Standardised Patient Teaching Strategies in an Undergraduate Pharmacy Curriculum: A Case Study

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Date of submission: May 2016

Acknowledgements

I have served a research apprenticeship under the finest academic and human being, Professor Jane Mills. Her unfailing faith, absolute mastery of research and natural gift as a supervisor has not only shown me how to research, but demonstrated to me a model of supervision I will carry forward. Her style is punctuated by dedication to excellence, superior technical knowledge and a healthy dose of compassion and personal investment. You set the benchmark for me in the conduct of research and supervision. Thank you seems an inadequate sentiment, but be assured I feel a deep debt to you Jane.

Dr Michelle Bellingan. Your encouragement, technical expertise and link back to the profession were invaluable to my success. You always made me feel important and valued. Your calmness, quiet encouragement, methodical attention to detail and willingness to persevere alongside me on this journey was and will always be deeply appreciated.

Professor Lee Stewart and Professor Melanie Birks. Your foresight, wisdom and professional respect facilitated simultaneous advancement in several important career milestones as well as (and most importantly) my PhD journey. Your support, both personal and collegiate was more than any one person could ask for. I am proud to be counted amongst your colleagues. Thank you for your unwavering support and (strategic) nagging.

To my mischievous and brilliant children, Amélie and Peter. Your love, patience and gentle encouragement allowed me great perspective, balance and motivation. I hope

your experience of my journey encourages you to follow on this path one day. To my beautiful wife, Natalia, your support and understanding was as unmeasurable as it was critical to my success. I could not have achieved this without you. You three are the reason for everything I do.

Statement of Contribution of Others

Professor Beverley Glass, who was my original primary Masters supervisor, provided guidance on the original data collection and helped form the genesis of this thesis's original idea.

Daniel Lindsay who provided excellent advice on statistics.

Elite Editing undertook final formatting and edits according to the guidelines for editing research thesis provided by the Institute of Professional Editors Limited (IPEd).

Abstract

Pharmacy practice has evolved from a model that focused on product knowledge and supply to one that emphasises patients and the delivery of cognitive services. This evolution is reflected in all areas of pharmacy practice, including over-the-counter prescribing and prescription medicine counselling. In order to effectively educate undergraduate pharmacy students, this study used teaching methods previously unexplored in depth in Australian pharmacy education to teach the skills, knowledge and attitudes necessary for competent management of over-the-counter and prescription medicine counselling presentations in an Australian pharmacy practice context. This study used two types of standardised patient teaching methods to teach the necessary knowledge and skills in an authentic context, with the aim of promoting mastery of knowledge in over-the-counter prescribing and prescription medicine counselling. This teaching strategy allowed students to apply new knowledge in the context of realistic pharmacy practice situations. This study used an embedded case study approach and multiple methods to explain the case for using standardised patient teaching methods in pharmacy undergraduate education. It investigated the effect of a standardised patient teaching strategy on undergraduate pharmacy students' performance in the management of over-the-counter and prescription medicine counselling presentations in pharmacy practice. This study also investigated early-career pharmacists' reflections on the transferability of knowledge and skills acquired during learning and teaching sessions with standardised patients, and the effect of this on their transition to practice as new graduates.

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List of Abbreviations

ANOVA	Analysis of Variance
FLOTE	First Language Other than English
HPS	Human Patient Simulation
IDO	International or Domestic Origin
IPPE	Introductory Pharmacy Practice Experience
OSCE	Objective Structured Clinical Examination
OTC	Over the Counter
PS-PoC	Pharmacy Student Perception of Confidence Questionnaire
PS-PoD	Pharmacy Student Perception of Difficulty Questionnaire
S2	Schedule 2
S3	Schedule 3
TA	Thematic Analysis

Definitions

Baccalaureate: Commonly referred to as a bachelor's degree in Australia, this is the minimum education level for the majority of professional health qualifications in Australia, including pharmacy.

Communication: The process of imparting or exchanging information, or the process of gathering information from a patient. It includes use of appropriate language, encouraging patient participation, appropriate use of open- and close-ended questions, and non-verbal communication techniques. This study generated a 'communication score' using prescriptive standardised assessment criteria. The generated score was used as a comparative metric of performance in communication ability within the sub-case at different time points, and between the two sub-cases at the first and last sessions. See also **process**.

Confidence Scale: Measures students' self-reported level of confidence in communication- or process-related elements using five Likert-type questions. See also **difficulty scale**.

Difficulty Scale: Measures students' self-reported level of difficulty in communication- or process-related elements using five Likert-type questions. See also **confidence scale**.

Extracurricular Pharmacy-related Work: Working at a community pharmacy as a pharmacy assistant part time. Not organised by the pharmacy program as part of an organised course-related experiential workplace learning experience. Students are often in paid employment. May be regular weekly work or condensed holiday work.

Extracurricular Non–Pharmacy Related Work: Work (either full time or part time) unrelated to pharmacy practice for the purpose of income.

Faculty Staff: Academic or teaching staff engaged in student teaching.

FLOTE: First Language Other than English. A student who speaks more than one language and their first language (mother tongue) is not English.

Full Time (Work): Working 35 hours or more per week. See also **part time (work)**.

Intern Pharmacist: A graduate of an approved program of study in Australia who is undertaking a period of supervised practice—usually 48 weeks—in preparation for eligibility to apply for general registration as a pharmacist in Australia.

International or Domestic Origin: This category distinguishes students born domestically (in Australia) or internationally (born in a country other than Australia).

Likert-type Item: A single question that uses some aspect of the original Likert response alternatives (such as a response alternative that ranged from 'strongly agree' to 'strongly disagree').

Likert Scale: A psychometric scale used to ascribe quantitative value to qualitative data for the purpose of statistical analysis. A Likert scale differs from a Likert-type item in that a Likert scale comprises four or more Likert-type items that measure a similar concept (such as communication confidence). Responses to the Likert-type items are combined into a composite scale before analysis is conducted.

Over-the-counter (OTC) Prescribing: The diagnosis and management of minor self-limiting conditions by a registered pharmacist—also known as 'counter prescribing'.

Part Time (Work): Working less than 35 hours per week. See also **full time (work)**.

Pharmacy Placement Experience: Organised and course-related experiential workplace learning experience, often referred to as 'clinical placement' or 'practicum'.

Prescription Medicine Counselling: Verbal and written advice provided by the pharmacist to the patient about the safe and effective use of prescribed medicines. This includes non-pharmacological interventions that complement the prescribed medicine's effectiveness.

Prior Study: Organised program of study undertaken after completion of secondary school, where the program of study is offered by a vocational education training institution (such as TAFE) or higher education institution (such as a university).

Process: All elements of a patient interaction, excluding those relating to communication. Process includes elements such as structure, priority and logicality of interaction; time management; drug, treatment and disease knowledge; and appropriate referral. A 'process score' was generated using prescriptive standardised assessment criteria. The generated score was used as a comparative metric of performance in process ability within the sub-case at different time points, and between the two sub-cases at the first and last sessions. See also **communication**.

Program or Course: A program or course of study designed to prepare a student for entry to the profession of pharmacy. The normal duration of such a program or course is four years.

Significant Family Responsibility: Personal responsibility for supervision of family or non-family members, where that person is dependent for care, supervision or both—such as children or a frail aged adult.

Simulated Patient: The substitution of 'real' patients with virtual-reality computer simulation, computer-aided mannequins, organ substitutions or trained standardised patients who role-play a patient experience. The term includes a broad range of distinctive teaching modalities.

Sporting or Social Group Involvement: Currently participating or has previously participated in regular sporting or social groups. Examples may include the Lions Club; outdoor adventure clubs, such as Scouts or Guides; or involvement in sporting teams or sporting events, such as football, basketball or archery.

Standardised Patient: A type of simulated patient defined in this study as someone who has been trained to portray a character or patient problem as described in a partially scripted case scenario. Standardised patients deliver a relatively consistent performance to a succession of students with the aim of providing exposure to clinical scenarios in a comfortable and predictable learning environment.

Student Pharmacist or Student: A student undertaking an approved undergraduate program of study in the discipline of pharmacy.

Time Point A: Before exposure to standardised patient (see Figure 4.5, Chapter 4).

Time Point B: After exposure to five sessions of standardised patients (see Figure 4.5, Chapter 4).

Total Score: The sum of scores for communication and process obtained from the prescriptive standardised assessment criteria.

Undergraduate: Commonly refers to a bachelor's degree (undergraduate degree or program) or a student enrolled in a bachelor's degree (undergraduate student) in Australia.

Undertake Significant Travel: Experienced significant travel either domestically or internationally since completion of secondary schooling and commencing undergraduate pharmacy degree.

Chapter 1: Thesis Introduction

1.1 Reflection

I had excellent educators teach me pharmacy. However, even with great teachers, my transition from university to practice as an early-career pharmacist was still complex. I, like many of my student peers at that time, had limited pharmacy practice experience. I did not work part time in a pharmacy during my undergraduate course, so my only exposure to 'real-life' pharmacy practice was clinical placement. The 15 weeks of placement experiences organised by the pharmacy program were important in my contextualisation of theory and practice in a 'real-world' context. I remember placement being an entirely appropriate learning opportunity, filled with challenges, value and opportunity. It allowed me to identify and explore my strengths and weaknesses, and reflect on the knowledge and skills I had achieved as a student pharmacist. However, despite the benefits, the learning opportunities were often opportunistic, mostly unstructured and insufficient in volume. My sense was that placement alone did not provide me with sufficient applied experience or breadth to wholly prepare me for my intern year as a new graduate pharmacist.

In the first few months in clinical practice as an intern pharmacist, I felt confident in my knowledge as a novice clinician in many areas. I was well prepared to predict or identify potential or real problems with reasonable accuracy, apply an evidence-based approach to drug therapy and disease treatment, and communicate appropriately and in a way that was efficient for me and the patient. I came to understand that what might appear as a straightforward intervention or patient interaction was part of a complex patient context, and my experience in integrating a range of skills, knowledge and communication practices in what I came to term

'complex routine' encounters was just as important a determinant of success as my theoretical knowledge and skills as a pharmacist.

I was proficient at identifying 'routine' problems when presented as paper cases, and while those cases did contribute to my preparedness, I came to realise that the application of knowledge in the complex context of the patient required a higher degree of integration of these skills, honed by practice. By this stage, my 'practice' time was coming to an end. From day one as a novice pharmacist, I treated unwell patients who needed efficient and safe solutions, and healthy patients who required effective health maintenance advice. As an intern, there were no more second chances or supplementary exams.

The result was that I felt much more comfortable behind the dispensing desk, away from the complex needs of my patients. Reflecting on that transition year now, I would have benefited from a learning strategy that bridged the gap between the theory and its application in early paper-based cases and my early interactions with patients as an early-career pharmacist—a strategy that allowed authentic application of my clinical knowledge and required me to demonstrate the integration of knowledge and professional and technical skills. Standardised patient teaching methods can benefit students in their transition to placement, and during students' transition into early-career practice. I hope that this study evidences and justifies this intervention, so that it may better prepare graduate pharmacists for the complex role of an intern pharmacist, and ease their transition from university to practice. This was my motivation for this study.

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1.2 Introduction

Ever increasing demands for work-ready pharmacy graduates, combined with escalating pressures on limited placement learning opportunities, require a valid and reliable set of learning and assessment strategies that develop and assess foundational professional skills, knowledge and attitudes under conditions reflective of clinical practice. To promote development and mastery of professional skills, knowledge and attitudes, learning and teaching strategies must be properly integrated into curriculum, have clearly identified outcomes, be supported by quality feedback mechanisms and measure student performance against standards relevant to industry practice.

Patient simulation–based education provides significant utility and experiential learning opportunities in many undergraduate curriculums, both nationally and internationally. The value of using simulation strategies in health-related disciplines is well recognised (Bennett, Arnold, & Welge, 2006; Carter, Wesley, & Larson, 2006; McAllister et al., 2013; Prochaska, Gali, Miller, & Hauer, 2012) and has been an integral part of undergraduate nursing (DeCarlo, Collingridge, Grant, & Ventre, 2008; Vessey & Huss, 2002) and medical (Bosse, Nickel, Huwendiek, et.al, 2015;Boulet J., Smee S., Dillon G. & Gimpel J., 2009; Boulet, 2008, Dillon, Boulet, Hawkins, et.al, 2004, Cleland, Abe, & Rethans, 2009; McManus, Vincent, Thom, & Kidd, 1993; Whitehouse, Morris, & Marks, 1984; Ziv, Wolpe, Small, & Glick, 2003) education for decades. Patient safety (Bradley, 2006; Decker, Sportsman, Puetz, & Billings, 2008; Lin, Travlos, Wadelin, & Vlasses, 2011), the ethical tension created by using real patients when training clinicians (Lynoe, Sandlund, Westberg, & Duchek, 1998; Ziv et al., 2003), increasingly limited clinical opportunities and a need to deliver health education in a learner-centred manner (Nestel et al., 2011) have driven the adoption of a range of simulation techniques.

Simulation involves the substitution of a 'real' patient encounter with either a non-human substitute (often referred to as human patient simulation [HPS]) or patient substitute played by a person following a partial script of some type (termed in this thesis the 'standardised patient'). Examples of HPS include computer simulations, mannequins, animal organ substitutes and task-trainer devices. The literature differentiates a live patient substitute from other forms of patient simulation using the term 'standardised patient'. Standardised patients include recruited actors, volunteers, faculty staff or students role-playing, often guided by a partial script or scenario. A standardised patient substitutes a bona fide patient encounter with a person enacting a planned scenario in order to replicate substantial aspects of the real experience (Smithson, Bellingan, Glass, & Mills, 2015). Patient actors are 'standardised' because they are trained to portray a character as described in a partially scripted case scenario in a consistent manner (Fiscella, Franks, Srinivasan, Kravitz, & Epstein, 2007; Monaghan et al., 1997; Rickles, Tieu, Myers, Galal, & Chung, 2009; Woodward, McConvey, Neufeld, Norman, & Walsh, 1985). The utility of two types of standardised patients—community volunteers and peers—as an instructional strategy is the focus of this thesis.

Standardised patients are used to monitor compliance with professional policies or standards and quality assurance aspects of professional practice in Australian community pharmacy practice. They are employed in both undergraduate and postgraduate pharmacy courses (Benrimoj, Werner, Raffaele, Roberts, & Costa, 2007; Kippist, Wong, Bartlett, & Saini, 2011; Watson et al., 2004; Weiss, Booth, Jones, Ramjeet, & Wong, 2010). More broadly, simulation is an adaptable teaching method that can be used to develop a range of topic areas, skills and professionally desirable attributes in pharmacy undergraduate training. It may be used to supplement learning

opportunities relating to scarce or unusual diseases, and to develop professionally important skills or attributes, such as communication skills and problem solving. It can facilitate important exposure to inter-professional experiences and enable the practice of specialist pharmacy-related tasks or procedures, such as medication therapy management, the design and modification of drug therapy regimens, and documenting and creating drug profiles.

From a curriculum perspective, simulation offers a structured, more comfortable and supported learning experience for both the novice and developing expert. It enables the systematic delivery of curriculum and provides an opportunity for detailed instructor feedback to the trainee (Nestel et al., 2011). As a teaching strategy, simulation environments remove undesired experiences from the learning process, such as distractions or confounding factors, and allow for student exposure to high-risk or uncommon medical conditions in a more safe and controlled environment. It can be offered on demand and with repetition to reinforce skills, and it increases the transferability of learnt knowledge to patient care contexts (Kane-Gill & Smithburger, 2011).

Less tangible outcomes from incorporating simulation in teaching are the development of critical thinking, experience working as part of a broader team, and the capacity to self-appraise and develop problem-solving skills. Importantly, it reduces the ethical risk associated with using real patients as a teaching resource, and the conflict between this and providing student-centred learning (Adamo, 2003; Gallimore, George, & Brown, 2008; Hargie, Dickson, Boohan, & Hughes, 1998; Nestel et al., 2011). A simulated environment also allows students to apply, practice and develop clinical skills and gain confidence in a controlled space before they are exposed to real-life patients (Lin et al., 2011; Seybert, Kobulinsky, & McKaveney, 2008).

In this chapter, the researcher provides an introduction to this study. After identifying the research aim, four research questions are proposed and justified in the context of the contemporary literature. Following this, an argument for the fit between the research questions and research design of multiple case study is provided. This chapter is concluded with an outline of the thesis chapters that follow.

