One of the primary goals of therapeutic communication in healthcare is to develop a rapport with patients and their families and to foster an environment of compassion, understanding, and empathy (Peplau, 1997). Therapeutic communication between patients and members of the healthcare team in the community and hospital settings is, therefore, essential in ensuring clarity in the provision of care, to mitigate medical errors and enhance patient safety (Rosen & Pronovost, 2014). The World Health Organization recognises the need for patients to be included in health care decision making and planning (Rimal & Lapinski, 2009). With a global agenda of improving quality and safety in healthcare, teaching faculty need to find engaging and impactful ways to integrate communication skills training into undergraduate and graduate nursing education (Mullan & Kothe, 2010).

Dealing with patients and families during difficult conversations can be challenging particularly about explaining complex treatments, working through mental health issues, and discussions about end of life care. Such discussions are often a source of anxiety and fear for many healthcare professions' students as well as practising clinicians (Martin & Chanda, 2015; Nestel et al., 2010; Eid, Petty, Hutchins & Thompson, 2009). Simulation provides an innovative approach to emphasise the critical role of communication skills and for students to develop a repertoire of effective techniques (Kelly et al., 2014). Simulation can be described as a teaching strategy to replicate real-life experiences (Brown, 2015) and offers an alternative learning experience given some of the limitations of clinical rotations (Howley et al., 2008). Several studies attest to the reliability, validity, and feasibility of the simulated patient (SP) approach for communication skills training (CST) in nursing education (Bolstad et al., 2011; Ebbert & Connors, 2004; Vu & Barrows, 1993). A recent meta-analysis highlighted the efficacy of simulation training in nursing across diverse clinical domains (Shin, Park & Kim, 2015). The meta-analysis examined 20 studies and provided evidence that using SPs in education across different areas in nursing was a useful technique over traditional learning methods. The results presented evidence, with a medium to large effect sizes, to advocate for the use of SPs to improve student outcomes (Shin, Park & Kim, 2015).

For students, rehearsing clinical conversations with peers offers a level of exposure to 'real-life' situations (Schlegel et al., 2011). However, the interactions may not be authentic because individuals may 'hold back' in the type and level of responses. Role-plays with simulated patients (SPs) offer opportunities for students to immerse themselves in a more authentic experience within a protected and controlled environment (Bearman

& Nestel, 2015). SPs are primarily *well* people trained to act as a patient in a clinical scenario (Bearman & Nestel, 2015). The terms of simulated patient and standardised patient are often used interchangeably. From the 1960s, SPs have been utilised for teaching and evaluating medical students in clinical assessment techniques (Barrows, 1993). More recently, SPs have been used to train clinicians to assess the effectiveness of communication training programs (Trickey et al., 2016) and to teach students' culturally sensitive communication skills (Swoboda & Bahreman, 2016). A variety of health professional schools are now using SPs for teaching and students' feedback, with the use of SPs in nursing programs gaining increasing momentum. In this educational context, the authenticity of role-play and quality of feedback provided by SPs is of utmost importance (Swoboda & Bahreman, 2016).

Regardless of the educational context - whether clinical or communication skills training - SPs are in a position of being able to provide valuable feedback to students from the *patient's* perspective (Bearman & Nestel, 2015). In this teaching role, they can be viewed as active facilitators of the specific training objective. Alternatively, SPs can also be engaged in scenarios to determine the impact of simulation interventions for research purposes, quality assurance, and program evaluation (Weaver & Erby, 2012). In such instances, SPs may take on a more passive role within the evaluative protocol. However, the extent to which the various positions of SPs are utilised, supported, evaluated, and reported is under reported in the extant literature (Weaver & Erby, 2012).

Measuring student performance in simulations with SPs, nursing researchers should seek advice on tool selection and use to build rigor into emerging research (Adamson, Kardong-Edgren, & Fitzgerald, 2010). However, the range and use of validated instruments in the literature remains weak, and an area where more sound approaches in research methods are warranted. While there are many approaches to the recruitment and training of SPs, Bearman & Nestel (2015) concede that few procedures are evidence-based. Some of the methods described in the literature include demonstrations, video-clips, observation of real patients, coaching by experienced SPs or professional actors, and feedback by students and teaching faculty regarding SP performance (Meirer, 1982). In a review of 121 SP articles Howley et al. (2008) identified that few authors provided sufficient detail about SP recruitment and training for reproducibility of research studies.

A recent text by Bearman and Nestel (2015) provides the most detailed instructions on the recruitment and training of SPs currently available. These authors developed a four-stage model that draws on evidence in the field of dramatic arts as an exemplar on which

to standardise SP training. The model allows SPs to be recruited and trained for multiple roles, for different scenarios, and in a range of health care contexts (Bearman & Nestel, 2015). In summary, SPs can offer valuable feedback and perspective to students, and provide facilitators with the opportunity to improve or expand on their program. As the use of SPs increases, it is now opportune to review the literature and report on current aspects of SP training and use including the preparation and support of these partners in learning. Of particular interest is an investigation of the scope and efficacy of using SPs in the training and evaluation of nurses' communication skills.

Aim

This integrative review aims to identify, critically appraise, and synthesise the existing evidence on the use of simulated patients in educational programs related to developing or enhancing therapeutic communication skills for undergraduate and graduate nurses to answer the following research questions:

1. How are SPs used in nursing education to develop communication skills?
2. What evidence is available to support the efficacy of using SPs for educating nurses in communication skills?
3. How are SPs recruited and trained for their role in communication skills training?

Design

An integrative review enables appraisal, analysis, and integration of literature on a phenomenon so that new insights can inform further research and evaluation. The Whitmore and Knafl (2005) strategy for conducting an integrative review was employed, as this strategy allows for the inclusion of studies with diverse data collection methods.

Literature search strategies

Eight electronic databases, including PubMed, Scopus, MEDLINE, CINAHL, Psych-INFO, ProQuest, Google Scholar, and Ovid, were searched for peer-reviewed articles published between January 2006 and April 2016. The decision to only include literature from the past 10 ten years was made on the following basis. The importance of RN education focused on nurse-patient communication has been recognised at a national and international level. However, nursing education's use of simulation in communication scenarios involving patient discharge has been very recent and is evolving currently. These databases were selected to capture publications that pertained to simulation as a teaching

and learning methodology in nursing education. An initial search using the term *standardised patient* was too broad; therefore, a Boolean search was conducted including the term *AND*. Keywords used were: simulation, * standardised patient or simulated patient*, and patient simulation, communication skills, communication skills training*, nursing communication* and health care communication.

Inclusion and Exclusion Criteria

Inclusion criteria for the search included: peer-reviewed research articles using standardised patients; nurse-patient communication skills with health care simulation as the teaching strategy. Articles included baccalaureate, associate, and diploma nursing programs. Peer-reviewed articles relevant to nursing staff development in hospitals and medical centres focusing on the above criteria were also included. Only articles in the English language were reviewed. Exclusion criteria included: virtual patients such as computerised cases and simulators such as mannequins; articles about allied health, nurse practitioners, paediatric nursing, community settings, and only medical education. Other exclusion criteria were conference proceedings and editorials.

Search Outcomes

The search combining the specified terms and keywords yielded a total of 727 articles including 136 articles from Medline/ProQuest, 73 from CINAHL, 92 in Psych info, 267 in Scopus, and 159 in PubMed. After the removal of duplicates, abstracts were reviewed to apply the inclusion and exclusion criteria, and full copies of relevant articles obtained and examined. Ultimately, 19 articles were evaluated using the Critical Appraisal Skills Program (CASP, 2002). Qualitative studies were synthesised using thematic analysis. Figure 2.1 details the search process and resultant study selections.

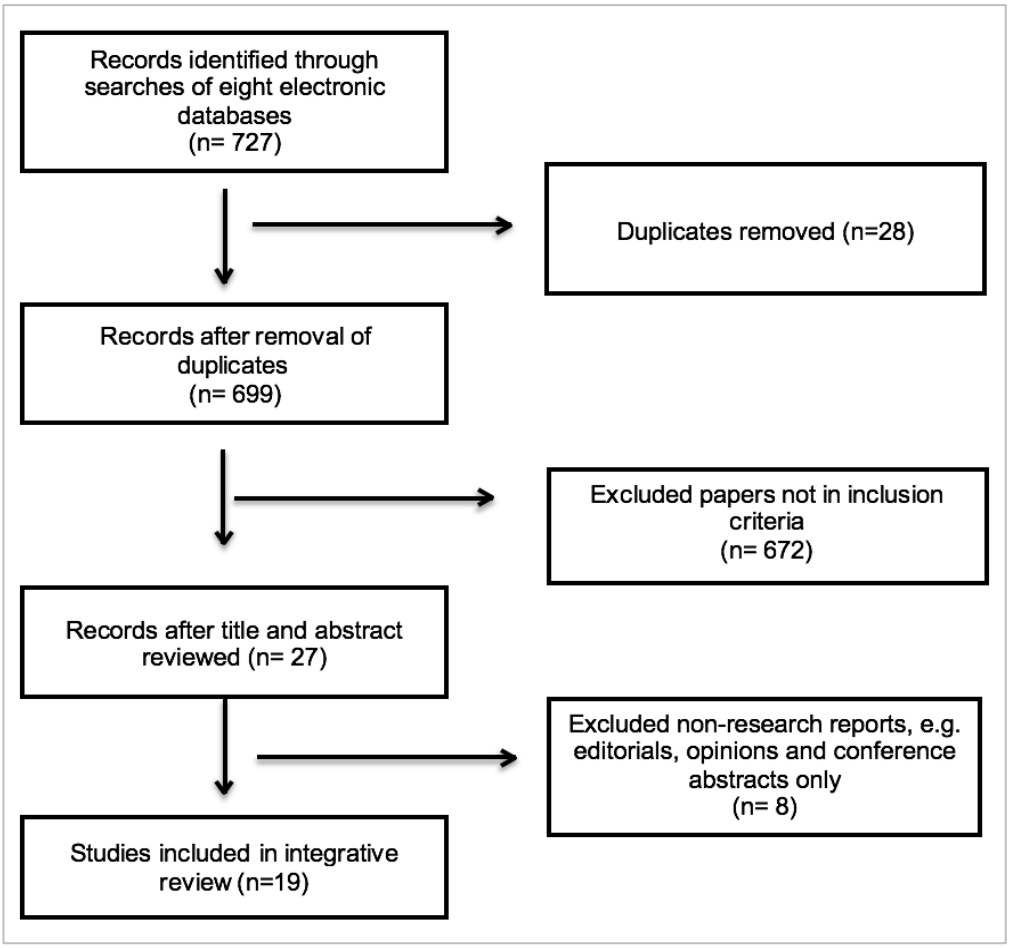

Figure 2.1 Flow chart of the integrative review selection process

Results

The 19 studies included in the review were drawn from five countries: the USA (9), United Kingdom (2), Asia (1), Europe (5) and the Middle East (2). Table 2.1 presents a summary of specific elements of interest from these 19 articles. Seven clinical communication contexts were identified: mental health (7), oncology and palliative care (5), patient admission, discharge, and general communication skills (5) and communicating with hearing impaired patients (2). Two purposes for SPs emerged: SPs as active facilitators in the teaching and learning strategy (12); and SPs as passive facilitators of course evaluation (6). One article used SPs for both communication skills training evaluation and student feedback. Of the 19 studies, three articles reported a systematic approach to SP training and development. The recruitment process was reported in 10 studies.

The study designs included quantitative (14), mixed methods (4) and qualitative (1) approaches. Questionnaires and semi-structured interviews were the primary data collection methods. Of the quantitative designs, the majority (9) used faculty-designed tools to address research questions. Only nine studies reported the psychometric properties

of validated instruments. Insufficient or no psychometric information was provided in the methods of the remaining studies. Four comparative studies encompassed teaching with SPs as a strategy versus the didactic teaching of recorded lectures; lecture slides; case-based learning of peer role-play. One study compared case-based learning and simulated communication training (Hsu et al., 2015). Schlegel et al. (2011) compared the effectiveness of CST with a peer role-play module versus CST with an SP. Zavertnik et al. (2010) compared traditional classroom (two 1-hour lectures) learning communication skills versus using a communication framework with an SP portraying a family member. The final study compared an SP against a recorded lecture in suicide prevention communication skills (Leubbert & Popkess, 2015). Only one study reported a medium effect size (0.5) (Hsu et al., 2015).

Purpose 1: Simulated patients for facilitation and student feedback

Twelve studies used SPs to facilitate learning and provide feedback to nurses. Seven studies in the review used SPs to help nursing students identify barriers and knowledge deficits in interviewing and assessing mental health patients (Becker et al., 2006; Robinson-Smith, Bradley, & Meacham, 2009; Doolan, et al., 2013; Kameg et al., 2014; Luebbert & Popkess, 2015; Martin & Chanda, 2016; Webster, 2013). Two studies (Adib-Hajbaghery & Rezaei-shahsavarloo, 2015; Yuksal & Unver, 2016) focused on the use of SPs to prepare nurses for specific communication skills required when interacting with hearing-impaired patients. One study focused on general communication skills and gathering patient information, imparting information and clarifying patient goals (Ryan et al., 2010). Another study focused on the end of life care (Bloomfield & O'Neill, 2015), using SPs to help prepare students for communicating with dying patients. In contrast, the final publication focused on general communication skills, such as communicating with families in the intensive care unit (Zavertnik et al., 2010).

Purpose 2: Using simulated patients for program evaluation

Six studies employed SPs to aid in the assessment of communication skills programs. Three studies (Bernard et al., 2012; Canviet et al., 2014; Langewitz et al., 2010) used SPs in oncology scenarios to evaluate the effectiveness of CST training. A further two studies used SPs in scenarios that evaluated nurses' communication skills in working with patients with depression (Brown et al., 2009) or chronic pain (Schlegel et al., 2011). The final article (Paan et al., 2013) used SPs to test a patient admission resource (pre-structured admission form based on Gordon's Functional Health Patterns (GFHP).

Dual purposes

One study used SPs for both of the purposes mentioned above - to aid in the evaluation of a discharge communication course designed for nurses and to provide students with feedback in the discharge process (Hsu et al., 2015).

Discussion

The use and application of SPs in the evaluation process or teaching clinical communication skills in the simulation were identifiable in the research methodologies of the 19 articles. While less established in nursing, the use of SPs as a means to evaluate clinical competencies has a long history in the medical literature (Bolstad et al., 2011). This review recognises that the utilisation of SPs and associated research in nursing has increased over the last decade.

Two SP purposes within a range of clinical contexts were identified in the analysis. SP use in teaching and learning is not a new concept; however, the findings from this review confirm that SPs are frequently used in CST for specialised areas. Fields of nursing such as oncology, mental health, and palliative care, which are considered outside of the scope of practice for a novice practitioner, were the areas studied. For example, studies included providing nurses with the opportunity to learn appropriate strategies for dealing with sensitive psychological issues such as the end of life care situations (Bloomfield, O'Neill & Gillett, 2015) and care of the patient in the intensive care unit (ICU) (Zavertnik et al., 2010). Further applications included rehearsing communication approaches with patients who have mental health issues such as depression (Brown et al., 2009), bipolar disorders, anxiety and schizophrenia (Doolen et al., 2014).

The benefit for students learning with SPs is the reality of the experience, with the ability of SPs to portray a patient authentically without placing actual patients at risk (Weaver & Erby, 2012). Hospitals and nursing schools providing communication skills training also implemented the use of SPs to support program evaluations. In the current review, communication skills programs focused on patient consultation skills (Ryan, et al., 2010), admission interviews (Paans, Muller-Staub & Nieweg, 2013), transitions of care (Hsu et al., 2015) and communicating oncology treatment (Bernard, et al., 2012; Brown, et al., 2009; Canivet, et al., 2014; Langewitz, et al., 2010). SPs were welcomed in these contexts as they provided the researchers with the ability to standardise client characteristics, and audio-visually record scenarios, thus allowing the capture of quality

data. Investigators were then able to measure research outcomes with a variety of appraisers, including faculty, SPs, and students (Weaver & Erby, 2012; Brown et al., 2015).

While comparative studies between SP and traditional teaching modalities indicate the utility of this approach, there is considerable scope to expand the evidence base for the efficacy of using SP methodology in nursing communication skills education. The comparison of control groups (traditional lectures, case-based learning, role play, and video recorded lectures) and intervention groups implementing SPs, were shown to improve communication skills and student satisfaction significantly following the intervention (Hsu et al., 2015; Schlegel, 2011). In the study by Hsu et al. (2015) students had the opportunity to be directly involved in SP care, build on their current level of communication skills and benefit from having structured SP feedback about the effectiveness of their communication skills. Schlegel et al. (2015) found that providing more opportunities for students to practice communication skills in high risk conversations enhanced students' confidence and reduced anxiety in real-world clinical settings. Of significance in the review was the limited use of SPs as actual evaluators of either the student's performance or for program assessment. The process of providing individual feedback during or after simulation sessions warrants consideration and input from the SP of the student's strengths and areas for improvement in performance. However, there is little evidence in the nursing literature of SPs contributing to the summative evaluation of students. Becker et al. (2006) rated the SP feedback as invaluable to student learning. While formative, students felt the timing (after the scenario) and the source (SP) was unique to their learning opportunities (Becker et al., 2006). Students reported that the feedback from SPs gave a different perspective to compare and improve on their self-evaluation. There is minimal evidence in this review on the potential relationship between students' self-evaluation, SP, peer, and faculty rankings.

Student performance in nursing must be evaluated with valid and reliable instruments. The validation protocols and psychometric properties reported in research methodology (Adamson, Kardong-Edgren, & Fitzgerald, 2010). Of the articles reviewed only 11 of the studies provided information on the validity and reliability of the tool (Adib-Hajbaghery & Rezaei-shahsavarloo, 2015; Hsu et al., 2015; Kameg et al., 2014; Langewitz, et al., 2010; Luebbert & Popkess, 2015; Paans, Muller-Staub & Nieweg, 2013; Robinson-Smith et al., 2009; Ryan et al., 2010; Schlegel et al., 2011; Yuksel & Unver, 2016; Zavertnik et al., 2010). Comprehensive training procedures are required if SPs are to be used to collect data, contribute to the assessment of students, and provide feedback. To assess or replicate

the research findings of published reports, authors must provide adequate and clear descriptions of the SP's recruitment and training methods. This methodology should include descriptions of how the SP encounter was developed and implemented (Nestel & Bearman, 2015; Howley et al., 2013; Wallace, 2006). In accord with Howley et al.'s (2008) early findings, this review found that few authors provided sufficient detail for the reproducibility of research. Of the 19 studies examined only three reported using a framework to train and recruit SPs (Doolen et al. 2014; Schlegel et al., 2012; Robinson-Smith et al., 2009). While the remaining studies acknowledged using trained actors, SPs with previous experience and some validation of scenarios, the reporting of the recruitment or training protocols was inadequate.

Implications for practice and further research

Simulation is recognised as an effective teaching strategy for the enhancement of therapeutic communication skills (Schlegel et al., 2011). However, this review found that a limited amount of research in general communication skills for nursing students. Of the reviewed articles, there was a bias towards a quantitative approach, with questionable measurement tools. Perhaps more studies with a mixed-methods approach with larger samples, applying a more rigorous quantitative and qualitative protocol to support triangulation are required to improve the generalizability of the research results. Communication skills for patient discharge or transitions of care, a priority in patient safety and quality reports (Rubin et al., 2014) needs further exploration.

Hospital readmission rates within 30 days of discharge is now a high priority in healthcare quality measures (Rubin et al., 2014) with many interventions to improve patient outcomes being targeted at improving health professional communication practices at transitions of patient care (Rubin et al., 2014). Despite the significant costs associated with hospital readmission, discharge communication skills with trained SPs are yet to be fully explored. Communication of discharge instructions can be improved with nurses delivering information at an appropriate health literacy level. SPs may be an effective means of preparing students to communicate with patients and their families at an appropriate health literacy level before discharge.

Limitations

This synthesis of the literature presents factors to be considered when using SPs in teaching and learning; however, this review has limitations. First, only publications from

2006-2016 in English were included which may not take account of initiatives emerging in other countries. Nurse practitioner studies were not included limiting the generalizability of findings to this employment category.

Conclusion

This integrative review provides a critique of the current use of SPs in communication skills training for nurses. The range of clinical contexts incorporating SPs included: end of life care, oncology care, mental health treatment, hearing impaired, patient admission, and patient discharge. There was variability in the use and reporting of SP recruitment and training and a lack of rigour in instruments used to determine student or program outcomes. Researchers are increasingly using SPs to measure student and program evaluation outcomes. To obtain valid and reliable results from the SPs, comprehensive training and recruitment protocols, using evidence-based approaches, should be employed. The findings of this review suggest a need for further research to grow the areas of SP training, validation of instruments and attention to transparency to support further investigation in this field of healthcare simulation. There are numerous other clinical contexts where SPs can partner with teaching faculty to enhance students' communication skills. Areas noted by patient safety and quality groups where communication plays a key role in influencing positive patient outcomes include patient discharge and during transitions of care.

References Publication One

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Table 2.1 Summary of Articles Reviewed

Author/s country	Study focus	Sample & setting	SP role, recruitment & training	Research design	Instruments *	Major findings
Adib-Hajbaghery and Rezaei-Shahsavarloo (2015) Iran	Communicating with hearing impaired patients using SPs for intervention	71 nursing students University	Role = part of the education intervention. Gives structured feedback. Recruitment = NR Training = NR	Cross-sectional quantitative study	N/S = Demographic questionnaire S/P = Nil F = Performance assessment checklist *(Cronbach Alpha 0.75)*	Nursing students lack the knowledge and skills required to effectively care for hearing impaired patients. The use of SPs allowed students to improve on this skill
Becker et al. (2006) USA	Evaluating knowledge of depression and therapeutic communication skills with SPs	103 nursing students University	Role = part of the education intervention, gives structured feedback. Recruitment = NR Training = NR	Pilot study, pre-test/post-test design. RCT	N/S = communication knowledge Test (CKT) N/S = Student self-evaluation of SP Encounter (SSPE) S/P = Post Encounter SP Checklist S/P = Standardized patient interpersonal ratings (SPIR) F = Nil *(Faculty designed tools; no Cronbach's alphas reported)*	Authors support the use of SP's in nursing education. The SP provided students with feedback and competence regarding verbal and non-verbal communication skills
Bernard, et al. (2012) Switzerland	Adherence to communication skills training with SPs	31 participants (18 Nurses and 13 medical) Hospital	Role = aid in the evaluation of a communication skills programs Recruitment = NR Training = NR	Exploratory Study	N/S = Psychotherapy Process q-set (PQS), 105-item instrument. S/P = Nil F = Nil *(No Cronbach Alpha reported)*	Communication skills training equally benefits all clinicians. Affective load is a mediating factor that may help clinicians reflect on their personal way to relate to cancer patients when breaking bad news
Bloomfield et al. (2015) UK	Communication skills with dying patients and their families	180 nursing students and 450 medical students University	Role = part of the education intervention, gives structured feedback Recruitment = R Training = NR	Mixed methods	N/S = pre-test/post-test Questionnaire S/P = Nil F = Nil *(No Cronbach Alpha reported, faculty designed tool)*	Simulation was found to be an effective way to prepare students to communicate with dying patients and their families
Brown et al. (2009) USA	Evaluation of a communication skills training workshop	12 nurses Cancer Centre	Role = aid in the evaluation of a communication skills programs Recruitment = NR Training = NR	Pilot Study Quantitative Observational	N/S = Likert scale questionnaire S/P = Nil F = Nil *(No Cronbach Alpha reported, faculty designed)*	Nurses reported more confidence to deal with patient depression after the communication intervention
Canivet et al. (2014) Belgium	Assessed the efficacy of a general communication skills program for cancer nurses with SPs	115 Nurses Hospital	Role = aid in the evaluation of a communication skills programs Recruitment = R Training = NR	RCT Mixed Methods	N/S = Nil S/P = Nil F = PainComCode-*Faculty designed qualitative measure*	A general communication skills program only enabled oncology nurses to acquire some of the skills needed to provide therapeutic care to patients with cancer pain. Further communication skills training is required more specific to cancer pain management
Hsu et al. (2015) Taiwan	Compare the effect of traditional course training versus scenario based simulation training in discharge planning	116 nurses Hospital	Role = part of the education intervention, gives structured feedback SPs to aid in the evaluation of a communication skills programs Recruitment = NR Training = NR	RCT	N/S = communication competence Scale (CCS) *(Cronbach Alpha 0.93)* N/S = communication self-efficacy scale (CSES) *(Cronbach Alpha 0.97)* N/S = Learning satisfaction scale (LSS)	Established both traditional classroom lectures and simulation improved on patient communication skills. However the latter performed better in learner satisfaction and communication performance

Author/s country	Study focus	Sample & setting	SP role, recruitment & training	Research design	Instruments *	Major findings
					(Cronbach Alpha 0.97) S/P = OSCE feedback *(Cronbach Alpha 0.54)* S/P = communication performance checklist (CPC) *(Cronbach Alpha 0.60)* *F = Nil*	
Doolen et al. (2014) USA	SP as a learning strategy in Mental health communication	94 mental health nursing students University	Role = part of the education intervention, gives structured feedback. Recruitment = reported Training = Reported *(Wallace, 2006)*	Mixed Methods design	N/S = Likert scale S/P = Nil F = Nil *(No Cronbach Alpha reported, faculty designed)*	Students improved on interviewing and communication skills in a safe and educational environment before encountering mental health patients in a clinical experience
Kameg et al. (2009) USA	Mental health simulations with the use of SP's may be one strategy to decease student anxiety and improve patient outcomes	69 Nursing students University	Role = part of the education intervention, gives structured feedback. Recruitment = previous SP Training = reported	Quasi experimental design	N/S = State trait anxiety inventory (STAI) *(Test–retest correlations 0.86)* N/S = Visual Analogue Scale (VAS) *(No Cronbach Alpha reported)* N/S = Simulation Evaluation Survey *(Cronbach Alpha 0.87)* S/P = Nil F = Nil	A reduction in anxiety was reported by the students nurses after completing the interaction with the SP
Langewitz et al. (2010) Switzerland	Evaluation of communication skills training programme for oncology nurses	70 nurses Hospital	Role = aid in the evaluation of a communication skills programs Recruitment = actors Training = not reported	Non – RCT Quantitative	N/S = Nil S/P = Nil F+ = Roter Interaction Analysis System (RIAS) *(Roter, 1991)*	The communication skills programme could be used to achieve a substantial increase in patient-centred communication
Luebbert and Popkess (2015) USA	Developed and tested an innovative learning strategy using SP's to determine the effectiveness of teaching suicide prevention	34 Nursing students University	Role = part of the education intervention, gives structured feedback. Recruitment = reported (student actors) Training = not reported	Experimental two group, post-test designs.	N/S = Student satisfaction and self-confidence in learning (SSSCL) *(Cronbach Alpha 0 0.94 and 0.87 respectively)* N/S = Educational practices Questionnaire (EPQ) *(Cronbach Alpha 0 0.88)* N/S = Simulation design scale (SDS) *(Cronbach Alpha 0 0.80)* N/S = Knowledge assessment *(not validated)* S/P = Nil F = Nil	Suicide prevention is a communication skill that can be effectively taught to nursing students using standardized patients
Martin and Chanda (2016) USA	Communication scenarios with emphasis on symptoms related to psychiatric disorders	27 Nursing students University	Role = part of the education intervention, gives structured feedback. Recruitment = reported Training = not reported	Quasi-experimental	N/S = Pre-test and post-test *(Faculty designed Tool)* N/S = Visual Analogue Scale SP = Nil F = Nil	Gave students the opportunity to participate in therapeutic communication with mental health scenarios. Gave students confidence and a decrease in anxiety
Paans et al. (2013) Netherlands	How the use of diagnostic resources such as admission forms and nursing diagnoses hand books-influences nurses communication during admission interviews	60 nurses Hospital	Role = assess the effectiveness of diagnostic resources. Recruitment = not reported Training = not reported	RCT Quantitative	N/S = Nil S/P = Nil F = Roter Interaction Analysis System (RIAS) *(Roter, 1991)*	Pre-structured forms may promote comprehensive communication skills, the needs to be aware that using certain diagnostic tools may hinder nurses from asking open-ended questions to further increase communication skills

Author/s country	Study focus	Sample & setting	SP role, recruitment & training	Research design	Instruments *	Major findings
Robinson-Smith et al. (2009) USA	Evaluating nursing students satisfaction with a SP mental health exam and suicide risk assessment	112 Nursing Students University	Role = part of the education intervention, gives structured feedback. Recruitment = reported Training = reported (Wallace, 2006)	Quantitative study	N/S = Student Satisfaction and Self Confidence Survey (SSSCL) *(Cronbach Alpha 0 0.94 and 0.87 respectively)* SP = Nil F = Nil	Overall a perceived increase in satisfaction and self-confidence
Ryan et al. (2010) United Kingdom	To evaluate the acceptability of introducing an SP program to assess communication and consultation skills training	46 medical students and 64 nursing students University	Role = part of the education intervention, gives structured feedback. Recruitment = reported Training = not reported	Quantitative study	N/S = Nil S/P = Nil F = Global Rating Scale for communication skills and attitudes *(Wiskin et al., 2003)*	Recommendations concluded students who are assessed in communication and consultation skills through SP's should be ideally learn those skills with a trained SP
Schlegel et al. (2012) Switzerland	Investigated the effectiveness of learning involving SP's and the use of role-play on training communication skills	55 nursing students University	Role = part of the education intervention, gives structured feedback Recruitment = not reported Training = reported (Wallace, 2006)	Randomized post-test control group design	N/S = The European Donor Hospital Education Programme Self-Efficacy Questionnaire *(Cronbach Alpha 0.93)* *(Cronbach Alpha 0.97)* F = Supervisors Perspective on the quality of Communication *(Cronbach Alpha 0.66)* S/P = Nil F = Nil P = The art of Medicine Survey Scale (AMS)	Clinical supervisors rated the intervention group to be significantly superior in communication skills. The results indicated that the use of SPs is superior to communication training over the use of role-play only
Webster (2013) USA	Competency of student nurses in patient centred care in mental health	15 nursing students University	Role = part of the education intervention, gives structured feedback Recruitment = actors Training = not reported	Pilot Study Quantitative	N/S = Self reflection *(Faculty designed, no Cronbach Alpha)* SP = Nil F = Nil	Desired learning outcomes were achieved using SPs, including the demonstration of therapeutic communication and assessment skills, empathy, caring and addressing patient values, preferences and beliefs
Yuksel and Unver (2016) Turkey	Senior nursing students communicating with deaf SPs for use in the emergency department	22 nursing students University	Role = part of the education intervention, gives structured feedback. Recruitment = not reported Training = NR	Descriptive Qualitative	N/S = Nil S/P = Nil F = Systematic text condensation *(Malterud, 2012)*	The findings showed allowing students to repeat the SP simulation 3 times improved students communication skills to provide serves to deaf patients
Zavertnik et al. (2010) USA	SP intervention designed to enhance the current curriculum classroom based approach to teaching communication skills	41 Nursing Students University	Role = part of the education intervention, gives structured feedback. Recruitment = R Training = NR	Quasi-experimental	N/S = Standardized grading tool *(Cohen's Kappa 0.086)* *SP = Nil* *F = Nil*	The simulation between SPs as family members allows students to develop communication skills in a controlled, non-threatening environment

END OF PUBLICATION ONE

2.7 Summary of Publication One

The evidence presented in the 19 articles reviewed indicates that the use of SPs in CST is diverse and there is a consensus in the literature that SPs are an effective teaching and learning method when adhering to best practice guidelines (MacLean et al., 2017). Engaging SPs in both CST program facilitation and course evaluation can provide teaching faculty with a strong foundation to develop further pedagogical and research capacity. Expanding the utilisation of SPs in SBE to enhance nurses' communication skills and the ability to engage with patients in a broader range of clinical contexts is recommended.

2.8 Simulation Frameworks and Theories

As identified in the integrated review by Maclean et al. (2017) the importance of applying a theoretical framework to all phases of simulation planning, implementation and evaluation cannot be understated. Research is often conducted to test or refine theories and frameworks (Nestel & Bearman, 2015). Currently, a no one-size-fits-all framework to support the use of simulation in education exists in the literature. This study applied four established simulation and educational frameworks. The four theories are well established in the literature and encompass elements from the fields of nursing, medicine, and educational theories. The chapter concludes with a proposed integrated conceptual model of presence including the four theories and frameworks used to inform the design and evaluation of this study. The model was designed to combine elements of the four frameworks to both fill a gap in the literature and support testing of the relationship between components from each of the frameworks.

2.8.1 National Health Education and Training in Simulation (NHET-Sim)

To ensure best practice, the teaching faculty who recruit and train SPs need comprehensive guidelines. The National Health Education and Training in Simulation (NHET-Sim) program was developed together with Health Workforce Australia to inform simulation practice. The training program is comprised of two core modules and 12 elective modules. Module five is simulated patient methodology (SPM). The focus of this module is to train SPs to work in health care simulations. Module five was used in the simulation design stage of this study to recruit and train the eight SPs. Module five contains four phases as a training methodology (Figure 2.2). The process is an evidence-

based model that draws on experience from the dramatic arts theories (Nestel, Fleishman & Bearman, 2015).

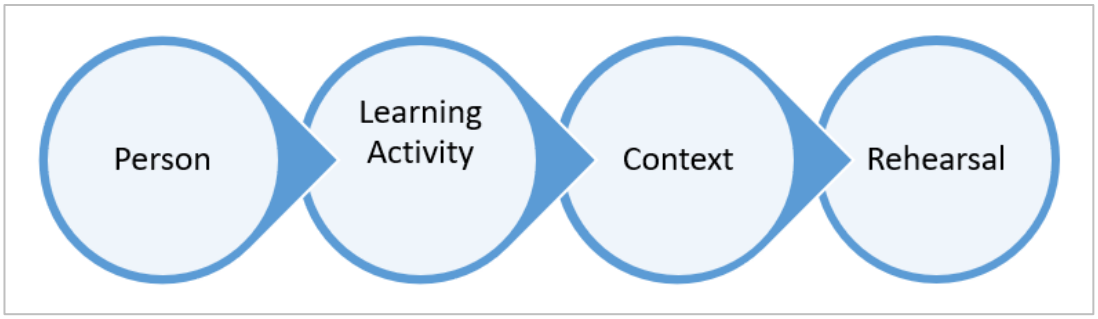


Figure 2.2 Phases for training SPs for role portrayal (Module five, NHET-sim)

Person Phase

Ensuring the authenticity of patient portrayal is critical in SP based simulation. Before training begins, the SP must match the demographic description of the patient case. Teaching faculty should look for qualities in potential SPs that will enhance the role. These characteristics can include age, gender, the SPs acting ability, keen observational skills, recall and willingness to work towards a standardised performance. Once a suitable SP is employed, the first phase of training can begin. This first phase places the primary value on the person to be portrayed, without reference to the illness or the disease. The SP should be given scope in this phase to develop the person's character and who the actual person is without a disease process (Nestel, Fleishman & Bearman, 2015).

Learning Activity

During the learning activity phase, the teaching faculty do most of the talking, explaining the purpose of the activity, learning objectives and details of the scenario. This stage provides the opportunity to make sure the SP understands the task, their role, and the teaching faculty's expectations. In this phase, it is often helpful to use a video or audio recording of the simulation, to demonstrate what is expected from the performance (Nestel, Fleishman & Bearman, 2015).

Context Phase

During the context phase, the SP moves into thinking about the character as a patient. This phase ensures the SP has a good understanding of the actual illness or disease and how it would manifest for the patient they are portraying. Depending on the complexity

of the scenario, this process may take 15 minutes or longer. The phase allows for clarification and time to ask questions (Nestel, Fleishman & Bearman, 2015).

Rehearsal Phase

The rehearsal phase allows the SP time to run through the scenario and integrates all components of the previous stages. This final phase is organised in four rounds. The aim of the first round is to practice the role. In the second round, the teaching faculty can ask the SP about the clinical information involved and any emotional aspects of the scenario. In round three, the SPs do a partial rehearsal, often using a hot seat to allow for calibration of the character. Finally, a full rehearsal of the scenario is conducted for additional practice and to demonstrate mastery of the skills.

The *NHET*-sim program (module five) provides a systematic approach to recruiting and training SPs. When used frequently, the program can result in a high level of SP proficiency and skill (Nestel & Bearman, 2015). The more experienced the teaching faculty becomes in directing (which can be learned on the job), the more effective they will be at shaping the SPs' performance to ensure it is accurate and realistic.

2.8.2 National League for Nursing/Jeffries Simulation Theory

The National League of Nursing/Jeffries Simulation Theory (NLN/Jeffries Theory) previously called the Nursing Education Simulation Framework was first published in 2005 (Jeffries, 2015). Nursing scholars from eight institutions in collaboration with Laerdal™ established the NLN/Jeffries Theory. In simulation literature, theories related to education such as Benner's novice to expert, Kolb's experiential learning and constructivist learning theory (Benner, 1984; Lafond & Van Hulle Vincent, 2012) are cited. The NLN/Jeffries theory links elements of Benner's and Kolb's experiential learning to explain learning outcomes specific to simulation. The major components of this theory are briefly described in the following section and shown in Figure 2.3.

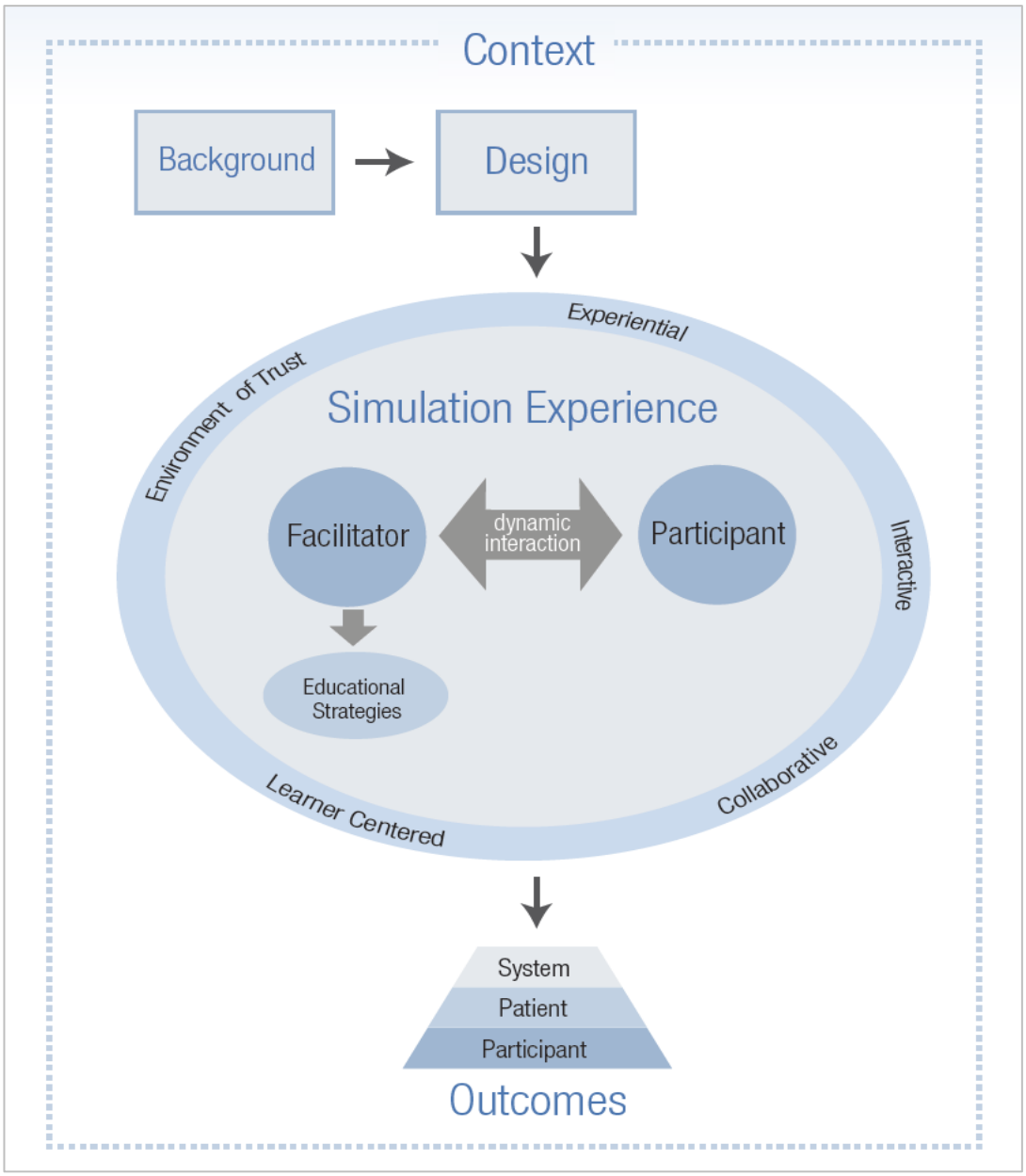


Figure 2.3 **NLN/Jeffries Simulation Theory.** Retrieved from http://Jeffries. P. R. (2015). A framework for designing, implementing and evaluating simulations used as teaching strategies in nursing. Nursing Education Perspective.

Context

Contextual factors are the setting or environment the simulation will take place in. The context is an essential starting point and should include whether the simulation is for research, student evaluation or instructional purposes (Jeffries et al., 2015).

Background

The background involves the goals of the simulation and how the simulation corresponds to the nursing program. The background also includes resources such as time and equipment required and how the resources will be allocated (Jeffries et al., 2015).

Design

Design characteristics include: specific learning objectives, elements of fidelity, student support, problem-solving and pre and post-simulation debriefing (Jeffries et al., 2015). Support can be given to the student at the pre-briefing, during and after the simulation to help the student work through the simulation. The facilitator adjusts the level and timing of support provided in a process described as "cueing" (Jeffries, 2012; Paige & Morin, 2013).

Debriefing is the last activity in the design phase. As described previously, debriefing is a constructivist, reflective teaching strategy that consolidates learning (Jeffries, 2015). Debriefing should occur after the simulation, in a comfortable environment that promotes inclusiveness and privacy. The length of time spent debriefing is still under considerable debate, in general students need time to reflect, analyse and postulate how the simulation performance could be improved or changed to develop further skills (Jeffries, 2015). In a critique of the NLN/Jeffries theory, students considered debriefing as the most valuable experience within the design characteristic (Lafond & Van Hulle Vincent, 2012).

Simulation Experience

The simulation experience is characterised by an environment that is experiential, collaborative, and student-centred (Jeffries, Rodgers & Adamson, 2015. P 292) Psychological safety is an integral part of the simulation experience with both the facilitator and student sharing the responsibility for promoting trust in the learning environment. The facilitator and student also need to work together to promote psychological fidelity, engagement and presence during the experience (Dunnington 2015; Jeffries, 2015).

Facilitator and Educational Strategies

The facilitator is crucial for any learning experience to be successful. Facilitators support students and provide encouragement, guidance and debriefing knowledge. The facilitator responds to the simulation experience by changing educational strategies such as the timing of activities and feedback. Unlike didactic teaching methods, the facilitator shifts the learning focus from being faculty-centred to student-centered (Jeffries, 2015). Facilitator characteristics that students have identified as important include; teaching ability, personality, nursing competence, and interpersonal skills. Facilitators themselves identified evaluation skills, nursing competence, expertise in designing scenarios, teaching ability, equipment manipulation, and technical skills as the most important (Jeffries, 2015; Parsh, 2010).

Student

The student can participate in the learning through direct contact with the patient/mannequin/SP or through observation (Jeffries, 2012). The NLN/Jeffries Simulation Theory considers the student's age, level of education and program type when determining learning outcomes. Researchers have also identified that student-related variables such as readiness to learn, gender, personal goals, self-confidence, and anxiety can also influence learning outcomes (Jeffries, 2012; Beishcel, 2013). While many factors in simulation, including design characteristics, are under the control of the facilitator, student factors are not. A student's personality traits, ability to be present (Dunnington, 2015), suspend disbelief (Muckler, 2017) and be motivated may affect their ability to learn.

Outcomes

Student learning outcomes in the NLN/Jeffries Simulation Theory include knowledge, skill performance, student satisfaction, critical thinking, and self-confidence. Evaluation of learning outcomes is essential to determine what students have gained and the overall effectiveness of the simulation (Jeffries, 2015). The type and importance of learning outcomes are discussed in detail further on in this chapter (Section 2.8.4).

The NLN/Jeffries Simulation Theory has impacted simulation practices in nursing. As the field of simulation matures in its science and is informed by research, other models such as Dunnington's Centricity of Presence have emerged to support and build on existing practice.

2.8.3 Centricity of Presence

Dunnington's (2014) Centricity of Presence model overlaps and expands on aspects of the NLN/Jeffries Simulation Theory. Dunnington's model has a clear focus on the experience of the individual student in the simulation. Dunnington refers to presence as having aspects of endocentricity and exocentricity. These concepts describe the student's state having sensory, perceptual, and actional dominance from the stimulation either on the inside (endocentricity) or external to (exocentricity) the situation represented by the simulation.

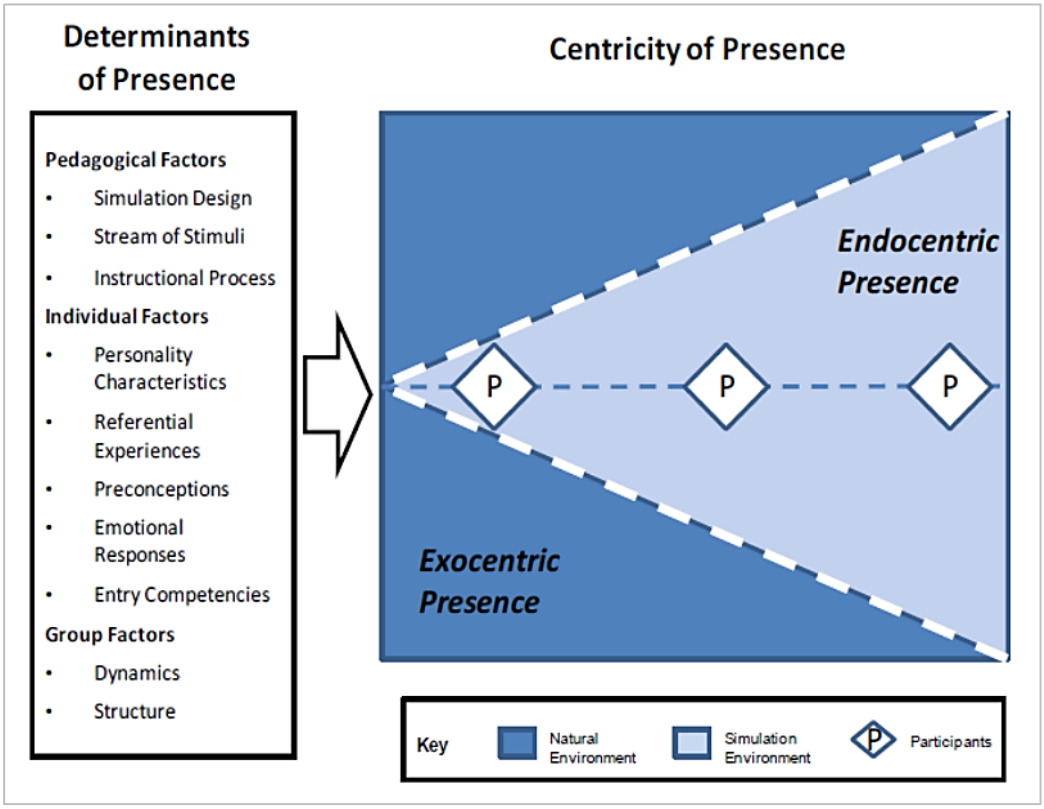


Figure 2.4 The Determinants of Presence in High Fidelity Human Patient Simulation (Dunnington, 2015). Retrieved from http:// Dunnington, R. (2015) The centricity of presence in scenario-based high-fidelity human patient simulation: A Model, Nursing Science Quarterly.

In describing Dunnington's (2015) model, the dark blue section of the rectangle in Figure 2.4 represents the natural environment in which the simulation takes place. The concepts within the rectangle represent states of endocentric presence (internal to the simulation) or exocentric presence (external to the simulation). The students who are considered endocentrically present are shown in the model by the diamonds (P) at various positions within the dashed triangle. Dunnington recognises that students can move

between endocentric or exocentric states and proposes that those students who can maintain endocentric presence have a more positive learning experience and achieve better learning outcomes. Dunnington's model expands on the work of Jeffries, as both models/theories claim that fidelity and realism correlate with student characteristics to create a state of engagement and presence in which the student's learning is potentially optimised (Dunnington, 2015).

2.8.4 Kirkpatrick Model of Evaluation

The Kirkpatrick Model of Evaluation (Figure 2.5) has emerged as a popular framework in learning evaluation (Kirkpatrick, 1959). The model was created to determine the effectiveness of a particular intervention, training or study. The model has four levels of evaluation, with level four being the most desired outcome.

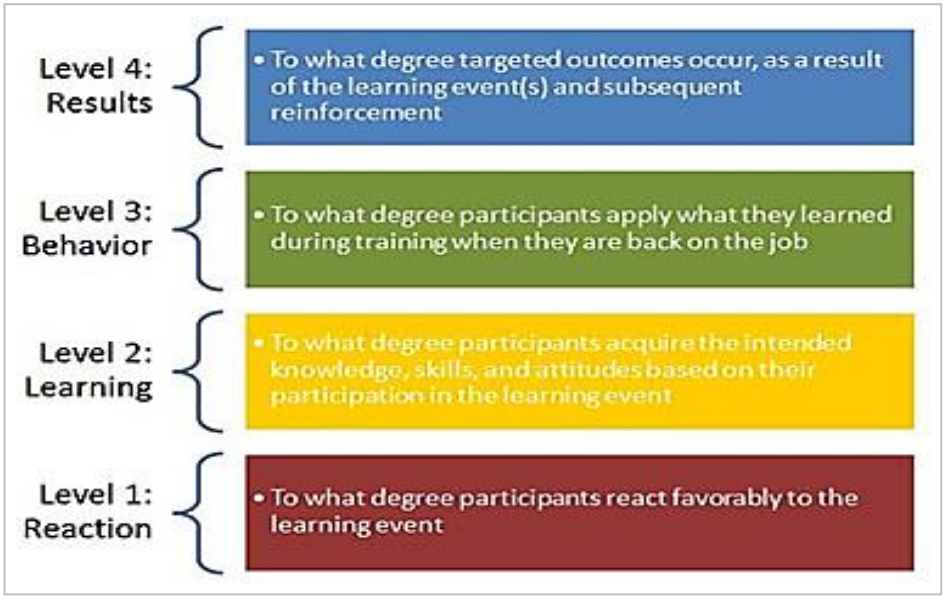


Figure 2.5 **Kirkpatrick's Model of Evaluation.** Retrieved from http:// Kirkpatrick, D. L. (1994). Evaluating training programs: the four levels / Donald L. Kirkpatrick. (1st ed). San Francisco.

Level One Reaction

Kirkpatrick's lowest level of evaluation measures students' satisfaction and reaction to teaching and learning. This level relies heavily on self-judgment and is based on the premise that when students are satisfied with the learning, the training program or intervention is successful in improving educational outcomes (Kirkpatrick, 1959).

Level Two Learning

Measuring at the second level considers skills, knowledge, and attitudes (Kirkpatrick, 1959). Level two typically applies psychometric measures (optimally via pre- and post-intervention testing) to evaluate learning outcomes. Knowledge is often derived from self-assessments rather than from a third party (i.e. a patient, SP or faculty).

Level Three Behaviour

At level three improvement is defined as the extent to which a change has occurred in a student's behaviour due to their involvement in training and education (Kirkpatrick, 1959).

Level Four Outcomes

In health care, level four consists of evaluating whether training is transferred into clinical practice and if changes are seen in patient health care outcomes (Kirkpatrick, 1959).

Kirkpatrick's Model of Evaluation Applied in Simulation

Recently, the Kirkpatrick Model of Evaluation has been modified for use in SBE (Adamson, Kardong-Edgren & Willhaus, 2013). The four levels are now described in Figure 2.6. The revised model has a focus on education and learning outcomes with a translational simulation framework attached (i.e.T0-T3). Level one of the model is how students react to learning (confidence levels). Level two translates to knowledge and skills learned in the simulation laboratory. Level three recognises if a behaviour or clinical skill learned in the simulation laboratory translates into patient care. Level four, as the highest level, evaluates the training programs impact on patient outcomes such as patient safety (Adamson, Kardong-Edgren & Willhaus, 2013).

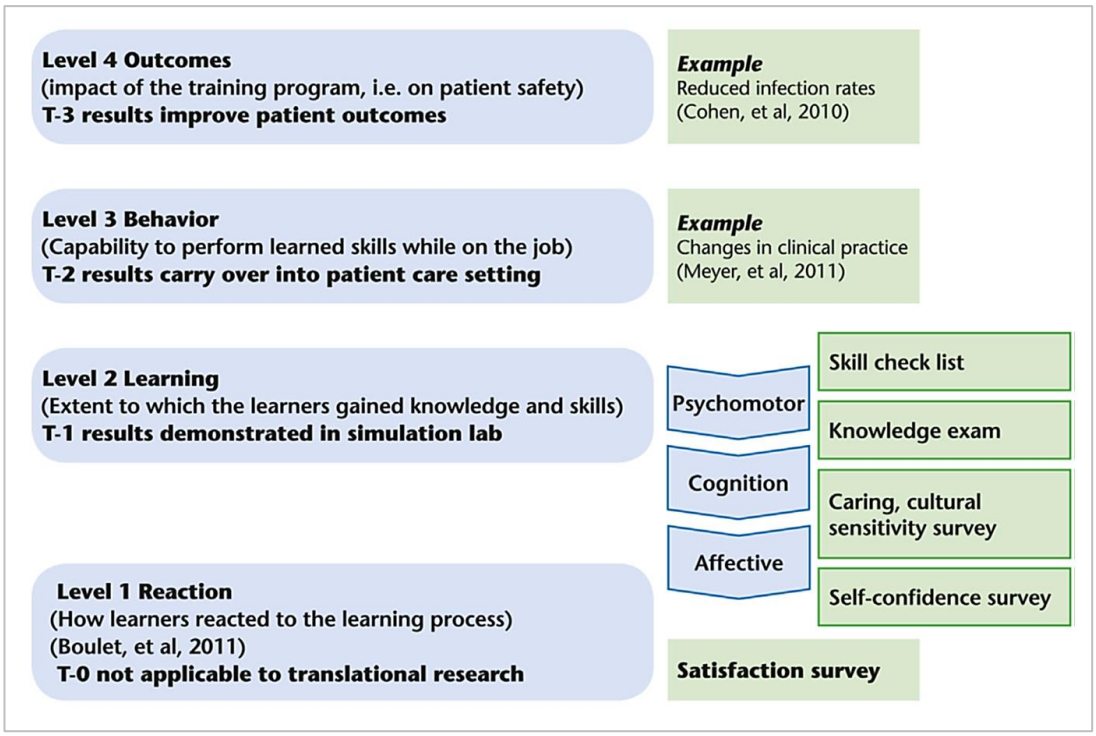


Figure 2.6 **T-1, Translation Phase 1; T-2, Translation Phase 2; T-3, Translation Phase 3; T-0, not applicable to translational research.** Retrieved from: http:// Adamson, K. A., & Kardong-Edgren, S. (2012). A method and resources for assessing the reliability of simulation evaluation instruments. Nursing Education Perspectives, 33(5), 334- 339. http://dx.doi.org/10. 5480/1536-5026-33.5.334.

A recent review by Seaton et al. (2019) investigated the impact of SBE on patient safety. They reviewed 15 studies that measured Kirkpatrick's evaluation at levels three (n=10) and level four (n=5). Seaton et al. recognised that research in SBE is often limited to lower levels of Kirkpatrick's evaluation because of conceptual and practical difficulties. Tertiary institutions that do not have a partnership with a hospital may not be able to execute a study that translates into patient outcomes. Researchers are, therefore not able to evaluate SBE at level three or four where the focus is on changes in clinical practice and patient safety.

A systematic review by Kaplonyi et al., (2017) examined CST with SPs in health care, identifying and categorising 63 studies using Kirkpatrick's levels of evaluation (11 from Nursing). Some studies were categorised across two levels. Kaplonyi et al. (2019) found that 34 studies frequently reported improvements in student confidence and satisfaction (level one). In 25 studies, knowledge acquisition was evaluated at level two and 44 studies measured behavioural changes at level three. Only two studies in the review reported patient outcomes (level four). To date only a few medical or nursing articles have

examined level four changes in student and patient outcomes after undertaking simulation-based CST, limiting the level of translational research evidence currently available in this field (Kaplonyi et al., 2017; Seaton et al., 2019).

2.8.5 Integrated Conceptual Model of Presence

An integrated conceptual model of Presence in SBE was developed within this study by combining elements of the NHET-Sim (module five), NLN/Jeffries Simulation Theory, Dunnington's Centricity of Presence and Kirkpatrick's Model of Evaluation. A student-centred focus is emphasised as a core component in the model presented in Figure 2.7. The purpose of designing the model was to assist the researcher in determining how variables within each theory or framework are related and influence student learning outcomes. This integrated conceptual model of presence proposes that educational and simulation design characteristics influence the students' sense of presence in the simulated environment, which in turn affects their learning outcomes. The model is described in further detail and components of the model are tested in publication five (section 4.3).

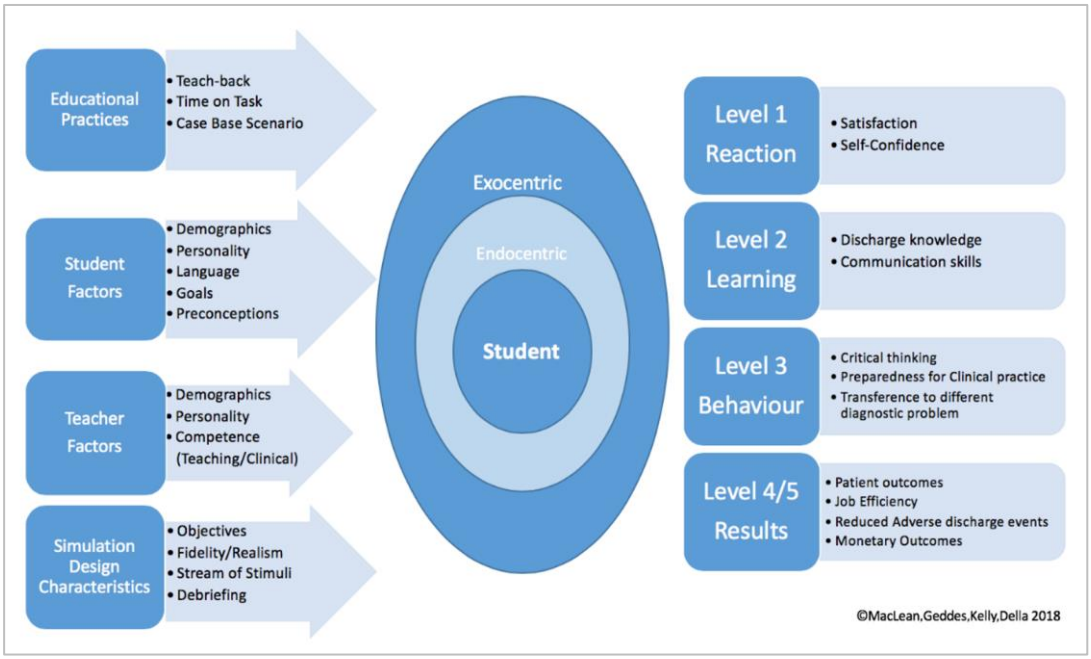


Figure 2.7 Integrated Conceptual Model of Presence

2.9 Conclusion

In summary, this chapter provided a critique of current evidence relating to SBE with a focus on working with SPs in communication skills training. This review identified that consideration of relevant theoretical frameworks plays a vital role in ensuring the planning, design and evaluation of SBE is undertaken to highest standards. The integrated conceptual model of presence in SBE developed provides a meaningful structure to implement and test the relationship between different variables critical to the successful implementation of SBE. In particular, it was argued that an essential goal of SBE is to create an environment that allows students to be present within the simulation, fully engaged in the learning experience, and given the opportunity to reflect on their experience to optimise their learning opportunities. The following chapter presents the methodology and mixed-methods design applied in this study.

Chapter 3 Methodology and Method

3.1 Chapter Overview

Chapter three presents the methodological approach implemented in this research. Sections 3.2 and 3.3 describe and justify the realist evaluation paradigm applied. Section 3.4 outlines ethics and the mixed-methods research design used. A summary of the research phases and design elements is shown in Table 3.1. The methods applied in the two-phases of the research, including the participants, sampling, instruments and procedures are described. Phase one involved preparation for the simulation, including the recruitment and training of SPs and establishing the reliability and validity of SP training as presented in publication two (Section 3.5). Phase two included data collection for the evaluation of CST interventions and testing of the integrated conceptual model of presence for SBE.

3.2 Methodological Paradigm

As healthcare simulation practice and research mature, there has been a call for an applied research paradigm that allows researchers to investigate "what works for whom, in what circumstances and why (or not)" (Graham & McAleer, 2019, p 3). Adopting a particular paradigm can inform the study design. Morgan states, "a paradigm is a shared belief system that influences the types of knowledge a researcher seeks to obtain and how they interpret the data" (2007, p.49). The realist evaluation paradigm explores both the context and underlying mechanism of why an intervention is successful (or not) (Graham & McAleer, 2019). The following section (3.3) explains the features of a realist evaluation paradigm and illustrates its rationale and application in this study.

3.3 Realist Evaluation

The term realist evaluation has evolved from the seminal work of Pawson and Tilley (1997). Realist evaluation is a paradigm that positions itself between positivism and constructivism and is an evolving methodology that is suitable for teaching interventions in SBE. Positivism is described as a simple ontological view of the world ("what exists"). Positivist researchers typically collect and analyse quantitative data to explain specific phenomena under highly controlled conditions (Creswell & Plano Clark, 2018). Alternatively, constructivism views reality and knowledge as not being fixed but built in

multiple meanings and values. The constructivist researcher typically uses qualitative methods, to see reality from different perspectives (Creswell & Plano Clark, 2018; Pawson & Tilley, 1997). Realist evaluation has no preference for quantitative or qualitative methods. The realist approach sees merit in applying multiple methods, and converging evidence derived data from various sources.

Based on experiences, realist evaluation takes an ontological view of the physical world we live in. In recognising personal values when conducting research, the realist investigator acknowledges that both unbiased and biased interpretations will be generated and seeks to explain and reconcile them (Creswell & Plano Clark, 2018). A realist may reject a hypothesis (single reality) or provide multiple realities (different perspectives) (Creswell & Plano Clark, 2018). The measures a realist seeks to explore include: context, mechanism, reasoning, and outcome. The following formula represents the methodology within this study design.

Mechanism (*resources*) + Context → M (*reasoning*) = Outcomes

The mechanism is the central component of realist evaluation as it develops or triggers a student response in a given context (Graham & McAleer, 2019). Pawson and Tilley (1997) explained that a mechanism is any step or series of steps that bring about change, either negative or positive. In health-related simulation, the real world consists of patients/ SPs and the clinical signs and symptoms assigned to them in any specific scenario. These stimuli are open to interpretation through each student's unique combination of senses, cognitions and cultural inputs (Graham & McAleer, 2019). For this study, it is not only the mechanism of working with SPs in a simulation that produces learning outcomes but how the process provides students with the opportunity to learn, gain confidence and apply their knowledge (reasoning). Teaching faculty should be familiar with educational theories that underpin the mechanism applied (Graham & McAleer, 2019).

The context reflects the conditions for which the mechanism (i.e. SP-based simulation) is introduced. For evaluation purposes, the context must be consistent with the broader education program and course outcomes. The context for this study is undergraduate nursing students discharging a patient with complex health care needs associated with T2DM. As nursing students have minimal clinical experience in patient discharge (context), it is expected that the SP will be able to elicit realistic responses and enable student decision-making during the scenario. The M (reasoning) is the way that the students engage

with the resources provided to generate outcomes. Simulated patients provide students with immediate feedback, to assist them in applying their knowledge and communication skills.

Finally, the realist evaluation focuses on positive (skill mastery, an increase in knowledge) or negative (psychological harm from a poorly structured intervention) student outcomes. There are several approaches available to realist researchers to evaluate outcomes, including Bloom's taxonomy, Kirkpatrick's Evaluation model and translational (TSR) outcomes (Graham & McAleer, 2019). Table 3.1 provides an example of the proposed context, mechanism, outcomes and educational theories in this study.

Table 3.1 Proposed context, mechanism, and outcomes for the SBE intervention for final year nursing students

Mechanism	Context	Outcomes(students)	Educational Theory/ Framework
Students provided with a realistic scenario using SPs in a high fidelity simulation laboratory	Final year undergraduate nursing students who have not had the responsibility of managing complex discharge conversations.	To manage a patient discharge who requires complex medication information.	NHET-Sim Kirkpatrick's Evaluation Concept of Presence NLN/Jeffries Theory

Note: M= Mechanism, C= Context and O= Student Outcomes

Using a methodology that explores components of why an intervention works (or not) by factors of context, mechanism, and outcome, supports greater understanding of the results (Graham & McAleer, 2019). A recent review examining the use of a realist evaluation by Graham and McAleer, reported that the methodology was gaining traction in a wide variety of health care contexts. Currently, 18 papers in SBE have been published describing a realist evaluation across a variety of healthcare journals. While the realist evaluation methodology is relatively new, researchers in SBE are encouraging its use in the simulation community and adapting its principles to help clarify "what worked and why" (Graham & McAleer, 2019).

3.4 Method

A mixed-method convergent design was chosen to meet the two aims of the study. Mixed-methods encompasses both quantitative and qualitative approaches (Creswell & Plano Clark, 2018). The purpose of adopting this method was to add rich layers of understanding to the areas of interest. Full details of design, analysis, and procedures undertaken are provided in each publication. A summary of the methods and design elements of this study, including aims, data type, sample, and design, are presented in Table 3.2. and briefly described below. Further details are provided in section 3.4.1 – 3.4.4.