1.3 Research Aim

A distinct set of competencies are required for novice intern pharmacists to be able to undertake clinical interventions in practice. This study sought to describe and explain the case for using standardised patient teaching methods in pharmacy undergraduate education using an embedded single case study design. This study examined demographic influences of student performance in simulation, the effect of simulation on student confidence, perceptions of the difficulty of and ability to undertake a patient intervention, and the effect of using standardised patients as a learning strategy on students' transition to their intern year. To achieve this aim, this study examined two sub-cases, each using a unique variant of standardised patient: peer standardised patients and volunteer standardised patients. The context of each sub-case was as follows:

- sub-case one: the development of undergraduate pharmacy students' skills in communication and counter prescribing
- sub-case two: communication, counter prescribing and prescription medicine counselling.

The researcher examined the use of community volunteers as standardised patients in the context of teaching and revising communication skills and counter prescribing with a penultimate-year (third-year) undergraduate pharmacy class in sub-case 1. Similarly, sub-case two was examined to investigate the use of peer standardised

patients to teach and practice communication skills, counter prescribing and prescription medicine counselling to a final-year (fourth-year) undergraduate pharmacy class. Four research questions were answered:

1. Are there student characteristics that influence strong or weak performance in communication or process ability, and can standardised patient teaching methods mitigate the effects of these characteristics?
2. Do teaching strategies integrating standardised patient teaching methods increase perceptions of confidence and reduce perceptions of difficulty in managing over-the-counter prescribing or prescription medicine counselling interventions for pharmacy undergraduate students?
3. Are teaching strategies integrating standardised patient teaching methods effective in developing foundational communication and process skills in undergraduate pharmacy students?
4. Does the use of standardised patient teaching methods in an undergraduate curriculum affect early-career pharmacists' transition into practice?

1.4 Justification for the Study

A change in the landscape of Australian pharmacy has occurred over the last decade (Hoti, Hughes, & Sunderland, 2011). The aging population, rising cost of health provision, poor health workforce retention and changes in public expectations of healthcare delivery and access have prompted the reform of Australia's healthcare policy objectives. These reforms aim to expand the scope of health professional practice, support multidisciplinary teams and emphasise patient-centred care (Mak, Clark, March, & Gilbert, 2013). The traditional model where pharmacists employ their expertise in medicine and disease to optimise health outcomes and minimise medication misadventure is changing. This traditional model is now being complemented with a

new paradigm of pharmacy practice that focuses on service delivery in preference to the traditional emphasis on product supply (Lorimer, Lalli, & Spina, 2013; Mak, Clark et al., 2013). This change has coincided with an increase in schools of pharmacy (Human Capital Alliance, 2008) and subsequent increase in the number of graduate pharmacists (Health Care Intelligence, 2003; Pharmacy Board of Australia, 2013, 2015; Waterman, 2011). This means that access by the Australian community to pharmacists and associated professional services is now greater than ever before.

The pharmacy profession provides an important and unique primary healthcare service (Pharmaceutical Society of Australia, 2010) to the community, with the major elements of this service being the diagnosis and treatment of minor self-limiting conditions, disease prevention, medication and chronic disease management, and patient and community education. A high standard of professional knowledge combined with broad public accessibility place community pharmacists in an ideal position to provide accessible, high volume, quality primary healthcare services and advice on a low-cost or cost-free basis to health consumers. The provision of one of these services—the diagnosis and management of minor self-limiting conditions—requires pharmacists to have an advanced and integrated skill set, comprising an understanding of prescribing practices, disease processes and therapeutic options; knowledge of unscheduled drugs and non-drug therapies, Schedule 2 (S2) and Schedule 3 (S3) drug pharmacology and forensics; and well-developed communication skills (Rutter & Newby, 2012). The group of medicines and therapeutic goods pharmacists use to manage consumers' common self-limiting conditions are commonly called 'over-the-counter' medicines or 'S2' and 'S3' medicines (Hoti et al., 2011; Therapeutic Goods Administration, April 2011). Overall, the process is usually referred to as 'over-the-counter prescribing', which is sometimes truncated to 'counter prescribing' or 'OTC prescribing'. This term

is commonly associated with unscheduled medicines and medicines contained in S2 and S3 of the *Standard for the Uniform Scheduling of Medicines and Poisons*, as these are the medicines prescribed and supplied by pharmacists in over-the-counter interventions. Prescription medicine counselling involves the advice provided by the pharmacist to the patient about the safe and effective use of prescribed medicines, and includes non-pharmacological interventions that complement the prescribed medicine's effectiveness. Pharmacist undergraduate education must prepare students to practice over-the-counter prescribing interventions and prescription medicine counselling in a competent and confident manner to the standard of a competent early-career pharmacist. Authentic learning experiences that replicate industry conditions and reflect real-life scenarios can facilitate the acquisition of a range of clinical skills.

There has been wide use of standardised patients during the training of medical and nursing students for many decades. Despite an acceptance of simulation in medical and nursing education, there is a paucity of literature describing and evaluating educational strategies that employ standardised patients in the undergraduate pharmacy context. More precisely, there is limited Australian (Rao, 2011) and international (James, Nastasic, Davies, & Horne, 2001; Marken, Zimmerman, Kennedy, Schremmer, & Smith, 2010; Rickles et al., 2009) evidence that specifically addresses the effect of standardised patients on students' ability to acquire the pharmacy-specific skills of prescription and non-prescription medicine counselling and over-the-counter prescribing, and the more ubiquitous skill of communication.

In this study, undergraduate pharmacy students enrolled in a regional Australian university experienced a training module that employed both traditional didactic teaching strategies and workshops that incorporated standardised patients. The purpose of the training module was to impart over-the-counter, prescription- and non–

prescription related patient intervention and communication skills. While the use of standardised patients as a teaching strategy has been successfully employed by other health disciplines, there is limited evidence to support the use of this resource and time-intensive intervention in undergraduate pharmacy education.

The use of standardised patients may provide the necessary segue between theory and practice for novices when developing the knowledge and skills to be competent future pharmacists, fulfilling an important and complex primary healthcare role. If properly implemented, teaching strategies using standardised patients can be used to teach a range of professional skills and knowledge in a contextually appropriate, feedback-rich environment with appropriate safety for patients and students. A clear understanding of the educational effect of this teaching strategy on students' transition into practice is needed to justify the use of this method.

1.5 Research Design

This research used an embedded single case study approach to define the subject of study (the Case) and multiple methods to answer the research questions. As a method, case study is widely used in science, social science, education and psychology as a means for developing and testing hypothesis (Flyvbjerg, 2011) and is a problem-driven research approach. Case study provides a foundation to define the phenomenon of interest, as in the focus on the individual unit of study (the Case) and its boundaries. This clear definition promotes clarity in the investigation. While a case study frequently examines a specific, often-unique system, the findings from a case study investigation are typically generalizable because they identify a logic that may be applied to other situations (Yin, 2012). The use of case study also allows the use of a range of different qualitative and quantitative methods (Flyvbjerg, 2011; Stake, 2008b), decided by fitness for purpose and practicality, rather than influence of a particular methodological bias to

promote relevant and detailed data. The combination of the most appropriate mix of methods and the clear identity of the case provides a rich understanding of the phenomenon in question.

A single case with two embedded units of analysis (also known as sub-cases) is used to describe and explain the case for using simulation in undergraduate pharmacy education. In this study the researcher implemented two variations of a standardised patient teaching method in the final two years of an Australian regional university undergraduate pharmacy program. Sub-case one involved a third-year class of 59 undergraduate pharmacy students that were exposed to standardised patients, in which community volunteers playing the partially scripted part of the patient. Sub-case two involved a fourth-year class of 73 undergraduate pharmacy students exposed to standardised patients, in which class peers acted in the role of patient. The content focus was on the development of counter prescribing skills, professional communication and patient counselling. In addition, for sub-case two, the content focus included prescription medicine counselling.

Multiple methods were used to collect a range of relevant data in order to better understand the case of standardised patients in undergraduate pharmacy education. Tables 1.1 to 1.4 briefly outline the methods and timing used to collect the data. The tables are organised by research question. Chapter 4 contains a full description of the research methods of this thesis.

Table 1.1

Description of Research Methods for Research Question One

Research question one: Are there student characteristics that influence strong or weak performance in communication or process ability, and can standardised patient teaching methods mitigate the effect of these characteristics?		
Data collection tool(s) and purpose	Data collected and collection time(s)	Analysis used
Demographics questionnaire Describe sub-case population Compare sub-cases	Student demographics Age Gender International or domestic origin (IDO) Previous work experience and type Hours worked in pharmacy-related employment Hours worked in non–pharmacy related employment Total hours worked in any employment First language other than English (FLOTE) Data collected before exposure to simulated patients	Kolmogorov-Smirnov test to assess normality Descriptive statistics
Workshop and examination marking schedule and demographics Identify demographics that influence student performance in simulation	Student workshop scores for process and communication ability using standardised marking criteria to identify demographic factors that influence student performance Sessions one to five of intervention Demographics collected immediately prior to exposure to standardised patient teaching methods	Difference between means (categorical variables) Bivariate correlations (continuous variables)

Table 1.2

Description of Research Methods for Research Question Two

Research question two: Do teaching strategies integrating standardised patient teaching methods increase perceptions of confidence and reduce perceptions of difficulty in managing over-the-counter prescribing or prescription medicine counselling interventions for pharmacy undergraduate students?		
Data collection tool(s)	Data collected and collection time(s)	Analysis used
Likert scale measuring perceptions of confidence	Self-rated confidence score using Likert scale Pre- and post-intervention	Z-test for different populations
Likert scale measuring perceptions of difficulty	Self-rated difficulty score using Likert scale Pre- and post-intervention	Z-test for different populations
Structured focus group	Immediate perceptions of standardised patient teaching method Sub-case one—immediately after six weeks of standardised patient teaching	Thematic analysis

Table 1.3

Description of Research Methods for Research Question Three

Research question three: Are teaching strategies integrating standardised patient teaching methods effective in developing foundational communication and process skills in undergraduate pharmacy students?		
Data collection tool(s)	Data collected and collection time(s)	Analysis used
Workshop and examination marking schedule	Communication performance using standardised communication marking criteria Process performance using standardised marking criteria Sessions one to five	Paired-samples t-test
	Change over time for each sub-case Comparison between sub-cases one and two Sessions one to five of intervention	Independent samples t-test
Semi-structured focus group	Immediate perceptions of standardised patient teaching method Sub-case one—immediately after standardised patient teaching	Thematic analysis

Table 1.4

Description of Research Methods for Research Question Four

Research question four: Does the use of standardised patient teaching methods in an undergraduate curriculum affect early-career pharmacists' transition into practice?		
Data collection tool(s)	Data collected and data collection time(s)	Analysis used
Long-term follow-up semi-structured interviews	Graduates' perceptions of effect of standardised patient teaching on transition to practice Longer than six months after graduation—currently working pharmacists	Thematic analysis

1.6 Thesis Outline

In Chapter 1, the researcher has introduced the study, described the research aim, presented the study justification and briefly described the research design. Chapter 2 contains a summary of the most important literature on the use of standardised patients in undergraduate pharmacy education, and examines the foundational literature evidencing the use of standardised patients in other disciplines—predominantly medicine and nursing. Reviewing the literature serves to define standardised patients, identify the use of standardised patients in other health professional education fields, and explore the limited literature on the use of standardised patients in pharmacy undergraduate education. This comprehensive review of the literature was published in *Currents in Pharmacy Teaching and Learning* in September 2015 (Smithson et al., 2015).

Chapter 3 contains a description of the study methodology used to understand the case for standardised patients in undergraduate pharmacy education. The chapter commences with a description of the philosophical underpinning of this research—specifically pragmatism and post-positivism as guiding philosophies—and the relationship between observations, analysis and the chosen philosophical approach. This

chapter also contains a description of the case study design, including the history and types of case study, and is concluded with the process of defining a case.

In Chapter 4 the researcher first describes the Case context, before defining the boundaries of the Case or unit of interest in this research, and the study sample. The specific methods used to answer each of the research questions, including the specific methods of data collection and any associated data collection tool development is then explained. The qualitative and quantitative analytical techniques used to examine and interpret the collected data is then described. The chapter is concluded with a discussion of the limitations of the study, and describes the recruitment methods and ethics.

Chapters 5 to 7, the researcher presents the predominantly qualitative research findings for the first three research questions. Briefly, the chapters are structured as follows:

- Chapter 5: Contains a description of the most relevant student demographics by sub-case, and identifies the demographic influencers of strong and weak differences in performance when undertaking a patient intervention using simulation-based teaching strategies. This chapter reports on research question one.
- Chapter 6: Contains a description of change in students' perceptions of confidence and difficulty in undertaking a patient intervention. Research question two is reported on in this chapter.
- Chapter 7: A comparison of the baseline performance of both sub-case populations is provided, followed by examination of the effect of standardised patients teaching methods on student communication and process skills. Finally, sub-case performance in communication, process and

total scores at the final session is directly compared. Research question three is reported on in this chapter.

Chapter 8 describes the potential benefits of simulation for early-career pharmacists during their transition from university to practice. The methods used in this chapter are predominantly qualitative and report on research question four. This chapter was prepared as a manuscript for publication and is currently under review. Chapter 9 is a response to the Case. In Chapter 9, the major findings and their relationship to the existing literature in the context of the Case are discussed, and significant conclusions drawn as a result of the synthesis of the literature and the findings of this study.

Chapter 10 is the final chapter, and contains recommendations based on the findings of this study. This chapter begins with a reflection on the researcher's journey and motivations for the study described at the beginning of the current chapter. It then describes the quality of the research, as well as the research limitations. It concludes by presenting this study's recommendations in three key areas: practice and education, policy and research.

1.7 Chapter Summary

This chapter has provided a brief synopsis of the research question and some useful background to the study. It has described the research aim and questions, and justified the study using both contemporary literature and the personal motivations and reflections of the researcher. The chapter then described the research design, and finally provided an outline of the thesis. Chapter 2 provides an in-depth examination of the existing literature. The first part of the literature describes the context of pharmacy practice and over-the-counter prescribing by pharmacists. The second part specifically examines the use of simulation and standardised patients in undergraduate pharmacy education. It also looks to other professional groups where simulation and standardised

patients have been used more extensively than in pharmacy undergraduate education. The third part of the literature, examining student transitions to practice, will be presented in Chapter 8.

Chapter 2: Literature

2.1 Introduction

This chapter contains a concise record of the available literature. The literature is divided into three parts. Part 1 describes the Australian pharmacy context within which the Case is positioned. Part 2 explores the use of simulation and standardised patients in pharmacy education. It briefly examines the literature from the national and international pharmacy perspective, as well as examining nursing and medicine, as these disciplines have a long history using simulation and standardised patient teaching methods. Part 2 is presented in the form of a published integrated review, accepted for publication in 2015. Parts 1 and 2 are contained in this chapter. Part 3 briefly examines the topic of pharmacy students' transition to practice. This literature will be presented in Chapter 8 with the qualitative interview data in the form of a manuscript, as this information will be particularly helpful in contextualising the findings from the transition to practice interviews conducted with pharmacy graduates. The manuscript that forms Chapter 8 has been submitted for publication.

2.2 Part 1: The Australian Pharmacy Context

Pharmacists feature prominently in the Australian healthcare system and are highly trusted by the public (Burton, 2013; Morgan Poll, 2013; Rigby, 2010). Extending on their principle role of the supply of medicines and medicine information, they also contribute to a collaborative patient-centred model of care that includes:

- triage and treatment of minor self-limiting conditions (Sibbald & Regehr, 2003)
- testing, screening, management and referral of more serious conditions

- collaboration on public health initiatives, such as illicit drug diversion programs or needle and syringe supply (The Pharmacy Guild of Australia, 2008)
- providing trusted and accessible information and advice on a broad range of health-related issues (Rigby, 2010)
- providing many other professional services that promote and contribute to the optimal use of medicines and the safe and effective delivery of health.

These services are underpinned by a unique body of professional knowledge centred on pathophysiology, pharmacology and therapeutics, the physical and chemical properties of drugs, pharmacokinetics and pharmacodynamics (Waterfield, 2010), and an understanding of public and primary healthcare principles.

As described in Chapter 1, the pharmacy profession in Australia is evolving (Hoti et al., 2011) to respond to changing population demographics, health workforce retention and dynamic patient expectations. Australian health policy objective reforms aim to expand the scope of health professional practice, support multidisciplinary teams and emphasise patient-centred care (Mak, Clark et al., 2013). These reforms are being complemented by new models of pharmacy practice that deemphasise product supply and emphasise pharmaceutical services (Lorimer et al., 2013; Mak, Clark et al., 2013).