Publication one employed Whitmore and Knafl's (2005) strategy for conducting an integrative review. Publication two was a quantitative, correlational study to assess inter-rater reliability of SPs. Publication three was a quantitative study applying a quasi-experimental control group design to evaluate the CST interventions. Publication four was a qualitative study describing student experiences during SBE. The final publication five was a mixed methods study using correlational (quantitative) and descriptive (qualitative) methods to evaluate the relationship between variables in the integrated conceptual model of presence in SBE.

Table 3.2 Method and Design elements

Component	Aim	Output	Data Source	Design	Sample	Instruments	Analysis
Phase 1							
Theories and Frameworks	Review of SBE models and theories	Integrated conceptual model of presence	Review				
SP Utilisation	Review	Publication 1	Review	Integrative Review	19 studies	CASP	
Scenario Design	Validation	Scenario		Expert Panel Review	6 Experts		
SP Training	Evaluation of SP consistency	Publication 2	Quantitative	Correlational	8 SPs 4 SF 42 students	QDTS ICAS	ICC Paired t-tests
Phase 2							
Communication Intervention	Evaluation of learning	Publication 3	Quantitative	Quasi-experimental control group	141 students 8 SP 6 SF	QDTS-C QDTS-D	EFA MANOVA
Reflective Debriefing	Evaluation of experience	Publication 4	Qualitative	Descriptive Qualitative	141 Students in 35 groups	GAS Interview	Content Analysis Thematic Analysis
Model Testing	Evaluation of integrated conceptual model of presence in SBE	Publication 5	Mixed methods	Convergent Mixed Correlational Descriptive Qualitative	141 students 12students	SDS COP QDTS GAS Interview	EFA ANOVA H-MRA Thematic Analysis

Note: SP= Simulated Patient, SF= Simulation Facilitator, CASP= Critical Appraisal Skills Program, QDTS= Quality Discharge Teaching Scale- (C=Content, D=Delivery subscales), ICAS= Interpersonal Communication Assessment Scale, SDS=Simulation Design Scale, Concept of presence (COP), GAS=Gather, Analyze & Summarize debriefing tool ICC= Intra-class correlations, EFA= Exploratory Factor Analysis, MANOVA= Multivariate Analysis of Variance, H-MRA= Hierarchical Multiple Regression Analysis

3.4.1 Ethics

Approval for the study was obtained from the Curtin University Human Research ethics committee (RDHS-240-15) (Appendix A). Students were invited to consider participating in this study by accessing the information sheet (Appendix B). Students who agreed signed a consent form to complete the survey questionnaires (Appendix C). Students were assured of confidentiality throughout the project, and all information collected and retained was stored according to university policy. Students were reminded that they could withdraw from the study at any time without consequence to themselves as described in section 3.4.4.

3.4.2 Participants

Sample

Participants for this study were 141 undergraduate nursing students enrolled in a Bachelor of Science (Nursing) Degree at Curtin University School of Nursing, Midwifery, and Paramedicine. Students in semesters five to seven were eligible for the study, as they had completed the required curriculum components and at least one acute-care clinical placement. Only Curtin University nursing students were asked to participate for pragmatic reasons. The student sample comprised 137 females and four males with a mean age of 27.67 years (*SD*=8.54). Screening of the demographic questionnaire confirmed that all students had previously been exposed to discharging patients in a clinical setting and had completed the relevant lecture and self-directed learning module related to patient discharge. (Refer to publications for more information on recruitment, sampling, and characteristics of sub-samples utilised in specific studies). Students were offered a gift voucher for participating in the study.

Simulated Patients

Eight SPs (six females and two males) were recruited through the university patient volunteer database. As shown in Figure 3.1, volunteers over the age of 60 years were selected based on the scenario patient criteria. The mean age of the volunteers was 65.67 years (*SD*=2.50). Before the study, volunteers had no previous experience as an SP. The SPs trained for the simulation were retired schoolteachers, paramedics, office administrators, and homemakers. The SPs were employed to facilitate the learning and data collection for the study.

Figure 3.1 Simulated patient and student working in scenario

Teaching Faculty

The researcher and all teaching faculty (facilitators) were aware of and competent in teaching the nursing curriculum relating to the nursing discharge process. Students were known to the researcher and faculty. Participation in the study was not a course requirement and students did not earn course credits.

Sampling Procedures

All nursing students in the cohort were offered the opportunity to participate in the study during semester breaks between January 2016 and 2017. Study recruitment information was distributed through the university database system. Students were allocated to one of the three communication training groups: (T1) Control Group (No intervention), (T2) Information Group (readmission risk factors provided), and (T3) Interaction Group (Risk factors and Teach-back provided).

Randomisation was not possible at the simulation session-level as students self-selected into session times that fitted with personal study and work commitments. Each session involved three to six students to allow time for completion of the pre-briefing, simulation, and debriefing within a 3-4 hour schedule. As a result, there were 35 groups in total.

A statistical power analysis was performed for sample size estimation. A sample size of 40 students in each of the three groups was required to detect a large effect size of 0.4 (Cohen, 1992), at 80% power and 5% level of significance. The total sample size required

for the study was estimated at 120 students. The final sample numbers (n=141) included 46 students in the control, 46 in the information and 49 in the interaction groups, respectively.

3.4.3 Instruments

This study used both quantitative and qualitative data drawn from the following:

- Demographic and Satisfaction Questionnaire (MacLean)
- Concept of Presence (COP) (Dinh et a.,1999)
- Simulation Design Scale (SDS) (Jeffries, 2012)
- Interprofessional Communication Assessment Scale (ICAS) (Klakovich & Felicitas, 2006)
- Quality of Discharge Teaching Scale (QDTS) (Maloney & Weiss,2008).

Demographic and Satisfaction questionnaire – (Completed by Student)

A demographic survey (Appendix E) developed by the researcher and ratified by the supervision team was completed to obtain age, gender, English as a second language, number of completed semesters and any previous health care experience. Data were collected concerning student's current knowledge of patient discharge practices and satisfaction with current training approaches.

Concept of Presence – (Completed by Student)

To assess the student's sense of presence, a modified version of Dinh et al.'s (1999) Concept of Presence was utilised (Appendix F). The questionnaire consists of 10 items (no Cronbach's alpha is reported), which were adapted from an existing presence questionnaire (Hendrix & Barfield, 1996). The questionnaire uses a 5 point Likert scale. This tool was used to measure the student's sense of presence in a simulated environment.

Simulation Design Scale (SDS) – (Completed by Student)

The Simulation Design Scale (SDS) is a 20-item tool with subscales measuring the various design features of the simulation (Appendix G). The design features rated by the student include objectives, student support, problem-solving, realism (fidelity) and guided reflection/debriefing. These features were suggested by Jeffries (2015) as an integral component of positive learning outcomes. The content validity of the tool was determined by a panel of nine nurse experts (Jeffries, 2015).

The objectives subscale contains five items measuring perceptions about the objectives, preparation materials, and cues provided during the simulation. The support subscale contains four items measuring perceptions about the need for and provision of support during the simulation. The problem-solving subscale contains five items measuring facilitation and opportunities for problem-solving during the simulation. The fidelity subscale contains two items measuring real-life factors of the simulation. Response choices for statements related to the simulation design features were 1) *strongly disagree*, 2) *disagree*, 3) *undecided*, 4) *agree*, 5) *strongly agree*, and NA) *not applicable*. Cronbach's alpha has been reported as 0.92 for the presence of design features and 0.96 for design features (Jeffries and Rizzoli, 2006). The coefficient alpha for the overall scale was 0.94. This tool was used explicitly in this study to measure Realism (fidelity).

Interpersonal Communication Assessment Scale (ICAS) – (Completed by SP & Teaching Faculty)

The teaching faculty and SPs completed the Interpersonal Communication Scale (ICAS) as part of the training evaluation process. The ICAS consists of 23 items and uses a four-point response format (Appendix H). The content subscale consists of 3 items representing advocacy, therapeutic interaction and use of self-validation. The ICAS was found to have construct validity and internal consistency, highlighting its potential as a formative and summative tool to assess the interpersonal communication competencies of nursing students. The overall Cronbach Alpha for the instrument is 0.96, with advocacy 0.93, therapeutic interaction 0.93 and use of self-validation 0.84 (Klakovich & Felicitas, 2006).

Quality of Discharge Teaching Scale (QDTS) – (Completed by Student, Simulated Patient, and Teaching Faculty)

The SPs, students, and teaching faculty all completed the Quality of Discharge Teaching Scale (QDTS). The triangulation of these data sources provided a more in-depth understanding of the simulation experience. The QDTS consists of 18 items and uses a 10-point response format. The content subscale consists of 6 items representing the amount of information the patient *receives*. The 12-item *Delivery* subscale reflects the skill of the student nurse as educators in presenting discharge information. The scale includes items about listening, expressing concerns, expressing sensitivity to personal beliefs and values, and teaching in a way that the patient and families can understand, providing consistent information, promoting patient confidence inability to care for them and knowing what to do in an emergency, and decreasing anxiety about going home. The Cronbach Alpha for the instrument is 0.92 (Maloney & Weiss, 2008). Approval was sought and obtained from all authors to access and use the scales listed above in the study (See Appendix I).

3.4.4 Procedure

The procedures described below consisted of scenario planning, training of simulated patients, establishing student groups, pre-briefing, simulation sessions, self-evaluation/audio-visual reflection, and group debriefing and individual interviews.

Scenario Planning

Student outcomes from simulation learning rely heavily on the quality of the scenario. A discharge communication scenario (Appendix J) was written focusing on a T2DM patient being discharged from the hospital with a new injectable medication. The patient was over 65 years of age, identified as having both clinical and communication risk factors during the discharge process. The scenario included a change in the patient's medication from oral to subcutaneous injection. The introduction of a new medication or a change to an existing medication regime is recognised as readmission risk factors. A diabetic educator, two registered nurses and two faculty staff members with expertise in diabetes and simulation authenticated the scenario.

Training of Simulated Patients

It became evident from the integrative literature review (publication one) that a comprehensive approach to training and recruitment of SPs was a core requirement to ensure standardisation of SP performances and reliability when providing feedback to students. At the conclusion of this chapter, full details of the recruitment, training and evaluation procedures for SPs are presented in publication two (Section 3.5).

Establishing Student Groups and Pre-Briefing

The study site currently uses a didactic structure to teach discharge communication skills. The focus of the teaching is on information content and does not allow for patient-student interaction. Since the 1960s, sociologists have reported that for communication at all levels to be effective both an informational (what content) and interactional (how the content is delivered) event must take place (Eggins & Slade, 2012).

All students completed one scenario. Data collection for each group (T1-T3) was completed in 35 sessions, scheduled in weekly blocks six months apart. Each session lasted three to four hours. Quantitative and qualitative data were collected on completion of each simulation. Data sources included questionnaires, semi-structured interviews and debriefing discussions.

Group T1– January 2016: (Control) Students received a didactic review of the current curricula content (patient discharge) through a 20-minute PowerPoint presentation. As the simulation scenario included a change in the patient's medication, students were also briefed on the correct administration and management of this new medication.

Group T2 – July 2016: (Information) Students received the curricular patient discharge process via a 20-minute PowerPoint. A summary sheet of 30-day hospital readmission risk factors for an elderly patient with T2DM was included in the pre-briefing discussions. Students were asked to consider the potential impact of risk factors on care needs with the given SP profile. The readmission risk factor summary is provided in Appendix K.

Group T3 – January 2017: (Information and Interaction) In addition to the curricular review and provision of patient readmission risk factors relevant to the case, students completed a teach-back education activity (Always Use Teach-back, 2019). The Teach-back education module has two parts:

- It describes teach-back and demonstrates its effectiveness as a health literacy intervention to improve patient-provider communication.
- Video and interactive self-assessment questions enhance, confirm, and reinforce student's ability to use teach-back and integrate it into their clinical practice.

The module takes approximately 45 minutes and enables students to identify and practice aspects of teach-back.

Simulation Sessions and self-evaluation/video reflection

In each session, scenarios were run concurrently in two fully-equipped simulation laboratories as depicted in Figure 3.2. Audiovisual recordings were taken of each student with both the ceiling camera system and a stationary Go Pro camera. A Go-Pro camera was used so each student could watch their AV recording on a laptop in a private viewing room immediately following the simulation and before the group debriefing. Students had an opportunity to perform the scenario and reflect on their communication skills independently, without feeling embarrassed or anxious about peer review.

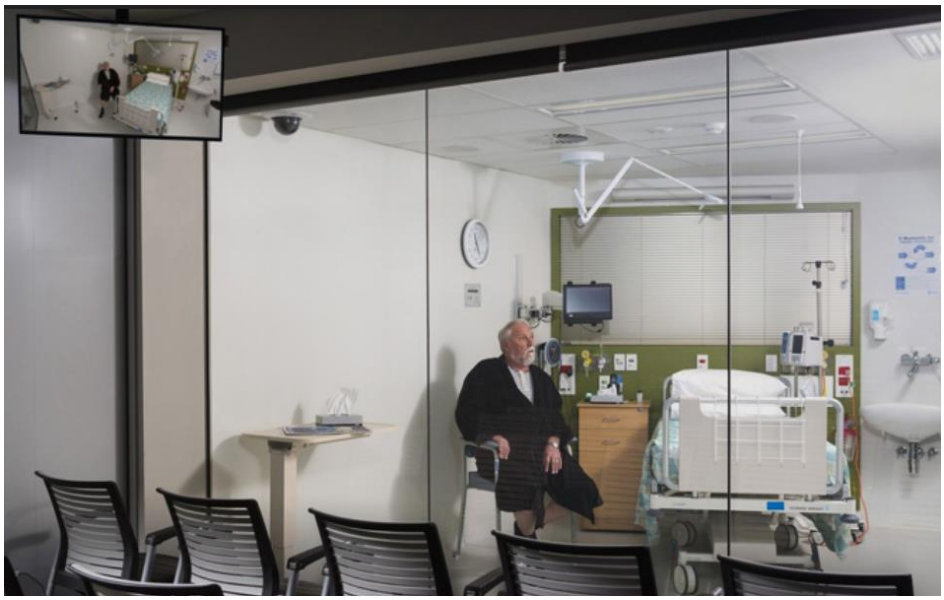


Figure 3.2 Simulation Laboratory with adjoining observation room

After each scenario, students were given tools to guide their reflection while watching their own AV recording. Following the AV students completed the Satisfaction Design Scale (SDS), Concept of Presence (COP) questionnaire, and the Quality of Discharge Teaching Scale (QDTS). After each scenario, SPs and the teaching faculty also completed the QDTS. All students were evaluated by the teaching faculty with the Interpersonal Communication Assessment scale (ICAS).

Group Debriefing

After the students had viewed their AV recording and completed self-assessments, a small group debriefing took place in a private and confidential environment. SPs also attended the debriefing to provide feedback from the patient perspective. Using the GAS debriefing model teaching faculty gathered, analysed and summarised the events that occurred. The gathering helped the teaching faculty understand what the students thought and how they felt about their simulation experience. The analyse/evaluate phase provided students time to reflect on their learning and generated discussion on improvement. In the summarising and extending phase, an overview of the take-home messages that the students had learnt was formulated. Debriefing was completed by teaching faculty (SM) who was formally trained in debriefing. All debriefing sessions were audio-recorded with student consent and transcribed for analysis.

Post-Simulation Interviews

Individual semi-structured interviews took place at the end of each data collection day with a randomly selected student from one of the sessions. Only one interview took place each day due to time constraints. This process was intended to minimise any systematic biases due to the timing of data collection, the interventions, or working with particular SPs. Data from the 12 interviews allowed the researcher to develop an understanding of the factors affecting the students' perception of presence in the simulation. Teaching faculty (SM) facilitated each interview using a semi-structured interview guide. All the interviews were audio-recorded and transcribed. Each interview included a short introduction and explanation of the interview process, as well as a request for permission to audio record the conversation for accuracy. Open-ended questions for the interview process were developed from the literature (Appendix L).

Informed Consent Procedures

Students were notified via email six months in advance that a SBE opportunity would be held in the simulation laboratory. Eight weeks before the simulation, all eligible students were sent a letter of invitation to participate in the study (Appendix B). The letter explained the purpose and general format of the study. Students were asked to email the researcher indicating their intent to participate. As a follow-up to the invitation, four weeks before the simulation, the researcher distributed the "Information and Consent to Participate in a Study" letter (Appendix C). Within the letter, the researcher described the study, including the risks and benefits, the right to refuse, and matters about the privacy, confidentiality, and anonymity of the students. To allow a data set to be assembled for each subject and to ensure anonymity, students were assigned an identifying code that was added to all questionnaires completed by students, SPs and teaching faculty. Completed instruments were returned to the researcher after each session.

Data Storage, Access and Disposal

The ongoing storage and security of study records were undertaken following the Western Australian University Sector Disposal Authority (WAUSDA) guidelines. All data collected for this study have been stored following guidelines under Section two of the Australian Code for the Responsible Conduct of Research (National Health and Medical Research Council, 2007). All documents were securely stored in a locked filing cabinet and electronically on a password encrypted university research repository, only accessible to the researcher. Study documents and raw data obtained remain in secure storage for

seven years from the date of the last publication of this study, after which time the electronic data will be erased and paper documents shredded. The contributions and cooperation of all students in this study are acknowledged while maintaining confidentiality. Anonymity was continually ensured when citing the findings of the study in all publications and presentations.

3.4.5 Data Analysis

Full details of analysis undertaken are provided in each publication. Initial data entry was carried out using Microsoft Excel and Word. The quantitative data analysis procedures applies to publications two, three and five. The qualitative data analysis applies to publications four and five.

Quantitative Data Analysis

Quantitative data analysis proceeded in three stages: (a) data inspection and description (b) validation of the scale factor structures and psychometrics followed by (c) analysis of differences across groups or relationships between variables in model testing. Quantitative data entry and analysis were undertaken using IBM Statistical Package for Social Sciences (SPSS) program version 22.0.

Data were cleaned and checked to ensure that individual questionnaires matched collated data. A sample (30%) of data were crosschecked for any missing, invalid or inconsistent values by a second researcher. These were corrected or removed from the dataset. All variables were examined at the item and scale level for outliers, missing data and potential violations of assumptions for the relevant analysis. Means, standard deviations and bivariate correlations were estimated for the continuous variables. Categorical variables were described in percentages.

The assessment of factor structures and measurement properties using Exploratory Factor Analysis (EFA) and scale reliability supports the selection of valid and reliable tools. Sample size requirements meant EFA was conducted on instruments completed by all students and when SPs and teaching faculty assessed the students (QDTS). The COP, SDS and QDTS were subjected to principal axis factoring with varimax factor rotation. Factors with eigenvalues above one where retained and a minimum criterion of .60 was set for factor loadings. The internal reliabilities of the resultant scales and subscales were calculated using Cronbach Alpha. To determine differences in students' performance between the three study conditions (T1, T2, and T3) and independent group Multivariate

Analyses of Variance (MANOVA) with planned comparisons were performed using an *alpha* of 0.05 and applying Bonferroni corrections.

Intra-class correlations are the recommended measure of inter-rater reliability when comparing two or more raters using interval level response data (Shrout and Fleiss, 1979). A series of Inter-Class Correlations and respective 95% confidence intervals were calculated to assess the consistency of SP and teaching faculty ratings of student performance. Paired sample t-tests were also completed to compare SP ratings in a performance-benchmarking task. Cohen's D statistics were calculated to estimate the effect sizes of the different QDTS and ICAS scores in the SP training evaluation study.

Model testing consisted of a three-stage hierarchical multiple regression with realism as the independent variable, presence as a mediating variable and student's QDTS scores as the dependent variable. Statistical significance was set at 0.05 *alpha* level. R^2 and SR^2 were used to measure the overall model and individual variable effect sizes and were interpreted using Cohen's conventions (1988). In line with Baron and Kenny's (1986) recommendations the regression entry procedures were: step one, control variables (dummy coded 3 x groups - Control, – informational, – interactional); step two, realism entered, and step three, presence entered.

Qualitative Data Analysis

Content analysis and thematic analysis are two commonly used qualitative approaches in nursing research (Vaismoradi, Turunen & Bondas, 2013). Despite the similarities between the methods, the difference lies in the ability of content analysis to quantify data. All content was transcribed by a professional service and then reviewed and validated by the researcher. A subsample of transcripts (30%) was then drawn from the three data collection periods for analysis by three of the researchers (SM, FG, and MK). A series of meetings were held to discuss the similarities and differences in identified content and themes. Once consensus was reached, themes were defined, and exemplars selected. The remaining transcripts were analysed, and any variations moderated as required. Thematic analysis was used, and a matrix of themes and sub-themes was created to represent responses to the debriefing questions (Appendix L) and individual interview data (Appendix L). Using the same identification and moderation process content analysis was applied to the final question in the group debriefing data to generate two-word clouds.

3.5 Introduction to Publication Two

The second publication reports on the recruitment and training procedures used in phase one of the study. Publication two includes measures of inter-rater reliability to evaluate the validity of the SPs training and their performance consistency.

MacLean, S., Geddes, F., Kelly, M., & Della, P. (2018). Simulated patient training: Using inter-rater reliability to evaluate simulated patient consistency in nursing education. *Nurse Education Today*, 62, 85 90. http://doi.org/10.1016/j.nedt.2017.12.024

This publication addresses research question two:

Q2**:** Does applying an evidence-based simulation framework provide a reliable and valid approach for training simulated patients?

Simulated patients are frequently involved in training nursing students and other health professionals in communication skills. A standardised approach is required to train SPs to ensure reliable and accurate performances and delivery of feedback. This study aimed to investigate applying the use of an evidence-based SP training framework to ensure standardisation of SPs. The training framework was employed to improve the inter-rater reliability of SPs. The study was completed before commencing data collection in phase two of the study.

Eight SPs were recruited through the university volunteer database. The SPs were deemed competent in the simulation scenario following a three-step, eight-hour training program. The program consisted of an orientation briefing via a PowerPoint presentation, face-to-face training using the NHET-sim SP training methodology and viewing and debriefing a prepared AV recording of an SP modelling the desired patient behaviour. The post-training evaluation took two forms; SPs undertaking a benchmarking task of a high and low student performance, and SPs rating student performances in an inter-rater reliability sample.

To provide evidence of SP validity and reliability for task performance the QDTS and ICAS were used to measure the SPs' perceptions of the scenarios. Both instruments have previously been validated and have a Cronbach's alpha of 0.92 and 0.96 (respectively).

This study adds to the existing literature by reporting on the NHET-Sim SP training methodology (Module S5) and provides evidence of SPs having high inter-rater reliability following training with an evidence-based framework. The study recommends that further

research be undertaken in broader clinical contexts, to understand how SPs' personalities, ethnicities, and affects may influence performance and contribute to the learning outcomes.

Findings from this study were submitted to Nurse Education Today. This international peer-reviewed journal publishes the highest quality scholarly contributions reflecting the advancement of educational theory and pedagogy. The journal aligns with this study's objective to improve educational processes and to apply a high standard of work through depth, rigor and originality. Nurse Education Today has an impact factor (IF) of 2.65 (2019).

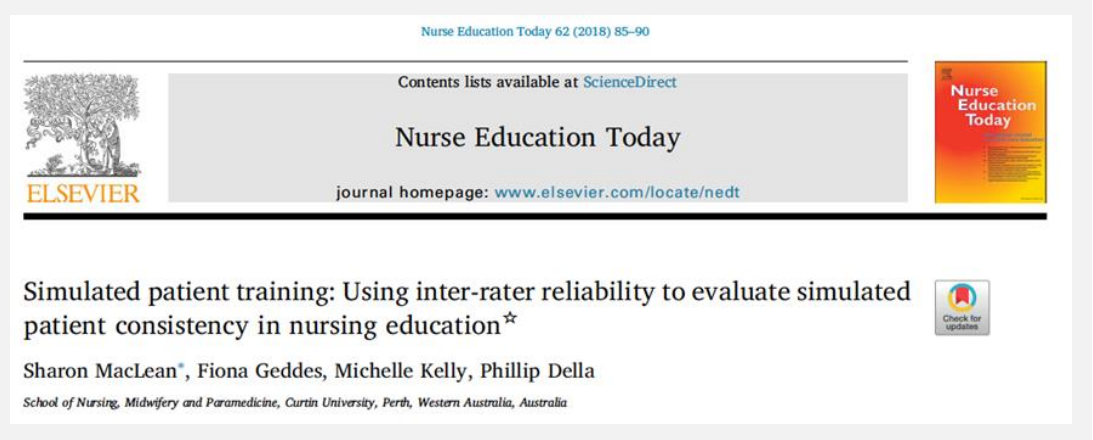
The article currently has eleven citations by other authors in the following journals.

- *Nurse Education Today* (IF 2.65, 2019)
- *Journal of Nursing Education* (IF 1.185, 2019)
- *Journal of Nursing Education and Practice* (IF 7.86, 2019)
- *Respiratory Care Education Annual* (IF Not Listed)

PUBLICATION TWO:

SIMULATED PATIENT TRAINING: USING INTER-RATER RELIABILITY TO EVALUATE SIMULATED PATIENT CONSISTENCY IN NURSING EDUCATION

(ACCEPTED PRE-PRINT VERSION)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Simulated patient training: Using inter-rater reliability to evaluate simulated patient consistency in nursing education☆

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Highlights

1. SPs play a vital role in ensuring an authentic and equivalence of each Students' experience.
2. SPs can provide summative and formative student feedback when trained using an evidence-based framework (NHET-Sim).
3. Further research is required to ensure SPs can adequately engage in scenario portrayal and provide valuable feedback.

Abstract

***Background*:** Simulated patients (SPs) are frequently used for training nursing students in communication skills. An acknowledged benefit of working with SPs is the opportunity to provide a standardised approach by which students can demonstrate and develop communication skills. However, relatively little evidence is available on how to best facilitate and evaluate the reliability and accuracy of SPs' performances.

***Aim*:** This study aimed to investigate applying the use of an evidence-based SP training framework to ensure standardisation of SPs. The training framework was employed to improve the inter-rater reliability of SPs.

***Methods*:** A quasi-experimental study was employed to assess SP post-training understanding of simulation scenario parameters using inter-rater reliability agreement indices. Two phases of data collection took place. Initially, a trial phase including audio-visual (AV) recordings of two undergraduate nursing students completing a simulation scenario is rated by eight SPs using the Interpersonal Communication Assessments Scale (ICAS) and Quality of Discharge Teaching Scale (QDTS). In phase 2, eight SP raters and four nursing faculty raters independently evaluated students' (N = 42) communication practices using the QDTS.

***Results*:** Intraclass correlation coefficients (ICC) were greater than 0.80 for both stages of the study in clinical communication skills.

***Conclusion*:** The results support the premise that if trained appropriately, SPs have a high degree of reliability and validity to both facilitate and evaluate student performance in nurse education.

***Keywords*:** Simulated Patient, standardized patient, simulation, inter-rater reliability, discharge communication skills.

Background

The reduction in clinical placements, higher patient acuity, and advances in health care has led to a demand for better-prepared health care students (Nestel & Kneebone, 2010). Simulation-based learning has the benefit of providing students with an environment in which to practice clinical skills, learn from errors, and develop the confidence to provide patient care in the clinical setting (Nestel & Kneebone, 2010). The Australian Commission on Safety and Quality in Health Care (ASCH, 2015) recently reviewed strategies to assist the smooth transition of patients from one setting to another. The review recommended that the national communication standards be included in undergraduate nursing curricula. They suggest using educational experiences that allow students to practice engaging with patients in clinical and discharge communications, such as simulation, role play and case-based learning (ACSQHC, 2015). Rehearsing communication skills working with SPs is one way of bridging the theory-practice gap that exists in healthcare education (Gaba, 2004). To play the role of patients, SPs should be trained reliably and consistently to re-enact scenarios and to evaluate the student. Researchers have found that experienced clinicians were unable to differentiate between SPs and real patients, exemplifying their authenticity (Lucky & Peabody, 2002; Levine & Swartz, 2008). SPs play a vital role in ensuring the equivalence and realism of each student's experience.

However, the adequacy of reporting SP recruitment, training and evaluation to support replication or critical review has often been lacking (Howley et al., 2008). Howley et al. (2008) proposed reporting standards for SPs to improve methodological rigor. The standards include criteria that can impact on the internal and external validity of the research. Howley et al. (2008) recommend providing a concise description of the encounter including the type of encounter (high stakes, summative or formative assessment), the number of students, length of the encounter, and feedback provider (faculty, SP, preceptor or peer). Training methods should also be including the amount of training, who conducts the training, and quality control checks such as inter-rater agreement. The final standard includes reporting the development, purpose, composition and psychometric properties of research instruments. Using the above criteria, Howley et al. (2008) reviewed 121 articles on SPs and demonstrated that 38% of studies (n = 44) reported adequate research instrumentation, 21% (n = 25) sufficient details of the encounter, and only 14% n = 15) reported SP training and recruitment methods. More recently, Maclean et al. (2017) reviewed 19 articles focusing exclusively on the use of SPs

in nursing to teach and assess communication skills. Approximately half the studies reported on the recruitment of SPs (n = 10) and only 2% (n = 4) mentioned training. Both reviews illustrated that authors significantly under-report training details for replication and verification in SP literature (Howley et al., 2008; Maclean et al., 2017).

Five different methods of SP training have been reported. Meier, Perkowski & Wynne (1982) initially published a set of self-instructional training materials to prepare SPs for their roles as patients. The material consisted of videotapes and written instructions containing the objectives and self-assessment tests. Meier et al. (1982) used a pre-posttest design to examine SPs' knowledge and found that it is possible to train SPs to portray patients effectively. Wallace (2007) provided a framework and method to train SPs for high stakes assessments, involving four education sessions. In this approach, SPs familiarise themselves with the scenario, learn to use a trainer checklist, apply performance and feedback strategies, and finish by performing a dress rehearsal which allows for the verification of authenticity. Furman (2008) published a web-based program developed by the National Board of Medical Examiners (NBME®) called eCase. The eCase is a multimedia approach that links to demonstrations, quizzes, and videos. Once trained, SPs are then selected for assessments and case scenarios. More recently, the IDEA framework (Howley, 2014) was published for use in training SPs. The framework consists of initiating, developing, executing and appraising SPs. Finally, Nestel, Fleishman & Bearman (2014) published evidence-based criteria for consideration when working with SPs. Their standard for training role portrayal is described in a four-stage model that draws from theory in the dramatic arts.

The first phase of Nestel et al.,'s (2014) approach focuses on defining and developing the person's character. In the second phase, SPs examine the purpose and format of the learning activity, such as whether the activity is formative or summative, feedback requirements and whether the simulation will be recorded. The third phase focuses on the person as a patient to ensure that the SP understands the health issue and complexity of the scenario. The final rehearsal integrates the three phases and allows the SP to assume and rehearse the patient role. This model places the SP at the centre of the training and encourages SPs' full engagement (Nestel et al., 2014). Given that students often engage with different SPs in a learning experience or assessment, any inconsistent SP performance can bias results. To use SPs for research or assessment purposes, they must offer valid and repeatable performances for reliable outcomes (Maclean et al., 2017). Where SPs act solely as facilitators, outcome validity can be defined as the extent to which the SP portrays the

range of behaviours associated with a real patient. Reliability relates to the consistency of the SPs' performance over time. To achieve these goals quality training approaches are critical. However, methods and measures used to evaluate such criteria are not typically reported in the nursing literature. When working with multiple SPs', a further issue emerges - consistency across SPs performance. In the evaluation context, the reliability of SP ratings should be measured using recommended psychometric methods, including inter-rater reliability (Swanson & Stillman, 1990; Tamblyn et al., 1991; Prion & Adamson, 2012).

Inter-rater reliability

A threat to the validity of student assessment is variation in assessors' perceptions or judgments (Shrout & Fleiss, 1979). One rater may judge students differently to another rater (inter-rater reliability), or differently over time (intra-rater reliability) (Jonnson & Svingby, 2006). A robust way to determine if the data is reliable is to have more than one rater complete the evaluation on the same performance and quantify the variance in results (Morris & Fitz-Gibbon, 1987; Thistlethwaite, 2002). Adamson & Kardong-Edgren (2012) quote "interrater reliability of data is population-specific and therefore must be established for each new sample" (p. 4). SP reliability can be influenced by factors pertaining to the rater, the tasks involved, and the rating scales used. When outcome criteria are clearly defined, well operationalised and measured, the likelihood of achieving a high inter-rater agreement is improved compared to when target skills and behaviours are complex, subtle, or poorly defined. The measurement instruments used can determine both the type of decisions made and the type of inter-rater reliability analysis performed. This ranges from agreement percentages, and Cohen's and Fleiss's kappa for nominal and categorical data, to correlations and intraclass correlations for interval data (Shrout & Fleiss, 1979).

Establishing high inter-rater reliability amongst SPs, using performance-based evaluation instruments, is dependent on appropriately training the raters (Nestel et al., 2014). When used as raters, SPs must understand the content and purpose of the simulation. Rigorous methods must be applied to evaluate SPs' performance and their ability to accurately and consistently complete measurement instruments (Shirazi et al., 2014). Training should include a discussion of the expected level of achievement for each clinical component and skill to ensure agreement within the pool of raters (Walshe et al., 2017). In summary, training is recognised as being one of the most significant factors leading to a highly reliable simulation and SP performance (Barrows, 1987).

Aim

The purpose of this study was to examine the use of SPs in nursing education. More specifically, the aim is to investigate if using an evidence-based framework for SP training provides a reliable and valid approach for assessing students.

Methods

Design

The research design is a quasi-experimental study. Data presented in this publication were collected in phase one of the study. Sample and Setting Eight SPs (six females and two males) were purposely recruited through the university's patient volunteer database and researcher's network. Before the study, the volunteers had no previous experience as an SP. Volunteers over the age of 60 years were selected, as the scenario was based on a patient over 60. The mean age of the volunteers was 65.67 years (SD=2.50). The volunteers were retired teachers, paramedics, office administration and homemakers. Students also included 40 females and two males, mean age 27.19 (SD=8.06) final year undergraduate Bachelor of Science Nursing students were recruited through the course online portals. Students in their final year were purposely recruited as they had completed the curriculum approved patient discharge module and an acute medical/surgical hospital rotation.

Procedure

SPs were trained in each simulation scenario, and SPs provide formative feedback to students based on two validated communication scales. SPs completed a one-day training (8.5 hours) program was completed in a university-based simulation laboratory, one week before student encounters. Evaluation of SP training was completed in two separate phases; immediately post-training (trial phase) and after completion of student sessions (phase 2). After gaining volunteer and student consent, all sessions were supervised and recorded by a nursing faculty member. In the trial phase, eight SPs were asked to review and independently rate AV recordings of two student nurses conducting patient discharge scenarios, resulting in a 16-cell data set (8 x 2). An expert panel had assessed the two student recordings as above and below the level of performance expectations for a third-year baccalaureate nursing student. Two validated instruments, focusing on discharge information, and the communication process were given to the SPs to guide their AV evaluations. The second phase of training evaluation involved eight SPs and four nursing faculty rating 42 students using the discharge information scale. Each student was

independently rated by the SP in the scenario and one faculty rater who observed the scenario. This resulted in an 84 (42 x2) cell data set spilt over four faculty raters. Ethical approval was obtained from the university research ethics board. The participation did not impact students' course outcomes. Student participation in the study was voluntary, and they were free to withdraw without prejudice at any stage. All information was electronically encoded and stored according to NHMRC requirements.

The Training Process

SPs participated in the following training program:

1. Participating in a PowerPoint-based orientation briefing
2. Face-to-face training (8.5 hours) using the NHET- Sim Training Program (Nestel, Fleishman & Bearman, 2015).
3. Viewing and debriefing an AV recording of the scenario using faculty in the SP role which modelled the desired SPs desired behaviours and responses.

The simulation scenario related to a 65-year-old person with a history of Type 2 diabetes who had been hospitalised after experiencing chest pain while exercising. The trajectory of the simulation targeted patient discharge communication skills to enable the patient to maintain a new, upscaled medication regime in the home environment and included the possible identification and discussion of readmission risk factors. To ensure the face and content validity of the character profile and scenario, an expert panel of experienced registered nurses and a registered diabetic educator reviewed the case details.

PowerPoint Presentation

The SP orientation briefing included a list of objectives, the purpose of the research, context surrounding the nursing discharge process, the importance of reliability when collecting observational data and an explanation of quality assurance.

NHET- Sim SP Training Program

The NHET-Sim program is a national training program for Australian healthcare professionals aimed at improving simulation training. NHET-Sim is designed for anyone who currently or intends to use simulation as an educational strategy to support the development of healthcare professionals (Bearman & Nestel, 2014). The SP training module provides an opportunity to prepare SPs in role portrayal and assessment with hands-on practice (Nestel, Fleishman & Bearman, 2015). All eight SPs participated in the

NHET-sim training program provided by the researcher. The researcher has completed the program and achieved certification.

Demonstration Training Video

In addition to written character and case information, SPs were shown an audio-visual (AV) recording of the nurse-patient scenario recorded in the university simulation laboratory utilizing registered nurses as both the patient and the student nurse.

Instruments

The Quality Discharge Teaching Scale (QDTS) (Maloney & Weiss, 2008) was used to measure SP's perceptions of discharge related information. The QDTS has 18 items and uses a ten-point Likert format with response anchors from "none" to "great deal". Four items not relevant to the simulation (item 6, 13, 14, and 15) were removed. The modified content subscale (QDTS-R) consisted of six items representing the information the SP receives. The eight-item Delivery subscale (QDTS-D) reflected the skill of the student nurse, as patient educators, in presenting discharge information. Maloney and Weiss reported Cronbach's alpha coefficients for the full scale (0.92), content received (0.85) and delivery subscales (0.89). The Cronbach alpha for the revised instrument was (0.86).

The Interpersonal Communication Assessment Scale (ICAS) (Klakovich & Dela Cruz, 2006) was also completed by the SPs when reviewing training and benchmarking videos. The ICAS consists of 23 items and uses a four-point Likert response format with a level of effectiveness anchors (seldom, often, usually, and almost always). The ICAS consists of three subscales representing Advocacy (10 items), Therapeutic Interaction (9 items) and use of Self-validation (4 items). Cronbach's alpha for full and subscales of 0.96, 0.85, 0.89 and 0.79 respectively, have been reported (Klakovich & Dela Cruz). Cronbach alpha for the revised instrument consists of the following (0.86, 0.75, 0.80) respectively. The author's permission was obtained before utilizing all scales.

Analysis

Data analysis was performed using SPSS version 22.0. Statistical analysis was undertaken using a variety of different statistical tools depending on the parameters under consideration. Cronbach alpha scale reliability estimates were calculated for each subscale using SP ratings. Intra-class correlations (ICC) are the recommended measure of inter-rater reliability when comparing two or more raters using interval level response data

(Shrout & Fleiss, 1979). ICC estimates and their 95% confidence intervals were calculated based on the absolute - agreement, using mean-ratings (k), for the 2-way random-effects model (ICC 2). In the trial phase, intra-class correlations, ICC (2, 8) were calculated for the QDTS and ICAS subscales using ratings of the eight SPs on both AV recordings. Paired samples t-tests were also computed to compare SP ratings of the two AV benchmarking recordings. Statistical significance was tested against an alpha of .05 with Bonferroni corrections applied for multiple analyses. Cohen's d statistics were calculated to estimate the effect sizes of the difference scores. A-prior power analysis indicated that the small sample numbers (N=8) provided less than a 70% chance to detect large effects (d >0.8) for difference scores using one-tailed testing. In stage 2, a series of ICC (2, 2) analyses were conducted to determine the inter-rater reliability of SPs (n=8) and faculty ratings (n=4) on a sample of 42 students.

Results

Scale psychometrics and ICC estimates are presented for each of the QDTS and ICAS subscales for the AV recording analysis in Table 3.3. Cronbach's alpha values above 0.70 indicate the adequate internal consistency of the scales (Shrout & Fleiss, 1979; Hallgren, 2012), and ICC values above 0.74 are regarded as good agreement. Agreement estimates on all subscales reached acceptable levels (ICC > 0.89) across the eight SP raters. Figure 3.3 shows that SP raters were in agreement regarding the two index performances when measured on the full QDTS and ICAS scales, with slightly greater variability observed on the QDTS scale.

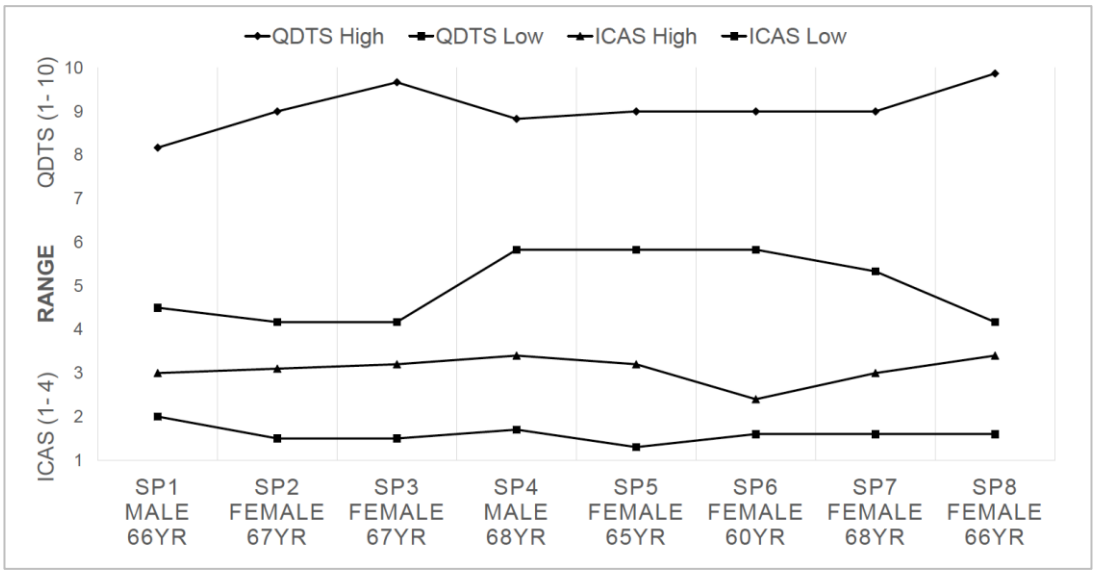

Figure 3.3 Simulated Patients ratings of standard training Audio-Visual recordings on QDTS and ICAS

As shown in Table 3.3, the results of the paired-samples t-tests comparing mean SP ratings of the student's performance on each of the ICAS and QDTS subscales were statistically significant (p<. 001). The largest effect (d =6.74) was observed on the ICAS - Therapeutic sub-scale. The mean difference between SPs' ratings of student performance in the above standard recording (AV1) ICAS subscales was 1.37 (95% CI – 1.19-1.55) scale points higher than the below standard benchmark (AV2), t (7) = 9.65, p =.001. Cohen's d for all pairwise comparisons were large, ranging from 5.01 to 6.74 (Cohen, 1960). For the QDTS mean difference scores were largest on the received scale (Mdiff = 4.06, 95% CI 3.16-4.95), t (7) =10.50, p =.001, d =6.18. These results indicate that after completing simulation training, SPs were differentiating between high and low-level performances when measured on two validated communication scales. Estimates of inter-rater reliability for the QDTS subscales when assessing students' performance during simulation sessions (n =42) are presented in Table 3.4. Agreement estimates reached acceptable levels, (ICC (2) range 0.59 - 0.97) indicating a high level of consistency in ratings between the 12 raters (8 SPs and 4 faculty).

Table 3.3 Means, Standard Deviations, Paired sample t-test and ICC Results for the ICAS and QDTS (N=8)

Scale	Items	AV	Mean	SD	α	ICC Agreement	t	95% CI	d
ICAS Advocacy	10		2.32	0.17	.86	.994*	13.15*		
		1	3.04	0.27					
		2	1.58	0.19				1.20-1.71	6.26
ICAS Therapeutic	9		2.39	0.17	.75	.957*	9.65*		
		1	3.07	0.18					
		2	1.70	0.22				1.19-1.55	6.74
ICAS Validation	4		2.38	0.19	.80	.989*	17.44*		
		1	3.13	0.25					
		2	1.61	0.35				1.16-1.89	5.01
QDTS Received	6		6.91	0.31	.97	.991*	10.50*		
		1	8.94	0.63					
		2	4.88	068				3.16-4.95	6.18
QDTS Delivered	6		6.66	0.39	.88	.899*	9.02*		
		1	8.76	0.68					
		2	4.55	0.90				1.40-5.29	5.29

*Note. *p< .001. AV=Audio-Visual Recording 1=High standard; 2=Low Standard*
α=Cronbach's alpha, SD=Standard Deviation, t= Pair Wise t-test, d=Cohen's effect size

Table 3.4 Means, Standard Deviations and ICC Results from the QDTS measure

			QDTS Received			QDTS Delivered		
Faculty Rater	SP Rater	Student (n)	Mean	SD	ICC Agreement	Mean	SD	ICC Agreement
1	1,4 5	13	7.92	0.71	.797*	7.69	0.50	.854*
2	8,2,6	7	7.26	0.63	.959*	7.24	0.30	.974*
3	7,3	15	7.80	0.40	.915*	7.69	0.43	.927*
4	8,2	7	8.18	0.29	.588*	8.10	0.32	.639*

**p= < .05, n=number of students per session, SD = Standard Deviation.*

Discussion

Providing nursing students with simulation learning experiences involving communication challenges, such as managing patient discharge, will lead to improvements in both their communication and clinical competence, which should ultimately improve patient outcomes (Kraft, Wise, Jacques & Burik, 2013). Conducting simulation education requires ongoing quality assurance of SPs' capacity to adequately engage in scenario portrayal, scoring of measurement tools and providing feedback (Furman, 2008) which can be achieved through quality training (Nestel & Kneebone, 2014). In this study, the

effectiveness of SP training was examined. The objective was to ensure consistent SP role portrayal, provision of feedback and summative assessment. It was proposed that utilizing the NHET-Sim Model for SP training and providing the SPs with sample AVs as benchmarks significantly improved agreement estimates of inter-rater reliability.

The results demonstrated strong correlations between SPs in the trial phase and also between SPs and faculty raters in the second phase of evaluation. Previously, Swanson & Stillman (1990) and Tamblyn et al. (1991) found that inter-rater reliability scores on interpersonal communication skills were good but lower than patient history taking and physical assessment skills. A more recent study by Shirazi et al. (2014) also found a strong correlation between raters in assessing medical student's communication skills. In this instance, SPs were trained using Wallace's Coaching Standardised Patient; for use in the Assessment of clinical competence approach.

Within current SP training approaches the use of standardised training videos is supported. Weidner et al. (2010) validated videos to train SPs to distinguish between superior and acceptable performance. In our study, the inter-rater reliability estimates conducted on benchmarking AV recordings for both general communication (ICAS) and discharge specific content (QDTS) were in agreement. These results suggest that training using videos improves SPs' capacity to effectively assess students' performance on both general and task-specific communication practices and may go towards reducing halo effects, leniency and central tendency as discussed Walshe et al. (2016).

Recently, Walshe et al. (2016) indicated that SPs reached fair reliability in consensus estimates and excellent levels with consistency estimates when training for the DARE2-patient safety program. They concluded that extended training and testing would further improve consensus estimates of the inter-rater reliability. Howley et al. (2013) used extensive training of raters (8-10 hours) to achieve adequate reliability. In line with the NHET-Sim recommendations, in this study, approximately 8.5 hours of training and rehearsal were provided to SPs.

The accuracy of scenario portrayal is essential if simulation providers are to have any confidence in retrieving consistent data for educational or research purposes (Ladyshewsky et al., 2000). Consistency is underpinned by SPs having a sound understanding of the purpose of the simulation and student skills being targeted. In educational contexts, this can result in inconsistent summative assessments or sub-optimal patient encounters. In research contexts, SP inconsistencies may limit the generalizability

of findings (Ladyshewsky et al., 2000). In a pilot study of SPs evaluating undergraduate medical communications in obstetrics, Rodriguez et al. (2016) found ICC -2 values with unacceptable reliability. The author speculated that the lower values might be attributed to inadequate SP training, highly complex scenarios, poor scale development, and difficulty objectively quantifying communication skills. Therefore, effort and time should be devoted to developing standardised scenarios, high-quality training, and the evaluation of performance.

Tamblyn et al. (1991) investigated the impact of SPs performing dual functions: that is role portrayal and student evaluation. They noted that biases might occur due to SP fatigue decreasing the accuracy of role portrayal and reducing the quality of feedback between scenarios. They found that the less accurate the SP perceived their portrayal to be, the more lenient they were on rating students' performance. Within the context of our study, SPs facilitated only two students per session and rated students directly after each scenario. This reduced SP fatigue is allowing them to focus on the accuracy of each assessment. In sum, our results indicate that the quality of SP training undertaken in this study provided students with consistent learning opportunities to develop skills in discharge planning. Furthermore, our findings indicate that the methods used to train SPs to evaluate student task performance are both effective and replicable.

Study limitations and future research

The study had several limitations. The small number of SPs of the same ethnicity potentially limits the extent to which our findings are generalizable. The use of only two AV recordings in the training phase is also a potential limitation. To better assess SPs capacity to differentiate target behavior, we would recommend they review a minimum of three or four benchmark videos of graded performance levels. Additionally, this study did not control for the SPs prior knowledge of the illness (Diabetes Type 2) in the case development. While SPs were asked to not offer any information about the medication or condition (so accuracy across all information delivered was appropriate) some SPs with more disease knowledge attempted to help a student who they perceived as having difficulties in the scenario. Furthermore, no SP Control group comparison was made. In sum, the potential for further simulation research using SPs, in broader clinical and communication contexts is warranted. In particular, research should focus on nurse-patient communication techniques, and how a student's or a SP's personality, ethnicity, affect and communication style may contribute to the outcome of the scenario.

Conclusion

This study examined the effectiveness of SP training in patient discharge simulation. SPs were found to achieve high inter-rater reliability when using two validated communication instruments. Comprehensive training ensured that SPs were able to consistently portray the scenario across a number of student interactions. These findings indicate that SPs can be trained to provide meaningful feedback, accurately portray roles and assess student performance using validated instruments. Training SPs using a recognised evidence-based framework (NHET-Sim), allowed the researcher to standardise the scenario to provide students with a consistent and rich learning experience and produce reliable and accurate research data.

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END OF PUBLICATION TWO

3.6 Summary of Publication Two

This chapter described the realist evaluation methodology and the mixed-method design applied in this study. The methodology and method support the study's aims and questions by providing a structure through which to examine and analyse the data from a quantitative and qualitative perspective. Employing a realist evaluation allowed the researcher to draw useful conclusions and recommendations about how particular simulation design characteristics influence learning outcomes and the advancement of knowledge.

The SP training evaluation publication confirms the importance of using an evidence-based framework to train SPs for role portrayal. If trained correctly, SPs have a high degree of reliability and validity to ensure rigor for data collection and educational purposes. This publication suggests that once standardisation of the scenario has been achieved, SPs offer an opportunity for students to practise communication skills in a highly realistic clinical setting. The following chapter presents the results for phase two of the study incorporating three publications.

Chapter 4 Results

4.1 Chapter Overview

This chapter presents the three publications from phase two of the study. Section 4.2 presents quantitative results from the teach-back intervention applied in the study. Section 4.3 is a qualitative study of nursing students' perceptions of video-reflection during SBE. Section 4.4 is a mixed-methods investigation of nursing students perceptions of realism and presence in SBE.

4.2 Introduction to publication Three

This article presents the findings from a quasi-experimental study measuring the effectiveness of a simulation-based training intervention to improve second and third-year nursing students' communication skills. The study aimed to determine whether providing students with information-based (risk factors) and interaction-based (teach-back) communication training could improve discharge communication skills. Two subscales of the QDTS were used to measure students' ability to deliver discharge related information to SPs.

Maclean, S., Kelly, M., Geddes, F., & Della, P. (2018). Evaluating Teach-back in Simulation to Improve Discharge communication. *Clinical Simulation in Nursing*. (22), 13-21. http://doi: org/10.1016/j.ecns.2018.06.005

This publication addresses research question three:

Q3**:** Does the type of communication intervention provided during discharge simulation training (information-based or interaction-based) impact student-learning outcomes?

This publication adds to existing knowledge by showing that preparing students with informational and interactional strategy can enhance discharge communication skills. The study recommends that nursing programs include a combination of teaching strategies, including didactic and simulation, to improve CST.

Findings from this study were submitted to Clinical Simulation in Nursing, as the results would be of interest to other teaching faculty within nursing and allied health. Clinical Simulation in Nursing is an international, peer-reviewed journal and is the official journal of the International Nursing Association for Clinical Simulation and Learning (INASCL). The journal has an impact factor (IF) of 2.286 (2020).

The article currently has one citation in: *Clinical Simulation in Nursing* (IF 2.286)

PUBLICATION THREE:

EVALUATING TEACH-BACK IN SIMULATION TO IMPROVE DISCHARGE COMMUNICATION

(ACCEPTED PRE-PRINT VERSION)

Highlights

- Simulated patients (SPs) provide an authentic clinical experience, as SPs provide valuable feedback from a patient's perspective.
- Offering students' opportunity to apply teach-back with simulated patients can effectively help to teach nursing students efficient communication strategies for use with patients transitioning to either home or another care facility.

Abstract

Background: This study evaluates the effectiveness of two information and interaction-based training interventions to improve nurses' communication skills during the discharge of a simulated patient.

Method: A quasi-experimental control group design was applied. Students demonstrated their discharge skills with simulated patients (SPs) in three randomly assigned groups – control, information, and interaction. Independent group MANOVAS were employed for

analysis both the quality of discharge content and delivery across groups using student, SP and faculty assessor ratings.

Results: Significant incremental improvements in student communication skills were achieved in the interaction and information groups compared with the control group.

Conclusion: A structured curriculum including high fidelity simulation, with SPs providing feedback and evaluation of students' information and interaction-based communication skills, are useful in improving student discharge practice and 'patients' understanding of discharge instructions.

Key Words: Simulation; teach-back; discharge communication; student nurses; simulated patients.

Key Points

- The use of the *teach-back* technique in simulation training is an effective interactional strategy to improve student nurses' discharge communication skills.
- Simulated patients provide an effective means to both evaluate student performance and provide feedback to ensure nurses appreciate the importance of a patient's having a sound understanding of discharge instructions.
- To enhance patient safety through evidence-based communication training, simulation curriculum should include strategies to improve information content and patient-focused delivery style during clinical interactions – knowing what to say and how to say it.

Background

Enhancing patient self-management is increasingly important and has been a targeted initiative in recent quality improvement projects to reduce hospital readmission rates (Agee, 2017; Hanson et al., 2011). When discharged from a health care facility, patients need to understand the information they have received during the process for their ongoing care. After discharge, patients often have to manage complex or different medication regimes, recognise risk signs and respond to changes in their health, follow dietician guidelines, and organise follow up appointments (Frank- Bader, Beltran & Dojlidko, 2011). While the ability to discharge a patient with significant health needs is considered by some to be a non-clinical nursing skill, (Piscotty, Grobbel & Tzeng, 2011) the importance of effective communication during patient care transitions aligns with patient safety and quality standards (ACSQHC, 2015; Maclean, et al., 2017).

To ensure compliance with accreditation requirements that reflect a growing awareness of health consumer needs, universities are increasingly using simulation to better prepare student nurses. Aspects of clinical practice, including strategies to improve communication need implementation. One such strategy is the *teach-back* technique which provides nurses with skills to better facilitate two-way interactions with patients by encouraging patients to confirm knowledge and clarify any misunderstandings during their discussions. Suggested strategies when applying *teach-back* include: using simple language; seeking confirmation of the patient's understanding by asking patients to perform or repeat instructions/information back; and encouraging open-ended questions (Caplin & Saunders, 2015). This study aims to examine the effectiveness of a simulation-based, *teach-back* educational intervention to improve nurses' communication skills during patient discharge.

Literature Review

It is widely accepted that communication failures are one of the leading causes of adverse patient events worldwide (Manias et al., 2015). The Australian National Safety and Quality Health Service Standards, which govern clinical standards, offer detailed guidelines for health care professionals to improve the safety and quality of patient care (ACSQHC, 2015). The importance of patient care transitions, including at discharge, falls within this framework. Preparing patients and their families for hospital discharge has become more complicated as patients are discharged earlier, with more co-morbidities and higher acuity, requiring more complex home care instructions (Kornburger et al., 2013). Evidence shows that ineffective communication at discharge may account for poor patient outcomes including medication errors at home and hospital readmissions (Kornburger et al., 2013).

The impact of ineffective discharge practices has gained attention as penalties have started being imposed on health services when patients return to the hospital. In the United States of America (USA), the Medicare Hospital Readmissions Reduction Program (MHRRP) financially penalises hospitals with higher than expected patient readmission rates. The challenge for hospitals is to identify potential risk factors of unplanned return and decrease readmission rates (McIntyre et al. 2016). A large number of patient readmissions are due to confounding issues. Patient complexity, mental health status, the presence of chronic disease, socio-economic status, substance abuse, homelessness, English as a second language and more intense discharge and post-discharge care are the leading factors (Kornburger et al., 2013). While research into communication processes and risk factors during care transitions have increased, there remains a growing demand for evidence regarding communications-based interventions that may be helpful to improve patient outcomes, particularly in vulnerable populations (McIntyre et al., 2016). Despite evidence that CST programs are effective (Berkhof et al., 2011), concerns remain regarding the extent of poor communication skills in health care professionals (Fidyk et al., 2014).

A priority in providing effective quality and safety education for undergraduate nursing students is to prepare graduates for communicating effectively in the clinical setting. However, a recognised gap in graduate communication skills is the degree to which students apply the knowledge and information presented to them (Berkhof et al., 2011). A systematic review of the literature by Berkhof et al. (2011) suggests that for effective communication to occur a combination of didactic and practical components must take place. Furthermore, training that provides interactional strategies such as role-play with simulated or real patients provides an additional dimension of feedback and encompasses structured practitioner-patient discussion, which improves communication techniques and patient satisfaction. A recent review by Williams and Song (2016) recognised the efficacy of using simulated patients when training health professionals' clinical and non-clinical skills; however, evidence from nursing education was limited in this review.

Teach-Back

Teach-back is a practitioner-patient interactional technique used by health care professionals to confirm that patients or family members have received and understood the correct medical and allied health care information before leaving the health care environment (Caplin & Saunders, 2015). The *teach-back* method ensures patients understand health care information by encouraging the practitioner to evaluate if the information was received correctly. The evaluation process involves the patient relaying

the information back to the health care provider. If the patient is not able to *teach-back* the information, this allows the health care provider to clarify further and reiterate information (Caplin & Saunders, 2015).

Teach-back also encourages health care practitioners to communicate with clarity to patients by modifying their language. Using simple, common usage terms allows people with moderate to low health literacy to more easily understand the information presented (Green et al., 2014). *Teach-back* is often used in conjunction with printed information, placebo medication devices, and other self-care tools (Ha Dinh et al., 2016). The effectiveness of *teach-back* as an educational intervention to improve communication skills within a simulated scenario has previously been reported in medical and nursing literature (Green, 2014; Mangold, 2016; Mahramus, 2011; Strosaker, 2012). Benefits of *teach-back* include improved patient satisfaction, decreased length of stay, reduction in hospital readmissions and identification of poor health literacy (National Quality Forum, 2010; Ha Dinh et al., 2016). These factors are important drivers for the implementation of effective patient discharge training in undergraduate nursing courses. This study aims to examine the efficacy of a simulation-based, *teach-back* interactional intervention to improve nurses' communication skills during patient discharge.

Theoretical Frameworks

Two theoretical frameworks informed the research reported in this publication. The National League for Nursing/Jeffries Theory integrates student-centred, socio-cultural, and constructivist learning theories. Jeffries (2012, 2015) proposed that essential elements of simulation design should include; clearly articulated objectives, specific learning outcomes and the inclusion of enough detail for optimal student participation in the clinical simulation experience.

The NHET-Sim framework also introduces the concept of a simulated patient (SP) methodology. SPs are people trained to both portray patients and to provide feedback to students on their interactions (Nestel et al., 2015). Importantly, SPs help to provide a safe environment for the student to practice clinical and non-clinical nursing skills, such as communication training. To achieve optimal outcomes, SPs should undergo comprehensive training so they can reliably and consistently portray health care problems, provide feedback to and evaluate the students who they engage with (Maclean et al., 2016). The NHET-Sim framework provides SPs with an evidence-based structure to prepare for role portrayal, rehearse, ask questions and spend time standardizing the scenario. The

ability of SPs to take an active role in CST and give immediate feedback to students and teaching faculty are two key advantages of working with SPs (Nestel & Kneebone, 2010). SP simulations can, therefore, be an effective way to train undergraduate nurses about the nuances of patient discharge practices and the skills of *teach-back* by engaging students in both the informational and interactional aspects of clinical communications.

Study Aim and Research Questions

The aim of this research is to determine if providing *information-based* (patient readmission risk factors) and *interaction-based* (*teach-back*) communication training can improve students' discharge communication skills. It is hypothesized that providing students with additional details about potential risk factors for patients will increase the quality of the information provided to SPs during the discharge process. Furthermore, students who receive *teach-back* training will improve their information delivery skills.

Methods

Study Design

A quasi-experimental control group design was employed for this study. The discharge communication protocol was designed to improve student's communication skills. Currently, students learning in this area focuses on a dialogic structure of communication. However, it focuses only on the informational content on the discharge information. Since the 1960's, sociologists have demonstrated that in order to be effective communication needs both an informational and interactive event to take place (Eggins & Slade, 2012). For this reason three study groups were established based on the patient discharge communication training protocol: group (1) Control - (no intervention), group (2) information based – (re-admission risk factor information provided), and group (3) information and interactional – (re-admission risk factor information and *teach-back* provided). Table 4.1 and the procedure below provides more details about the groups.

Table 4.1 Details of the components and content/data for the three study groups

Component	Content	Intervention/ condition		
		Control	Risk	Teach-back
Information Pack & Briefing	Student provided with simulation scenario including patient profile, medications information and clinical requirements.	✓	✓	✓
Didactic Session	Review of current discharge curricula learning.	✓	✓	✓
Risk Factor Module	Training provided on 30 day re-admission risk factors. Information used to help guide communication about patient's needs before & after discharge.		✓	✓
Teach-Back Module	Training provided on teach-back, including the use of simple language, questioning techniques & strategies to confirm patient understanding of instructions.			✓
Simulation Exercise	Student discharge interview with SP. Focus on reviewing new medication use, care needs and discharge instructions for home.	✓	✓	✓
Self-Evaluation	Student Video Reflection. Focus on discharge communication skills. Complete QDTS questionnaire.	✓	✓	✓
Debriefing	Participation in group debriefing with SPs	✓	✓	✓

Sample (Students, SPs and faculty)

Students were second or third year bachelor degree nursing students purposely recruited through one large, metropolitan Australian university. During recruitment, students were randomly allocated to one of the three groups. Prior to the study, students had minimal to moderate experience in discharging patients in a hospital setting.

Eight SPs (six females and two males) were purposely recruited through the university's patient volunteer database and faculty's network. Prior to the study, the volunteers had no previous experience as an SP. The mean age of the SPs was 65.67 years (SD=2.50), a requirement as the scenario was based on a patient over 65 years of age. SPs were retired teachers, paramedics, and office administrators or homemakers. Faculty raters consisted of six registered nurses working within the university. The simulation sessions took place in a purpose-built simulation space at the university during non-teaching periods.

Ethics

The study was approved by the university's human research ethics committee (approval No. 151012). The participation did not impact students' course outcomes. The students completed the simulation during semester breaks and were not engaged in curricula activities with the researcher. Student participation in the study was voluntary, and they were free to withdraw without prejudice at any stage. All videos and outcome data were electronically encoded and stored according to university requirements.

Measurements

Two subscales of the Quality Discharge Teaching Scale (QDTS) (Maloney & Weiss, 2008) were used to measure students' ability to deliver discharge related information. The full QDTS comprises 24 items with a ten-point Likert format with anchors from "none" to "a great deal". One subscale of six items relating to patients' needs was deemed not relevant to the SPs scenario, and four timing-based items in the remaining subscales (item 6, 13, 14, and 15) not relevant to the simulation were removed. The modified Content subscale (QDTS-C) consisted of 6 items representing the type of information the patient receives. The 8-item Delivery subscale (QDTS-D) measures the non-clinical skills of the student nurse, as a patient educator, in presenting discharge information. The Delivery sub-scale includes items about listening, expressing concerns, expressing sensitivity to personal beliefs and values, and teaching in a way that the patient can understand. Further items in this sub-scale focus on providing consistent information, promoting patient confidence in the ability to care for themselves and knowing what to do in an emergency, and decreasing anxiety about going home. Maloney and Weiss (2008) reported Cronbach alpha coefficients for the original full scale (0.92), content sub-scale (0.85) and delivery sub-scale (0.89). An exploratory factor analysis will be conducted to investigate the underlying structure of the student version of the QDTS 14 item questionnaire to enhance the quality of the tool. Author permission was obtained for the use of this modified scale.

Procedure

The study involved a number of phases: Planning scenarios for the simulation session; SP training; student groups and pre-briefings, simulation sessions; Audiovisual reflection/self-evaluation; rater evaluations; and group debriefing.

Planning Phase

Using the *NHET*-sim model (Nestel, Fleishman & Kneebone, 2015) a communication scenario simulating the discharge from the hospital of a diabetic patient requiring a change in medication was created. The scenario was based on patient data that identified both clinical and communication risk factors in the discharge process for patients over 65 years of age. This phase of the research paralleled with a component of a funded research project - The Australian Research Council Linkage Grant (LP140100563).

SP Training

The next phase consisted of preparing SPs for the patient role using an established evidence-based framework (*NHET-Sim, SP Role Portrayal)* (Nestel et al., 2014). Full details of the SP training and interrater reliability evaluation have been reported elsewhere (MacLean et al., 2017).

Student groups and pre-briefing

Students were conveniently allocated to one of three groups, based on their semester of study.

Group T1 (*control*) received a didactic *review of current curricula content.* A 20-minute power point presentation refresher focusing on patient discharge practices was presented to students. As the simulation scenario included a change in the patient's medication, students were also briefed on correct medication administration and management of this new medication. Data from this group are categorized as T1.

Group T2 *(information based - readmission risk factors).* A refresher of the curricula in the patient discharge process was repeated for this new student group. A summary sheet of 30-day hospital readmission risk factors for elderly patients with diabetes was included in the briefing discussions. To help guide the discharge discussion students were asked to consider the potential impact of the risk factors on care needs given the simulated patient's profile. Data from this group are categorized as T2 and occurred 6 months after T1.