These services—including the diagnosis and treatment of minor self-limiting conditions, disease prevention, chronic disease management advice, and patient and community education (Pharmaceutical Society of Australia, 2010)—require a high degree of professional knowledge and public accessibility in order to be effective. The provision of one of these services—the diagnosis and management of minor self-limiting conditions using unscheduled and over-the-counter medicines or S2 and S3 medicines (collectively referred to as ‘over-the-counter prescribing’, and sometimes

truncated to ‘counter prescribing’ or ‘OTC prescribing’)—is a necessary foundational skill for pharmacy graduates’ successful transition to practice. Anecdotally, industry partners rate these skills as important when assessing the work-readiness of Australian pharmacy graduates, particularly in community practice. Authentic learning activities and contexts allow students the opportunity to demonstrate professional knowledge and skills as it would be used in professional life (McDowell et al., 2016; Weller et al., 2012; Mantei & Kervin, 2009). The learning environment should also have quality feedback mechanisms and measure student performance against standards relevant to industry practices. By accomplishing this, a program of learning can promote the transferability of skills into students’ future practice. Limited placement learning opportunities make it difficult for pharmacy programs to provide the necessary real-life exposure to over-the-counter prescribing experiences. Thus, these real-life experiences must be supplemented by other learning and teaching strategies.

Despite an acceptance of simulation in medical and nursing education, there is significantly less evidence in the literature describing and evaluating educational strategies that employ standardised patients in an undergraduate pharmacy context. More specifically, there is limited Australian (Rao, 2011) and international (James et al., 2001; Marken et al., 2010; Rickles et al., 2009) literature that specifically addresses the effect of standardised patients on students’ ability to acquire the pharmacy-specific skills of counter prescribing, communication and prescription medicine counselling. Additionally, there exist relatively few studies that use comparative or blinded methods, such as control intervention studies. Six studies (Grice, Wenger, Brooks, & Berry, 2013; Lupu, Stewart, & O’Neil, 2012; Sales, Jonkman, Connor, & Hall, 2013; Vyas, Bhutada, & Feng, 2012; Wamsley et al., 2012) reported the use of control intervention or quasi-experimental methods in pharmacy undergraduate education comparing the use of

standardised patients with a control group or alternative. None of these studies used blinded methods or assessed the effect of confounding factors on performance.

Pharmacists' expanded scope of practice requires knowledge and skills in evidence-based practice and patient care to effectively perform this highly patient-focused role (Emmerton, Marriott, Bessell, Nissen, & Dean, 2005; Hoti et al., 2011). Pharmacist undergraduate education must prepare students to practice over-the-counter prescribing interventions in a safe and confident manner to the standard of a competent early-career pharmacist. Authentic learning experiences that replicate industry conditions as much as possible and reflect realistic scenarios and contexts can facilitate the acquisition of a range of clinical skills. The use of standardised patients may provide an effective and efficient segue between theory and practice for novices when developing the knowledge and skills to be competent graduate pharmacists. If properly implemented, teaching strategies using standardised patients can be used to teach a range of professional skills and knowledge, with a high level of supervision to provide a contextually appropriate, feedback-rich environment with appropriate safety for patients and students.

In this study, undergraduate pharmacy students enrolled in a regional Australian university experienced a training module that employed both traditional didactic teaching methods, and workshops incorporating standardised patients, in order to impart the counter prescribing, prescription counselling and communication skills—skills commonly drawn upon during their intern year after graduation. While these methods have been successfully employed by other health disciplines in the past, there is limited evidence to support the use of this resource and time-intensive intervention in undergraduate pharmacy students. A clear understanding of the educational effect of this teaching method is needed to justify its use.

2.3 Part 2: Standardised Patients in Pharmacy Education: An Integrative Literature Review

Adobe Acrobat Document

(Double-click Adobe Acrobat icon for portable PDF.)

2.4 Declaration of Authorship

Smithson, J., Bellingan, M., Glass, B., & Mills, J. (2015). Standardized patients in pharmacy education: An integrative literature review. *Currents in Pharmacy Teaching and Learning, 7*(6), 851–863.

Chapter	Publication details	Author contribution	Signature
2	Smithson, J., Bellingan, M., Glass, B., & J. Mills (2015). Standardized patients in pharmacy education: An integrative literature review. *Currents in Pharmacy Teaching and Learning, 7*(6), 851–863. Accepted for publication 8 June 2015. e-Publication 7 August 2015. Publication November 2015.	Developed the initial idea and argument for the manuscript, conducted literature search and analysis, developed initial draft, and edited subsequent drafts of the manuscript.	Smithson, J.
		Assisted with the argument for the manuscript, and writing and editing the manuscript.	Bellingan, M.
		Edited the manuscript.	Glass, B.
		Assisted with the argument for the manuscript, and writing and editing the manuscript.	Mills, J.

Available online at www.sciencedirect.com
ScienceDirect
Currents in Pharmacy Teaching and Learning 7 (2015) 851–863
Currents in Pharmacy Teaching & Learning
http://www.pharmacyteaching.com

Review article

Standardized patients in pharmacy education: An integrative literature review

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Abstract

Background: The value of standardized patients in undergraduate health-related education is recognized broadly in the literature as it can improve patient safety, provides a nexus between theory and practice, can supplement limited placement experiences, and improves work readiness of graduates.
Aim: This integrated review examines the evidence for the use of standardized patients as a teaching strategy in pharmacy education programs that prepare the graduate for initial registration as a pharmacist.
Method: A systematic search of Scopus, CINHAL, PubMed, ProQuest, Science Direct, Medline, A+ Education, and ERIC of 2000–2013 was conducted, revealing 27 articles for inclusion into this review. Suitable articles were systematically analyzed to identify relevant data for this review.
Results: Four themes relating to the use of standardized patients have emerged from the literature: student satisfaction, effectiveness to confer knowledge, skills and interprofessional practices, and its use in assessment and the cost of the educational intervention. Findings from this review show student acceptance for standardized patients as a teaching strategy, benefit for the technique in imparting knowledge and skills related to pharmacy, evidence to support the notion of standardized patients as a valid and reliable assessment tool and cost as a commonly identified barrier to the use of the teaching strategy.
Conclusion: The use of standardized patients in pharmacy education is increasing. Standardized patients have been used to develop the essential knowledge, clinical skills, and professional attributes required for practice. Gaps in knowledge around transferability, scalability, and cost benefit of this technique still exist, and there is a need for pharmacy educators to address these gaps to justify this resource-intensive teaching method.

Keywords: Patient simulation; Standardized patient; Simulated patient; Models educational; Pharmacy; Education

Introduction

Pharmacists are highly accessible health care providers[1] and feature prominently in an Australian health care system characterized by an aging and more demanding health consumer.[2–4] In response to increased demand for services and the down scheduling of prescription medicines, the pharmacy profession has extended its principle role of the supply of medicines and medicine information to include a range of other services that support a collaborative, patient-centered model of care.[5,6] To ensure that recently graduated pharmacists are adequately prepared for this extended role, teaching methods utilizing patient simulation, including standardized patients, are being used increasingly to ensure that students practice and are

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http://dx.doi.org/10.1016/j.cptl.2015.08.002

being assessed under conditions that reflect clinical practice.[7]

The use of standardized patients in educating students in entry-level health-related programs is widely reported in the literature.[8–11] For the purpose of this paper, an entry-level program is defined as one designed to deliver the minimum required training and education for entry into the pharmacy profession. A student who has completed such a program is an entry-level graduate. The value of using simulation in health-related education and training has long been recognized and has been considered an integral part of nursing and medical curricula for decades.[12–15] The main drivers for expansion of simulation-based learning and teaching include improved patient safety,[16,17] a need to supplement increasingly limited practicum experiences, and the goal to produce "work-ready" entry-level graduates who are prepared for collaborative clinical practice from day one. Simulation is not as widespread nor as advanced in entry-level pharmacy programs as it is in medicine and nursing programs.[18]

Defining simulation

The term simulation in the context of clinical teaching encompasses a number of complementary but distinctive teaching modalities. Simulation has been described by many authors[18–27] as substituting "real" patients for virtual-reality computer simulation, computer-aided mannequins, low-fidelity organ substitutions, or trained standardized patients role-playing a patient experience. Early work by Barrows and Abrahamson[28] describes the use of a "programmed patient," in which the simulation of disease is carried out by a normal individual who is trained to accurately portray the history and findings of a patient's condition in the manner of an actual patient. Patient simulation practices today echo that early work and can be defined as the substitution of a bona fide patient encounter with artificial models or mannequins, virtual reality, or live actors enacting a scenario that replicates substantial aspects of the real experience in a controlled environment.[29–31]

Two broad classifications of patient simulations have emerged in the literature. The first is human patient simulation (HPS) that includes high-fidelity computer-aided mannequins[32,33] and task trainers as well as low-tech, low-fidelity substitutions such as preserved animal organs.[34] The second is the "standardized patient" that commonly involves community volunteers or paid actors,[7] student peers, or faculty academics, teaching and administrative staff (faculty staff) who role-play a patient-based scenario.

There is contrast in the use of the different simulation types across the health disciplines. For example, medicine and nursing commonly use patient simulation to teach a broad range of clinically related skills such as history taking, patient examination, the practice of physical therapy techniques, clinical decision making, and critical thinking and communication.[18,33,35,36] This is demonstrated in a great number of articles describing the use of HPS techniques such as task trainers, computer simulators, and medium- and high-fidelity mannequins in addition to standardized patients. Despite the perception that pharmacy practice does not necessitate the same degree of physical contact with patients, there is evidence for the use of simulation across a range of discrete pharmacy practice-related skills including communication,[20,37,38] clinical decision making, patient history and physical assessment,[39,40] and the application of pharmaceutical care.[41,42] A prima facie assessment of the literature on pharmacy use of simulation suggests a bias toward the use of standardized patients in pharmacy programs with fewer examples of the application of HPS techniques found.[39,43,44]

Defining the standardized patient

A standardized patient can be defined as someone who has been trained to portray a character or a patient problem as described in a scripted case scenario, and who can deliver a consistent, similar performance to different students.[20,45–48] The experience exposes trainee practitioners to clinical scenarios in a safe and predictable learning environment.[7] Standardized patients might also assess or provide feedback on student performance based on their experience of the patient–practitioner interaction.[45] Standardized patients often follow a script, allowing for varying levels of improvisation, to create a more fluid environment that mirrors an authentic situation more closely.

Standardized patients may be selected for existing disease profiles but are equally valuable when free from the disease of interest if complementary scripts or scenarios are developed. Appropriate selection of the standardized patient and scenario can allow for a range of clinical learning opportunities not limited to patient history and physical assessment, interpersonal and interprofessional communication, clinical reasoning, and the selection and application of relevant clinical therapies.[40,48–50]

The literature describes three distinct types of standardized patient: community volunteers or paid actors; faculty academic staff, teaching staff and administrative staff; and student peers. Each type of standardized patient has a unique combination of advantages and limitations, making each standardized patient type more or less suitable for different teaching and learning experiences. Table 1 summarizes some of the relative advantages and limitations of each of the three main types of standardized patient.

Why use standardized patients to teach?

Simulation is an adaptable teaching method and can be used to develop a range of skills and knowledge in pharmacy teaching. Simulation can be used to address gaps in clinical exposure; it can develop communication techniques; facilitate exposure to interprofessional experiences; and allow for the practice of patient assessments and clinical interventions in a controlled and safe environment.

Table 1
Advantages and limitations of standardized patient types

Type	Advantages	Limitations
Community volunteers and paid actors	Unfamiliarity to and with students Increase the fidelity of simulation Generally flexible when scheduling and training Tend to stay close to script provided Provide valid feedback on the "patient experience" Cost is often less than that of academic staff when using for volunteers	Require training Limited ability to provide feedback on technical aspects of performance Higher cost (if using paid actors) Significant time investment needed to design and implement[1]
Faculty staff in role of patient	Enhanced feedback Feedback aligned with documented learning outcomes Experience with assessment and grading Requires less training Accepted by faculty and students Gives insight into efficacy of instructional program[2]	Significant expense May stray from case or script[2] May provide unintended cues[2]
Peer (student) in role of patient	Requires less training Generally inexpensive[2] More readily available May reduce student anxiety[2] The student–patients benefit directly from experience themselves[3–5]	Less consistent feedback and rating[2]

From a curriculum perspective, standardized patient teaching methods can reliably deliver experiences that complement the planned curriculum and allow for targeted instructor feedback to the trainee.[51] Standardized patient experiences can reduce undesired distractions that can occur in real life situations, while allowing for student exposure to high-risk or uncommon medical conditions in a safe and controlled environment. Standardized patients allow for repeated clinical scenarios, and cases can be offered on demand, increasing exposure and consistency of transferable learned knowledge to the patient-care context.[27] Arguably, the most important is the way standardized patients can enhance patient safety because students can practice clinical skills without risk to actual patients.[16–18]

This integrative review examines evidence for the use of standardized patients as a teaching strategy in pharmacy education programs. This focus reflects the need for pharmacy educators to prepare entry-level graduates for modern pharmacy practice.

Design

An integrative review[52] was conducted of the literature relating to the use, cost, and advantages of standardized patients as a teaching strategy in entry-level pharmacy education programs. The review purpose was established, search terms and databases identified, and inclusion and exclusion criteria set. A database search was undertaken and articles meeting the inclusion criteria were assessed using Critical Appraisal Skills Program (CASP) checklists.[53,54] Studies judged to be of sufficient quality were analyzed and synthesized for this paper.

Search methods

The following key terms were used: *patient simulation*, [*models, educational*], *pharma**, *educat**, *studen**, [*simulated patient* OR *standardi* patient*], "high-fidelity simulation", "*patient education", and "*education, pharmacy". The term "high-fidelity simulation" was included to ensure that articles describing high-fidelity simulation in the context of human actor role-play were included (as opposed to high-fidelity simulation using human patient simulation (HSP) technologies). The terms were used to search the following databases: Scopus, CINHAL, PubMed, ProQuest, Science Direct, Medline, A+ Education, and ERIC. Where combinations of these terms failed to narrow the search to appropriate levels of fidelity in studies of simulation in pharmacy, appropriate permutations or limits were applied, "related searches" were used, or search terms were exploded. The search was limited to peer-reviewed articles, in English, published between January 2000 and December 2013: a date range that reflects a period of sustained increase in the number of pharmacy schools in Australia. A hand search using an ancestry approach was also undertaken for selected relevant articles.

Search outcome

In total, 1993 journal articles were identified. A primary review of the journal article titles was conducted, and 304

articles with titles identifying a relationship to the topic were retained. Abstracts of the 304 articles were reviewed and 44 articles reporting the use of and evidence for the efficacy of standardized patients as a teaching strategy in pharmacy education were retained. An additional nine records were identified through ancestry searches of these articles during the review process.

Quality appraisal

In all, 53 journal articles were comprehensively assessed for rigor and relevance to the purpose of the review. Criteria for assessing qualitative research, systematic reviews, and case control study as described by the Critical Appraisal Skills Program (CASP)[54–56] were used. After this critical appraisal, 28 journal articles were included in this review. Table 2 provides an overview of these articles. An overview of the process of identification, screening, eligibility determination, and inclusion of articles used in this integrative review is illustrated in the Figure. This figure follows the PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) process described by Moher et al.[57]

Method of analysis

A data reduction process was used to extract, simplify, organize, and code data from the articles. Data sources were organized under pre-determined classifications as described by Whittemore and Knafl.[52] Complete coding was undertaken simultaneously as described by Braun and Clarke.[58] Each journal article was systematically analyzed to identify data relevant to this review. Relevant data were initially marked on a hard copy of the journal article, and then a summary of the information was recorded in a memo under the relevant coding category to facilitate grouping and comparison. Categories were further refined and collapsed using pattern-based analysis as described by Braun and Clarke[58] and Saldana.[59] Pattern-based analysis captures ideas, concepts and relationships that recur across a data set to develop themes. Themes can evolve based on the frequency or saliency of the ideas, concepts, or relationships elucidated from the data.

Findings

Four main themes relating to the use of standardized patients as a teaching strategy in pharmacy education programs were identified in this integrative review:

1. students' preference for standardized patient type,
2. applications and efficacy,
3. student assessment, and
4. cost.

Theme 1—Student preference for standardized patient type

The medical and nursing literature reports acceptance of the use of standardized patients in entry-level programs[60–62] and these findings are confirmed in a number of articles that assessed pharmacy student preference for a type of standardized patient. While pharmacy students rate all types of standardized patients positively,[39,63] they strongly preferred non-pharmacy participants such as community volunteers or actors rather than faculty academic staff, teaching staff and administrative staff, and student peers.[39,41,63,64] Reasons commonly cited for this preference included the following:

- Volunteers were more believable as their chronological age often matched the patient scenario more closely, resulting in a more authentic experience.[38,41,63–65] Faculty academic, teaching, and administrative staff were found to be less believable.[63]
- Interactions with standardized patients made students feel more confident working with real patients during clinical rotations or placements.[41,63]
- Standardized patients created a comfortable environment that allowed students to effectively engage in communication, improving their ability to collect pertinent patient information.[64]
- Volunteers were less intimidating than faculty academic, teaching, and administrative staff as they were not usually involved with grading of performance.[63,64]
- There was a reduced potential of embarrassment, which could be felt when interacting with peers.[63]

Theme 2—Applications and efficacy

The intent of teaching strategies using standardized patients in pharmacy programs is to reinforce knowledge, teach a broad variety of professional skills, and develop professionally appropriate attitudes in the student population. Assessment of knowledge transfer is an important consideration and a small number of articles found that standardized patients were beneficial in facilitating knowledge transfer,[43,66,67] but did not show benefit above other simulation methods.[67] Despite this, simulated-patient encounters can provide pharmacy students with the opportunity to integrate pharmaceutical knowledge and skills (for example, physical assessment and history taking, problem solving, and disease management) to a practice-oriented situation.[40]

Evidence suggests that students acquire a range of professional pharmacy-related skills from standardized patient experiences. Two articles demonstrated that students

Table 2
Literature review summary

Title	Year	Author(s) and origin	Journal/source	Design	Sample size and participants	Summary of findings
Theme 1—Student satisfaction with and preference for type of standardized patient						
Community-based collaboration with high school theater students as standardized patients	2007	Schultz, K. and Marks, A., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	97 PharmD students	Evaluate pharmacy students' preference for type of SP and acceptability of high school student as a SP
Pharmacy students' preference for various types of simulated patients	2008	Gallimore, C., George, A. and Brown, M., USA	American Journal of Pharmaceutical Education (AJPE)	Sample survey	107 Pharmacy students	Evaluates pharmacy students' preferences for various types of simulated patients
Comparison of patient simulation methods used in physical assessment course	2013	Grice, G., Wenger, P., Brooks, N., and Berry, T., USA	American Journal of Pharmaceutical Education (AJPE)	Prospective randomized case study?	*N* = 156 group-A, N = 76 (mannequin), groupB, N = 78 (SP)	Investigates potential difference in student pharmacists' learning or satisfaction when using standardized patients or manikins to teach physical assessment
Assessment of anticoagulation management in a simulated ambulatory care clinic.	2007	Raney, E., USA	American Journal of Pharmaceutical Education (AJPE)	Evaluation survey of experience and preference for using role-play	56 PharmD students	Investigates the effectiveness of adding a simulated anticoagulation clinic practical examination
The design and evaluation of a simulated-patient teaching programme to develop the consultation skills of undergraduate pharmacy students	2001	James, D., Nastasic, S., Horne, R., and Davies, G., UK	Pharmacy World and Science	Descriptive paper and case study	91 PharmD students	Describes the design and implementation of a structured "consultation skills" teaching program using SPs. Identify key skills and knowledge required for the delivery of an ideal patient consultation (to inform the development of a training program using SPs). Evaluate students' ability and confidence in performing effective consultation
Using volunteer simulated patients in development of pre-registration pharmacists: learning from the experience.	2007	Nestel, D., Calandra, A., and Elliott, R., Australia	Pharmacy Education	Survey	97 Pre-registration pharmacists	Describes the development of a communication session that uses volunteer SPs to support the training of pre-registrant pharmacists
Theme 2—Use of standardized patients to develop professional skills, knowledge, and attitudes						
Comparison of active learning strategies for motivational interviewing skills, knowledge, and confidence in first-year pharmacy students.	2012	Lupu, A., Stewart, A., and O'Neil, C., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experimental double-blinded control design	143 PharmD students	Compares three strategies for pharmacy student learning of motivation interviewing skills, knowledge of motivational interviewing principles, and confidence and attitudes toward their application
A comparison of educational interventions to enhance cultural competency in pharmacy students.	2013	Sales, I., Jonkman, L., Connor, S., and Hall, D., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experimental	84 PharmD students	Evaluates three different educational interventions designed to enhance cultural competency in pharmacy students
Comparing effectiveness of 3 learning strategies—simulation-based	2012	Smithburger, P., Kane-Gill, S., Ruby, C.,	Simulation in Health care: The Journal	Prospective, randomized crossover study	103 PharmD students	Compares the effectiveness of three commonly used learning strategies—(HF) simulation-

Table 2
Continued

Title	Year	Author(s) and origin	Journal/source	Design	Sample size and participants	Summary of findings
learning, problem-based learning, and standardized patients.		and Seybert, A., USA	of the Society for Simulation in Health Care			based learning, problem-based learning, and standardized patients
The impact of a standardized patient program on student learning of communication skills	2009	Rickles, N., Tieu, P., Myers, L., Galal, S., and Chung, V., USA	American Journal of Pharmaceutical Education (AJPE)	Blinded retrospective analysis	107 PharmD students	Evaluates the value of a lecture–laboratory course with standardized patients on communication skill. Investigates student attitude toward standardized patients
Development and assessment of social and emotional competence through simulated-patient consultations.	2012	Galal, S., Carr-Lopez, S., Seal, C., Scott, A., and Lopez, C., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	212 PharmD students	Investigates if a quantitative tool could be used to measure social emotional competence and whether the development of social emotional competence through a pharmacy practicum course is possible. Intervention uses patient simulation
Skills development using role-play in a first-year pharmacy practice course.	2011	Rao, D., Australia	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	$N = 130$ in S1 and $N = 129$ in S2	Investigates the usefulness of a role-play model in developing students' patient-care skills in a first-year undergraduate pharmacy practice course
An interprofessional course using human patient simulation to teach patient safety and teamwork skills.	2012	Vyas, D., McCulloh, R., Gregory, G., and Higbee, D., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	208 Students, including 23 PharmD students	Investigates the effectiveness of simulation (including standardized patients) to teach patient safety, teambuilding skills, and the value of interprofessional collaboration to pharmacy students.
The impact of an interprofessional standardized patient exercise on attitudes toward working in interprofessional teams.	2012	Wamsley, M., Staves, J., Kroon, L., Topp, K., Hossaini, M., and Newlin, B., Lindsay, USA	Journal of Interprofessional Care	Quasi-experimental design comparing intervention group (undertook ISPE) to convenience sample not exposed to intervention	Intervention group $N = 94$ pre- and 91 post-control N = 152 post-	Describes the creation, implementation, and evaluation of interprofessional standardized patient exercise (ISPE)
An interprofessional activity using standardized patients.	2006	Westberg, S., Adams, J., Thiede, K., Stratton, T. and Bumgardner, M., USA	American Journal of Pharmaceutical Education (AJPE)	Descriptive paper. Survey methodology with written responses	26 PharmD students	Describes the development and implementation of an interprofessional activity using standardized patients
Standardized patient assessment in a disease state management model.	2002	Glasser, D., Ahrens, R., Caffee, A. and Johnson, M., USA	American Journal of Pharmaceutical Education (AJPE)	Descriptive paper		Describes a workshop to teach basic patient assessment skills in a disease state management model using standardized patients
Human Simulators and Standardized Patients to Teach Difficult	2010	Marken, P., Zimmerman, C., Kennedy, C.,	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	11 Students	Evaluation of simulation to teach interprofessional teams to recognize and

Conversations to Interprofessional Health Care Teams		Schremmer, R. and Smith, K., USA				engage in difficult conversations with patients
Theme 3—Assessment						
Simulated patients vs. standardized patients in objective structured clinical examinations.	2006	Austin, Z., Gregory, P. and Tabak, D., Canada	American Journal of Pharmaceutical Education (AJPE)	Multiple methods study	99 PharmD students, 14 in follow-up	Describes the use of patient actors as educators and to contrast the value and application of "standardized patient" and "simulated patient" educational methodologies
Traditional student, non-traditional student, and pharmacy practitioner attitudes toward the use of standardized patients in the assessment of clinical skills.	2000	Monaghan, M., Turner, P., Vandergush, R. and Grady, A., USA	American Journal of Pharmaceutical Education (AJPE)	Survey	64 PharmD students	Evaluates the assessment process using standardized patients from the perspective of the person being tested to determine differences in student type (traditional vs. non-traditional vs. BS-degree pharmacy practitioners)
Patient simulation to demonstrate students' competency in core domain abilities prior to beginning advanced pharmacy practice experiences.	2012	Vyas, D., Bhutada, N. and Feng, X., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experiment Multiple-method study Baseline control group using traditional methods	28 to intervention group, 60 to control group	Describes the implementation of IPPE with simulation and measure effect on student competency in core domain abilities prior to beginning advanced pharmacy practice experiences
Using first-year students as standardized patients for an objective structured clinical exam for third-year pharmacy students.	2001	Sibbald, D., Canada	American Journal of Pharmaceutical Education (AJPE)	Multiple-method study	120 PharmD students	Investigates the reliability, validity, feasibility, and acceptability of using first-year SP and faculty raters to evaluate performance in a third-year OSCE
Impact on the psychometric properties of a pharmacy OSCE: using first-year students as standardized patients.	2009	Sibbald, D. and Regehr, G., Canada	Teaching and Learning in Medicine: An International Journal	Quasi-experimental (comparison of outcomes for professional SPs and first-year student SPs	$N = 108$ first-year PharmD students	Investigates the quantitative impact of using first-year pharmacy students as SPs
Use of standardized patients as an assessment tool at the end of an ambulatory care rotation	2000	Weathermon, R., Erbele, S. and Mattson, M., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple-method study	28 PharmD students	Describes the use of standardized patients to evaluate clinical competence of PharmD students at the end of a four-week ambulatory care clerkship. Assesses communication skills, therapeutic judgement, and knowledge of technical tasks
An assessment program using standardized clients to determine student readiness for clinical practice.	2013	Ragan, R., Virtue, D. and Chi, S., USA	American Journal of Pharmaceutical Education (AJPE)	Multiple-method study	$N = 103$ and $N = 170$ PharmD students	Describes and evaluates a competence-assessment program to identify students at risk of underperforming at advanced pharmacy practice experience sites
Performance-based assessment: using pre-established criteria and continuous feedback to enhance a student's ability to perform practice tasks.	2000	Beck, D., USA	Journal of Pharmacy Practice	Literature review		Investigates the issues limiting widespread use of performance-based assessment, based on findings from the pharmacy, medical, and general education literature. Proposes a model for successful implementation of performance-based assessment—part of which includes simulations involving standardized patients

Table 2
Continued

Title	Year	Author(s) and origin	Journal/source	Design	Sample size and participants	Summary of findings
Theme 4—Cost of simulation						
Simulation and introductory pharmacy practice experiences.	2011	Lin, K., Travlos, D., Wadelin, J. and Vlasses, P., USA	American Journal of Pharmaceutical Education (AJPE)	Literature review		Literature review reporting various types of simulation and their incorporation into health professions curricula, describing how simulation training is recognized in other professions and evaluates the feasibility of integrating simulation into experiential education programs of pharmacy schools. Positions the different simulation strategies in relation to each other
Use of Simulation-based Teaching Methodologies in US Colleges and Schools of Pharmacy	2013	Vyas, D., Bray, S. and Wilson, M., USA	American Journal of Pharmaceutical Education (AJPE)	Survey study	88 Colleges and schools	Characterizes the use of mannequins and standardized patients and the use and applications in US pharmacy course curricula. Brief discussion on barriers, including cost
Standardized patients: an ability-based outcomes assessment for the evaluation of clinical skills in traditional and non-traditional education	1997	Monaghan, M. Gardner, S, Schneider, Grady, A., and McKay, A., USA	American Journal of Pharmaceutical Education (AJPE)	Quasi-experimental		Describe the development of a Pharmaceutical Care Encounters Program and to assess the reliability and validity of the use of simulated patients (also described as standardized participants) in assessment

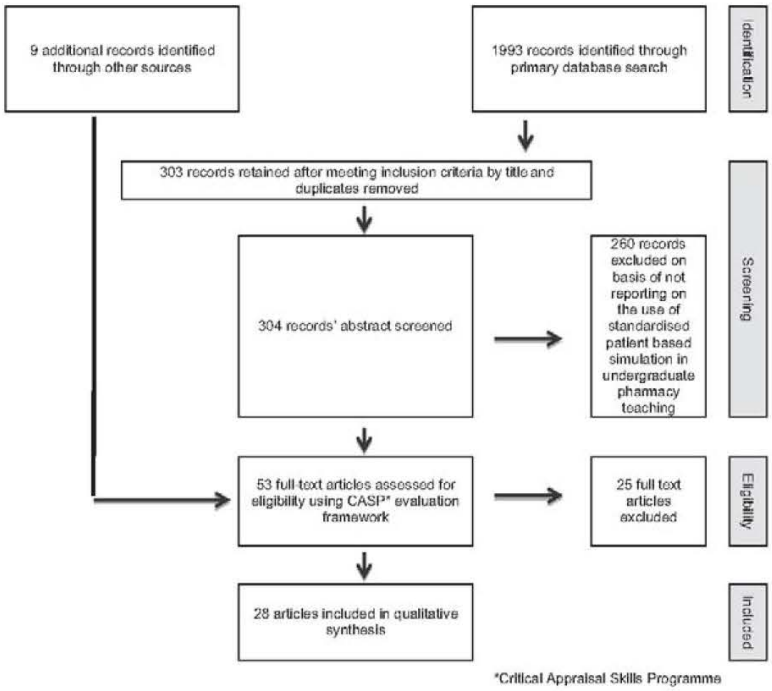

Fig. Flow diagram of the study selection process.

performed significantly better on skill-based assessments,[39,67] particularly during the formative phase of assessment, and one article found that students were better prepared for the minimal competency examinations when standardized patients were used.[66] Further adding to the benefit of standardized patients, students' self-reported confidence levels improved across a range of skills.[37,66,67] Despite the improvement in skill level demonstrated by students exposed to standardized patient methods, there is conflicting evidence to support the benefit of one standardized patient type over another for skill development,[39,45,63,67] and little evidence from longitudinal studies showing a sustained advantage over other teaching methods.[67]

Four articles evaluated the use of standardized patients in teaching communication skills to pharmacy students. Two studies found positive, significant, and progressive improvements in student communication,[7,20] while another found a high degree of student satisfaction with the method and self-reported improvement in verbal skills.[42] Another study found significant improvement and better performance in motivational interviewing, knowledge of motivational interviewing principles, and confidence in and attitudes toward their application compared with peer role-play or written instructional techniques.[67] While students exposed to standardized patients were found to perform better during the practice-laboratory sessions, the difference was not significant among the three instructional techniques at the final examination.[67]

Two papers reported the use of standardized patients in improving cultural competency[68] and social emotional competency[65] of pharmacy students. Both articles found an improvement in student cultural and social emotional competency scales compared with case study instructional techniques.[65,68]

Standardized patients have also been used successfully to teach team-based skills and interprofessional collaboration.[7,48,69–71] Three articles reviewed the impact of standardized patients on interprofessional outcomes such as teamwork, interprofessional communication, and understanding of professional role for pharmacy students. Pharmacy students demonstrated positive improvements in knowledge, skill, and attitudes toward team-based care, had a more developed understanding of the roles of other professions, and had greater confidence in interacting with other health professionals.[71–73] While one study found that students were not more confident reacting to patient safety concerns, in general, there were improvements in knowledge, skill, and attitudes toward team-based behaviors,[72,73] specifically:

- Improvements in student knowledge of the role of other health professionals[71–73];
- fewer students felt that the interprofessional experience diluted the quality of training in their own field[73]; and

- students responded more positively to questions about interprofessional communication and teamwork.[72,73]

Theme 3—Student assessment

The broader health literature reports widely on the use of standardized patients in assessment, most commonly in the medical profession. The pharmacy literature contains fewer articles.[21,23,45,66,74,75] The articles reported on the use of standardized patients in objective structured clinical examinations (OSCEs), in formative assessment, and the acceptability and quality of feedback provided by the standardized patient and its correlation to "expert" feedback from experienced teaching staff. One of these articles investigated the use of standardized patients to identify students at risk of poor performance in an advanced pharmacy practice experience (APPE).[66]

Standardized patients are used in both formative and summative assessment to test a variety of skills and knowledge in a context that replicates clinical settings. Evidence supports the notion that students trained using standardized patients are better prepared for competency exams; the instruction technique is an effective method to measure knowledge and communication ability and can indicate future performance in real clinical encounters.[66,75] Four articles reported on aspects of students' acceptance of and comfort level in working with standardized patients during assessment:

- The strategy is authentic, that is, standardized patients can effectively portray the patient condition[74] and the process reflected real world practice[21,75,76];
- assessments using standardized patients provided a good indication of the student's strengths or weaknesses[21];
- OSCEs or similar examinations using standardized patients challenged students to think critically[76]; and
- feedback improved their pharmaceutical care skills.[74]

One article described student concern over the fairness of grading because of the potential bias introduced by differences in portrayal when using multiple standardized patients but researchers concluded that these concerns were more than offset by the educational experience.[74]

High costs can be associated with assessment methods that use standardized patients; therefore, students are sometimes used to perform the role of standardized patient to reduce the cost.[77] Two articles assessed the reliability and validity of student–standardized patient performance ratings or assessments. The scores produced by students were adequately reliable and valid for formative assessment[45] or OSCE scores.[23] Additional benefits of the student–standardized patient were networking with other (often more senior) students, improved communication skills, and a deeper understanding of the patient experience and future course expectations.[23]

Supporting the relatively limited pharmacy literature about reliability and validity in assessment using standardized patients, a small number of articles also comment on the lack of reliability of using standardized patients as part of an assessment program or as assessors themselves. Evidence from the pharmacy and medical literature suggests that reliability can be achieved through adequate sampling of tasks,[76,78] increased length of test, and the use of multiple examiners.[78] Achieving reliability in this way requires significant resources and can reduce assessment validity.[78] Even when high levels of reliability cannot be achieved, the validity that standardized patients offer is considered to be of significant value and therefore the trade-off of reliability for validity is acknowledged in the context of a broader assessment program.[13]

Theme 4—Cost

Simulation can be a cost-effective[23,45] but expensive[20,77] teaching method. The high cost of simulation is often associated with high- and medium-fidelity HPS where initial purchase costs remain very high.[18] Even when volunteer patients or students are used, significant investments of time and resources to plan the intervention, develop scenarios, and recruit and adequately train the standardized patients are needed to achieve a consistent case portrayal and use an associated student rating (assessment) tool.[7,23,45] Where volunteers or students were not used and pharmacy programs remunerated their standardized patients, the cost of the simulation was obviously greater, though one study suggested that the cost of implementing simulation in pharmacy education—specifically in the application of OSCEs—may be lower than that experienced in medical education.[48] The reason for the cost differential was not explained. In addition, simulation spaces, irrespective of simulation type, require significant spatial and human resources to be used to their full potential.[18,44]

Resources are a commonly reported barrier to the use of simulation[44] and there is a paucity of evidence about the potential return on investment.[18] Therefore, the careful selection of experiences, sites, and resources most suited for simulation and student assessment can optimize what can be a significant resource investment.[66]

Discussion

Simulation-based training has been used extensively in high-risk professions such as aviation, mining, military, and the nuclear industry in an effort to maximize training opportunities and minimize risks.[16,79] Recognizing the potential for nursing and medical education, a variety of simulation techniques have been adopted in health education to improve learning outcomes, student preparedness for practice, and patient safety. Beginning with the early work of Barrows and Abrahamson[28] who first described the use of the "programmed patient" in a medical course, the application of the

standardized patient method and the potential benefits in teaching and learning have been extensively described in nursing and medicine.[50,80–84] This literature presents findings consistent with that found in the four themes identified in the pharmacy literature describing the use of standardized patients in entry-level pharmacy courses.

Consistent with the findings in the pharmacy literature, both students and instructors reported high levels of satisfaction with standardized patient methods. Students reported that the experiences created a safe and authentic environment; instructors said the experiences could be tailored to the student and integrated theory with practice. Further, students and instructors reported that standardized patients allowed for the synthesis of knowledge; sharing of strategies and communication at an individual level[7,80,85]; can promote interdisciplinary collaboration and interprofessional education[86]; and improve the student knowledge and skills.

Standardized patients are used for a broad range of knowledge and skill development activities. Frequently, knowledge and/or skills (such as interdisciplinary experiences, communication, patient assessment, and clinical decision making) are reported in the literature, as are changes to attitudes. The majority of articles described benefits during the course with a smaller number of articles reporting on the effect on learning in clinical practice. In the nursing and medical literature, standardized patients have been used to develop communication,[25,50,81,87] clinical skills,[50,85] improve learning satisfaction,[85] improve confidence in managing clinical problems,[82] improve knowledge and skill acquisition,[31,88] enhance cultural[89] and ethical awareness, improve patient assessment skills,[90] expose students to interdisciplinary activities,[71,86] and develop clinical decision making.[83] Standardized patients are commonly employed as part of assessment programs such as OSCEs, becoming a standard method of evaluation for high-stake and registration examinations in both pharmacy and medical examinations.[78,79,84,91] While the high degrees of assessment reliability desired in high-stake assessment can be difficult to obtain with modest resources, the validity offered by standardized patient in assessment remains valuable.[13]

While it is agreed that the training of health professionals requires exposure to real patients at some stage, the educational imperative must be balanced against patient safety and well-being.[92] Standardized patient teaching methods have been used across health disciplines to mitigate the ethical tensions of using real patients in clinical training[49] and provide scaffolded exposure to relevant clinical scenarios in a safe environment. Simulation as a learning, teaching, and assessment strategy is increasing in pharmacy. Despite the extensive reporting in the literature, there exist gaps in knowledge around the transferability, scalability, cost benefit, and alignment with educational theory and design. More robust research is required to properly understand the benefits in relation to the costs of this teaching method.[93] There is an opportunity to increase the use of simulation in pharmacy education and this requires pharmacy educators to borrow from the experiences of other health professions and to be creative in incorporating this teaching method into existing curricula.

Conflict of Interest and Financial Disclosure Statements

We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no financial support for this work that could have influenced its outcome.

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2.5 Review of Most Recent Literature: January 2014 to January 2016

Following from the manuscript published in 2015, a review of the recent literature using a similar search strategy was conducted. The following key terms were used: *patient simulation*, [*models, educational*], *pharma**, *educat**, *studen**, [*simulated patient** OR *standardi** *patient**], "*patient education" and "*education, pharmacy". The terms 'high-fidelity simulation', 'HPS' and 'HF' were excluded using the 'AND NOT' function, as the terminology in recent literature has become more consistent to ensure articles describing high-fidelity simulation do not include standardised patients or human actor role-play. A Scopus database search was conducted limited to the date range between January 2014 and January 2016, manuscripts published in English and manuscripts from peer-reviewed journals. Sixty-five manuscripts were identified using the search strategy (see Table 2.1). The manuscript title and abstract were reviewed for relevance to the four themes identified in the original manuscript (Smithson et al., 2015). This produced 10 manuscripts for inclusion in this section. A summary of the findings of these manuscripts is organised by the four themes in the following paragraphs.

Table 2.1

Scopus Search Results January 2014 to January 2016

Search	Search term(s)	Return count
#1	"patient simulation"	568
#2	"models, educational"	578
#3	pharma*	111,312
#4	educat*	153,564
#5	studen*	79,659
#6	"simulated patient*" OR "Standardi* patient*"	582
#7	"patient education"	7,450
#8	"education pharmacy"	381
#9	"high fidelity simulation" OR "HPS" OR "HF"	79,659
#10	(#1 OR #6) AND #3 AND NOT #9	63
#11	Number of articles retained after review of title and abstract	**8**
#12	(#1 OR #6) AND (#2 OR #4 OR #5 OR #7 OR #8) AND #3 AND NOT #9	45
#13	Number of articles (not identified in #11) retained after review of title and abstract	**2**
	Number of articles retained after review of title and abstract	**10**

2.5.1 Students' preference for standardised patient type. None of the manuscripts provided new comment on students' preference for standardised patient type. The literature findings on standardised patient type preference have been consistent for some years—that is, students rate all types of standardised patient positively, but prefer community volunteers or actors over academic staff and peers. A number of more recent studies or reviews have extended the commentary on learner satisfaction with simulation use in pharmacy or pharmacotherapy teaching. A number of studies have reported that student acceptance for simulation (including standardised patients) remains high because it is found to be realistic, a good learning experience, time effective and motivating for learners (Aura, Sormunen, Jordan, Tossavainen, & Turunen, 2015; Chen, Kiersma, & Abdelmageed, 2015; Fejzic & Barker, 2015a; Hanya, Yonei, Kurono, & Kamei, 2014). This supports previous findings about students' acceptability of standardised patients.

2.5.2 Applications and efficacy. The recent literature continues to find evidence to support standardised patients as an effective teaching method, although, like previous studies, more recent studies' findings remain hindered by small and under-resourced studies and less powered study designs, which may limit the broader generalisability of their findings. A review by Aura et al. (2015) (which included some of the same research used in the manuscript written for this chapter [Smithson et al., 2015]) found that simulation teaching strategies increased knowledge, improved pharmacotherapy evaluation skills, improved the application of pharmacotherapy and increased student confidence. Aura et al. also found the comparison with other teaching methods was also favourable; however, similar to earlier evidence, there was no evidence of superiority over other similar teaching strategies. In a study evaluating the effect of standardised patient teaching on student pharmacists' counselling confidence and communication skills involving 64 pharmacy students, Chen et al. (2015) found that standardised patients significantly improved students' counselling confidence. Of significant interest is their conclusion, which was that exposure to standardised patients prior to experiential education rotations (placements) could improve students' comfort level and confidence in patient counselling (Chen et al., 2015, p. 817). Similar improvement in student confidence was identified by authors in other studies, such as those by Davies, Schonder, Meyer, and Hall (2015); D'Souza, Lempicki, Mazan, O'Donnell, and Sincak (2015); Koo et al. (2014); and Vyas, Feng, Bhutada, and Ofstad (2014).

Davies et al. (2015) assessed the effect of standardised patients and standardised colleagues (peers) on 109 third-year pharmacy students' inter-professional interactions, communication, SOAP (Subjective, Objective, Assessment Plan) note preparation, and confidence. They found that students performed significantly better from the practice activity using standardised patients to the final activity on communication and

evidenced-based SOAP note preparation, but also found no difference in performance for the standardised colleague interaction arm. Koo et al. (2014) used standardised patients and role-play physicians to develop pharmacy students' and nurse practitioners' inter-professional collaboration skills during an inter-professional education experience. They found that using standardised patients increased confidence, gave improved understanding of roles, and gave a better sense of inter-professional support. The fidelity of the experience was credited for students' ability to observe other professionals' performance in a comprehensive manner.

In a study examining the effect of simulated learning modules incorporating standardised patients in a Master of Pharmacy course, Fejzic and Barker (2015a) found significant improvement in students' pharmacy practice skills and professionalism. In addition to skills improvements, the students reported that using simulation learning modules was a time-efficient learning method. The authors reported that a particular strength of the simulated learning modules was the delivery of professional practice scenarios in a comfortable and supported environment that allowed for immediate feedback on student performance.

Similar to Chen et al. (2015) and Davies et al. (2015), Hanya et al. (2014) found that standardised patient teaching methods improved student communication performance. Hanya et al. found that the use of role-play with simulated patients and reflection using video review facilitated the acquisition of both written and verbal communication skills, and was deemed an effective method of providing communication skills training.

Finally, Vyas et al. (2014) compared the use of standardised patients in introductory pharmacy practice experiences (IPPEs) with an IPPE class using traditional teaching methods. They found that students' sense of preparedness was similar between

the standardised patient and traditional IPPE groups, although students in the study arm exposed to standardised patient teaching were significantly more confident, and a greater number passed the practical exam at the conclusion of the IPPE. The authors concluded that simulation (standardised patient)–based IPPE is at least as effective in providing select IPPEs as standard IPPE methods.

2.5.3 Student assessment. There remains scarce literature evaluating the efficacy of standardised patients in assessment. Only two recent studies attempted to contribute to this area. Eukel, Frenzel, Skoy, Focken, and Fitz (2014) found benefit in incorporating both simulated (including standardised patient exposures) and actual patient care activities into the curriculum. They reported that these simulated exposures enabled the assessment of more complex skills, and gave a greater level of assurance that students were prepared for advanced pharmacy practice experiences. They also found that simulated dispensing activities involving peer standardised patients allowed them to effectively assess students' knowledge and accuracy when working with prescription medicines and drug information. Eukel et al. found that using various types of simulation methods aided students' transition from introductory to more advanced practice experiences (Eukel et al., 2014). Hirsch and Parihar (2014) also used standardised patients as part of a pharmacy program capstone course assessment to prepare students for their advanced pharmacy practice experiences. They found that simulation was effective as part of a broader set of teaching and assessment techniques in preparing students for transition from the primarily didactic to experiential parts of the curriculum.

2.5.4 Cost. The cost of implementing standardised patients or simulation remains a barrier to implementation in the curriculum. Only three studies (Davies et al., 2015; Eukel et al., 2014; Koo et al., 2014) have commented on the cost or resource

implications, the need to better understand the true cost of this teaching strategy, and the resultant effect of the perceived or actual high cost of standardised patient teaching methods in limiting their broader application in the curriculum. These reports were consistent with the previous review's findings.

2.5.5 Conclusion. These recent findings confirm those described in the original integrative review. Students found simulation and standardised patients highly acceptable, the teaching method increased student confidence in pharmacy-related professional activities, and simulation generally had a positive effect on student performance. Even with the addition of these studies to the broader literature on simulation and its effect on students and graduates, there remains a need for more research to determine the effect of simulation teaching methods on student outcomes and graduate effectiveness (Aura et al., 2015). The majority of research is small-scale and lacks sufficient power to draw solid conclusions. The original conclusions drawn in the published manuscript remain the same—that is there is a need for research that is both more robust and greater in volume.

2.6 Part 3: Transition to Practice

The literature for transition to practice will be presented in Chapter 8, alongside the relevant qualitative findings from the semi-structured interviews conducted with the graduates. In Chapter 8, the researcher responds to research question four: Does the use of standardised patient teaching strategies affect early-career pharmacists' transition into practice?

2.7 Summary

In this chapter the context of Australian pharmacy practice, and the local and international use of standardised patient teaching methods in pharmacy undergraduate education is described. It also contains the key learnings from nursing and medicine's

experience of the use of standardised patients in undergraduate education as interpreted by the researcher. Chapter 3 provides a description of the methodology used in this study.

Chapter 3: Methodology

3.1 Introduction

The researcher positioned this study within a pragmatist theoretical framework and used an embedded single case study design incorporating two sub-cases. The research design included multiple methods to describe and explain the case for using simulation in pharmacy undergraduate education. Specifically, the researcher of this study addressed the following research questions:

1. Are there student characteristics that influence strong or weak performance in communication or process ability, and can standardised patient teaching methods mitigate the effects of these characteristics?
2. Do teaching strategies integrating standardised patient teaching methods increase perceptions of confidence and reduce perceptions of difficulty in managing over-the-counter prescribing or prescription medicine counselling interventions for pharmacy undergraduate students?
3. Are teaching strategies integrating standardised patient teaching methods effective in developing foundational communication and process skills in undergraduate pharmacy students?
4. Does the use of standardised patient teaching methods in an undergraduate curriculum affect early-career pharmacists' transition into practice?

In this chapter, the researcher identifies the guiding philosophical underpinning of this study, describes case study as a methodological approach, discusses the theories that underpinned the multiple methods used for data collection and analysis, and provides a detailed explanation of an embedded case study. The chapter is concluded with a brief characterisation of the embedded case (the Case) that forms the study's foci.

3.2 Pragmatism as a Guiding Philosophy

> The word pragmatism was invented to express a certain maxim of logic … The maxim is intended to furnish a method for analysis of concepts … The method prescribed in the maxim is to trace out in the imagination the conceivable practical consequences—that is, the consequences for deliberate, self-controlled conduct—of the affirmation or denial of the concept. (Pearce, 1905, as cited in Cherryholmes, 1992)

Research is a systematic enquiry whereby data are collected, analysed and interpreted to generate knowledge (Mills & Birks, 2014). There are three major components of research design: the research philosophy, strategy of enquiry, and specific methods or procedures used to translate the research approach into practice (Creswell, 2009). Of these, the underlying philosophy or theoretic paradigm guides both the strategy of enquiry and the specific methods chosen to explain an observed phenomenon. Given the range of theoretical paradigms available to the researcher (positivist, post-positivist, critical, constructivist, deconstructivist and interpretivist to name a few) and its often-concealed nature in research, it is important to acknowledge the effect a chosen paradigm has on the researcher's assumptions, and its influence on the strategy of enquiry, specific methods or procedures used, and interpretation. This theoretic paradigm influences the way we examine, decipher and construe knowledge (Mackenzie & Knipe, 2006; Mills & Birks, 2014). For some researchers, without a philosophical paradigm embedded in the research, there can be no basis for subsequent choices regarding research design (Mackenzie & Knipe, 2006) or interpretation.