Group T3 (*Information and interactional). This group focused on* in addition to the curricula review (refresher) and provision of patient risk factors relevant to the case, and students completed a 45-minute *teach-back* education module (Always Use *teach-back*, 2016). This interactive learning module has two parts:

- Describing *teach-back* and demonstrating its effectiveness as a health literacy intervention to improve patient-provider communication.
- Offering an interactive self-assessment question to enhance, confirm, and reinforce students' ability to use *teach-back* and integrate it into clinical practice.

Data from this group are categorized as T3 and occurred 6 months after T2.

Introduction to the simulation scenario, and patient profile and status information were included in all pre-briefings. The full details of the groups and procedures are represented in Table 4.1.

The Simulation Encounter and Audio-visual Reflection

Each session (four per day) consisted of four to five students. Simulations were run concurrently in two fully equipped hospital rooms in the university's simulation unit. Following permission, audio-visual (AV) recordings were taken of each student-patient simulation. Following each simulation, students individually reviewed their AV recording in private to reflect on and evaluate their own communication skills using the QDTS questionnaire. SPs and faculty also completed the QDTS immediately after each simulation.

Debriefing

A group debriefing was conducted with each student group, including the SPs and faculty on completion of all simulations scheduled in the session. The Gather, Analyse, and Summarize (GAS) debriefing tool was used. This tool allowed the researcher to rapidly debrief in a safe learning environment and supported the overall aims (Phrampus & O'Donnell, 2013).

Data Collection

Data collection took place over a 12-month period and consisted of three 1-week blocks of simulations held during non-teaching periods (T1, T2, and T3). To minimise the potential for bias across the three groups, the information (risk-factors) and interaction (risk factors and *teach-back*) training interventions were conducted in the second and third blocks, respectively. Two weeks prior to the simulation blocks, the researchers distributed an "Information Package" containing the scenario information, consent forms, and demographic questions. Quantitative data were collected from all students and raters immediately following each simulation and prior to the group debriefing. The use of three data sources (students, SPs & faculty raters) allowed triangulation of QDTS measures.

Data Analysis

Data were entered into an SPSS database (version 22.0) and checked for completeness and missing data. Analysis proceeded in two stages: validation of scale factor structure and psychometrics, followed by an analysis of differences across groups. QDTS data were subjected to principal axis factoring with varimax factor rotation. Psychometric properties of the QDTS subscales were assessed for student, SP and faculty responses. As factor structures for the two QDTS subscales were replicated across data sources only results for the student responses are reported below. Independent groups MANOVA's with planned comparisons were performed to determine differences in students' performance between the three study conditions only, using an alpha of 0.05 and applying Bonferroni corrections.

Results

Descriptive results

A total of 141 nursing students (137 females and four males) completed one of three simulations. The mean age was 27.67 years (*SD* 8.54). The final numbers included 46 students in the control, 46 in the informational and 49 in the interactional groups respectively.

Factor Analysis

An exploratory factor analysis was conducted to investigate the underlying structure of the student version of the QDTS 14 item questionnaire (n=141). Initial data screening indicated no violations of assumptions for normality or homogeneity. Two factors (with eigenvalues exceeding 1) were identified as underlying the 14 item questionnaire (Table 4.2). In total, these factors accounted for 59.08% of the variance in the data. The seven items aligning with Factor 1 represented how the information was delivered (Cronbach alpha = .886). The seven variables aligning with Factor 2 represented the content received (Cronbach alpha = .912). When combined as a 14 item QDTS scale, the internal consistency was .934, indicating good internal reliability for both full and subscale versions. Inter-rater reliability for the QDTS in this study has previously been reported (Maclean et al., 2017).

Table 4.2 Descriptive Statistics, Communalities and Factor Loadings for the Two-Factor Model of QDTS (*N=141*)

Item		*M*	*SD*	h^2	*Loadings* F_1	F_1
1	Checking the patient's understanding of information and instructions	7.92	1.34	.595	***.760***	
2	Providing information about caring for themselves in a way they could understand	7.74	1.37	.700	***.812***	
3	Teaching the patient about how to care for them self at home	7.37	1.49	.707	***.727***	
4	Being sensitive to the patient's personal beliefs and values	7.58	1.46	.457	***.479***	
5	Listening to patient's concerns	8.13	1.28	.371	***.504***	
6	Providing patient's with the opportunity to practice their treatments or medications	7.48	1.53	.518	***.542***	
7	Answering the patient's specific concerns and questions	7.59	1.57	.587	***.625***	
8	Providing information about who and when to call if the patient has problems once they are at home	7.35	1.76	*.513*		***.648***
9	Providing information about the patient's medical needs or treatments after they go home	7.14	1.70	*.583*		***.622***
10	Discussing information about the patient's emotions after they go home	6.48	2.32	*.536*		***.684***
11	Delivering information about how the patient can care for them self after they go home	6.84	1.95	*.721*		***.778***
12	Helping the patient to feel confident in their ability to care for themselves at home	7.18	1.65	*.718*		***.768***
13	How confident do you feel that your patient would know what to do in an emergency?	7.40	1.96	*.628*		***.771***
14	Did the information you provided about the patients care at home decrease their anxiety about going home?	7.31	1.76	*.635*		***.765***
	Percentage of Variance Explained:				33.23%	25.83%

Note: M= Mean, SD= Standard deviation, h2= communalities, F1=Delivery, F2 = Content

Multivariate Analysis of Variance

Inspection of descriptive statistics (See Table 4.3) indicated that mean scores on both content and delivery QDTS subscales for all data sources (T1, 2 & 3) were higher, and with reduced variability for students in the intervention groups (T2 & 3). Three multivariate analyses of variance (MANOVA) were conducted to test the hypothesis that there would be significant improvement across study groups (control, information, interaction) on measures of both content and delivery of discharge information using data sources from students, SPs, and faculty (Table 4.3). Data inspection indicated the underlying assumptions for MANOVA were met when using the three data sources. To highlight response trends across the three study groups, Figure 4.1 shows ratings by students, SPs, and faculty on the QDTS content and delivery subscales.

Table 4.3 QDTS MANOVA Results

			QDTS - Content				QDTS - Delivery			
			M	*SD*	*(95%CI)*	*Partial Eta Sq*	*M*	*SD*	*(95%CI)*	*Partial Eta Sq*
Student		*Comparison*			F=37.21*	.350			F=10.19*	.129*
1	Control	1-2	6.25	1.50	(-0.24, 0.96)		7.30	1.14	(-0.31,0.72)	
2	Information	2-3	6.61	1.37	(-2.25, -1.06)*		7.50	1.19	(-1.22, -0.21)*	
3	Interaction	1-3	8.27	0 .64	(1.42,2.61)**		8.21	0 .75	(0.41,1.43)**	
Faculty		*Comparison*			F=38.43*	.358			F=29.32*	.298
4	Control	4-5	6.57	1.47	(0.26, 1.54)***		7.11	1.31	(0.25, 1.40)***	
5	Information	5-6	7.48	1.49	(-2.03, -.77)***		7.94	1.21	(-1.57, -.43)***	
6	Interaction	1-6	8.88	0.82	(1.67, 2.93)***		8.95	0.97	(1.67, 2.93)***	
Simulated Patient		*Comparison*			F=32.74*	.322			F=20.50*	.229
7	Control	7-8	6.96	1.49	(0.09, 1.34)*		7.73	1.36	(-.20, 1.04)	
8	Information	8-9	7.68	1.51	(-1.94,-.72)**		7.74	1.60	(-1.79, -.54)**	
9	Interaction	7-9	9.02	0.55	(1.44, 2.66)**		8.92	0 .64	(.98, 2.21)**	

P=<.05, P=<.01**, P=<.001****

Student Results - QDTS

For student self-ratings of both content and delivery subscales omnibus results were statistically significant (student: Wilk's Lambda = F (4,274) = 17.23, p<.001; Wilk =Λ .638, partial = η^2= .201). As shown in Table 4.3, post hoc analyses with Tukey's HSD revealed no significant difference between the *control* and *information* intervention on either QDTS subscale. Significant differences on both subscales were found between *control* and *interaction* groups (Content: M_{diff} = 2.02, Delivery: M_{diff} = 0.91) and between the *information* and *interaction* groups (Content: M_{diff} = 1.66, Deliver: M_{diff} = 0.71).

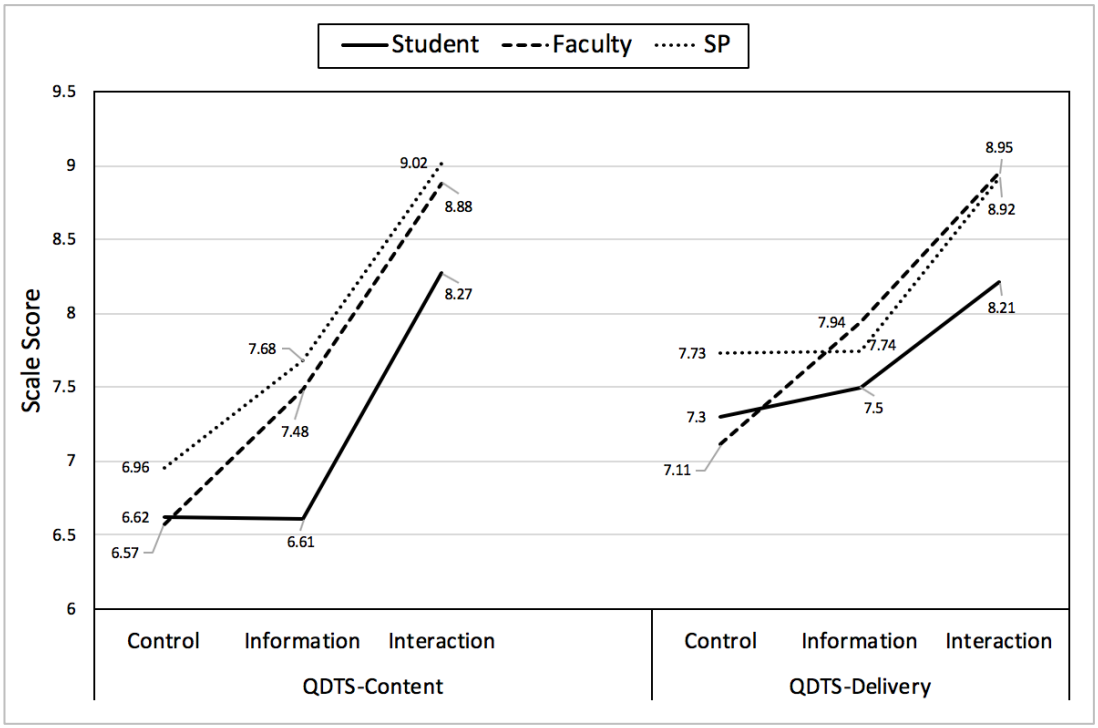

Figure 4.1 QDTS content and delivery mean results for control, information and interaction groups

Faculty and SP Results - QDTS

For both faculty and SP raters, omnibus results showed that subscales were significantly affected by communication interventions. Faculty: Wilk's Lambda = F (4, 274) = 17.46, p<.001; Wilk = Λ.635, partial = η^2= .203. SP: Wilk's Lambda = F (4, 274) = 15.23, p<.001: Wilk = Λ.669, partial = η^2= .182. For faculty ratings, post hoc analysis of dependent variables showed statistically significant incremental improvement in student performance across the three study groups on both QDTS content and delivery subscales.

In line with the student self-ratings, analysis of SP ratings showed no significant effects between the *control* and *information* groups on the Delivery subscale, but significant effects between the *information* and *interaction* groups (M_{diff} = 1.18). On the QDTS content subscale, significant increases were observed across the three groups when using SP ratings. In addition, response trends indicated that students were typically harsher in the self-evaluation of their communication abilities than either SP or faculty raters. The eta squared statistics indicated moderate to large effects across groups (T1, 2 & 3) with the strongest effects being observed for performance comparisons between *control* and *interaction* groups. These results suggest that the use of a combined *information* and *interaction* intervention increased the student's ability to communicate patient discharge information effectively with optimal outcomes achieved.

Discussion

A key objective of nurse-patient communication during care transitions is to improve patient safety and self-management. Equipping nursing students with knowledge (patient risk factors) and interaction strategies (*teach-back*) to better prepare patients to transition to home is an essential component of nurse-patient communication.

The results of this study indicate that highlighting potential risk factors can be effective in increasing nurses' knowledge base for recognizing and selecting information communicated when discharging patients. However, combining both *information-based* (risk factors) and the *interaction-based* (*teach-back*) approaches incrementally increased student nurses' ability to deliver the required information in an easy to understand way that allows confirmation of recipient understanding. These results are based on ratings of student discharge communication competencies from students themselves, as well as SPs and faculty members. Overall response trends across the study indicate that student self-evaluations were more conservative than either SP or faculty assessments.

When considering the information-based intervention, it is important to note that while SPs and faculty observed an improvement in students' coverage of relevant discharge information (as indexed on the QDTS - content subscale), students' self-ratings did not reflect this improvement in performance. However, the marked increase seen in student self-ratings on the QDTS-content subscale when both the risk factors (information) and the interaction method (*teach-back*) was provided (T3), indicates that the students felt more competent and effective in patient discharge conversation when they had learned both strategies.

In discharge simulation scenarios where information needs are not met, the use of *teach-back* provided students with an opportunity to offer supplemental teaching. One advantage of the QDTS questionnaire as a research tool is that it permits a measure of achievement of nurse-patient teaching goals at the individual patient level. By obtaining SP evaluations of the discharge, from their patient perspective, the interactional training intervention significantly increased SPs' perceptions of being engaged and listened to, as well as increasing their level of satisfaction, knowledge, and confidence in being discharged from the health care setting.

In combination, these results indicate that providing an educational intervention that consists of specific content (patient risk factors) and strategies to enhance interaction (*teach-back*), taught in a simulation environment allows direct engagement with and continued feedback from SPs which optimizes students' communication skills for patient discharge.

Our results are comparable with other studies (Green et al., 2014; Strosaker, 2012) where medical residents were able to demonstrate *teach-back* with an SP effectively. A significant improvement was seen in doctors' ability to use plain language and to clarify information delivered (Green et al., 2014). Mangold (2016) and Mahramus et al. (2011) also employed *teach-back* in simulations with SPs as an intervention to improve communication between health care professionals and patients. Unlike the above studies, our results showed positive outcomes from three evaluative sources - the student, faculty and the patient (SPs) perspectives which highlighted similarities and differences in perceptions of the students in the simulations and should be considered for future research and educational applications.

Strengths and Limitations

A strength of this study is the application of two theoretical frameworks (NHET-Sim and NLN/JEFFRIES Theory) to guide the study design and inform simulation development, specifically the training and standardization of SP performance which is not always reported. In addition, this is one of the few nursing studies that have sought to evaluate the effectiveness of a *teach-back* intervention by examining data on communication during patient discharge conversations. A strength of our approach was the use and validation of an amended version of the QDTS tool, which aligned with our specific context and allowed triangulation of outcome data from three viewpoints.

The results of our study should be interpreted with the following limitations. First, the study was implemented at a single university, so the generalizability of our results may be limited. Second, the time required for each student to individually review the student-patient encounter (to assign a faculty rating) may be excessive for some institutions. Third, the work could be strengthened by evaluating the intervention (*teach-back)* on patient care during clinical placement and for longer term effects, for students as new graduate nurses in their patient discharge performance.

Conclusion

Studies are limited with regards to interventions to improve nurses' communication skills at patient discharge. Findings from this study showed that providing information-based and teach-back education in a high fidelity simulation environment using SPs achieved a marked improvement in students' performance of discharge communications. The outcomes were positive from the SPs, faculty staff and student evaluations. A

curriculum that includes a combination of teaching strategies including, didactic teaching of risk factors related to patient readmission and practising *teach-back* communication using SPs is recommended. Larger studies across multiple universities or other settings are needed to confirm these results and further add to the body of knowledge about this concept.

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4.3 Summary of Publication Three

In summary, this is one of the few nursing studies that have sought to evaluate the impact of teach-back intervention during patient discharge conversations. The results support the efficacy of both interventions to improve discharge practices with the best results achieved when both risk information and teach-back skills are provided. The results show that students in group three rated themselves as being more competent in the content covered and their delivery style during the patient discharge in comparison to students in groups one and two. The teaching faculty and the SPs mirrored these results. For all except two indicators across the study conditions, teaching faculty and the SPs rated student's performances higher than students themselves. SPs ratings for both outcome variables most closely aligned with expected effects for the two interventions.

4.4 Introduction to Publication Four

The next publication explores students' perceptions of the simulation, with a focus on the video-assisted reflection and debriefing. This aspect of the study allowed students to reflect on the simulation experience and express their thoughts and feelings of achievement or concern.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2019). Video reflection in discharge communication skills training with simulated patients: A qualitative study of nursing students' perceptions. *Clinical Simulation in Nursing.* (28), 15-24. http://doi:org/10.1016/j.ecns.2018.12.2006

This publication addresses research questions four and five:

Q4: Does providing time for nursing students to engage in video-assisted reflection prior to group debriefing enhance their learning outcomes?

Q5**:** Do nursing students consider the communication skills discharge simulation and the video-assisted reflection process as valuable learning experiences?

This qualitative study aimed to examine nursing students' perceptions and learning experiences after participating in a patient discharge simulation. Each student was able to privately view their own audio-visual (AV) recording of the simulation. Students completed self-assessment of their communication skills before the group debriefing. Audio recordings from 35 facilitated debriefing sessions involving 141 students were transcribed and analysed using content and thematic analysis.

This publication adds to the existing literature by examining students' thoughts about completing the scenario and the use of video-assisted self-reflection. On completion of the simulation and reflection students were able to identify strengths and weaknesses in their communication skills and discharge practices. The results also demonstrated that students were able to reflect on their ability to make clinical decisions, anticipate patient needs and provide patients with the most relevant information before discharge from the hospital. Students indicated that having the opportunity to see that they performed competently during the scenario improved their confidence and self-efficacy.

Findings from this study were submitted to Clinical Simulation in Nursing, as the results of this study would be of interest to other teaching faculty within nursing and allied health. Clinical Simulation in Nursing is an international, peer-reviewed journal and is the official journal of the International Nursing Association for Clinical Simulation and Learning (INASCL). The journal has an impact factor (IF) of 2.286 (2020). The article currently has two citations in: *Midwifery* (IF 2.048, 2019)

PUBLICATION FOUR:

NURSING STUDENTS' PERCEPTIONS OF LEARNING AFTER PATIENT DISCHARGE SCENARIOS: REFLECTIONS FOLLOWING VIDEO-ASSISTED DEBRIEFING

Clinical Simulation in Nursing (2019) 28, 15-24

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Featured Article

Video Reflection in Discharge Communication Skills Training With Simulated Patients: A Qualitative Study of Nursing Students' Perceptions

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Abstract

Background: The use of video-assisted reflection as part of the debriefing process is a growing area of interest in nursing education. This study examined nursing students' reflections on their experience and learning after independently viewing audio-visual recordings of themselves engaging in a patient discharge simulation.

Methods: A qualitative study design was employed. Students demonstrated their discharge communication skills with simulated patients (SPs) in three learning intervention groups. Each student privately viewed an audio-visual (AV) recording of his or her simulation session prior to attending a group debriefing. Audio recordings from 35 debriefing sessions were transcribed for both content and thematic analysis. The sample included 141 nursing students enrolled in a Bachelor of Science (Nursing) program.

Results: Six themes and four sub-themes were identified. Themes were realism, non-verbal communication, verbal communication skills, reflective learning, becoming a

nurse, and patient needs. Two-word clouds using wordcloud.com were generated from the content analysis of students' thoughts and feelings about the simulation experience.

Conclusion: Using simulated patients and video-assisted reflection when teaching communication skills resulted in students reporting a high level of self-awareness, confidence and a sense of achievement. Students indicated that the process helped to gain a greater understanding of the importance of effective verbal and non-verbal communication skills during interactions with patients. Students reflected on the importance of engaging with patients and considering their post-discharge needs and well-being as part of discharge communication practices.

Key Words: Simulation; discharge communication; student nurses; simulated patients, video-assisted reflection, debriefing.

Key Points

- Using video-assisted reflection when teaching communication skills resulted in students reporting a high level of self-awareness and confidence.
- A strength of this study is the application of two theoretical frameworks (NHET-Sim and Schön's *reflection-on*-action) to inform simulation development and the debriefing/reflection process.
- A key finding was that students uniformly shifted from feeling anxious and stressed before the simulation and viewing, to feeling positive and enjoying the experience once they had completed the process.

Background

With communication failures still recognised as one of the leading causes of error in healthcare (Powers, Staton-Williams, Sheeler, & Howard, 2017), education and training are the most common strategies suggested to strengthen communication skills and to improve patient safety (Kellogg et al., 2017). Nursing students must develop high-level communication skills if they are to be effective and safe caregivers (Kaplonyi et al., 2017). However, a recent review by Grant and Jenkins (2014) found that communication training continues to be a low priority in nursing education. Grant and Jenkins (2014) recommended that more research into the efficacy of communication skills training, applying appropriate theoretical frameworks and targeting diverse learning outcomes, is required to support the implementation of evidence-based practices in teaching institutions. In line with this recommendation, our study reports on students' perceptions of their experience and learning when participating in a simulation-based training program to improve patient discharge skills. A key focus is to examine the impact of video-assisted self-reflection before group debriefing. This study forms part of a comprehensive study looking at the use of simulated patients (SPs) in communication education for undergraduate nursing students.

Theoretical Frameworks

Two theoretical frameworks informed the research reported in this paper: The National League of Nursing/Jeffries Theory (NLN/JEFFRIES) (Jeffries, 2015) and Schön's reflective practitioner framework (Schön, 1983, 1987). The NLN/JEFFRIES Theory has five conceptual components: design characteristics, educational practices, facilitator characteristics, student characteristics, and learning outcomes. Simulation design characteristics include objectives, fidelity (realism), complexity, student support, and reflection/debriefing. Debriefing traditionally refers to the period immediately after the scenario when faculty and students critically examine the simulation experience (Jeffries, 2015).

Reflective practice is the process of learning from experiences to inform future practice (Schön, 1987). Schön identified two types of reflection: reflection-*in*-action and reflection-*on*-action. The former allows practitioners to reflect and critically think while they are performing an action while the latter involves retrospective reflection on their performance. Schön (1987) advocates for the use of reflection-*on*-action in a risk-free environment, such as during simulation debriefing.

Simulation

Simulation in nursing education is used as a teaching methodology to provide students with an opportunity to develop communication skills (Maclean, Kelly, Geddes & Della, 2018), clinical judgement (Lasater, 2007) and clinical reasoning skills (Levett-Jones & Lapkin, 2014) in a non-threatening learning environment. Increasingly, tertiary institutions are using simulation to ensure nursing students can perform clinical tasks, have effective communication skills, and have higher-order thinking skills on graduation (Levett-Jones & Lapkin, 2014). As the use of simulation increases in nursing education, facilitators must continue to improve their understanding of how simulation, and the process of debriefing and video reflection influences student learning outcomes (Neill & Wotton, 2011).

Simulation Fidelity

The International Nursing Association for Clinical Simulation (INACSL Standards of Best Practice: Simulation^{SM}) include fidelity as a criterion that must be implemented to provide effective nursing education (INACSL Standards Committee, 2016). Fidelity of the simulated environment is often enhanced by having a clinical setting, and using simulated patients, authentic scenarios and documentation that mimics the "real world". When teaching communication skills, the use of simulated patients, who can interact in real-time, helps create a greater sense of realism for students (INACSL Standards Committee, 2016). When students are engaged in the learning experience, they are more likely to reflect on critical elements, such as patient safety, compassion, and management strategies (Hayes, Jackson, Davidson, Daly & Power, 2017). Students' perceptions of realism are reported in this study as a validation of the authenticity of the patient discharge communication scenario, setting and use of simulated patients.

Debriefing

An integral part of the simulation-based learning outcomes for this research was the debriefing and reflection processes (Levitt-Jones & Lapkin, 2014). Effective debriefing is believed to link theory to practice and promote critical thinking (Kelly & Guinea, 2018). Debriefing also provides students with a process to develop clinical reasoning skills through self–reflection and feedback (Levett-Jones & Lapkin, 2014). The debriefing phase immediately follows the simulation and has been described as an essential component of reflection and learning (Husebo, O'Regan & Nestel, 2015). In their review of simulation

debriefing practices, Hall and Tori (2017) stated that debriefing should be based on a well-defined framework and that all simulation should have a planned debriefing session with a focus on self-reflection. For this research, the Gather, Analyze and Summarize (GAS) (Phrampus & O'Donnell, 2013) and Reflection-on action (Schön, 1987) approaches were adopted when conducting facilitated debriefings.

Video-Assisted Debriefing (VAD)

Video recorded segments of simulations have been used to complement debriefing (Levett-Jones & Lapkin, 2014) providing students with an opportunity to review, reflect upon and discuss key elements of the scenario (Reed, Andrews & Ravert, 2013). Faculty and student perceptions of VAD have been reported in the literature (Ha, 2014; Krogh et al., 2015; Reed et al., 2013). According to Krogh et al. (2015) faculty felt that the value in using VAD depended on equipment, scenario design (realism), learning objectives, and the student group dynamics. Challenges in VAD identified by Krogh et al. (2015) included distractions during the debriefing process, which diverted the student and facilitator's discussion from the learning outcomes. From a student's perspective, Ha (2014) and Karlsen et al. (2017) reported that while students found watching the video to be tiresome and humiliating, it boosted self-confidence for some students. Reed et al. (2013) also observed that VAD enhanced students' self-confidence and self-reflection. A point to note is that the studies described above used VAD in a group setting, having the students watch excerpts of other students or their performance as a group. Only one study in nursing investigated the impact of providing individuals with the opportunity to review their performance (Bussard, 2016) independently. However, this viewing occurred one week after the simulations and debriefing.

Building on the successful use of video-reflexive ethnography to improve clinical practice (Iedema, Mesman, & Carroll, 2013) Gough, Yohannes & Murray (2016) have applied a video-reflexive approach in simulation education with physiotherapy students. Gough, Yohannes & Murray (2016) allowed students to independently review their video. Students found value in this opportunity as they were able to verbalise their clinical decisions and clinical reasoning skills. In sum, evidence indicates that students learnt from the simulation with or without VAD (Ha, 2014; Reed et al., 2013) however, the extent to which VAD impacts learning and optimal viewing protocols warrant further investigation.

Study Aim

Nurses acquire theoretical knowledge about communication during their tertiary training; however, what students learn in a classroom is not always transferred to and enacted during clinical practice. Simulation is an evidence-based pedagogy to bridge the theory to practice gap (Jeffries, 2012). Even though clinical experience through simulation provides an opportunity to improve nursing skills, Schön (1983, 1987) believes that more meaningful learning happens through the process of self-reflection. The implementation of video-assisted, reflective practice following a simulation may help students embed their professional knowledge and skills, gain better self-awareness (Schön, 1987), and increase their readiness for clinical practice (Levitt-Jones & Lapkin, 2014).

While the benefits of using simulation to enhance student nurses' learning are well accepted, research about students' experiences and perceptions of video-assisted reflection in simulation and education are limited (Alhaj Ali & Musallam, 2018; Zhang et al., 2019). To our knowledge, no study in nursing has used a combination of independent viewing of AV recordings for self-reflection before participation in a group debriefing following simulation. The purpose of this study was to examine nursing students' perceptions and learning experiences after participation in a patient discharge simulation with independent AV reflection time and group debriefing. Specifically, we sought to explore students' thoughts about (1) the simulation experience (2) having the opportunity to watch the AV recording privately and independently and (3) the patient's needs during and after the discharge process.

Methods

Study design

A qualitative, descriptive approach was applied to explore reflective debriefing in simulated patient-based learning. As reported in MacLean et al. (2018), three study groups were established based on a patient discharge communication training protocol: T1 – control group (no intervention); T2 – information group (re-admission risk factor information provided); and T3 – information and interaction group (re-admission risk factor information and *teach-back* provided). The simulation sessions took place in a purpose-built simulation space at the university during non-teaching periods. All students completed: (a) the discharge scenario, (b) independent video-assisted reflection (c) standardised debriefing in a group of 3-5.

Sample

A convenience sample of 141 students enrolled in a Bachelor of Science (Nursing) program in a large metropolitan university voluntarily enrolled in the study. Students for this study met the following criteria: (1) second- or third-year nursing students; (2) had attended a clinical placement in an acute care setting; (3) agreed with the study procedure and purpose; and (4) had completed the course curriculum discharge module.

Ethics

The study was approved by the university's human research ethics committee (approval No. 151012). The participation in the study did not impact students' course outcomes. The students completed the simulation during semester breaks and were not engaged in curricular activities with the researcher. Participation in the study was voluntary, and students were free to withdraw without prejudice at any stage. All videos and outcome data were electronically encoded and stored according to university ethics and requirements.

Procedure

The study involved a number of phases: simulation/scenario design; SP training; creating student groups and providing pre-briefing; simulation sessions; audiovisual self-reflection/evaluation; and debriefing/focus groups. For this paper, the scenario design, video reflection, and debriefing/focus groups have been reported in detail. The procedure of SP recruitment and training has been reported elsewhere (MacLean, Geddes, Kelly & Della. 2018).

Scenario Design

Communication involves a complex interconnected range of verbal and non-verbal skills. In this study, the students had well-defined, task-directed communication skills to focus on. Using the NHET-Sim framework (NHET-Sim Monash Team, 2012) a patient discharge communication scenario was written to inform the simulation design. The scenario depicted a patient being discharged from the hospital with a new diabetic medication. Contextual details were based on patient data that identified both clinical and communication risk factors for a patient over 65 years of age. The scenario was authenticated by a Diabetic educator, two registered nurses and two academics who have expertise in both clinical and simulation education.

Simulation Sessions and Video Reflection

Simulations were run concurrently in two fully equipped simulation laboratories in the university's School of Nursing. Audiovisual recordings were taken of each student with both the ceiling camera system and a Go-Pro camera. A Go Pro camera was used so each student could watch their AV recording on a laptop in a private viewing room immediately following the simulation and prior to the group debriefing. This gave students an opportunity to reflect on their performance and communication skills independently, without feeling embarrassed or anxious about peer review. At this time, students also completed the research questionnaires to help guide their reflections.

Group Debriefing Interviews

Once the student viewed their AV recording, a small group debriefing took place in a safe and confidential environment. When applying GAS, the instructor initially engages, explore and explains the events that occurred. Listening helps the instructor understand what the students think and how they feel about their simulation experience. The analyze/evaluate phase provides students time to reflect on their learning and generate discussion on improvement. Finally, in the summarizing and extending phase, an overview of the key take-home messages that the students have learned is formulated.

The debriefing was facilitated by the researcher who was formally trained in debriefing, and all sessions were audio-recorded with student consent. The following questions from the debriefing interview guide were asked:

1. How would you describe the simulation you just completed?
2. How do you think watching the AV recording by yourself has developed your communication skills?
3. What are your thoughts/feelings on how your patients will manage once they are discharged home from the hospital?
4. Describe in one or two words how you felt when you were informed you were being filmed in the simulation and had the opportunity to watch it back.
5. Describe in one or two words how you felt once you had completed the simulation and watched the AV recording.

Data Collection and analysis

Data collection took place over a 12-month period and consisted of three 1-week blocks of simulations. Each simulation lasted approximately 12–15 minutes per student,

with a maximum of 5 students rostered for each session. Immediately following the simulation scenarios and video reviews, group debriefings with 3-5 students were conducted. In total 35 debriefing sessions were held, lasting between 26-47 minutes (mean=38 minutes). The debriefings were audio-recorded and professionally transcribed. The recordings and scripts were then listened to and reviewed by the first author for accuracy. In the whole process, Guba and Lincolns (1985) principles of transferability, confirmability, credibility, and dependability were utilised to ensure trustworthiness.

Qualitative content analysis and thematic analysis are two commonly used approaches in data analysis of nursing research (Vaismoradi, Turunen & Bondas, 2013). Despite the similarities between the approaches, the difference lies in the ability of content analysis to quantify data. This paper utilised both approaches. All themes and content descriptors were initially identified, compared and validated in a subsample of transcripts (30%) drawn from across the three data collection periods by three reviewers, the first author (SM) and corresponding authors (MK and FG). Once consensus was reached on themes, the remaining transcripts were analysed and any variations moderated as required. Thematic analysis was used, and a matrix of themes and sub-themes was created to represent responses to the first three debriefing questions. Content analysis was applied to questions four and, five and results are displayed as word clouds. Wordclouds.com is a free online word cloud generator used to create the clouds. Words that appear more frequently in the source data have greater prominence in the word cloud.

Trustworthiness

The rigor or trustworthiness of the data was assured through the components of credibility, and dependability (Lincoln & Guba, 1985). Credibility was achieved through an iterative process of each author independently deciding on concepts, before collaboratively coming to an agreement on the themes/sub-themes and quantifying word cloud information. Dependability was achieved by maintaining an audit trail documenting the coding decisions made by the research team.