Pragmatism originated in the United States around the 1870s. The earliest pragmatists were Charles Sanders Peirce, William James and John Dewey (Johnson & Onwueguzie, 2004, p. 408; Morgan, 2014; Stumph & Fieser, 2015). The influence of

pragmatism declined for several decades until the 1970s, when it was rediscovered and pragmatist ideas were recognised once again as a legitimate contributor to philosophy (Hookway, 2013). Recent writers on pragmatism—sometimes referred to as the 'neo-pragmatists'—include Rorty (Creswell, 2009), Davidson, Rescher, Putnam (Johnson & Onwueguzie, 2004), Murphy, Patton and Cherryholmes (Creswell, 2009).

3.2.1 Pragmatism as a practical method of problem solving. Pragmatism as a philosophy is often narrowly linked to 'what works' or what is practical (Morgan, 2014); however, this is a superficial and clumsy interpretation, as pragmatism offers much more. Pragmatism can be viewed as a method of solving problems, rather than a metaphysical system of the world (Stumph & Fieser, 2015). The pragmatist researcher is concerned with the significance of the research outcomes; thus, the researcher primarily seeks to clarify the meaning of intellectual concepts with an emphasis on determining 'conceivable practical consequences' (Cherryholmes, 1992, p. 13). Thus, pragmatically-based research begins with a concern for the fruit that will be borne of the research.

Pragmatism frees the researcher from the burden of philosophical debate about internal and external viewpoints, assumptions about the nature of reality, and the dichotomy of qualitative and quantitative research methods (Denzin, 2012; Mackenzie & Knipe, 2006). It achieves this partly by maintaining an impartial or agnostic approach to the 'what' and 'how' (the methodology and methods) used to answer the research problem (Mackenzie & Knipe, 2006; Morgan, 2014). Pragmatic researchers place the research question at the centre of enquiry, with methodology and methods chosen based on their contribution to best answering this question (Denzin, 2012; Hoshmand, 2003; Johnson & Onwueguzie, 2004; Mackenzie & Knipe, 2006). In this manner, pragmatism allows for triangulation of findings in the traditional sense through mixing different

approaches (data sources, investigators, theories and methods) to amass converging evidence to produce greater rigour, understanding and depth for any enquiry (Denzin, 2012; Yin, 1999). A central tenet of pragmatism is rejection of traditional dualisms (that is, particular research methods are exclusively linked to specific philosophical paradigms) in preference for a more moderate and common-sense philosophical model based on how well a method works or how well it is suited to solving the problem(s) (Howe, 1992; Johnson & Onwueguzie, 2004). Knowing this, it is unsurprising to find pragmatism often linked to mixed and multiple methods (Creswell, 2009; Denzin, 2012; Denzin & Lincoln, 2011; Johnson, Onwuegbuzie, & Turner, 2007; Maxcy, 2003; Morgan, 2014), different views and assumptions, and different forms of data collection and subsequent analysis (Creswell, 2009). Pragmatism can be viewed not as a methodology *per se*, but as a doctrine of meaning or theory of truth (Denzin & Lincoln, 2011).

3.2.2 Influence on context and the 'changing truth'. Subscribers to pragmatism see little value in theories that do not make a difference in daily life. As already stated, pragmatist researchers are focused on outcomes; however, more importantly, they recognise the inextricable influence of context on investigative findings. The pragmatic view also acknowledges the existence of an external or 'real' world that is independent of our minds, and that research occurs in context—such as social, historical or political contexts (Creswell, 2009; Stumph & Fieser, 2015). Any truth derived (from research) cannot be accurately understood in the absence of the context; therefore, the pragmatist interpretation comes from actions, situations and consequences, rather than antecedent conditions (Creswell, 2009; Denzin, 2012). This relationship to context allows the pragmatic researcher to acknowledge what can be termed a 'responsive or changeable truth'—that is, a 'truth' that becomes more or less true within an ever-changing world

(the changing context). As Stumph and Fieser (2015) wrote, ‘As a method, pragmatism takes its cue from the newly discovered facts of life. We should not accept as final any formulation in science, theology or philosophy, but instead see them as only approximations’ (p. 408). In this description, Stumph and Fieser acknowledge the influence of a changing context upon observations of the phenomenon, and thus the changeability (or temporary nature) of our observations and discoveries.

3.2.3 Theory value and contextual suitability. Pragmatists view theories as a means, and acknowledge that the degree of truth (or ‘provisional truth’) can change based on how well such theories currently work (contextual suitability). Pragmatism has a focus on change or evolution; therefore, truths are not fixed, but are always changing (Johnson & Onwueguzie, 2004; Stumph & Fieser, 2015) and often change in response to context. A limitation to this approach is the promotion of incremental change, rather than more fundamental or revolutionary change in society (Johnson & Onwueguzie, 2004). Despite this, for pragmatists, the workability of a theory is judged on the criteria of predictability and applicability in the real world (Johnson & Onwueguzie, 2004).

Pragmatism supports a practical and outcome-oriented method of enquiry based on action that leads to further action, and the elimination of doubt, while holding a position of philosophical middle ground (Johnson & Onwueguzie, 2004). Pragmatism is fundamentally concerned with the consequences of actions. This position allows researchers the freedom to prioritise their research question as the determining factor for selecting the method(s) of research data collection and analysis (Mackenzie & Knipe, 2006), as opposed to selecting a traditional set of methods that must be used in order to comply with accepted norms. As a result, pragmatism legitimises researchers selecting what they consider the most appropriate qualitative and quantitative methods, with the motivation for selection being those methods that are most suitable for the research

purpose (Creswell, 2009; Johnson & Onwueguzie, 2004). Pragmatism is a theoretic paradigm particularly suited to multiple methods research, and was selected as the umbrella philosophical paradigm for this research.

3.3 Post-positivism

Post-positivism complements a pragmatic philosophical position. Traditionally, post-positivism is closely associated with quantitative research and the 'scientific method' of empirical science (Creswell, 2009). As post-positivists use a deterministic philosophy in which cause most likely determines effects or outcomes (Creswell, 2009), this philosophical viewpoint is well suited to an experimental approach to research. Post-positivism positions the researcher and focus of the research as independent of each other, but accepts that researchers are influenced by their own beliefs and the social and political context within which observations occur (Lincoln, Lynham, & Guba, 2011). It also attempts to reduce ideas into smaller parts (hypotheses or research questions) that are suitable for testing by careful observation and measurement (Creswell, 2009). Such observation is linked to an understanding that absolute truth can never be found, and that instead describes an 'objective reality' as the best that can be achieved by a researcher. This objective reality approximates reality as best as it can, while recognising the influence of the researcher's subjectivity in shaping that reality (Lincoln et al., 2011; Muijs, 2004).

Like positivism—the precedent philosophical viewpoint—post-positivism acknowledges that 'blocks of knowledge' can accumulate to form generalisations and cause–effect relationships. While collecting these 'blocks', a post-positivistic researcher concurrently applies benchmarks of rigour, such as internal and external validity, reliability and objectivity; excludes research values as much as possible; and takes a disinterested posture of enquiry (Lincoln et al., 2011). Post-positivism differs from

positivism in that it recognises a single reality, but acknowledges that this may never be fully understood because of hidden elements. Thus, on this basis of incomplete data, only approximations of reality can ever be made (Creswell, 2009; Lincoln et al., 2011). This lack of 'absoluteness' requires truth to be viewed in conjunction with statistical confidence levels and inbuilt objectivity in data produced as part of the process of enquiry (Lincoln et al., 2011).

3.4 Relationship between Observations, Analysis and Philosophy

3.4.1 Post-positivism and statistical analysis. Aliaga and Gunderson (2002) described quantitative research as a method of explaining a phenomenon by collecting numerical (quantitative) data that can be analysed using statistical (mathematical) methods. The predominant methods of data collection (summarised in Table 3.1) and analysis in this study were quantitative in nature. The first three of the five methods listed below relied on self-reported or collected quantitative data in the form of numbers, and subsequently reflected the post-positivistic position of the researcher in this case study.

Table 3.1

The Five Primary Data Collection Methods Used in this Study

	Type	Research question	Data collection tool
1	Quantitative	1	A student demographics questionnaire
2	Quantitative	2	Two Likert questionnaires each employing a six-point Likert scale to assess students' perceptions of confidence and difficulty in undertaking a patient intervention
3	Quantitative	3	A scored assessment criteria to evaluate students' performance in undertaking a patient intervention
4	Qualitative	2 and 3	Focus group to understand students' perceptions of the use of volunteer standardised patients in undergraduate teaching and assessment, immediately after exposure to standardised patients
5	Qualitative	4	Individual follow-up interviews after graduation to explore participants' perceptions of the use of standardised patients in teaching and the effect it had on their transition to practice

The dualist extremes of quantitative and qualitative epistemologies are 'realism' or 'positivist' epistemology in quantitative research, and 'subjectivism' (often termed 'constructivism' or 'interpretivism') epistemology in qualitative research (Grbich, 2010; Muijs, 2004). At one end, realists argue that research uncovers an existing reality or truth, with the researcher's role being to uncover that truth in a detached and objective manner to minimise the influence of the researcher. Muijs (2004) argued that it is problematic to suggest that one can measure reality in a completely objective manner, as observations and findings are influenced by our beliefs and the political or social climate within which the research is conducted. As a result, quantitative researchers now have a variety of less radical epistemologies, which can be used when philosophically underwriting this type of research, including post-positivism, experiential realism and pragmatism.

Post-positivist researchers accept that their results can never be certain, and reject such certainty for a measure of confidence—that is, a measure of how much we can rely on our findings. Post-positivists do not reject the idea of a single truth or reality, but acknowledge that a single (elusive) truth or reality can be hidden in the

variables and absence of absolutes in nature (Lincoln et al., 2011). In short, the post-positivist researcher attempts to represent reality and a measure of confidence in that reality. A post-positivist view is complemented by pragmatism, which enables the researcher to select a combination of research methods that can best answer the question of interest.

3.4.2 Post-positivism and qualitative methods.

3.4.2.1 Interviews. Interviewing is a useful data collection strategy for collecting 'experience-type' questions (Braun & Clarke, 2013) that allows for further probing or clarification when needed to better understand the phenomenon (Johnson & Turner, 2003). The interview style differs with interviewers, researchers, participants, topics, research contexts and the theoretic paradigms that influence the study (Roulston, 2010). Qualitative interviews may be conducted individually, in groups, face to face, via technological assists (such as telephone calls or videoconferences), synchronously or asynchronously. Irrespective of the method, the purpose of the interview is to generate elicit spoken data for later coding and analysis (Roulston, 2010).

The interview may be highly structured, semi-structured or unstructured (Braun & Clarke, 2013, DiCicco-Bloom & Crabtree, 2006; Mills & Birks, 2014; Roulston, 2010), spanning the spectrum between more quantitative and more qualitative in nature. In structured interviews, researchers provide an interview script and often a 'list of possible responses' to questions (Johnson & Turner, 2003; Roulston, 2010; Silverman, 2011). The use of one or both of these is intended to restrict deviation from the script, although in practice it is difficult to do because of differences in understanding questions and the potential range of responses to each question. These interview scripts often contain items that are closed-ended, as well as pre-planned probing questions that are used in response to interviewee responses (Braun & Clarke, 2013; Johnson &

Turner, 2003). This type of interview requires training to ensure consistency, but does not rely so much on rapport being established for interview success (Silverman, 2011). In semi-structured interviews, the interviewer refers to a prepared interview guide that includes a number of open-ended questions. These questions are planned, but may be reordered or reworded during the interview (Braun & Clarke, 2013; Johnson & Turner, 2003). This type of interview often follows up the interviewee responses with probing questions to better understand the response to the preceding question. These questions may be planned or spontaneous in order to follow unpredicted directions. Using this approach, each interview has the same starting point, but the subsequent direction of the interview and data collected may be significantly different. This type of interview requires the interviewer to have well-developed listening skills and an attuned sense about if and how well the question has been addressed, and how and when it is appropriate to follow up (Roulston, 2010). The unstructured interview has a 'loose' or no formal interview guide and is often completely unstructured. Questions emerge in response to both participant observations and spontaneous conversations generated during fieldwork. Despite the seemingly 'unfocused' nature of unstructured interviews, the interviewer has the research topic in mind and guides the conversation towards the topic of interest (Roulston, 2010).

Further classifications of interview type include ethnographic interviewing, feminist interviewing, oral history interviewing, life history interviewing, dialogic and confrontational interviewing, and phenomenological interviewing. Of interest to this study is phenomenological interviewing, which examines the lived experience of participants. This type of interview generates detailed and in-depth descriptions of human experiences—specifically feelings, perceptions or understandings. As a result, an open-ended question format followed by follow-up questions is often most useful.

For this type of interviewing to be effective, it is necessary to select participants who have experience in the phenomenon of interest and are able to talk about it (Roulston, 2010).

Phenomenological interviewing is often associated with phenomenological theory. It is reasonable to draw on the form of phenomenological interviews to gain detailed description of a phenomenon and use analysis techniques, such as narrative or constant comparative methods. Thus, some researchers apply the thinking that the term 'phenomenological' is a synonym for 'qualitative' (Roulston, 2010). In phenomenological interviewing, the interviewing takes an interested, yet neutral stance. This impartial and non-judgemental positioning also reduces bias introduced by the interviewer (Johnson & Turner, 2003). The relationship between the interviewer and interviewee is sometimes described as 'pedagogical', in that the interviewer's role is to be a student of the interviewee, learning as much about the topic as possible through questioning (Roulston, 2010).

Johnson and Turner (2003) and Braun and Clarke (2013) described some inherent strengths and weaknesses of interviews as a data collection strategy. Table 3.2 lists some of these commonly cited strengths and weaknesses.

Table 3.2

Strengths and Weaknesses of Interviews as a Data Collection Strategy

Strengths
Good for measuring attitudes and most other content of interest.
Can provide in-depth information and allow for exploration, as well as provision for follow-up where additional clarity is sought.
Allows good interpretative validity.
Good validity for well-constructed and tested interview protocols.
High response rates are attainable and smaller sample sizes are required to generate adequate data.
Useful to get people to talk about sensitive issues.
Researcher has control over the data produced, increasing the chance of useful data.
Weaknesses
Interview process is time consuming and expensive, and analysis can be time consuming, especially for semi-structured or unstructured interviews.
Small sample size means a lack of breadth.
Potential for investigator bias.
Respondents' perceptions of anonymity may be low.
Participants may not be empowered, as they have less control over the data produced.
Measures in need of validation.

Note: Table adapted from Johnson and Turner (2003, p. 80).

In this study, the interviews provided in-depth information around graduates' experience of their transition to practice and the potential influences exposure to standardised patients may have had. Like the focus groups, graduates used their own language to explain their experiences which resulted in good interpretative validity. Response rates were relatively low though saturation of concepts/ideas was achieved with the sample size. The method enabled graduates to speak freely about their experiences. As the interviews were conducted one-on-one, graduate anonymity was achieved with careful data management and coding.

The data collection is relatively time consuming with each of the primary interviews taking between 14 and 29 minutes and follow-up interviews taking between 8 and 12 minutes. This coupled with transcription of the interviews make this data collection method resource intensive. Methods to reduce moderator acceptance bias and analysis bias are detailed in detailed in section 3.4.4 and section 4.5.3.5.

3.4.3 The focus group. Focus groups are a flexible and increasingly popular data collection strategy (Braun & Clarke, 2013; Johnson & Turner, 2003; Morgan, 2001). Focus groups have their origins in political and market research, when, in the 1990s, it became a more widely accepted method of data collection in health and the social sciences (Braun & Clarke, 2013; Morgan, 2001). Focus groups can be used as an independent method, but are commonly used in inter-method mixing (Silverman, 2011) and are useful to explore in depth group thinking on a research topic in depth. Focus groups may be used as a method to develop research foci or questions (Silverman, 2011), to develop questionnaires and interviews in the early stages of the research process, or to measure experimental effect or provide post-study feedback (Johnson & Turner, 2003; Silverman, 2011).

Focus groups are 'focused' on a particular topic area, may use a topic guide containing a series of questions and depend on group interactions to develop relevant data or information from the participants. One significant difference between conducting an individual interview and focus group methods is the social interaction between members in the focus group. During focus group interactions participants question, challenge, agree or disagree which reduces the 'artificiality and decontextualisation' of many other forms of data collection (Braun & Clarke, 2013). This 'social exploration' often uncovers related issues and other useful insights.