Results

A total of 137 females and four male students with a mean age of 27.67 years (*SD*= 8.54) completed the simulations. The majority of the students were Caucasian with English as their first language (*n*=112). Students of other ethnicities, with English as a second language, included Chinese, Indian, Sudanese, European, South East Asian (*n*=

29). Eight SPs (six females and two males) over the age of 65 were purposely recruited through the university's SP database (M= 65.67 years, SD=2.50), as the scenario was based on a patient over 65 years of age. Thematic analysis identified six themes and four sub-themes: (1) realism; (2) non-verbal communication, with sub-themes listening and body language; (3) verbal communication (4) reflective learning, sub-themes safety and confidence; (5) becoming a nurse; and (6) patient needs. Quotes are used to represent themes, with emphasis added on occasion. Two-word clouds generated from the content analysis reflect students' thoughts and feelings about the simulation experience.

Theme 1 – Realism

Students spoke about their experience in the simulation in terms of "how realistic" the scenario, task, patient and setting were. Students described the clinical interaction as being engaging and authentic which supported self-reflection on their learning experience.

> *It was realistic because the patients had real concerns and worries that you could empathise with.*

> ***The scenario immerses you into it**, which is probably a lot easier than using mannequins. The discussion with the patient is realistic, and exactly like a patient, you would look after in the hospital.*

Theme 2 – Non-Verbal Communication

Listening

The importance of having effective listening skills was identified by students. They described how watching themselves on a video gave them a greater awareness of their lack of ability to sit and listen to their patients.

> *I think the one thing I noticed was that I am a little too quick to answer, I need to take a **step back and listen more to my patients**.*

> *It's definitely more about listening to what your patient's needs are and actually answering their questions until they are satisfied and you're not rushing them home.*

Body Language

Students recognised that their non-verbal communications, including, body language, posture, and awareness of non-purposeful hand movements, impacted how they might be perceived by their patients. Feelings of concern over students' hand gestures, poor posture and positioning were raised.

I realized that I fidget, and while I am being friendly when I watched myself on video, I thought my fidgeting showed I was disengaged.

*I liked how I communicate with the patient; however**, I wish I had sat down on the chair next to the patient, so it was more personal.***

Theme 3 - Verbal Communication

Specific aspects of verbal communication, including the tone, volume, and speed of voice, were recognised as being critical for effective nursing care. Students spoke about the importance of speaking clearly and at a pace that would allow patients to understand all aspects of the discharge information.

It was really interesting to watch yourself back, as I haven't seen myself, nurse, before. I realize I talk too fast and need to slow down.

I talk with a really high pitch voice; I'm worried about that in clinical practice.

***I realized watching the video I cut patients off a lot,** I need to slow down and listen to the patient more.*

Theme 4 – Reflective Learning

The fourth theme, reflective learning, includes two overlapping sub-themes relating to the safety of the learning environment and improved confidence gained as an outcome.

Safety

Students described watching the AV on their own as a unique opportunity to reflect on their performance without feeling embarrassed or judged by faculty or classmates. This allowed them time to understand their strengths and weaknesses and to consider their own learning needs.

***I found watching the scenario back on my own built my confidence**; you can receive feedback without being embarrassed. The learning was great as I can see what I need to improve on.*

***When you told us, it was just us watching the video on our own, and I felt relieved.** It's really positive just having that moment to yourself for self-reflection, as you are nervous that you are going to look like an idiot in there, you can laugh at yourself.*

Confidence

Despite initial reservations about the simulation, students indicated their confidence grew once they realized how well they performed in the scenario. Their comments included the following:

> *I usually walk out of exams or simulations thinking oh my goodness, I am an absolute failure. Being able to watch the video back, I could actually see how well I did, so it definitely improved my confidence.*

> ***I think this simulation has pushed me to deliberately** go out of my way to increase my own education, think critically, be confident and be even more reflective in the future.*

Students were asked to consider how patients would manage once they were discharged home from the hospital. The themes identified from this question were thinking like a nurse and patients' needs.

Theme 5 - Becoming a Nurse

Students said that watching the scenario helped them consider how their thinking and actions as a nurse were developing and how this impacted on their patient.

> *I'm thinking too much like a nurse and what **I** think is important. Sometimes you need to take a step back and think about what the most important information for the patients is. So, it made me realise this and that I got the main points out.*

> *The main thing as a nurse is you hope you have given patients enough information that they can manage well at home and not represent again.*

Theme 6 - Patient Needs

Students talked about being aware of their patients' wellbeing and the importance of ensuring that patients feel confident and can manage their care after discharge.

> *It is actually really important to encourage the patient to participate in their own care when they are going home. So, I liked watching the video back as I could see, I gave my patient confidence to manage at home.*

> *There's so much more to think about; it's not just how they [patients] use the medication but how they're going to get to their GP in a week's time. It's helping patients become confident in using health practitioners as well, and to ask how they are feeling.*

I didn't give her [patient] enough time to tell me what she was feeling if she was feeling ok to go home. She did say that she was feeling anxious, I really picked up on that although I didn't think I let her discuss all of her concerns with me.

Student Affect - Word clouds

The results for questions four and five are displayed in two content word clouds. The first cloud (Figure 4.2) shows students' initial thoughts and feelings towards being filmed in the simulation and having the opportunity to watch the scenario back as part of the reflection process. The majority of students described feeling anxious, nervous and worried. They initially felt awkward and self-conscious about watching themselves. However, students also stated that they were curious and excited about the simulation, and felt the experience would be beneficial.

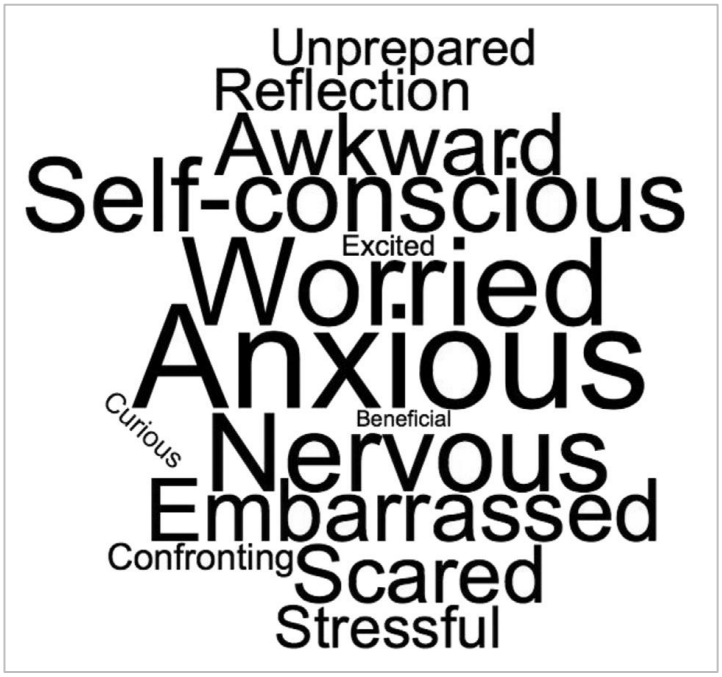

Figure 4.2 Pre-simulation Experience

The second-word cloud (Figure 4.3) displays students' thoughts and feelings once they had finished the scenario and had watched the AV recording independently. All students described the experience in positive terms including enjoyable, reflective, useful, educational and informative. The most frequent response was that the learning experience gave them more confidence in their communication skills and performing a patient discharge.

Figure 4.3 Post-simulation Experience

Discussion

The purpose of the present study was to explore the efficacy of video-assisted self-reflection in an authentic communication skills simulation. Students' initial responses highlighted realism as an important factor in the simulation experience design. Students believed that the use of SPs in the scenario provided an accurate portrayal of a patient being discharged home from the hospital, which strengthened their capacity to engage in and reflect on the learning task.

Students' *reflection-on-action* occurred after the simulation was completed during both the independent viewing of their performance and the group debriefing. By participating in the simulation and VAD, students were able to identify strengths and weaknesses in their communication skills and practices in the discharge process congruent with the learning objectives of the simulation. By watching themselves, students were able to reflect on the importance of listening and not interrupting patients when they are speaking. Comments indicated that self-reflection fostered a greater appreciation of the need for patient-centred care and the importance of making sure patients understood all of the relevant information. These findings are consistent with previous research in health (Pawlikowska et al., 2012) which has found doctors and nurses to be verbally dominant in their interactions with patients. Our results suggest that students were aware that adopting a patient-centred approach to allow more discussion with patients is essential

The results also highlight students' recognition that they are becoming nurses. Students were able to critically reflect on their ability to make clinical decisions, anticipate patient needs and provide patients with the most relevant information before discharge

from the hospital. Having full responsibility for discharging their patients gave the students time to build rapport and focus on their patient's emotional and physical well-being. This triggered reflection on how important it is to be available to patients, to understand individual patient needs and to discuss and clarify essential discharge information.

A final and key finding was that students uniformly shifted from feeling anxious and stressed before the simulation and viewing, to feeling confident and enjoying the experience once they had completed the process. This finding is consistent with previous research by Lestander, Lehto, and Engstrom (2016) and Karlsen, et al. (2017) who found that despite feeling anxious, students' feelings moved towards self-awareness and confidence in their ability after VAD. While our study did not measure the impact of stress on performance, results indicate that students believed that watching their own AV recording in private helped them overcome feelings of anxiety and inadequacy and allowed time to reflect on what they achieved in the simulation and could apply in their clinical placements. In sum, students' comments indicated that having the opportunity to see that they performed competently during the scenario improved their confidence and self-efficacy about their communication and discharge skills.

Strengths and limitations

A strength of this study is the application of two theoretical frameworks (NHET-Sim and Schön's *reflection-on*-action) to inform simulation development and the debriefing/reflection process. This is one of few nursing studies to have examined the effectiveness of AV debriefing from the student perceptive and is unique in having allowed the students' time to watch and reflect on their scenario performance immediately after the simulation and in privacy, prior to group debriefing. The results of our study should be interpreted with the following limitations. First, the study was implemented at a single university so the generalizability of our results may be limited. Second, the time required for each student to individually review their own AV may be excessive for some institutions or programs. Finally, no direct comparison of the efficacy of independent viewing against group viewing was made.

Conclusion

The main finding of this study is that students reported having greater confidence in their communication and discharge skills after the simulation. Having the opportunity to

watch their performance independently, supported students' individual learning needs and increased their ability to self-reflect and level of confidence. Even though students often feel anxious about being filmed and the prospect of viewing their performance, this cohort appreciated the opportunity and value of self-reflection that independent viewing of their AV recording offered for learning. There is a need for additional research comparing different methods of independent and group video-assisted debriefing in communication skills training.

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END OF PUBLICATION FOUR

4.5 Summary of Publication Four

In summary, during the debriefing, students expressed an appreciation of being able to watch the AV recording in private. Students stated that it gave them an opportunity to reflect, overcome their fear of failure without being judged by peers, and process what they had achieved through participating in the simulation. During the debriefing, students also commented on the realism of the simulation. Realism influenced their ability to self-reflect and engage in the learning activity.

4.6 Introduction to Publication Five

The fifth publication in this study explored students' perceptions of realism and presence and how these concepts influence learning outcomes.

Maclean, S., Geddes, F., Kelly, M., & Della, P. (2019). Realism and presence in simulation: Nursing student perceptions and learning outcomes. *Journal of Nursing Education*. http://doi: 0.3928/01484834-20190521-03

This publication addresses research questions six and seven:

Q6**:** Does modifying design elements of the scenario (clinical risk information and interaction-based guidelines) significantly increase student's perceptions of realism?

Q7**:** What is the relationship between a student's perceptions of realism, sense of presence and learning outcomes?

This mixed-methods study aimed to examine if and how simulation design elements influenced students' discharge communication skills as proposed in a new developed integrated conceptual model of SBE. To date, no other study has examined the relationship between realism, presence and student learning outcomes when working with SPs in nursing education.

This publication adds to the existing literature by (1) validating a Concept of Presence tool that can be used in further investigations, (2) testing a newly developed integrated conceptual model of presence for simulation, (3) examining students' perceptions of realism and presence and how these concepts impact on their learning outcomes. Results revealed that student nurses' perceptions of enhanced realism and presence substantially increased their learning outcomes.

Findings from this study were submitted to the *Journal of Nursing Education*, as the results of this study would be of interest to other teaching faculty within nursing and allied health. The *Journal of Nursing Education* is a monthly, peer-reviewed journal publishing original articles and new ideas for nurse educators in various types and levels of nursing programs for over 50 years. The journal publishes innovative nursing education research to improve best-practice in nursing. The journal of Nursing Education has an impact factor (IF) of 1.070 (2019).

The article currently has two citations by other authors in the following journal:

- *Clinical Simulation in Nursing* (IF 2.286, 2019)

PUBLICATION FIVE:

REALISM AND PRESENCE IN SIMULATION: NURSING STUDENT PERCEPTIONS AND LEARNING OUTCOMES

(ACCEPTED PRE-PRINT VERSION)

Realism and Presence in Simulation: Nursing Student Perceptions and Learning Outcomes

Sharon MacLean, RM, RN; Fiona Geddes, PhD; Michelle Kelly, PhD, RN; and Phillip Della, PhD, RN

Abstract

Background: Optimizing realism in simulation is important; however, research examining how perceived realism and presence affects a student's learning experience and outcomes are limited.

Method: This study has a mixed-method design. Quantitative survey data was collected from 141 undergraduate nursing students. Interviews with a subsample of 12 students provided qualitative data. Students completed the Concept of Presence, Simulation Design Scale, and the Quality of Discharge Teaching Scale. A hierarchical multiple regression analysis was performed on the quantitative data and thematic analysis for qualitative data.

Results: Differences in students' perceived realism and level of presence were not affected by the two communication-based learning interventions. A positive, fully mediated relationship between realism, presence, and learning outcomes in discharge communication skills was found. The quality of the simulation experience provided students with the opportunity to reflect on their knowledge and capacity to transfer skills into clinical practice.

Conclusion: The convergence of findings supports the theory that perceived realism and presence have a positive impact on student learning outcomes.

Introduction

Simulation has become popular in contemporary education because of its ability to provide a "real clinical experience". The use of simulated patients (SPs) is increasing as it offers a realistic and affordable model of teaching (Nestel et al., 2014). While several studies have refuted the idea that high levels of realism are required for effective training in simulation (Grossman & Salas, 2011; Stevens & Kincaid, 2015), Dunnington (2015) argues that students should perceive the simulation as realistic to induce a sense of presence. The question of what constitutes an adequate or optimal level of realism and the nature of the relationship between simulation fidelity and students' subjective perceptions of realism continues to be explored. The aim of this study is to investigate whether students' subjective perceptions of realism influenced their level of presence in a simulation experience and correspondingly had any direct or indirect impact on their learning outcomes.

Realism

The term realism is defined as "the ability to impart disbelief to the learner by creating an environment that mimics that of the students' work environment. Realism includes the environment, simulated patients, and activities of the teaching faculty, educators, assessors, and/or facilitators" (SSH, 2016, p.30). The International Association for Clinical Simulation in Learning (INACSL Standards of Best Practice: Simulation^{SM},2016) outlines 11 criteria for effective implementation of simulation in education, including fidelity/realism (criterion five). To promote realism, the guidelines identify three aspects of fidelity; physical, conceptual, and psychological which should inform the simulation design (INACSL Standards of Best Practice: Simulation^{SM}, 2016). All the contextual elements are intended to help students suspend their disbelief, become immersed in the learning (Brackney & Priode, 2017) and as Dunnington (2015) describes, be *present* within the simulation. The level of fidelity is often linked to realism, simulation design, and learning outcomes (Choi et al., 2017). A recent meta-analysis (Shin, Park & Kim, 2015) reported on the impact of fidelity and learning outcomes. The results indicated that a high amount of realism and fidelity had benefits for cognitive, affective and psychomotor skills. By providing a more realistic experience, simulation provides students with an education modality that could improve learning outcomes, compared with traditional education (Shin et al., 2015).

Presence

The concept of presence is not new in the field of nursing. Presence has long been reported as an important notion in the context of nurse-patient care and is derived from the Latin term, *praesetia*, meaning, "To be present – as with others" (Welsh & Wellard, 2005.p 5). In nursing, presence is defined as a sense of "being with" a patient or family member for the benefit of a therapeutic relationship (Covington, 2003; Welsh & Wellard 2005). While presence in the nursing care context suggests the process of "being with" a patient, presence in the virtual simulation world implies the sense of "being there" (Minsky, 1980, p. 45).

In the virtual reality (VR) domain, presence is defined as the subjective interaction of a person with the virtual environment, or as Witmer and Singer (1998) described, how well a student is involved or immersed in a virtual simulation. As a multidimensional construct, presence has been studied extensively in VR contexts (Lee, 2004; Sanchez-Vives & Slater, 2005) where it has been shown to have a positive impact on task performance, learning and the transfer of skills (Leo, Diggs, Radici & Mastaglio, 2014; Witmer & Singer, 1998). More recently, presence has been evaluated in nursing simulation studies using VR modalities (Dang, Palicte, Valdez & O' Leary-Kelley, 2018; Dubovi, Levy & Dagan, 2017). Dubovi, Levy & Dagan, (2017) found a positive correlation between students' sense of presence during VR skills training and their conceptual-procedural learning of medication administration. Students found that their sense of presence was greater in virtual simulation with application to medication administration compared to studying via a lecture-based curriculum. Dubovi, Levy & Dagan, (2017) recommend further research should be performed to compare learning outcomes achieved when using traditional lecture, VR and high-fidelity patient simulations. Dang et al. (2018) found that the sense of presence experienced by nursing students engaged in VR simulations closely mirrored that of students actively involved in the scenario. Dang et al. (2018) recommend that future simulation studies should modify terminology and items used in VR presence scales to accommodate non-VR modalities and avoid potential variability in simulation research data. Both these studies indicated that simulation education could benefit from exploring the impact of presence on learning performance.

Theoretical Underpinnings

Figure 4.4 presents an integrated conceptual model of presence in SBE that incorporates elements of three key education and simulation frameworks described below. The model underpins the simulation design, methodology, and analysis of this research.

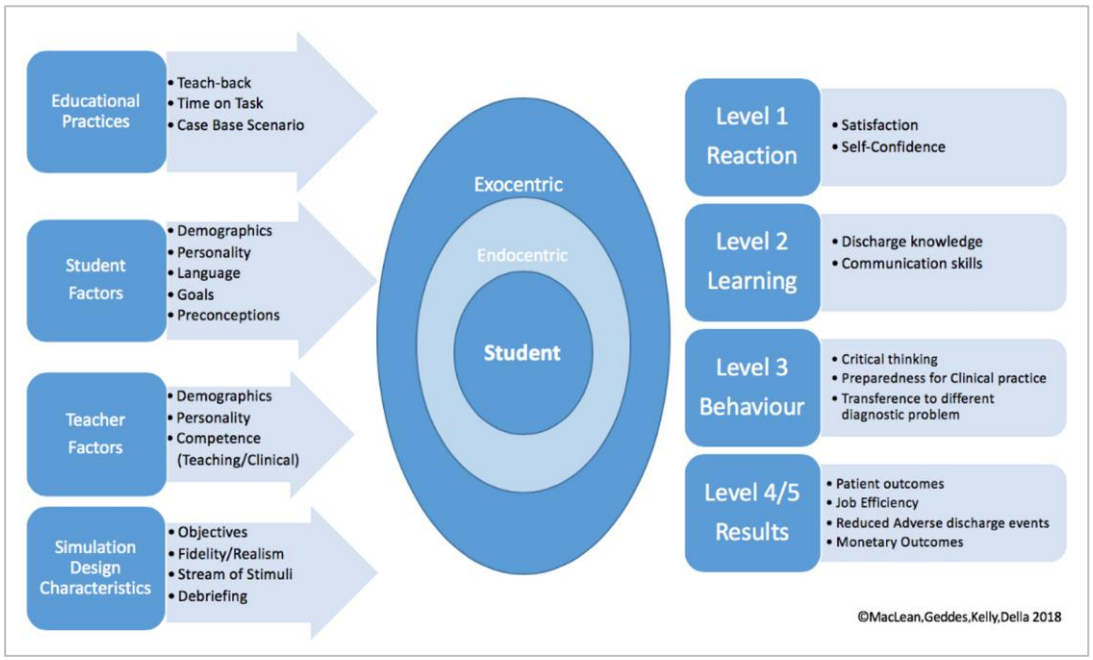

Figure 4.4 Integrated Conceptual Model of Presence

Centricity of Presence

In relation to nursing education, Dunnington (2015) defined presence as a state of being between the primary domains of endocentricity and exocentricity. These concepts refer to the centricity or focus of a student's state of being and involves them having sensory, perceptual, and actional dominance from the simulation either internally (endocentricity) or externally to (exocentricity) the situation. More specifically, an endocentric presence is the dominant perception of the person interacting in a real patient care situation represented by the simulation. Dunnington proposes that the goal of the simulation is to induce a sense of an endocentric presence where the student believes they are in the actual clinical environment. To achieve this, simulation facilitators have the challenge of creating learning environments that generate a sense of presence to promote "real life" learning opportunities.

The linkage between simulation design and presence has been reported in Dunnington's (2015) research comparing different clinical problems in high-fidelity mannequin-based scenarios. Dunnington found no difference in presence based on the

type of clinical problem represented in the simulation. However, a change in patient cues indicating deterioration in the scenario invoked a more endocentric presence in students. Dunnington noted that while students often started off standing on the periphery of the simulation in a more disconnected and observational mode, as the scenario unfolded to include more stimuli the students were pulled into the clinical situation - into a state of being endocentrically present in the simulation. This finding supports the idea that the stimuli experienced during the simulation, which is determined by the scenario design, is critical to evoking presence.

The National League of Nursing Jeffries Simulation Theory

The National League of Nursing Jeffries Simulation Theory (NLN/Jeffries) synthesizes learner-centred, socio-cultural, and constructivist learning theories in developing five conceptual components of simulation: design characteristics, educational practices, teacher characteristics, student characteristics, and learning outcomes. The NLN/Jeffries theory is relevant to this study because it explores the relationship between simulation design characteristics and learning outcomes into which presence can be embedded (Jeffries, 2015).

Kirkpatrick's Model of Evaluation

When seeking to measure students' learning outcomes and the transfer of skills into practice, Kirkpatrick's (1994) model of evaluation is recognised as a core framework. The four levels of evaluation that are integrated into the model proposed in this study are reaction, learning, behaviour and, results. The objective of this study was to improve the communication skills of nurses in a simulation of discharging a patient from a hospital setting. To date, no research has investigated the association between students' perceptions of realism, their experience of presence and the subsequent impact of these two factors on their learning outcomes when working with SPs in simulation.

Research Questions

1. Does modifying design elements of the scenario (clinical risk information and interaction-based guidelines) increase student's perceptions of realism?
2. What is the relationship between a student's perceptions of realism, sense of presence and learning outcomes?

Method

Study Design

A multi-phase convergent mixed-method approach was used to allow both model testing with quantitative data and examination of students' perceptions of the concepts in question using qualitative data. This convergent design is where quantitative and qualitative data are collected and analysed at the same time (quantitative + qualitative = convergence) (Morse & Niehaus, 2009). The purpose of convergent design is to define relationships between variables of interest more accurately. In convergent designs, both qualitative and quantitative are collected at the same time, although one form of data is often given more weight over the other (Creswell & Plano Clark, 2018). Three groups were established based on the patient discharge communication intervention: T1 – control group (no intervention); T2 – information group (re-admission risk factor information provided); and T3 – information and interaction group (re-admission risk factor information and *teach-back* provided). Full details of the study groups have been reported elsewhere (MacLean, Kelly, Geddes & Della, 2018). The simulation scenarios took place in a purpose built simulation laboratory at the university during non-teaching periods.

Sample (Students and SPs)

A convenience sample of 141 students enrolled in a Bachelor of Science Nursing voluntarily enrolled in the study. Students met the following criteria: a) second or third-year nursing students who had completed discharge education in course curriculum, b) attended a clinical placement in an acute care setting and agreed to the study procedure and purpose. A total of 137 females (97%) and four male students, with a mean age of 27.67 years (*SD*= 8.54) completed the simulation. A randomly selected sub-sample of twelve students completed semi-structured interviews at the completion of their scenario (four students from each group). Eight SPs (six females and two males) between-groups through the university's SP database. Consistent with the depiction of a patient over 65 years of age in the scenario, the mean age of the SPs was 65.67 years (SD=2.50)

Ethics

The study was approved by the university's human research ethics committee (approval No. 151012) as part of the first author's doctoral study. The participation did not impact students' course outcomes. The students completed the simulation during semester breaks and were not engaged in curricular activities with the researcher.

Participation in the study was voluntary, and students were free to withdraw without prejudice at any stage. All videos and outcome data were electronically encoded and stored according to university requirements. Author permission was obtained for the use and modification of all surveys.

Data Collection and Management

Quantitative

Students completed the Simulation Design scale (SDS student version) (Jeffries, 2005). The SDS is a 20-item instrument using a five-point agreement scale, designed to evaluate the five design features of simulation: 1) objectives/information; 2) support; 3) problem solving; 4) feedback; 5) fidelity/realism. The full-scale reliability of the instrument was found to be .92 (Jeffries, 2005). To assess the students' perceptions of realism, two questions from the fidelity subscale were used in combination with one question from Dinh's Concept of Presence scale (COP) (Dinh et al., 1999).

To assess the students' sense of presence, a modified version of the COP was used. The original questionnaire, used in a virtual simulation, consists of 14 items with a five-point response scale. For this study, nine items were modified for use in a SP context. The COP scale had not been previously validated in the simulation with SPs, and no Cronbach's alpha has been reported in the virtual context.

The Quality Discharge Teaching Scale (QDTS) (Maloney & Weiss, 2008) was used to measure students' ability to deliver discharge-related information. The full QDTS comprises 24 items and applies a ten-point Likert format with anchors from "none" to "a great deal". One subscale of six items relating to patients' needs was deemed not relevant to the SP scenario, and four timing-based items (items 6, 13, 14, and 15) were removed. The modified Content subscale (QDTS-C) consisted of 6 items, representing the type of information the patient receives. The 8-item Delivery subscale (QDTS-D) measures the non-clinical skills of the nurse, as a patient educator, in presenting discharge information. The Delivery sub-scale includes items about listening, expressing concerns, expressing sensitivity to personal beliefs and values, and teaching in a way that the patient can understand. Further items in this sub-scale focus on providing consistent information; promoting patient confidence in their ability to care for themselves and knowing what to do in an emergency; and decreasing anxiety about going home. Maloney and Weiss (2008) reported Cronbach alpha coefficients for the original full scale (0.92), Content sub-scale (0.85) and Delivery sub-scale (0.89). An exploratory factor analysis was previously

conducted to investigate the underlying structure of the scales in this study population; results, including internal reliabilities, have been reported in Maclean et al. (2018).

Qualitative

Qualitative data were collected to generate an understanding of students' perceptions of realism and presence. The initial interview questions were structured around concepts of presence drawn from the literature (Dunnington, 2015). Sample questions for the interviews included: How would you describe the simulation? Please describe your focus during the simulation, what were you aware of during the simulation and did you notice anything else in the room? What were you thinking about during the simulation? How did the simulation compare to a real patient care situation? How present were you during the simulation?

Procedure

The study involved a number of phases: simulation design, SP training, creating student groups, and providing pre-briefing, simulation sessions, and video reflection/self-evaluation, group debriefing, and individual interviews.

Simulation Design

The *National Health Education Training* – Sim (NHET-sim) model of simulation (Nestel et al., 2014) provided the framework for the simulation scenario design. One scenario of a diabetic who required a new medication on discharge from the hospital was developed. The scenario was validated by a diabetic educator, two simulation experts, and three registered nurses with acute care experience.

SP Training

The next phase consisted of preparing SPs for the patient role using an established evidence-based framework (NHET-Sim) *(*Nestel et al., 2014). Full details of the SP training and reliability evaluation have been reported elsewhere (MacLean, Geddes, Kelly, & Della, 2018).

Student groups and pre-briefings

Six students were randomly allocated to each of the 24 scheduled simulation sessions held to cross a 12-month period. All students had previously undergone course approved education in communication and transitions of care (discharge) skills in the first year of the nursing course. A group briefing was conducted prior to students individually completing

the simulation task. Details of procedures for standardised briefing and groups (control, information, and interaction) can be found in Maclean, Kelly, Geddes, & Della (2018).

Simulation Sessions and Video Reflection

Simulations were run concurrently in two fully equipped simulation laboratories in the university's school of nursing. With permission, audiovisual (AV) recordings were taken of each student using laboratory cameras and a Go-Pro Camera™. At the conclusion of each simulation, students were invited individually to watch and self-reflect on their own AV recording in a private space. Students completed the study questionnaires at this time.

Group Debriefing

The Gather, Analyze, and Summarize (GAS) debriefing tool was used during the debriefing. This tool allowed the researcher to rapidly debrief in a safe learning environment and supported the overall aims (Phrampus & O'Donnell, 2013).

Individual Interviews

Individual semi-structured interviews took place at the end of each data collection day with a randomly selected student from the sessions. The interviews were intended to develop a greater understanding of the factors affecting the students' perception of presence in the simulation. An experienced faculty member (SM) facilitated each interview using an interview guide with open-ended questions. All the interviews were audio-recorded and transcribed.

Analysis

Quantitative - Factor analysis

All quantitative data analysis was performed using IBM SPSS version 24.0. Initially, factor analysis using principal component extraction with Varimax rotation was conducted to explore the underlying structure of the scales. Factors with Eigenvalues above one where retained and a minimum criterion of .60 was set for factor loadings. The internal reliabilities of the resultant subscales were calculated using Cronbach Alpha.

Quantitative – Main Analysis

All variables mixed methods at the item and scale level for outliers, missing data and potential violations of assumptions for the relevant analysis. Means, standard deviations and bivariate correlations were estimated for the continuous variables.

To answer research question one, group differences in perceived realism, presence and learning outcomes were tested using three one-way between-groups analysis of variance (ANOVA). Any significant differences between the three groups would need to be statistically controlled in the main analysis. To answer the second research question, a three-stage hierarchical multiple regression (HMR) was conducted with realism as the independent variable, presence as a mediating variable and QDTS score as the dependent variable. When conducting HMR Baron and Kenny (1986) recommend testing three criteria for mediation. First, that the independent variable (Realism) is significantly associated with the mediator variable (Presence). Second that the independent variable (Realism) is significantly correlated with the dependent variable (QDTS). The final test is that the relationship between the mediator variable and the dependent variable is significant when the impact of the independent variable is statistically accounted for. If the effect of the independent variable is reduced or made non-significant in the last of these criterion equations, partial or complete mediation is inferred. As the impact of the education intervention on learning outcomes has been previously established (MacLean, Kelly, Geddes, & Della, 2018) the categorical variable (Groups) was dummy coded and entered in the first stage of the regression to account for the influence of the condition on learning outcomes.

Statistical significance was set at .05 *alpha* level. R^2 and SR^2 (squared semi-partial correlation coefficient) were used to measure the overall model and individual variable effect sizes and were interpreted using Cohen's conventions (1988). In line with Baron and Kenny's (1986) recommendations the regression entry procedures were: Step 1, control variables (dummy coded 3 x Groups - Control, – Informational, – Interactional); Step 2 Group + Realism entered, and Step 3 Group + Realism + Presence entered.

Qualitative

Verbatim transcriptions of the student interviews conducted provided the qualitative data for this study. Data were coded using NVivo 10 and analysed using thematic analysis. A five-step process of data familiarization, generating initial codes, searching for themes, reviewing themes, and naming themes to produce the final results was applied. The rigor

or trustworthiness of the data was assured through the components of credibility, and dependability (Lincoln & Guba, 1985). Credibility was achieved by cross-checking the data across the research team, then coming to an agreement on the themes. Dependability was achieved by maintaining an audit trail documenting coding decisions made by the research team to ensure the consistency of the data.

Results

Quantitative findings

The principal components analysis for the COP items identified a two-factor solution, accounting for 59.63% of the total variance. As shown in Table 4.4, the two factors represented (1) presence - sense and (2) presence - affect. The remaining four items did not load cleanly within the two factors. One item overlapped with the realism scale items and was included in the 3 items Realism scale. Additionally, as students' level of satisfaction with the simulation experience corresponds with Kirkpatrick's level 1 learning outcome and does not fit with the definition of presence in this study, only the 3 item Sense of presence (SOP) subscale was used in the hierarchal regression. All scale psychometric statistics are shown in Table 4.5. The internal consistency of the Presence subscale was considered adequate (Cronbach alpha =.864).

Table 4.4 Results of exploratory factor analysis and internal consistency of the Presence sub-scales (*N=141*)

Items: In the simulation how was your:	Factor 1.	Factor 2.	Scale	α
Sense of Presence	.75	.28	Presence - Sense	.86
Sense of "Being there"	.84	.29		
Sense of Inclusion	.71	.29		
How aware of the real world surroundings were you?	.18	.28		
Sense of realism	.54	.29		
Overall comfort level	.21	.74	Presence - Affect	.76
Overall enjoyment	.34	.64		
How was the quality of the scenario	.35	.32		
What Degree could you move around the environment?	.46	.49		

As shown in Table 4.5, students found the simulation experience to be highly realistic (*M*=4.59, *SD*=0.40) and reported a strong sense of presence (*M*=4.11, *SD*=0.68). Pearson's correlation coefficients (*r*) between study variables were significant. In answer to research question one, the ANOVAs for both realism and presence were not statistically significant (*p*=.089, *p*=.952 respectively), indicating that students given extra information (patient risk factors - Groups 2 & 3) or interactional strategies (teach-back- Group 3) did not perceive the scenario as more realistic or report a greater level of presence than those in the control condition. This finding indicates that variation in perceived realism and presence was operating at an individual level rather than a group level. In contrast, the ANOVA for QDTS was significant *F* (2,138) = 8.41, *p*=.000, indicating that students in the intervention groups had improved learning outcomes which supported the need for the effects of the group to be controlled in the regression analysis.

Table 4.5 Means, standard deviations and bivariate correlations for groups and combined sample (*N=141*)

Variable	Group	Mean	SD	α	Items	1	2
1 Realism		4.59	0.40	.54	3		
	1 Control	4.50	0.45				
	2 Information	4.68	0.31				
	3 Interaction	4.59	0.42				
2 Presence		4.11	0.68	.86	3	.52**	
	1 Control	4.11	0.70				
	2 Information	4.13	0.70				
	3 Interaction	4.09	0.64				
3 QDTS		7.68	1.13	.86	14	.28**	.30**
	1 Control	7.36	1.16				
	2 Information	7.46	1.19				
	3 Interaction	8.18	0.86				

Note. *$p < .01$, ** $p < .001$. *SD*= Standard deviation, α = *Cronbach Alpha: Sample size for training groups (N_1=45: N_2=46:N_3=50)*

Following Baron and Kenny's (1986) recommendations, the bivariate correlation between realism and presence was positive and strong *r* (*139*) =.515, p<.001. The coefficients for each predictor in the three-stage hierarchical regression with learning outcomes (QDTS) as the dependent variable are presented in Table 4.6. In step one, to control for the influence of the intervention on learning outcomes, dummy coded variables for the group were entered and found to be statistically significant R^2=.11, *F* (2,138) = 8.41, *p*<.001. The condition accounted for 11% of the variance in the model. In step two, realism was added to the regression model and contributed significantly $\Delta R^{2=}$.08, Δ*F* (1,137) = 12.88, p<.001, accounting for a further 8% of the variation in the QDTS. In step

three, presence accounted for a further significant change $\Delta R^{2=}.04$, ΔF (1,136) = 6.59, p<.01. In combination all three variables accounted for 22.3% of the variation in the QDTS, $R^2=.22$, F (4,136) = 9.76, p <.001. By Cohen's (1998) convention this is considered a medium effect (f^2= .29). In support of the proposed mediation model, when both realism and presence were included in stage three, presence was a significant predictor (sr^2 = .04) while realism was no longer a significant predictor of learning outcomes. It was therefore found that presence fully mediated the relationship between realism and positive learning outcomes (QDTS). In combination, these quantitative findings illustrate that despite exposure to the same high-fidelity simulation environment, when the impact of the communication intervention was controlled for, the students who perceived the simulation as comparatively less realistic also found it more difficult to immerse themselves in the experience, which subsequently negatively impacted their self-ratings of task performance. Supplementary analysis at the group level indicated that the strength of the relationships was greatest in the information group, $R^2=.25$, F (2,43) = 6.98, p =.002 and was suppressed by ceiling effects and reduced variability in learning outcomes in the interactional group $R^2=.04$, F (2,47) = 1.06, p =.356.

Table 4.6 Hierarchical regression analysis coefficients and effect sizes (*N=141*)

Variable		*B* [95% CI]	β	sr^2	R^2
Step 1	Group				.11**
Step 2					
	Realism	0.79 [.36-1.23] **	.28	.08	.18**
Step 3					
	Realism	0.45 [-0.50 - 0.95]	.16	.02	
	Presence	0.38 [0.09 – 0.67] *	.23	.04	.22**

Note. *p < .01, ** p < .001. Coefficients for intervention group dummy coded variables are not reported in the model

Qualitative findings

To complement these findings, the theme analysis of responses about the simulation revealed three main themes: Realism, Presence, and the Learning experience.

Realism

Realism was manifest in all of the responses (N=12) and included sub-themes relating to the physical environment, the scenario/task and the simulated patient. The majority of comments were positive, recognizing the appropriateness of the scenario, and

the value of working in the simulation laboratory working with SPs to facilitate the authenticity of the simulation.

> *Yeah, the scenario was real to life; my patient was not compliant, it was a good scenario because that is the type of patient [that] would get discharged without much thought into the process. I think because they haven't had surgery nurses might dismiss their concerns.*

> *Apart from having the business of a ward, it was similar. Having a real person, as a patient made it real and the way they would ask you like questions and so on, what I am supposed to do about this, it made it real. It's the most real-life setting I have worked at university.*

The following examples illustrate how students perceived limitations to realism in the simulation:

> *I think maybe it was a little controlled, but you are always going to get that with a simulation. I feel as though in a hospital setting, the patient's concerns are going to be different.*

> *It would have been more realistic if the MET call emergency button went off, or I feel like I should have been interrupted with more nurses coming in and out of the room.*

Presence

Presence was also a significant theme across the three groups. Two sub-themes of Presence were identified: immersion and engagement. Immersion relates to the intensity of the student's involvement in their physical environment and task. Engagement relates to the quality of the connection and interaction with their patients. Comments relating to immersion and engagement both supported the value of the simulation and highlighted how students were able to suspend their disbelief during the learning experience.

> *I forgot I was in a simulation; for me, it was about trying to convince my patient to be compliant with his medication and how to use the medication.*

> *She was such a good actor that you just completely forgot you were even being watched by anyone or being filmed. I completely forgot about it [camera]. Even though it was right in front of me.*

> *I did feel very present in the scenario. The patient asked me what they will do if they have problems once they are home, and I felt lost in that conversation.*

> *I felt very focused and engaged with the patient; you get a person to person relationship going.*

Learning experience

When describing the value of the learning experience, three sub-themes emerged: personal reflection; self-efficacy; and transfer of learning. Students reflected on how the simulation scenario would better prepare them for clinical practice and had increased their confidence to transfer their learning during clinical placements. A number of students also reflected on deficits in their knowledge and capabilities.

> *Next time on clinical placement, I will be more comfortable talking to patients when they are going home.*
>
> *As I was working through the discharge, I thought about when I go on clinical placement and how I will feel confident doing this again.*
>
> *It does instil more confidence when you are working with the simulated patients as you get good feedback. So, it does make you focus, and it does make you feel like you need to know your stuff in the clinical area.*

Discussion

In this study, the 9-item COP was assessed for validity and reliability using a sample of 141 undergraduate nursing students. The tool was designed to measure the student's perceptions of presence in virtual reality simulations but has not previously been validated in VR or healthcare simulation. Therefore, a requirement of this study was to modify the item terminology and validate the tool for use with SPs. Factor analysis revealed a two-factor model representing a Sense of presence and Affect. Other items in the original COP overlapped with the realism construct. We found that while the COP demonstrated applicability to nursing simulation inclusion of items relating to engagement with SPs may be warranted.

As would be expected in a study using SPs in a simulation laboratory, the majority of students across the three groups, reported high realism scores. Our results indicated that the incorporation of additional information and interactional elements in the simulation context did not impact significantly on the perception of realism. However, for those students who rated realism lower across all groups, there was a significant negative effect on both their sense of presence and learning outcomes.

Evidence from the qualitative analysis supported the quantitative findings that the simulation was realistic, with students recognizing the authenticity of the scenario, SP, and physical environment. Several students commented on the lack of background noise and need for distractions such as a call bell, monitor alarms or another nurse coming into

the room to better replicate the hospital environment and enhance the realism. In this instance, the educator's attempts to remove potential distractions from the simulation diminished some student's sense of realism. This may have been mitigated by discussing the potential for or lack of "hospital-based interruptions" in the simulation briefing and highlights the importance of providing consistent and comprehensive briefings for managing student's expectations leading into the simulation.

In 1998, Witmer & Singer claimed that an increase in presence would increase learning and learning outcomes; however, to date, there has been little research regarding presence in healthcare simulation using SPs. Our results show a positive correlation between realism, presence, and learning outcomes which are comparable with studies in nursing virtual reality (VR) simulation (Dang, et al., 2018; Dubovi, Levy & Dagan, 2017). Our results provide nursing facilitators with evidence that working with SPs in scenarios that represent realistic clinical experiences can optimize the student's sense of presence and learning outcomes in communication-based simulations.

Important details relating to our understanding of the concept of presence also emerged from the qualitative data. In asking students to reflect on their learning experience, it was clear that they distinguished between being both nursing task- and patient-focused. The use of SPs in the scenario provided the students with an endocentric presence, which enabled them to immerse themselves in their role and engage in realist patient-nurse interactions.

Quantitative and qualitative data converged around the finding that nursing students achieved level two (learning) and three (behaviour) in Kirkpatrick's model of evaluation (Kirkpatrick, 1998). Learning can be said to have taken place when attitudes change, knowledge is increased, or skill is improved as a result of the experience. The results showed both an increase in confidence and performance across the groups, as assessed by the QDTS questionnaire and qualitative evidence.

Strengths and limitations

The strengths of this research include the study design incorporating both quantitative and qualitative data to explore the concepts of realism and presence. The interviews provided greater detail of the students' perceptions of their learning during the simulation, which supported the operationalization and measurement of presence in the study. The integrity of quantitative research depends largely on the accuracy of the measures used,

especially when exploring the complex, subjective phenomena such as Presence. The three-item Sense of Presence (SOP) subscale within the COP tool demonstrated validity in the SP context and is an instrument that can be used for further research in simulation.

Regarding limitations, the consideration and measurement of realism were an important component of this study, but characteristics of students that could potentially affect their perceptions of realism were not considered. While designers of simulation cannot account for all of the related experiences an individual brings to a simulation, further investigation of how personal characteristics such as motivations and prior experiences contribute to the perception of realism and presence is recommended. A further limitation was the reliance on self-report measures. While the subjective nature of realism and presence necessitated self-report ratings, future research could examine the effects using independent ratings of learning outcomes from SPs or facilitators.

Conclusion

Our results indicate that realism and presence should be treated as independent but highly correlated concepts. The finding that ratings of realism did not increase systematically across the three study groups, regardless of the introduction of communication-based interventions, but rather varied within the groups, indicates that perceived realism is sensitive to characteristics of the individual students as well as the simulation design. Furthermore, in designing simulations, there may be an optimal level of fidelity beyond which perceived realism is not impacted. Presence was found to be a function of the individual's perception of and reaction to the simulation experience and a mediating influence on learning outcomes. In sum, a student's capacity to suspend their sense of disbelief and perceive the simulation as realistic was found to induce a higher sense of presence, which in turn impacted their learning. Since the goal of simulation-based education is to optimize learning and increase student's capacity to transfer their knowledge into the clinical setting, this finding is significant. This study shows promising results and recommends that future research focuses on examining the personality traits, characteristics and, clinical experiences of students to understand further how these factors impact the concepts of realism and presence in healthcare simulation.

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END OF PUBLICATION FIVE

4.7 Summary of Publication Five

In summary, this publication presents and tests a new integrated conceptual model of presence in SBE combining aspects of recognised education and simulation theories and frameworks. The model developed may be employed in all practices of simulation utilising SPs to support teaching faculty to create and evaluate simulation experiences. Results show that once different levels of modality and fidelity are considered, and realistic expectations are achieved, students translate this into a sense of endocentric presence. As anticipated, when working with SPs in a simulated hospital setting, students reported high levels of realism across the three groups. The two interventions (information and interaction) did not affect students' perceptions of realism or their sense of presence. A finding was the positive correlation between realism, presence and learning outcomes. Both realism and presence were influenced by student's perceptions at an individual level, potentially linked to characteristics such as their capacity to suspend disbelief.

As technology continues to advance, SBE will become more complex and incorporate further tactile and auditory elements. As such, this framework may be used to develop a greater understanding of working with SPs in simulation and how to engage all students. The final chapter revisits the aims and questions to provide a final synthesis of results for the study. Recommendations, strengths, limitations, and implications for future research are also presented for consideration.

Chapter 5 Discussion and Conclusion

5.1 Chapter Overview

This chapter describes the study significance of each publication (Section 5.2). A synthesis of the findings is presented in section 5.3. The synthesis discusses findings in each study and how they individually and collectively, add new knowledge to the maturing discipline of SBE in nursing. Study strengths and limitations are offered in section 5.4. Future research and concluding comments are provided in sections 5.5 and 5.6.

5.2 Study Significance Re-visited

With an increase in patient admissions, a reduction in clinical placements and pressure to prepare undergraduate nursing students with the skills to manage complex patients, teaching faculty have turned to SBE to provide learning opportunities (Aebersold, 2018). In this study, students were encouraged to apply their cognitive, interpersonal, and clinical skills in a purposefully designed simulation scenario. The simulation offered a realistic and challenging experience that helped students develop and practice clinical decision-making and discharge skills without inconveniencing or harming actual patients.

For SBE to have an impact on students' learning outcomes, teaching faculty need to have a clear understanding of the students' experience and ideally how their learning can be transferred to clinical practice. This study adds to the limited empirical evidence currently available supporting the use of SPs in developing undergraduate nursing students' communication skills. Additionally, this study examined the manner and extent to which SPs can provide reliable feedback to contribute to positive learning outcomes.

Globally, communication errors are a leading cause of patient morbidity and mortality (WHO, 2017). Among nursing students, the opportunity to rehearse and discuss complex care issues, particularly at patient discharge is limited. Designing and implementing CST scenarios that are realistic and relevant to the clinical setting, as was done in this study, have the potential to improve patient safety. Simulation-based education can address communication skills deficits and have the potential to prevent adverse events that directly or indirectly risk patient safety. This study aimed to explore if implementing CST while working with SPs, could increase knowledge and improve nurse-patient discharge communication skills for undergraduate nursing students. Ultimately, if the use of SBE is shown to improve students' communication skills, then it is likely to result in better-prepared students in the clinical setting. This study highlights processes to enhance the quality of the student SBE experience.

Publication One

Publication one (Section 2.6) aimed to establish how effectively SPs have been used in nursing education to develop communication skills. The second aim was to review the available evidence supporting the training and recruitment of SPs.

Two specific roles for SPs emerged from the review: SPs can have an active evaluative role in the teaching and learning process or a more traditional role of participating in the simulation itself. The integrated review identified that there was limited use of SPs as evaluators of students' performance. Students reported that the feedback from the SPs gave them a different perspective to compare and improve their communication skills. Simulated patients providing student feedback adds to the learning process.

The review identified methodological flaws common throughout the studies appraised. One limitation was that the majority of studies gave little or no indication regarding the reliability, validity and internal consistency of the instruments used to collect data. In addition, the recruitment and training of SPs were not well documented in the reviewed studies. To assess or replicate the findings of published studies, authors must provide adequate and clear descriptions of the SPs training method employed and the qualities of instruments used.

A question often raised when teaching communication skills is which method is most successful in helping students reach their full potential. When considering the time and cost associated with training SPs, there needs to be advantages in student outcomes to compensate for the effort expended. Despite the methodological weaknesses discussed above, all studies indicated that learning outcomes are superior in CST where SPs are employed. Of the reviewed articles, it was suggested that more studies with a mixed-methods approach, larger sample sizes, and more rigorous protocols to support the triangulation of data where required.

Publication Two

Publication two (Section 3.5) aimed to investigate the effectiveness of an evidence-based framework to train and recruit SPs. The program selected was NHET-Sim module five. The training framework was employed to improve the consistency of SPs performances and feedback. Efforts to standardise and evaluate the training process was intended to ensure consistent student evaluation during the data collection process for the communication skills intervention.

Given that subsequent studies in this research used data from the SPs in the evaluation of the CST interventions, SPs needed to provide valid and repeatable performance standards, during both the simulation activity and when providing summative feedback to the students. Often a threat to the validity of student assessment is variation in assessor's perceptions or judgements. A robust way to determine if data is reliable is to have more than one rater evaluate on the same performance and to then quantify any variance in results. In this study, establishing high inter-rater reliability between the SPs on benchmarking tasks provided a measure of how well the SPs were trained.

The results of this study indicated strong correlations between SPs on the performance discrimination task and a high degree of consistency between SPs and teaching faculty when rating the communication skills of 42 students in the first phase of the study. These results indicate that when comprehensively trained SPs can accurately portray roles, provide meaningful feedback, and assess student performance using validated instruments. The effort expended to train the SPs was considered an essential part of the simulation design and methods applied in this study to ensure the integrity of the overarching research.

Publication Three

The purpose of publication three (Section 4.2) was to determine if providing information- and interaction-based communication strategies improved student discharge practices. The information-based material was comprised of patient risk factors for readmission and the interactional approach incorporated teach-back to close the communication gap between student nurse and patient.

The results of the study suggested that highlighting potential risk factors allowed students to be more selective and to expand upon information that was pertinent to the patient. Combining both informational (risk-factors) and interactional (teach-back) strategies increased student's ability to deliver the required information in a way that was easily understood and allowed for clarification of information before the SP was discharged. The results of the study included SP, teaching faculty and student evaluations. As such, this is one of the only studies that has triangulated data from three rating sources to evaluate discharge practices in simulation. In combination, the results indicated that providing both interventions enhances learning outcomes. The assessed outcomes correspond to Kirkpatrick's level one (satisfied with learning), two (improved learning outcomes) and three (student was able to perform the interventions in the simulation laboratory).

The results of this study also go toward substantiating the conclusions from study one and two. By using the NHET-Sim framework for SP training, the standardisation of the SP performance was supported, which allowed for accurate and reliable evaluation of the CST. As SPs were also part of the evaluation process, they were able to provide feedback from a patient's perspective, such as whether they felt confident being discharged from the health care setting.

Publication Four

Publication four (Section 4.3) aimed to explore students' perceptions of the learning experience after participating in a discharge simulation. More specifically, to provide them with a unique learning opportunity to review the recorded event and reflect on their actions during the simulation. Of the six themes identified, a core theme related to students' psychological safety. Students reported that reviewing the AV recording in private decreased their anxiety and potential discomfort that can occur when reviewing performances during group debriefings. Students were able to critically reflect and build self-confidence in how they currently communicate and what aspects required improvement. Students indicated that the process helped them consider how their current decision-making as a nurse was developing, particularly when providing patient-centred care.

The central purpose of this study was to improve patient safety, well-being, and ability to self-manage during the discharge process. To improve the overall health of patients, the National Safety and Quality Health Care standards (NSQHS, 2017) Partnering with Consumers (Standard two) states nurses must tailor their communication to support patients in understanding health care information. Completing this simulation and reviewing the AV recording highlighted to students how valuable verbal and non-verbal communication skills are in providing safe, effective care. Students in this study recognised that nurses need to be available to clarify information and provide patients' with emotional and physical support before being discharged home.

Publication Five

Publication five (Section 4.4) applied a mixed-method approach to investigate the elements that impact on realism, presence and student learning outcomes in SBE. In the current nursing program, not all learning environments (i.e. the classroom setting) are conducive to learning that translates to clinical practice. A challenge in this teaching and

learning space is the ability to engage students. If teaching faculty are to engage students in complex conversations, we must create interactive experiences such as SBE.

The concept of realism means creating a simulation that emulates clinical experiences at a physical, conceptual and psychological level for students. Presence is the student's level of immersion or engagement in that simulated experience. In applying the components of the integrated conceptual model of presence in SBE, the simulations generated were designed to engage the students at ideal levels. When working with SPs, the majority of students reported the simulation as realistic. However, levels of perceived realism varied between individual nursing students which was found to impact their sense of presence, ability to suspend disbelief and be more engaged. Students that were present also reported gains in knowledge, self-efficacy, confidence, and preparedness for clinical practice.

Notably, the addition of the two communication interventions did not increase the student's perceived level of realism or sense of presence. This finding indicates that the modality of the simulation, including the consistency of the SPs, was uniform across the study groups and at an optimised level of realism that was not influenced by the introduction of the addition of education materials. The small number of students who perceived the simulation as being less realistic were distributed across the intervention groups and were found to have lower presence and learning outcomes. Evidence from the qualitative data showed that for some students, the absence of certain realistic factors such as background noise, alarming call bells, and other nurses' interrupting the scenario detracted from their experience. As the simulation was designed to minimise unnecessary distractions, the absence of these real-life cues could have been discussed in the simulation pre-briefing to lessen student's expectations about background sounds and potential interruptions. Alternatively, if the purpose of the simulation was to help students deal with such issues during discharge communications, the inclusion of auditory cues could be introduced.

Students who perceived the simulation to be realistic and achieved endocentric presence demonstrated improved learning outcomes and a positive behavioural change in clinical performance when working with the SPs. These effects were strongest in groups T1 and T2. In group T3, the impact of the teach-back intervention, which resulted in unified improvements in learning outcomes for students, the influence of realism and presence on outcomes was undetectable.

The results of this study provide evidence that creating realistic scenarios and applying elements of the integrated conceptual model of presence in SBE, allowed students to achieve level two and three Kirkpatrick evaluation learning outcomes. While our understanding of presence as a conceptual element is still limited, these results indicate that presence could potentially be an important consideration in student's learning outcomes. Building on Dunnington's research, our results show that variations in individual student's levels of realism and presence are occurring. While not examined in this study, variables that can potentially impact these concepts include student and faculty characteristics and cognitive factors such as attention and focus. These variables offer scope for future research.

5.3 Synthesis of Findings

Inadequate communication at patient discharge may account for poor patient outcomes including medication errors and hospital readmissions (Kornburger et al., 2013). This study is unique in evaluating an information- and interaction-based intervention to improve undergraduate nursing students' communication skills in patient discharge. The integration of results from the quantitative and qualitative data collected in publications three, four and five indicate that both interventions in this study demonstrated that the additional preparation and discussion of risk factors and teach-back strategies during the pre-briefing and debriefing stages of the simulation benefited the student's learning.

Collectively, the findings from the five studies add new knowledge to the maturing discipline of SBE in nursing. When considering each of these publications in the context of SBE, the findings add to a growing number of mixed-method studies that have transparent reporting processes, larger sample sizes, and apply more rigorous methods when working with SPs. In particular, this study provided evidence advocating for the use of SPs in patient discharge CST and requirement that SPs be trained using an evidence-based framework.

In the medical literature, the use of SP feedback to foster student learning is well documented. Evidence from publication one showed that SPs are rarely used in nursing CST to provide either formative or summative feedback. This study is one of the few in nursing that reports on SPs providing feedback in the evaluation of the students. Results from publications two and three showed that when SPs are well trained the feedback and ratings provided by SPs are both reliable and valid. In some ways, students and teaching faculty can consider SP ratings superior as they are less likely to be affected by the response and

attribution biases. In particular, self-reporting as a data collection method can be unreliable due to issues of truthfulness and completeness (Prion & Adamson, 2012). As SP ratings come from a patient perspective, they provide unique learning insights for the students.

As highlighted in the recent review by Kaplonyi et al. (2017), the majority of SBE research in health care has focused on student satisfaction and lower-level outcomes. In line with recommendations made by Kaplonyi et al. (2017) and Seaton et al. (2019), this study made progress by presenting results at higher levels of evaluation by measuring student learning outcomes (Kirkpatrick's evaluation level two) and behavioural changes with SPs (Kirkpatrick's evaluation level three). While investigating results for patient safety outcomes (Kirkpatrick's evaluation level four) were outside the scope of the study, they should be examined in future research.

The literature indicates that SBE is a safe learning environment (Jeffries, 2012). However, students often do not feel psychologically safe when peers and teaching faculty are watching them perform. This study provided a unique opportunity for students to practice communication skills with a SP under two supportive conditions: (1) no peers watched them perform the scenario (2) they individually watched their performance in privacy and reviewed themselves without fear of failure or being judged. The findings from publication four offer some suggestions to other teaching faculty when designing simulations. While not always practical the need to be aware of: (1) the number of students in each scenario; (2) the number of teaching faculty or students watching the scenario and finally (3) the inclusion of pre and post-debriefing strategies to relieve performance anxiety within the learning environment.

Taken together, the results of the study in its entirety are as follows:

1. Comprehensive SP training and recruitment procedures should be employed and reported in all simulation publications.
2. Simulated patients can be effectively engaged in program facilitation and evaluation tasks if trained using an evidence-based model.
3. Simulated patients provide an authentic, realistic clinical experience, as SPs can offer valuable feedback from a patient's perspective.
4. Providing students with an opportunity to use teach-back with SPs can effectively help nursing students with communication strategies.
5. Using video assisted reflection, while initially challenging, provides students with a unique opportunity to view and review their communication skills.

6. Watching the AV recording in private supports students' learning needs to reduce their anxiety and increases their ability to self-reflect.
7. When adequate levels of simulation realism are achieved, students can engage and be present in SBE.
8. Undergraduate nursing students would benefit from further exposure to realistic learning opportunities earlier and throughout the curriculum, specifically in communication skills, such as patient discharge and clinical handover.

5.4 Study Strengths and Limitations

Below (Table 5.1) presents the strengths and limitations previously described in the five publications. As indicated in the table notation, points discussed in each publication are indicated with a tick while issues applicable to, but not explicitly raised in the publication, are indicated with an asterisk.

Table 5.1 Summary of strengths and limitations of publications

Strengths and Limitations	Publication				
	1	2	3	4	5
Strengths					
Critical Appraisal Skills Programme (CASP)	✓				
Validated SP training framework – NHET- Sim		*	✓	✓	*
Validated simulation design framework- NLN/JEFFRIES		*	✓	*	*
Schön's Reflection Model			*	✓	*
Integrated Conceptual Model of Presence		*	*	*	✓
Kirkpatrick's Model of Evaluation			✓	*	*
Individual time to watch own Scenario			*	✓	*
Small Go-pro Camera			✓	*	*
Tool Validation		✓	✓		✓
Limitations					
Publications from 2006-2016	✓				
No Nurse Practitioner Studies	✓				
Small Number of SPs with the same ethnicity		✓	*	*	*
SPs helping students		✓	*	*	*
Time and cost associated with Training SPs		✓	*	*	*
Single University		*	✓	*	*
Only Nursing Students			✓	*	*
Students being filmed			*	✓	*
Time allocated to watch individual scenarios			*	✓	*
Student Characteristics not evaluated			*	*	✓

Strengths and Limitations	Publication				
	1	2	3	4	5
Self-Reported Measures			*		✓
QDTS tool used with three viewpoints			✓		

Legend. ✓= Discussed in Publication *= Applicable to publication

The following are strengths and limitations not previously discussed in the five publications. As identified in the integrative review, the majority of studies had small sample sizes resulting in the underpowered analysis. A strength of this study was the use of a larger sample size that ensured adequate power to identify meaningful effect sizes. Often it is difficult to triangulate data within a project, a strength of this was data collected from multiple instruments regarding CST, using multiple sources (teaching faculty, students and SPs) in a mixed-methods design. The mixing of the methods is a more profound form of triangulation that helped to validate the results of the study. By combining these sources, two fundamental ways of thinking about a phenomenon such as presence were examined. The use of SPs, as identified in the integrative review, also strengthened the results of this study. Simulated patients provided feedback from a patient perspective adding to students learning outcomes.

A limitation of the study also resulted from two of the instruments used. The Simulation Design Scale (SDS) was used to measure: objectives, support, problem-solving, feedback, and fidelity (NLN/Jeffries Theory, 2015). This study only used the fidelity component of the instrument. The Concept of Presence (COP) instrument was not previously validated in SBE. In the results, after performing a factor analysis, only three items of the original 14 were considered useful in examining presence. While some of the original data were not used in the final study, the data may prove helpful in subsequent publications.

A further limitation of this study was the use of a convenience sample. While, block randomisation was used for the allocation of the students and teaching faculty members into each group, students self-selected into the study as a whole. By using this method, males are under-represented and the homogeneity of students for gender evident. In acknowledging this limitation, the sample is still broadly reflective of the overall ratio of men within the nursing courses and the profession (Stanley et al., 2016).

5.5 Avenues for Future Research

From this study, the following recommendations are made in the domain of healthcare education in simulation. As well as undertaking replication studies at multiple sites, with

different clinical and communication areas in health care, simulation research should consider evaluation of a higher-level outcomes using validated and reliable measures. The outcome measures should also be patient-centred and extend beyond the simulated environment. With limited rigorous evidence validating changes in clinical behaviour, researchers should focus on achieving Kirkpatrick's level three and four evaluation. Future research should undertake longitudinal studies examining if students employ teach-back in the discharge process and if the usefulness of the simulation experience has impacted their clinical practice. To a higher level again, the evaluation could track patient satisfaction with discharge practice and readmission rates for patients discharged by graduate nurses who have completed the intervention compared to those who have not. To succeed, this would require substantial planning and collaboration with industry partners.

There is a paucity of information in the literature on how to design a simulation experience that can generate learning outcomes at Kirkpatrick's level three and four (Blackmore, Kasfiki & Purva, 2017). Suggestions are made that outcomes should also be assessed after a period in the clinical setting to allow for degradation of the acquired skill. However, the timing of this "decay phase" is not well reported (Blackmore, Kasfiki & Purva, 2017). Studies in SBE should be designed to look for impact in the clinical setting at immediate, short- and long-term intervals.

Further areas for future research are listed below:

1. Teaching faculty need to design scenarios that consider the modality, to enhance realism and presence.
2. Evaluating the quality of the SPs' feedback in debriefing.
3. The application of teach-back in other clinical communication scenarios in simulation – such as wound care, peri-operative and post-operative care, and end-of-life care.
4. The use and timing of audio-visual recordings for reflective feedback in relation to before, after or during the simulation needs further consideration.
5. The impact of group factors (size of group), individual factors (personality characteristics), gender, English as an additional language and previous clinical experience on realism, presence and learning outcomes.

5.6 Concluding Comments

The current need for nurses to be workforce ready demands teaching faculty to be resourceful and comprehensive in their teaching strategies; this is the underlying

importance of this study. It is the authors' hope that this study will be influential in improving undergraduate nursing students' discharge practices. This study has highlighted that SBE with trained SPs is beneficial in developing an undergraduate nurse's communication skills. The findings from this study also indicate that using both information- and interaction-based interventions was valuable for the student. Learning outcomes were improved for those students who were able to develop a strong sense of realism and to be present within the scenario. The ability of students to be present in the simulation greatly improved the scope of the training that the students accomplished. The study emphasised that students' participation in communication scenarios gave them a greater self-awareness and a sense of achievement in their current nursing capability. Students reflected on the importance of patient-centred care, with a focus on patient needs. Overall, this study has provided strong evidence that working with SPs and allowing students the opportunity to self-reflect is beneficial to developing students' communication skills when transitioning to the workforce as new graduates.

APPENDICES

Appendix A Human Research Ethics Approval

MEMORANDUM

Curtin University

To:	Prof Phil Della
	School of Nursing, Midwifery and Paramedicine
CC:	Sharon MacLean
From:	Dr Catherine Gangell, Manager Research Integrity
Subject	Ethics approval
	Approval number: RDHS-240-15
Date:	20-Oct-15

Office of Research and Development
Human Research Ethics Office

TELEPHONE 9266 2784
FACSIMILE 9266 3793
EMAIL hrec@curtin.edu.au

Thank you for your application submitted to the Human Research Ethics Office for the project: 6467

Using simulation to evaluate discharge communication: the relationship between realism, presence, and student learning outcomes

Your application has been approved through the low risk ethics approvals process at Curtin University.

Please note the following conditions of approval:

1. Approval is granted for a period of four years from **20-Oct-15** to **20-Oct-19**
2. Research must be conducted as stated in the approved protocol.
3. Any amendments to the approved protocol must be approved by the Ethics Office.
4. An annual progress report must be submitted to the Ethics Office annually, on the anniversary of approval.
5. All adverse events must be reported to the Ethics Office.
6. A completion report must be submitted to the Ethics Office on completion of the project.
7. Data must be stored in accordance with WAUSDA and Curtin University policy.
8. The Ethics Office may conduct a randomly identified audit of a proportion of research projects approved by the HREC.

Should you have any queries about the consideration of your project please contact the Ethics Support Officer for your faculty, or the Ethics Office at hrec@curtin.edu.au or on 9266 2784. All human research ethics forms and guidelines are available on the ethics website.

Yours [redacted]

Dr Catherine Gangell
Manager, Research Integrity

Appendix B Information Sheet

Study Title: Evaluating nursing communication skills in simulation: The relationship between presence, fidelity, and skill performance

Research Team: Sharon MacLean, Professor Phil Della, Dr. Fiona Geddes and Dr. Michelle Kelly

You are invited to participate in a research project that is being conducted in conjunction with Curtin University, this project is working towards the completion of my PhD.

Curtin University Human Research Ethics Committee (HREC) has approved this study (HREC number RDHS – 240-15). Should you wish to discuss the study with someone not directly involved, in particular, any matters concerning the conduct of the study or your rights as a participant, or you wish to make a confidential complaint, you may contact the Ethics Officer on (08) 9266 9223 or the Manager, Research Integrity on (08) 9266 7093 or email hrec@curtin.edu.au.

The aim of this study is to examine how students learning outcomes are influenced by simulation fidelity and communication training targeting discharge nursing practices.

As a participant you will be required to complete an online teaching package and one simulation scenario. After each scenario you will complete 3 paper based surveys and be interviewed for further data.

Your participation in this project will remain confidential. Only a study number will identify the information you share. All research information will be stored in locked filing cabinets and accessed only by the researcher and supervisors named above. If you chose to participate you will be reimbursed via a $20.00 gift voucher.