The focus group often consists of a homogenous collection of three to 12 people who are guided by a moderator (the researcher, moderator or interviewer), who uses a topic guide to focus on a particular research question (Braun & Clarke, 2013; Johnson & Turner, 2003). The role played by the focus group moderator is important. In essence, the moderator's primary task is to keep the group focused on the topic, ensure that no single participant dominates the discussion, and allow the group to interact freely

(Johnson & Turner, 2003; Morgan, 2001). In a focus group, the moderator is less central to the discussion compared with group interviews and plays a less active role in directing the discussion. The moderator is also often responsible for recruitment processes, ensuring participants are matched to the research topic, developing the interview guide and preparing the collected data for reporting (Morgan, 2001).

Following a similar schema to interviews, focus groups and group interviews can be conducted in a range of ways. At one end of the spectrum, a focus group may be less structured and more organic in nature. While still based on one or more research questions, the discussion evolves spontaneously and is influenced by group interactions, with little intervention from the moderator other than ensuring the group is appropriately focused on the question. More commonly, focus group uses a semi-structured topic guide, where the moderator guides the process with a balanced collection of open- and closed-ended questions (Johnson & Turner, 2003). At the other end of the continuum is a more structured and less fluid group interview. In this study a topic guide with a mix of open- and closed-ended questions was used with a convenience sample of participants recruited directly from one of the two groups of interest. Table 3.3 lists some of the commonly cited strengths and weaknesses of focus groups as a data collection strategy.

Table 3.3

Strengths and Weaknesses of Focus Groups as a Data Collection Strategy

Strengths
Useful for exploring ideas and can obtain in-depth understanding on how people think about an issue.
Identifies unanticipated issues.
Good interpretive validity and high ecological validity (everyday ways of talking about a topic).
Allows probing of ideas and can facilitate disclosure.
Can lead to empowerment of participants or social change.
Shifts some power and control from researcher to participants, and potentially reduces influence of moderator.
Can be conducted quicker than individual interviews.
Weaknesses
Open to reactive and investigator effects, and vulnerable to investigator bias.
Does not allow for in-depth follow-up of individual views or experiences.
Group thought can be dominated by one or two participants.
Group dynamic may make it easier to get off topic and can be more difficult to bring focus back to research question.
Difficult to generalise if small, unrepresentative samples are used.
Measurement validity possibly low.
Transcription and data analysis can be time consuming.

Note: Table adapted from Johnson and Turner (2003, p. 80).

The focus groups were successfully conducted with two groups of students from sub-case one. Focus group one lasted 59 minutes and focus group two lasted for 52 minutes. It was an efficient method of collecting data on the students experience in an environment that successfully generated free discussion. The format also gave the moderator insight into the degree of congruence of ideas put forward by an individual in that focus group. Despite the 'public nature, the focus groups did allow the moderator to follow up on individuals opinions and experiences. Student were also able to use their own language to describe their experiences resulting in higher interpretative validity. Moderator acceptance bias and moderator analysis bias are risks with this type of data collection method, though strategies were successfully enacted to minimise any effects on the interpretation of the data obtained using this method (detailed in section 3.4.4 and section 4.5.3.5).

3.4.4 Minimising researcher bias using qualitative methods. Taking a post-positivistic research position means acknowledging the influence of theories, experiences, the social and political context within which observations occur, and the researcher's own beliefs about what is observed (Lincoln et al., 2011). This is particularly relevant to data collection and analysis associated with qualitative methods, such as the individual and focus group interviews used in this study. Investigators using survey data would like the variation observed to be a result of the variation in the concept measured, not a result of interviewer variance or bias (Schaeffer & Maynard, 2001). Accordingly, the post-positivist researcher strives to limit the effect of personal bias, and maintain objectivity and neutrality in the research (Mertens, 2015).

Bias has been considered from two perspectives in this study. The first limits the effect of bias and preserves rigour through standardisation and the use of multiple data sources. Standardisation involves the use of interview guides and procedures, and clearly defined methods of analysis in order to systematise how questions are delivered and responses subsequently recorded and analysed. In this way, standardisation attempts to 'hold the behaviour of the interviewer constant, thereby to reduce variable error' (Schaeffer & Maynard, 2001, p. 579). In doing so, it reduces the net effect of the interviewer in the aggregate; thus, the interviewer's contribution to variance is small (Schaeffer & Maynard, 2001). The neutrality of the interviewer can be further facilitated through careful attention to the way questions are structured and sequenced. To reduce bias in interviewing, Roulston (2010) suggested three main methods: (i) using open-ended questions, (ii) sequencing questions from general to specific, and (iii) delaying questioning about sensitive topics until sufficient rapport is established between interviewer and interviewee. Complementing this, data triangulation can also reduce bias. Yin and Creswell described the process of collecting multiple forms of data—

Creswell (2013) used the term ‘validation strategies’ (p. 13) and Yin (2012) referred to ‘convergent lines of inquiry’. Both involve data triangulation in which multiple independent data sources point to the same interpretation, thereby reducing the chance of bias because the findings from one data collection method (potentially at greater risk of compromise through bias) are validated by others. The rigour is further strengthened by maintenance of quality procedures and a chain of evidence.

The second and possibly more important perspective is to acknowledge the true nature of qualitative data, the influence of the researcher in the process of enquiry, and its potential application or end use. Researchers bring a personal history, a particular orientation to the process of enquiry, a sense of ethics and a political or social bent that influences the research (Creswell, 2013). The subjectivity of the data produced by qualitative research methods is necessary to understand the data (or outcomes from its analysis) in its context (Braun & Clarke, 2013; Gubrium & Holstein, 2001). Thus, one may consider the typically quantitative notion of ‘uncontaminated knowledge’ as unsuitable when using qualitative methods. To answer the criticism of bias, one may treat subjectivity not as bias (which is impossible to eliminate from the research), but instead acknowledge the contextualised nature of the data and interpretations. This approach is particularly useful in critical qualitative research, where one can defend this interrogative stance towards the meanings or experiences expressed in the data in order to legitimately use it to explore some other phenomenon (Braun & Clarke, 2013).

Research demands scepticism, commitment and detachment. As argued by Norris (1997), to avoid sources of error and premature conclusion, detachment is necessary. The method of enquiry and subsequently the research is influenced by one’s own presuppositions, strengths and weaknesses, as much as it is by the best match between the methodology and method or research paradigm (Norris, 1997). In the

absence of convenient rules to prevent bias, or processes to identify bias in qualitative research methods, the researcher must consider the influence of the self in relation to topic of research as a precondition for dealing with bias. This act of self-criticism and judgement allows the researcher to challenge assumptions and prejudices, and maximise the quality of the research.

3.5 Case Study Design

Case study design is used in medical science, economics, biology, history, political science, education and psychology, and has long been central to scientific development (Flyvbjerg, 2011) because it is suitable for both generating and testing hypotheses (Stake, 2008b). Case study is an increasingly popular research approach (Thomas, 2011) that is sometimes referred to as both a method and methodology (Hyett, Kenny, & Dickson-Swift, 2014). Irrespective of one's position on method and methodology, case study is a way of clearly defining what is being studied, and facilitates the structure of the data collection and analysis methods to be used.

A case study focuses on an individual unit of study (Silverman, 2005). This unit of study is the topic of the research, has defined boundaries and is set in a real-world context (Flyvbjerg, 2011; Stake, 2008b; Yin, 2012). Yin (2009) provided a useful definition of case study as 'an empirical inquiry about a contemporary phenomenon (e.g. a "case"), set within its real-world context—especially when the boundaries between phenomenon and context are not clearly evident' (p. 18).

3.5.1 History of case study. Case study was first introduced by Frederic Le Play in 1829 (Kothari, 2004). Over the past few decades, its popularity in testing hypotheses has increased in fields such as education (Merriam, 1998), law, anthropology (Johansson, 2003), the social sciences (Kothari, 2004) and business. Case study has also been used in medicine and psychology (known as case work or case history)

(Johansson, 2003) and as a tool for learning and professional development. Problem-based learning is a readily available example of this (although the use of case study for learning differs significantly from its use in research). Case study is sometimes described as case method, casebook method or critical incidents. More recently, our understanding of case study has been significantly informed by authors such as Robert Stake, Michael Patton, Bent Flyvbjerg and Robert Yin. The case study method complements the pragmatist philosophical view, as the case study is defined by interest in a particular case, not by the methods of enquiry (Stake, 2008b). This is because of its fit with positivistic-like paradigms, whereby it allows for the identification of study variables in advance and then makes judgements regarding their fit in the findings, and it focuses on testing and refining the original theory based on evidence from the case (Crowe et al., 2011). This study adopted the approach to case study presented by Yin (Crowe et al., 2011; Yin, 2012), as Yin provided a convenient and comprehensible concept of how to unify multiple units of study (units of analysis or sub-cases) within one case, while maintaining the focus on the general phenomenon.

Yin (2012) described three steps in the design of a case study. The first step is to define the case to be studied. The initial definition of the case is important, yet may be revised as the research progresses and initial data are collected. The second step is to select the type of case study design to be used (see discussion on types of case study below). The final step is to decide whether or not to use the theoretical perspective of hypotheses (Yin, 2012).

3.5.2 Defining the case. A case is often distinctive, unique or extreme, but can still be descriptive of a common phenomenon. Even the most tentative attempt at defining the case and its context will help conduct research investigations of the phenomenon (Yin, 2012). The case and its boundaries are influenced by the research question, a detailed

understanding of the theoretical issues and settings, and careful analysis of the existing literature (Crowe et al., 2011). The case is generally a bounded entity that may include social phenomena, structures, organisations, events or even individual people (Stake, 2008a; Yin, 2012), and can be straightforward to define. In contrast, the context of the case and what describes and defines it are often more blurred (Yin, 2012).

The case must be defined in a way to maximise our learning from it (Stake, 1995). Careful and deliberate defining of the case (that is, what is and what is not 'the Case') will facilitate transferability of the findings and a more informed appreciation of the outcomes (Crowe et al., 2011; Stake, 2008a; Yin, 2012). The case may be defined using a range of elements that often include the nature of the case (its activity and functioning), relevant background, physical setting, relevant contexts (such as economic, political and legal contexts) and other cases or sources of relevant information (Stake, 2008b). The case may also be defined by the crucial issue(s) (or general phenomenon) it can illuminate, or simply by the opportunities available. Put another way, the important defining features of the case are a function of the general notable characteristic and access to cases. While opportunity is an important feature, case selection cannot be random because sample size is often small. Purposeful selection of relevant cases will allow an in-depth understanding of the phenomenon and maximise opportunities for generalisation because what is known about one (carefully selected) case may be true for similar cases.

The case of interest in this study—the use of standardised patients as a teaching strategy in pharmacy undergraduate education—is more completely described in Chapter 4. The process for defining the case and the context within which the case sits followed that described by Yin (2012) and Stake (2008b), as the case of interest fit neatly within Yin's paradigm of case study (a main unit of study with two nested units

of analysis within), and because Stake provided a practical description of the necessary considerations for defining the case. The approach to case study by these two authors is complementary.

3.5.3 Types of case study. According to Yin (2012), there are four types of case study designs organised by two major classifications—that of 'single case study' and 'multiple case study'. Both single and multiple case studies can further be classified as holistic or embedded, rounding out the four types. A single case study examines a single unit of study, such as a single organisation. Predictably, a multiple case study examines multiple units of study or organisations in the same manner. Stake (2008a) and Yin (2012) both described the concept of a multiple case study. This type of case study design uses a collection of cases that have some common characteristic. They may be similar or dissimilar—that is, the cases might be similar in order to replicate the findings or might be deliberately contrasting (Stake, 2008b; Yin, 2012). Despite how they are organised or their degree of dissimilarity, they will manifest a common characteristic and are chosen because understanding each of the cases will lead to a better understanding of a larger collection of cases (Stake, 2008b).

The usefulness of a case study for testing a theory or examining a phenomenon will relate to the generalisability of the findings and has a direct relationship to the selection of the case. The findings from either a single or multiple case study may be generalizable for a number of reasons. First, while a single case does not represent a sampling point from a known population, and cannot be statistically generalizable to a larger population, case study design does allow for an analytical generalisation that establishes a logic that might be applied to other situations (Yin, 2012). Second, case study sampling is purposeful. A carefully selected case may prove advantageous over a randomly selected case because random selection may not give the greatest amount of

information about a problem or phenomenon (Flyvbjerg, 2011; Silverman, 2005). A well-selected case study may be atypical in terms of extremes, but the process being studied is of significant importance and may be more likely to occur in that sample case. The issue of generalisability and case selection may lead one to conclude that case study is not an easy method to develop specific propositions or conclusions from a summary of the case. While understanding this argument, case studies remain helpful when a study addresses more descriptive questions, such as 'what is happening', 'what happened' or 'why did something happen' (Yin, 2012).

There are four distinctive features that, when considered together, comprise a case study. The first is the ability to select one of various methodologies to frame the case. Case study design may use methodology from qualitative, quantitative, mixed or multiple method research paradigms (Flyvbjerg, 2011; Stake, 2008b); however, irrespective of the methodology selected, there is a focus on the case. That is, a case study design can complement a quantitative methodological approach as well as a qualitative methodological or any combination of methods to understand the problem. It is not focused on or confined by a required set of methods of enquiry. Indeed, a combination of case study and quantitative methods may be the most suitable path to understanding, or, just as likely, relevant case data could come from multiple evidence sources, including those traditionally considered qualitative (Yin, 2012). The second feature is the intensive nature by which 'the Case' is examined. Case studies typically comprise detailed, rich and multi-variable datasets that enable deeper understanding of the unit of study (Flyvbjerg, 2011; Yin, 2012).

The last two features of case study design are that of development and context. A case study design stresses 'development factors', meaning that case studies typically evolve over time with a string of tangible and interrelated data collection events that

occur in ‘a time’ and ‘a place’. Considering each of these events in a string, and then as multiple strings within a defined context, comprises the whole case—one that has a relationship to the environment (Flyvbjerg, 2011). Drawing these strings together results in a ‘detailed examination of a single example’ (Flyvbjerg, 2011, p. 301).

Both single and multiple case studies can be either holistic or embedded in design. A holistic study is concerned with a single phenomenon within that case. An embedded case study has, within the single common context, a case comprised of a number of sub-cases, which are examined within the discrete unit of study (Yin, 2012). The embedded single case design represented in this study is illustrated in Figure 3.1, adapted from Yin (2012). A detailed description of the case and the two units of analysis is included in Chapter 4.

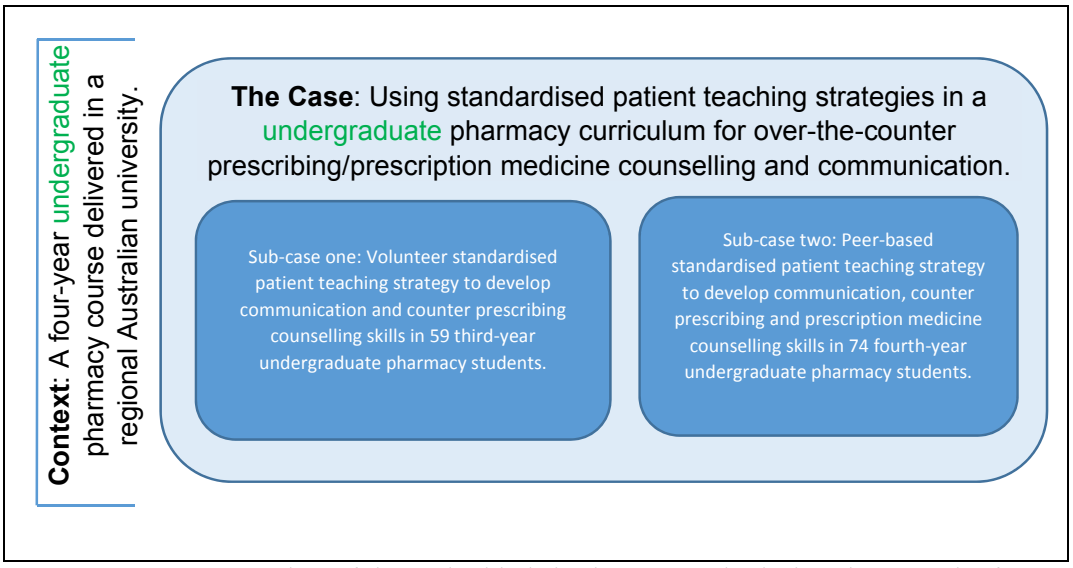


Figure 3.1. Representation of the embedded single case study design that was the focus of this study.