If you are interested in answering questions in more detail please contact the researcher at sharon.maclean@curtin.edu.au or by calling 0402 839 413 about participating in the research.

The researcher will be available by phone or email to answer any questions you may have about this research. Alternatively if you have any concerns you may contact the Principal Supervisor Professor Phil Della on (08) 9266 2062

In the event of any questions or concerns of an ethical nature in relation to the intentions of this study you are welcome to contact the Secretary of the Human Research Ethics Committee, Curtin University on (08) 9226 2784.

Researcher: Sharon MacLean

Email:sharon.maclean@curtin.edu.au

Appendix C Consent Forms for Students and Simulated Patients

Title: Evaluating nursing communication skills in simulation: The relationship between presence, fidelity, and skill performance

Research Team: Sharon MacLean, Professor Phil Della, Dr. Fiona Geddes and Dr. Michelle Kelly

Student Consent Form

I have been given clear written information and understand the intentions of this study. I have taken the time to consider participation in this study.

I have had the opportunity to ask questions and had them answered to my satisfaction.

I understand that in the event of this work being published, as a participant, I will not be in any way identifiable.

I understand I may withdraw from the study at any time without consequence, effect or access to routine health care.

I know that I can contact the Principal Supervisor Professor Phil Della if I have questions or concerns.

I am also aware that in the event of my having any complaints regarding this study, I can contact Professor Phil Della on (08) 9266 2062 on a confidential basis. My concerns will be drawn to the attention of the Ethics Committees who are monitoring this study. I am aware that Curtin University Human Ethics Committee has given approval for this research to be conducted.

Participant Statement

I…….. (Print full name)

understand the intentions of the study and know that I have the opportunity to ask questions at any time.

I agree to complete a questionnaire and / or participate in a simulation and / or one on one interview.

I understand that my participation in this study is voluntary and I can withdraw at any time without any consequences to position or my child's access to health care and services.

Signature	……	Participant
Signature	……..	Researcher
Date	……	

Title: Evaluating nursing communication skills in simulation: The relationship between presence, fidelity, and skill performance

Research Team: Sharon MacLean, Professor Phil Della, Dr. Fiona Geddes and Dr. Michelle Kelly.

Simulated Patient Consent Form

I have been given clear written information and understand the intentions of this study. I have taken the time to consider participation in this study.

I have had the opportunity to ask questions and had them answered to my satisfaction.

I understand that in the event of this work being published, as a participant, I will not be in any way identifiable.

I understand I may withdraw from the study at any time without consequence, effect or access to routine health care.

I know that I can contact the Principal Supervisor Professor Phil Della if I have questions or concerns.

I am also aware that in the event of my having any complaints regarding this study, I can contact Professor Phil Della on (08) 9266 2062 on a confidential basis. My concerns will be drawn to the attention of the Ethics Committees who are monitoring this study. I am aware that Curtin University Human Ethics Committee has given approval for this research to be conducted.

Participant Statement

I…… (Print full name)

understand the intentions of the study and know that I have the opportunity to ask questions at any time.

I agree to complete a questionnaire and / or participate in a simulation.

I understand that my participation in this study is voluntary and I can withdraw at any time without Any consequences to position or my child's access to health care and services.

Signature	……	Participant
Signature	……...	Researcher
Date	……	

Appendix D Approvals (Instruments)

Marilyn D. Klakovich, DNSc., RN, NEA-BC
mklakovich@apu.edu

May 5, 2015

Sharon MacLean
Bsc Nursing, PGrad Dip, MS Mid, PhD Student
CNP 2 Unit Co-ordinator
AB for Complex Conditions Unit Co-ordinator
Ab for Acute Conditions Unit Co-ordinator Singapore
Lecturer | School of Nursing and Midwifery
Curtin University
Tel | +61 8 9266 7337
Email | sharon.maclean@curtin.edu.au

Dear Sharon,

We are pleased to hear that you would like to use our *Interpersonal Communication Assessment Scale (ICAS)* for your PhD project to evaluate communication skills of undergraduate nursing students in simulation. We are happy to grant you permission to use the *ICAS* subject to the following terms and conditions.

- Permission to use the *ICAS* is granted royalty free for individual research and institutional non-commercial use. This permission does not extend to reproduction or transmission of the instrument or scoring guidelines on a computer network, Intranet, Internet server, or Interactive Voice Recognition (IVR) system. It also does not extend to those wishing to re-sell, sub license, or otherwise distribute the *ICAS* or scoring guidelines as part of their product or service offerings (whether or not a fee is charged). Such use requires a fee, and interested parties should contact one of us directly for more information.
- The *ICAS* is not to be altered in any way without our permission.
- The complete *ICAS* is not to be included in any publications. One item per subscale only can be included as examples, if needed.

Please let us know if you have any questions. We would be happy to provide any assistance that we can.

Sincerely,

Marilyn D. Klakovich DNSc., RN, NEA, BC
mklakovich@apu.edu
Felicitas A. dela Cruz, DNSc., RN, FAANP
fdelacruz@apu.edu

Scoring Guidelines

Subscales:
Advocacy: Items 1,2,4,8,11,12,15,17,18,20
Therapeutic Use of Self: Items 3,6,10, 14, 16, 19, 21, 22, 23
Validation: Items 5, 7, 9, 13

Dear Sharon,

It is my pleasure to grant you permission to use the "Educational Practices Questionnaire," "Simulation Design Scale" and "Student Satisfaction and Self-Confidence in Learning" NLN/Laerdal Research Tools.

In granting permission to use the instruments, it is understood that the following caveats will be respected:

1. It is the sole responsibility of (you) the researcher to determine whether the NLN questionnaire is appropriate to her or his particular study.
2. Modifications to a survey may affect the reliability and/or validity of results. Any modifications made to a survey are the sole responsibility of the researcher.
3. When published or printed, any research findings produced using an NLN survey must be properly cited. If the content of the NLN survey was modified in any way, this must also be clearly indicated in the text, footnotes and endnotes of all materials where findings are published or printed.

I am pleased that materials developed by the National League for Nursing are seen as valuable, and I am pleased that we are able to grant permission for the use of the "Educational Practices Questionnaire," "Simulation Design Scale" and "Student Satisfaction and Self-Confidence in Learning" instruments for your important work to advance the science of nursing education.

Warm Regards, Amy

Amy McGuire | Administrative Coordinator, NLN Chamberlain Center | National League for Nursing | www.nln.org | amcguire@nln.org | Tel: 202-909-2509 | The Watergate | 2600 Virginia Avenue NW, 8th Fl, Washington, DC 20037

Hi Sharon,

Congratulations on your journey toward PhD! I am happy to give you permission to use my model. In case you did not come across it, the model was published across two different articles in Nursing Science Quarterly (NSQ). Using both articles will give you full description of the model. Please use the NSQ citations when referencing the model in your work. I will be very interested in your results since they will build on testing the linkages in the model. I will also be happy to collaborate in the future. Feel free to contact me anytime.

Best Wishes,
Renee

Renee' M. Dunnington PhD RN
Associate Professor
Vice-Chair Nursing Pre-licensure Programs
School of Natural Science Nursing & Health
Capital University
1 College & Main
Columbus, OH 43209
(o) 614.236.7221
(c) 614.425.4365

From: Sharon Maclean [sharon.maclean@curtin.edu.au]
Sent: Thursday, April 30, 2015 3:21 AM
To: Renee M. Dunnington
Subject: PhD in Simulation

Hello Dr. Renee Dunnington,

My name is Sharon Maclean, I am currently a PhD student in Perth, Western Australia. My PhD proposal is in simulation, investigating presence and realism and their impact on learning outcomes.

I would like your permission to apply your model of Centricity to my current proposal. I'm thinking about combining a few models as the underpinning of my research. Of Course I will reference your work and would like to invite you to be on my expert panel to review my simulated scenarios before students participate in the research.

If you are interested in working collaboratively on any research papers in the future for publication (I'm not there yet, by any means) from my research please let me know, I can then email you closer to that time.

Kind regards

Sharon MacLean
Bsc Nursing, PGrad Dip, MS Mid, PhD Student
CNP 2 Unit Co-ordinator
AB for Complex Conditions Unit Co-ordinator
Ab for Acute Conditions Unit Co-ordinator Singapore
Lecturer | School of Nursing and Midwifery
Curtin University
Tel | +61 8 9266 7337
Email | sharon.maclean@curtin.edu.au
Web | http://curtin.edu.au

PERMISSION FOR USE AGREEMENT

READINESS FOR HOSPITAL DISCHARGE SCALE (RHDS)
QUALITY OF DISCHARGE TEACHING SCALE (QDTS)
POST-DISCHARGE COPING DIFFICULTY SCALE (PDCDS)
Marianne Weiss, DNSC, RN, author

You may use the RHDS/QDTS/PDCDS for clinical practice or research purposes, with appropriate referencing to our original work, under the following conditions: You agree to provide me with

1. a brief description of the study and/or clinical population for which it is used

2. a summary of any results from use of the instrument; for example, reliability coefficients, differences among groups, correlations, predictors, and/or outcomes

3. where possible, a copy of RHDS/QDTS AND/OR PDCDS data for inclusion in an instrument database for further analysis of psychometric properties (not required for permission to use)

4. a copy of any translation of the instrument into a langiage other than English or any modifications to the instruments. I will make these available to others with appropriate reference to you.

5. a copy of any publications arising from use of the instruments.

Please complete the following questions:

1. Your name:_____

2. Your organization:_____

3. Your address:_____

4. Your telephone number:_____

5. Your e-mail address:_____

6. Purposes(s) for using the instrument(s):
   [ ] clinical practice
   [ ] research, If yes, will you use the instrument(s)for [ ]master's thesis [ ] PhD dissertation

7. Which Iinstrument(s) do you plan to use in your research?
   [ ] RHDS [ ] QDTS [ ] PDCDS

   Which version of the instrument(s) do you plan to use?
   [ ] New mothers form(s) [ ] Adult medical-surgical form(s) [ ] Parent of hospitalized child form(s)

8. Describe how you plan to use the instrument? (If research, please briefly describe the research questions and methods)

9. Describe the patients who will complete the instrument(s).

Signature:_____Date:_____

Please e-mail this form to Dr Marianne Weiss at Marianne.weiss@marquette.edu or mail to:
Dr Marianne Weiss, Marquette University College of Nursing,PO Box 1881,Milwaukee WI, 53201-1881

From: LARRY F HODGES <lfh@clemson.edu>
Sent: Thursday, 16 August 2018 10:38 PM
To: Sharon Maclean <sharon.maclean@curtin.edu.au>
Subject: RE: Sense of Presence Tool - 1999

Sharon,

The 14 questions are listed in the appendix at the end of the paper. These were adapted from questionnaires that appeared in References 4 and 7 in the paper. Let me know how the validation works out.

Larry

LARRY HODGES, PHD CLEMSON UNIVERSITY
Professor & Interim Director
School of Computing
FACULTY SCHOLAR: School of Health Research
FACULTY FELLOW: Spiro Institute for Entrepreneurial Leadership
LFH@clemson.edu
http://lfh.people.clemson.edu/

From: Sharon Maclean [mailto:sharon.maclean@curtin.edu.au]
Sent: Thursday, August 16, 2018 5:12 AM
To: LARRY F HODGES <lfh@clemson.edu>
Subject: Sense of Presence Tool - 1999

Good Afternoon Dr Hodges,

I am a PhD student in Perth, Western Australia. I wrote some time ago to Huong Dinh but did not get a reply in regards to the use of your "Sense of Presence" questionnaire from the paper - Evaluating the Importance of Multi-sensory Input on Memory and the Sense of Presence in Virtual Environments.

I am validating the tool for use in Healthcare simulation.

So I am requesting the use of this tool from your paper published in 1999. Of course all citations will be made in any publications and my thesis.

I am hoping to hear from you soon.

Kind Regards

Sharon MacLean

Bsc Nursing, PGrad Dip, MS Mid,
PhD Student
Applied Bioscience 3009 Unit Co-ordinator
Nursing Bioscience NURS 5002
Capstone NURS 4001 Unit Co-ordinator Singapore
Capstone NURS 4001 Unit Co-ordinator Bentley
Lecturer | School of Nursing and Midwifery
Curtin University
Tel | +61 8 9266 7337
Email | sharon.maclean@curtin.edu.au

Dear Sharon

Absolutely feel free to use the presence questionnaire. I also do not know where Huong Dinh is now as I was out of academics for about 10 years after this work was done and while I still do some computer work now it is all related to maternal and child health, where VR is not a big issues.

Good luck with your work.

Neff

Neff Walker
Department of International Health
Johns Hopkins Bloomberg School of Public Health
615 N Wolfe St, Room E5531
Baltimore, MD 21205
(1) 410 502 9034

YAHOO!

From: Sharon Maclean <sharon.maclean@curtin.edu.au>
To: "pwalke20@jhu.edu" <pwalke20@jhu.edu>
Sent: Thursday, August 16, 2018 5:40 AM
Subject:

Good Afternoon Dr Walker,

I am a PhD student in Perth, Western Australia. I wrote some time ago to Huong Dinh but did not get a reply in regards to the use of your "Sense of Presence" questionnaire. I think this may be due to an old email address.

So I am requesting the use of this tool from your paper published in 1999. Of course all citations will be made in any publications and my thesis.

I am hoping to hear from you soon.

Kind Regards

Sharon MacLean

Bsc Nursing, PGrad Dip, MS Mid,
PhD Student
Applied Bioscience 3009 Unit Co-ordinator
Nursing Bioscience NURS 5002
Capstone NURS 4001 Unit Co-ordinator Singapore
Capstone NURS 4001 Unit Co-ordinator Bentley
Lecturer | School of Nursing and Midwifery
Curtin University
Tel | +61 8 9266 7337
Email | sharon.maclean@curtin.edu.au
Web | http://curtin.edu.au

Appendix E Demographic data

A1. What is your gender?
……
A2. What semester are you currently completing?
……
A3. What is your year of birth?
……
A4. Do you have any previous health care experience? Y/N
Please describe ……
A5. Is English your first language? Y/N **If NO, what is your first Language?**
……

Appendix F Concept of Presence

Concept of Presence Questionnaire Please complete this questionnaire after each simulation scenario is finished					
Poor **Fair** **Good** **Very Good** **Excellent**	**1**	**2**	**3**	**4**	**5**
A1. How strong was your sense of presence in the simulated environment?	○	○	○	○	○
A2. How strong was your sense of "being there" in the simulated environment?	○	○	○	○	○
A3.How strong was your sense of inclusion in the simulated environment.	○	○	○	○	○
A4. How aware were you of the real world surroundings while moving through the simulated Environment (i.e., sounds room temperature, other people, etc.)?	○	○	○	○	○
A5. In general, how realistic did the simulated environment appear to you?	○	○	○	○	○
A6. What was your overall comfort level in this environment?	○	○	○	○	○
A7. What was your overall enjoyment level in the simulated environment?	○	○	○	○	○
A8. To what extent were there times during the scenario when the simulated environment becomes a reality for you and you almost forgot about the “real world” outside?	○	○	○	○	○
A9. How was the quality of the simulated scenario?	○	○	○	○	○
A10. With what degree of ease could you move around the simulated environment?	○	○	○	○	○

Appendix G Simulation Design Scale

Simulation Design Scale (Student Version)

In order to measure if the best simulation design elements were implemented in your simulation , please complete the survey below as you perceive it. There are no right or wrong answers, only your perceived amount of agreement or disagreement. Please use the following code to answer the questions.

Use the following rating system when assessing the simulation design elements:

1 - Strongly Disagree with the statement
2 - Disagree with the statement
3 - Undecided - you neither agree or disagree with the statement
4 - Agree with the statement
5 - Strongly Agree with the statement
NA - Not Applicable; the statement does not pertain to the simulation activity performed.

Rate each item based upon how important that item is **to you.**

1 - Not Important
2 - Somewhat Important
3 - Neutral
4 - Important
5 - Very Important

Item	1	2	3	4	5	NA	1	2	3	4	5
Objectives and Information											
1. There was enough information provided at the begining of the simulation to provide direction and encouragement.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
2. I clearly understood the purpose and objectives of the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
3. The simulation provided enough information in a clear matter for me to problem-solve the situation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
4. There was enough information provided to me during the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
5. The cues were appropriate and geared to promote my understanding.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
Support											
6. Support was offered in a timely manner.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
7. My need for help was recognized.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
8. I felt supported by the teacher's assistance during the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
9. I was supported in the learning process.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5

Revised December 22, 2004

Simulation Design Scale (Student Version)

Use the following rating system when assessing the simulation design elements:

1 - Strongly Disagree with the statement
2 - Disagree with the statement
3 - Undecided - you neither agree or disagree with the statement
4 - Agree with the statement
5 - Strongly Agree with the statement
NA - Not Applicable; the statement does not pertain to the simulation activity performed.

Rate each item based upon how important that item is **to you.**

1 - Not Important
2 - Somewhat Important
3 - Neutral
4 - Important
5 - Very Important

Item	1	2	3	4	5	NA	1	2	3	4	5
Problem Solving											
10. Independent problem-solving was facilitated.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
11. I was encouraged to explore all possibilities of the simulation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
12. The simulation was designed for my specific level of knowledge and skills.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
13. The simulation allowed me the opportunity to prioritize nursing assessments and care.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
14. The simulation provided me an opportunity to goal set for my patient.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
Feedback/Guided Reflection											
15. Feedback provided was constructive.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
16. Feedback was provided in a timely manner.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
17. The simulation allowed me to analyze my own behavior and actions.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
18. There was an opportunity after the simulation to obtain guidance/feedback from the teacher in order to build knowledge to another level.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
Fidelity (Realism)											
19. The scenario resembled a real-life situation.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5
20. Real life factors, situations, and variables were built into the simulation scenario.	O 1	O 2	O 3	O 4	O 5	O NA	O 1	O 2	O 3	O 4	O 5

Revised December 22, 2004

Appendix H Interpersonal Communication Assessment Scale (ICAS)

AZUSA PACIFIC UNIVERSITY
SCHOOL OF NURSING
Interpersonal Communication Assessment Scale (S)

In **column 1** below are listed the interpersonal communication behaviors expected of undergraduate and graduate nursing students.

In **column 2**, please circle the number that reflects the level of effectiveness of your interpersonal communication behavior by using the following scale: ***1 = seldom, 2 = often, 3 = usually, 4 = almost always***

COLUMN 1	COLUMN 2
Interpersonal Communication Behaviors	**Effectiveness**
1. I give clear instructions on management of condition.	1 2 3 4
2. I use behavioral descriptions instead of judgments about the patient/family to give feedback.	1 2 3 4
3. I encourage patient/family members to express reactions to care and treatments.	1 2 3 4
4. I provide referrals when necessary.	1 2 3 4
5. I use specific questions to gather detail about a potential problem area.	1 2 3 4
6. I demonstrate behaviors (such as eye contact, touching) when communicating if appropriate to situation and acceptable to the other person's cultural background.	1 2 3 4
7. I ask for confirmation of own perceptions.	1 2 3 4
8. I state discrepancies in information provided by patient and family during interview.	1 2 3 4
9. I ask for clarification.	1 2 3 4
10. I detect inconsistency between verbal and non-verbal communication.	1 2 3 4
11. I invite patient and family to explore discrepancies of information.	1 2 3 4
12. I prepare patient/family for procedures by explaining the process and reasons before occurrence.	1 2 3 4
13. I give descriptive feedback indicating broad observations of content, feelings, and process.	1 2 3 4
14. I acknowledge concerns of patient and family members as important.	1 2 3 4
15. I request consultation when needed.	1 2 3 4
16. I identify indications of patient/family member need for emotional support.	1 2 3 4
17. I teach and promote preventive health care.	1 2 3 4
18. I explain to patient/family varied treatment options.	1 2 3 4
19. I spend time with patient and family members to listen to their concerns and problems.	1 2 3 4
20. I question decisions not to take needed action or to discontinue needed treatment.	1 2 3 4
21. My facial expressions match the context of the conversation.	1 2 3 4
22. I maintain distance and space suitable to the other person's cultural background while talking with patient/family members.	1 2 3 4
23. I initiates a conversation with patient/family member who is usually silent.	1 2 3 4

AZUSA PACIFIC UNIVERSITY
SCHOOL OF NURSING
Interpersonal Communication Assessment Scale (CI)

In **column 1** below are listed the interpersonal communication behaviors expected of undergraduate and graduate nursing students.

In **column 2**, please circle the number that reflects the level of effectiveness of your student's interpersonal communication behavior by using the following scale: ***1 = seldom, 2 = often, 3 = usually, 4 = almost always***

COLUMN 1	COLUMN 2
Interpersonal Communication Behaviors	**Effectiveness**
1. Gives clear instructions on management of condition.	1 2 3 4
2. Uses behavioral descriptions instead of judgments about the patient/family to give feedback.	1 2 3 4
3. Encourages patient/family members to express reactions to care and treatments.	1 2 3 4
4. Provides referrals when necessary.	1 2 3 4
5. Uses specific questions to gather detail about a potential problem area.	1 2 3 4
6. Demonstrates behaviors (such as eye contact, touching) when communicating if appropriate to situation and acceptable to the other person's cultural background.	1 2 3 4
7. Asks for confirmation of own perceptions.	1 2 3 4
8. States discrepancies in information provided by patient and family during interview.	1 2 3 4
9. Asks for clarification.	1 2 3 4
10. Detects inconsistency between verbal and non-verbal communication.	1 2 3 4
11. Invites patient and family to explore discrepancies of information.	1 2 3 4
12. Prepares patient/family for procedures by explaining the process and reasons before occurrence.	1 2 3 4
13. Gives descriptive feedback indicating broad observations of content, feelings, and process.	1 2 3 4
14. Acknowledges concerns of patient and family members as important.	1 2 3 4
15. Requests consultation when needed.	1 2 3 4
16. Identifies indications of patient/family member need for emotional support.	1 2 3 4
17. Teaches and promotes preventive health care.	1 2 3 4
18. Explains to patient/family varied treatment options.	1 2 3 4
19. Spends time with patient and family members to listen to their concerns and problems.	1 2 3 4
20. Questions decision not to take needed action or to discontinue needed treatment.	1 2 3 4
21. Facial expressions match the context of the conversation.	1 2 3 4
22. Maintains distance and space suitable to the other person's cultural background while talking with patient/family members.	1 2 3 4
23. Initiates a conversation with patient/family member who is usually silent.	1 2 3 4

Appendix I Quality of Discharge Teaching Scale

Quality of Discharge Teaching Scale
Administration Notes and Scoring

The Quality of Discharge Teaching Scale (QDTS) was developed to measure patients' perceptions of the discharge teaching received from nursing staff in preparation for discharge. Discharge teaching was conceptualized as the composite of teaching provided by nurses over the course of hospitalization to prepare the patient for managing their own care and recovery in the post-hospitalization period. The QDTS is a measure of the receiver characteristics of the nursing process of discharge teaching. Three formats of the tool have been developed for use in 3 separate populations: adult medical-surgical, new mother, and parents of hospitalized children. The QDTS consists of 24 items that are common across the 3 formats of the QDTS.

Administration Instructions:

- The QDTS is designed to be self-administered but can be read to a patient if visual or motor impairments preclude independent completion by the patient.
- The instrument is completed on the day of discharge after the decision to discharge is made and within 4 hours of the patient's projected discharge time.
- The instrument takes approximately 10 minutes to complete.

Scoring Instructions:

- The instrument consists of 3 subscales:
  - Content needed: Items 1a, 2a, 3a, 4a, 5a, 6a
  - Content received: Items 1b, 2b, 3b, 4b, 5b, 6b
  - Delivery: Items 7,8,9,10,11,12,13,14,15,16,17,18.
  -
- Subscale scores are created by summing the item scores
- A 'content difference' subscale score can be computed by creating a difference score for each content item (for example 1diff= 1b-1a) then summing the 6 difference scores.
- A total scale score can calculated by adding the 'content received' and 'delivery' subscale scores (the total scale score contains 18 items). However, based on a study of 1800 patients (Weiss et al., 2011), we are recommending the use of subscale scores rather than total scores in analyses. The scales perform differently in predictive analyses.

Weiss, M.E., et al., (2007). Perceived readiness for hospital discharge in adult medical-surgical patients. Clinical Nurse Specialist, 21 (1), 1-12.

Maloney, L.R. & Weiss, M.E. (2008). Patients' perception of hospital discharge informational needs. *Clinical Nursing Research*, 17. 200-219.

Weiss, M., Yakusheva, O., & Bobay, K. (2011). Nursing staffing, readiness for hospital discharge, and post-discharge utilization. *Health Services Research,* E-publication in advance of print, DOI: 10.1111/j.1475-6773.2011.01267.x.

ID# ☐☐☐

QUALITY OF DISCHARGE TEACHING SCALE - ADULT FORM

Please check or circle your answer. Most of the responses are on a scale from 0 to 10. The words below the number indicate what the 0 or the 10 means. Pick the number between 0 and 10 that best describes how you feel. For example, circling number 7 means you feel more like the description of number 10 than number 0 but not completely.

1a. How much information <u>did you need</u> from your nurses about **taking care of yourself** after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
1b. How much information <u>did you receive</u> from your nurses about **taking care of yourself** after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
2a. How much information <u>did you need</u> from your nurses about your **emotions** after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
2b. How much information <u>did you receive</u> from your nurses about your **emotions** after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
3a. How much information <u>did you need</u> from your nurses about your **medical needs or treatments** (for example, caring for a surgical incision, respiratory treatments, exercise, rehabilitation, or taking mediations in the correct amounts and at the correct times) after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
3b. How much information <u>did you receive</u> from your nurses about your **medical needs or treatments** after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
4a. How much **practice** <u>did you need</u> with your **medical treatments or medications** before going home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
4b. How much **practice** <u>did you receive</u> with your **medical treatments or medications** before going home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal

ID# ☐☐☐

5a. How much information <u>did you need</u> from your nurses about **who and when to call** if you have problems after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
5b. How much information <u>did you receive</u> from your nurses about **who and when to call** if you have problems after you go home?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
6a. How much information <u>did your family member(s) or others need about your care</u> after you go home from the hospital?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
6b. How much information <u>did your family member(s) or others receive about your care</u> after you go home from the hospital?	0 None	1	2	3	4	5	6	7	8	9	10 A great deal
7. How much did the information provided by your nurses answer your **specific concerns and questions?**	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal
8. How much did your nurses **listen** to your concerns?	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal
9. Were your nurses **sensitive** to your personal beliefs and values?	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal
10. Did you like the way nurses **taught** you about how to care for yourself at home?	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal
11. Was the information your nurses provided about caring for yourself presented to you in a way you could understand?	0 Not at all	1	2	3	4	5	6	7	8	9	10 Always
12. Did your nurses **check** to make sure you understood the information and instructions?	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal
13. Did you receive **consistent** (the same) information from your nurses, doctors, and other health workers?	0 Not at all	1	2	3	4	5	6	7	8	9	10 Always

ID# ☐☐☐

14. Was the information about caring for yourself given to you **at times that were good for you?**	0 Not at all	1	2	3	4	5	6	7	8	9	10 Always
15. Was the information you received from your nurses provided at **times when your family member(s) or others could attend?**	0 Not at all	1	2	3	4	5	6	7	8	9	10 Always
16. Did your nurses help you to feel **confident** in your ability to care for yourself at home?	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal
17. How confident do you feel that you would **know what to do in an emergency?**	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal
18. Did the information your nurses provided about your care at home **decrease your anxiety** about going home?	0 Not at all	1	2	3	4	5	6	7	8	9	10 A great deal

Thank you for responding to our survey.

Appendix J Simulation Scenario

Learning Outcomes:

- Demonstrate understanding of the Patient Discharge procedure
- Patient Communication
- Demonstrate the decision-making process used
- Demonstrate knowledge about Medication administration and patient education

Situation:

Jackie/Jack Anderson (19/12/1955) presents to the emergency department for chest pain. She has a history of hypertension (high blood pressure), angina (chest pain) and Type 2 diabetes mellitus. Jackie is a non-smoker and consumes 2–3 standard glasses of wine per week. Jackie admits to a few indiscretions of eating cake and sweets with the grandchildren.

Jackie is taking Metformin (SR) 1000mg BD and checks her blood glucose levels approximately once or twice a week, stating she eats so well she does not need to check her blood more than that. Jackie is also taking medication for high blood pressure and angina. Jackie was out playing golf and had an episode of chest pain relieved by GTN spray, however, her friend felt she needed to be brought into the hospital, as she was very short of breath and anxious.

Jackie was admitted to the medical ward for further telemetry, further investigations, and a review of her current medications for angina and Type 2 Diabetes. After two days of admission, Jackie is being discharged home with new Type 2 diabetic medications (LIRAGLUTIDE) a once a day subcutaneous injection into the abdomen, or upper thigh. Jackie is also required to check her blood glucose levels (BGL) 3 times per day until further review by the GP and has a referral to a cardiologist; she needs to make the appointment in one-week time. The cardiologist appointment will review her angina further and suggest if further treatment is required.

Patients past medical history

- Angina
- Hypertension
- Type 2 Diabetes

Patient's family history

- History of cardiac problems

Patient's social information (Work, Lifestyle, Habits)

- Retired
- Plays Golf
- Widowed 2 children (2 boys)
- Looks after grandchildren
- Previous work – Retired School Teacher

Medications

- Perindopril 5mg BD
- GTN Spray 1-2 sprays PRN
- Liraglutide 0.6mg Daily

Appendix K Readmission Risk Factors

Patients who present to the hospital and are admitted for care are often readmitted within 30 days post-discharge. Talking with your patient and recognising these risk factors may help the patient to cope and make plans to prevent readmission. Below is a list of risk factors that may contribute to your patient being readmitted? Use the table provided to identify your patient's risk profile. Consider how you might talk to your patient about their level of risk during discharge.

- Gender – Higher risk Male
- Age – Higher risk over 65 years increasing with age
- Work status – A Higher risk when not working (associated with age & activity)
- Number of previous admissions – A Higher risk with an increasing number of previous admissions in the past 12 months)
- Therapy intensification on discharge – A Higher risk with changes to medication and upscaling of medication
- Comorbidity – A Higher risk with an increased number of comorbidities
- Care planning – A Higher risk with lack of direction during the hospital stay (including discharge)
- Diabetes – A Higher risk with this comorbidity
- Health care literacy (understanding) – a Higher risk with poor health literacy
- Family support – A Higher risk with reduced support
- Length of hospital stay – A Higher risk with a short stay

	Risk Level		
Risk Factor	**Low**	**Moderate**	**High**
Gender	Female	Male	
Age	<65 years	>65 years	>75 years
Work status	Working	Not working	
Previous Admissions	None	<2	>2
Therapy intensification	No change	Change dose	New medication
Comorbidities	None	<2	>2
Care planning	High	Moderate	Low
Diabetes	No		Yes
Health literacy	High	Moderate	Low
Family support	High	Moderate	Low
Length of stay	>7 days	3-7 days	<3 days

Appendix L Interview Questions

The Nature of Presence among Nursing Students in High Fidelity Human Patient Simulation

Presence Interview Guide

1. How would you describe the simulation you just completed?
2. How do you think watching the AV recording by yourself has developed your communication skills?
3. What are your thoughts/feelings on how your patients will manage once they are discharged home from the hospital?
4. Describe in one or two words how you felt when you were informed you were being filmed in the simulation and had the opportunity to watch it back.
5. Describe in one or two words how you felt once you had completed the simulation and watched the AV recording.

Debriefing Questions

1. How would you describe the simulation?
2. Please describe your focus during the simulation, what were you aware of during the simulation and did you notice anything else in the room?
3. What were you thinking about during the simulation?
4. How did the simulation compare to a real patient care situation?
5. How present were you during the simulation?

Appendix M Critical Appraisal Skills Program

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CASP Checklist: 10 questions to help you make sense of a Systematic Review

How to use this appraisal tool: Three broad issues need to be considered when appraising a systematic review study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Systematic Review) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference:

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes ☐ Can't Tell ☐ No ☐

HINT: An issue can be 'focused' in terms of
- the population studied
- the intervention given
- the outcome considered

Comments:

2. Did the authors look for the right type of papers?

Yes ☐ Can't Tell ☐ No ☐

HINT: 'The best sort of studies' would
- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes ☐ Can't Tell ☐ No ☐

HINT: Look for
- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Comments:

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4. Did the review's authors do enough to assess quality of the included studies?

Yes ☐
Can't Tell ☐
No ☐

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

Comments:

5. If the results of the review have been combined, was it reasonable to do so?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- results were similar from study to study
- results of all the included studies are clearly displayed
- results of different studies are similar
- reasons for any variations in results are discussed

Comments:

Section B: What are the results?

6. What are the overall results of the review?

HINT: Consider
- If you are clear about the review's 'bottom line' results
- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

Comments:

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7. How precise are the results?

HINT: Look at the confidence intervals, if given

Comments:	

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- the patients covered by the review could be sufficiently different to your population to cause concern
- your local setting is likely to differ much from that of the review

Comments:	

9. Were all important outcomes considered?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider whether
- there is other information you would like to have seen

Comments:	

10. Are the benefits worth the harms and costs?

Yes ☐
Can't Tell ☐
No ☐

HINT: Consider
- even if this is not addressed by the review, what do you think?

Comments:	

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