3.6 Chapter Summary

In this chapter, pragmatism is identified as the guiding philosophy underpinning this study. The researcher then described case study as a methodological approach,

described the synergy of pragmatism with case study as a methodological approach, discussed the multiple methods used for data collection and analysis, and explained the basis of the qualitative data collection methods used (interviews and focus groups). Chapter 4 contains a detailed characterisation of the embedded case (the Case) and its two individual units of analysis that form the study's foci. In this chapter the researcher describes the quantitative statistical methods used for data analysis, as well as the methods to analyse the qualitative data from the focus groups and interviews. Chapter 4 is concluded with a description of the recruitment processes and procedures followed to ensure compliance with ethics requirements.

Chapter 4: Methods

4.1 Introduction

This chapter begins with a detailed characterisation of the embedded case (the Case) that formed the study's focus, including the individual units of analysis (the sub-cases) and the context within which the Case was situated. This characterisation is followed by a description of the data collection and analysis methods used, organised by the four research questions outlined in Chapters 1 and 3. In this chapter, the researcher details the specific data collection and analysis methods used for both the quantitative and qualitative data. The chapter is concluded with a brief description of the recruitment process and the steps taken to ensure compliance with ethics requirements.

4.2 Case Context

The Case was set in a four-year undergraduate pharmacy program in a regional Australian university that prepares undergraduate students for entry to the pharmacy profession. In 2005, the program team and accrediting body identified that program content related to over-the-counter (OTC) prescribing was delivered in a disaggregated manner. Industry partners also identified the limited capacity of new graduates to independently manage OTC presentations in community practice. In response, this researcher designed a new clinical module of six weeks duration, designed to teach, model and assess the necessary foundation skills for a pharmacist-led, patient-initiated OTC prescribing intervention and prescription medicine counselling intervention in the context of Australian community pharmacy practice. To facilitate high levels of student engagement and an authentic and valid learning experience, a standardised patient teaching strategy was designed to complement the theory component. The intended outcomes from this new clinical module were to develop third- and fourth-year students' competence in OTC prescribing and communication skills, and reinforce

prescription counselling in the fourth-year student cohort. The overall aim of this curriculum change was to optimally prepare students for clinical placement and graduates for transition from university to practice as intern pharmacists.

4.3 The Case

The researcher used an embedded single case study to examine two sub-cases, each using a unique variant of standardised patient—peer standardised patients and volunteer standardised patients. The context of each sub-case was the use of standardised patients as an instructional strategy in a regional undergraduate level pharmacy education program.

4.3.1 Sub-case descriptions. In sub-case one community **volunteer** standardised patients were used to teach OTC prescribing and communication skills to 59 third-year undergraduate pharmacy students as part of an OTC prescribing module (OTC module). In preparation for the standardised patient interaction, these students experienced traditional didactic teaching of theory content over a six-week period. This material introduced foundational OTC prescribing processes; disease aetiology, symptomology and treatment options; and communication theories. This theory was put into practice in an authentic context using weekly two- to three-hour workshop sessions in which students participated in case scenarios incorporating community volunteer standardised patients. Over the duration of these sessions, each student in sub-case one participated in a minimum of five simulation scenarios and directly observed another 15 observations of their peers managing an OTC scenario.

In sub-case two, **peer** standardised patient interactions were employed, in a similar structure to sub-case 1 to teach 74 fourth-year undergraduate pharmacy students OTC prescribing and communication, and reinforced their previous learning in prescription medicine counselling. Like the students in sub-case one, the students in

sub-case two received theoretical content on foundation communication; OTC prescribing theories; and disease aetiology, symptomology and treatment. This content was directly adapted from material designed for the students in sub-case one. The students then experienced five sessions of case-based simulation experiences using peers as standardised patients. During the five sessions of simulation, each student led a minimum of five OTC or prescription medicine counselling interventions, and directly observed a further 15 standardised patient interactions conducted by their peers. Students in sub-case two acted in the role of standardised patient, guided by a case scenario. The majority of sessions focused on the new OTC-related content.

4.3.2 Simulation event.

4.3.2.1 Event description. The simulation was partially scripted using scenarios selected for its reflective nature of common OTC and prescription medicine counselling presentations in the Australian community pharmacy practice context. The simulation used both volunteer standardised patients and peers standardised patients to achieve the broad learning objectives described in 4.3.1.2.

4.3.2.2 Learning objectives of sub-case 1 and 2. Standardised patients were used to achieve the following in sub-case one and two respectively:

- in sub-case one: the development of undergraduate pharmacy students' skills in communication and over-the-counter prescribing
- in sub-case two: the development of undergraduate pharmacy students' skills in communication, over-the-counter prescribing and prescription medicine counselling.

Students in each sub-case experienced a different variant (volunteer or peer) of standardised patient. The researcher used sub-case one to examine the use of **community volunteers** as standardised patients with 59 third-year undergraduate

pharmacy students. Similarly, sub-case two focused on the use of **peers** as standardised patients with 74 fourth-year undergraduate pharmacy students.

Students in both sub-cases were exposed to theoretical content on communication and counter prescribing. In addition, sub-case two encompassed revising prescription medicine counselling procedures. The two sub-cases are described in greater detail in the following sections.

4.3.2.3 Structure of Group Simulation. Students in both sub-cases were divided into small groups, in which they remained for all five simulation sessions. Each small group consisted of one tutor (a registered pharmacist), one standardised patient (either a community volunteer or student peer), and one student role-playing the pharmacist and two to three other students observing the interaction. Students rotated through the different student positions after each scenario, as described in Figure 4.1 for sub-case one (using community volunteer standardised patients) and Figure 4.2 for sub-case two (peer standardised patients) during the weekly workshops.

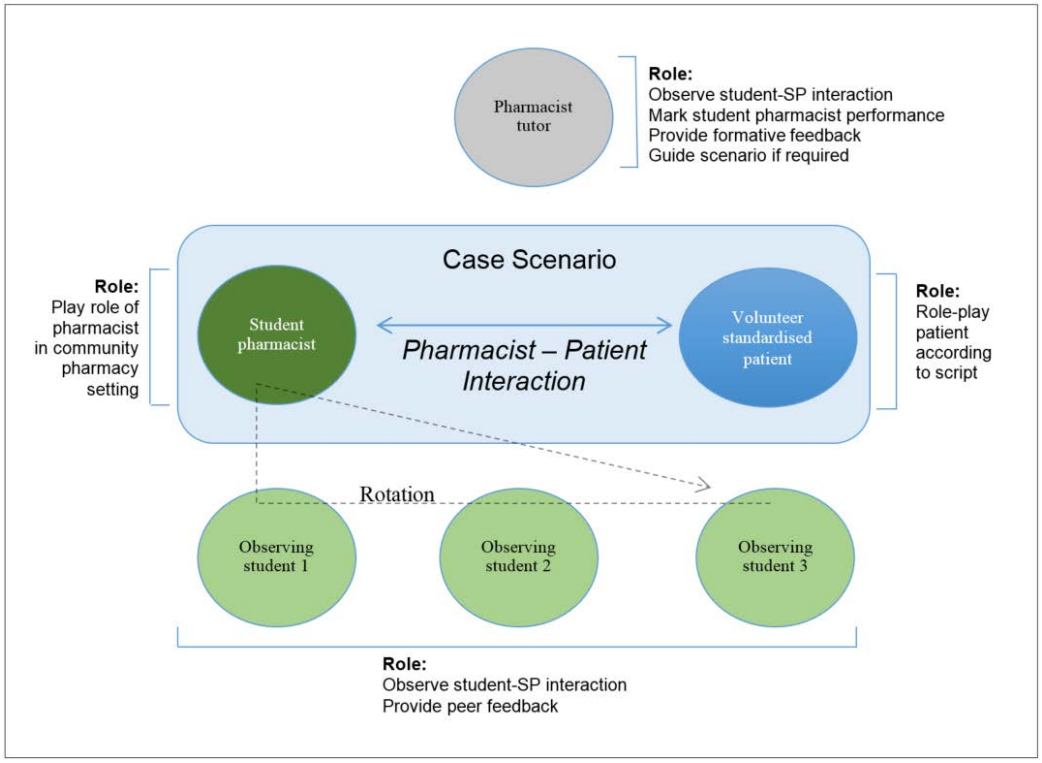


Figure 4.1. Construction and rotation cycle for sub-case one, incorporating volunteer standardised patient teaching strategy.

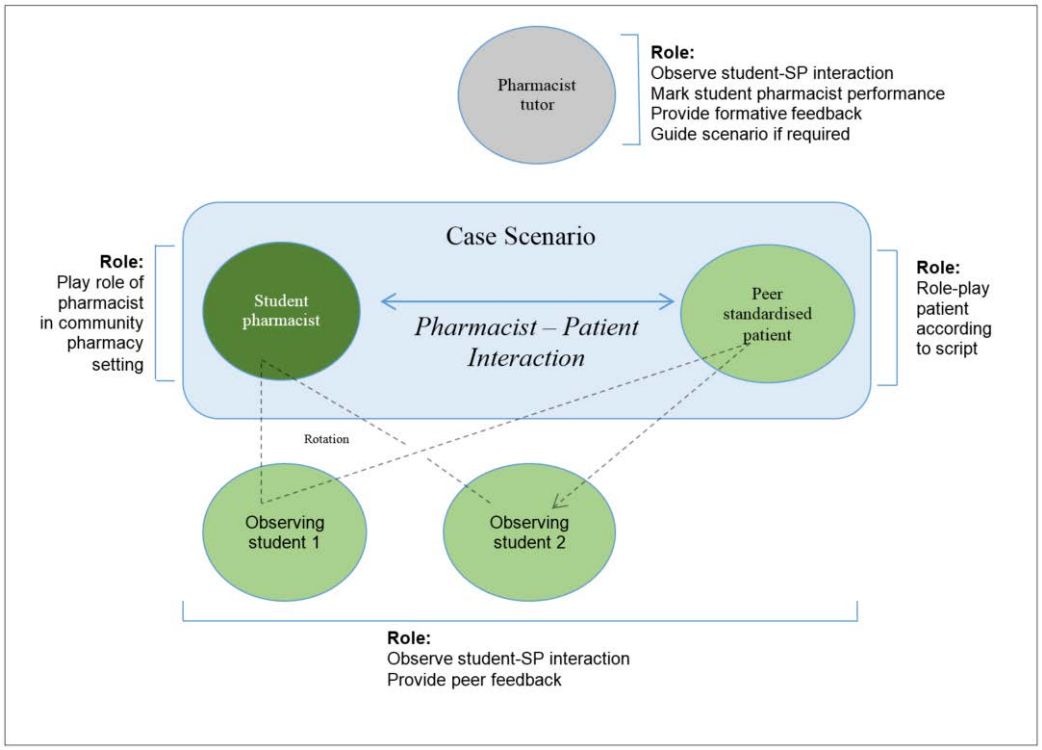


Figure 4.2. Construction of sub-case two, incorporating peer standardised patient teaching strategy.

The effect of this learning strategy was studied to assess the influence of standardised patients on the acquisition of OTC prescribing, prescription counselling and communication skills in the undergraduate pharmacy students, as well as changes to students' perceptions about their ability to undertake a patient intervention, and the effect on students' transition to practice.

4.3.2.4 Use of Adjuncts. Where possible, adjuncts were used to improve the realism of the experience and as far as was possible, to provide access to references and resources that would be available in a community practice environment. Students were provided with the following adjuncts as was appropriate for each session:

- Common pharmacy reference resources such as the Australian Medicines Handbook and the Australian Pharmaceutical Formulary and Handbook (APF);

- Printed consumer medicines information leaflets and other relevant printed patient handouts;
- Where available, a selection of packaged unscheduled, Schedule 2 and Schedule 3 medications / treatment options for demonstration use;
- Where medications were unavailable, mock packages replicating the prescription or non-prescription medicine being used; and
- Patient training devices such as standard metered dose inhalers (MDI), Turbuhalers and Accuhalers containing pharmacologically inert substances, Volumatic spacers and cream applicators.

4.3.2.5 Facilitator characteristics. Currently practicing and registered clinical / community pharmacists were recruited to facilitate the simulation sessions as tutors. Pharmacist tutors were recruited from an established pool of pharmacist sessional teaching staff who were also currently practicing pharmacists. This pool of pharmacist tutors had previously expressed interest in sessional teaching and were experienced pharmacists or had previous experience in sessional teaching in the pharmacy program. An expression of interest was sent to the pool of tutor pharmacists to identify pharmacist tutors willing to participate in the standardised patient teaching sessions. Tutors were selected based on their willingness to participate and their previous clinical and teaching experience.

4.3.2.6 Duration, timing and frequency of intervention. The standardised patient intervention consisted of five two- to three-hour sessions conducted over a five week period. A sixth (final) session of exposure to standardised patients took the form of a summative examination using faculty members as standardised patients. Data from the sixth session were not included in the analysis, as this fell outside the two sub-cases of interest. Figure 4.3 illustrates the timeline of the delivery of the three main components for both sub-cases.

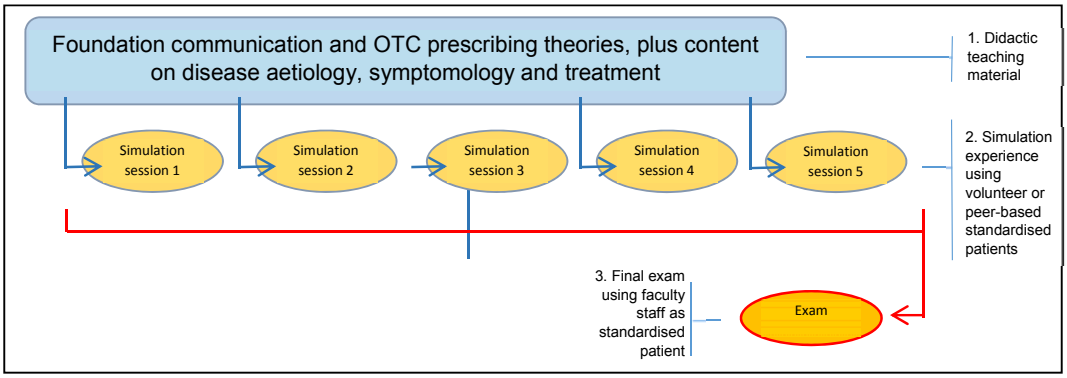


Figure 4.3. Timeline and three main elements of the new clinical module incorporating standardised patients.

4.3.2.7 Pharmacist tutor briefing.

Initial briefing. An initial briefing of the recruited pharmacist tutors was conducted immediately prior to the first standardised patient scenario. The pharmacist tutors were briefed on the role of the student, standardised patient and tutor, the intended outcomes of the simulation experience, use of the assessment tool, marking criteria, direction on the elements of feedback to be provided (guided by the assessment tool) and their role in briefing both the volunteer and peer standardised patients. The briefings were conducted face-to-face and allowed for questions where clarification was required.

Session case briefing. Pharmacist tutors were sent the case description and supporting reference material (readings, references to professional guidelines) approximately 1 week in prior to the session. The tutors were asked to review the case and material and

attend a session briefing prior to the session. During this session, the Pharmacist tutors were briefed in the main features of the case and where volunteer standardised patients were used, the pharmacist tutor was introduced to the volunteer SP they would be working with. The pharmacist tutors were then given the opportunity to further discuss the case with the SP. Pharmacist tutors were asked to observe for congruity between described case and that presented by the standardised patient during the session.

4.3.2.8 Pharmacist tutor de-briefing. Pharmacist tutors were debriefed after the sessions to identify any abnormalities in standardised patient performance (such as straying from the intention of the case) and report on student performance. Where the tutors identified variable performance of a particular standardised patient, a subsequent individual briefing was conducted prior to the following session to reduce variability between case and performance.

4.3.2.9 Recruitment of standardised patients. The volunteer standardised patients were recruited from a pool of patient volunteers maintained by an Australian regional university medical program. Student peers acted as standardised patients rotating through the role of SP as part of their participation in a final year pharmacy subject.

4.3.2.10 Standardised patient briefing. The standardised patient were briefed prior to the simulation exercise being conducted to achieve standardisation between the delivery of each scenario. The volunteer standardised patients were allocated a single case for the session and briefed by the researcher on the case using a written case scenario immediately prior to each session. The student peer standardised patients were briefed immediately prior to the case presentation. The briefing was structured to describe the topic and key feature of the scenario, relevant patient details, symptoms experienced by the patient highlighting the classic features of the disease, patient preference statements,

health and medication history, diet and exercise practices where relevant, smoking status and alcohol intake.

The pharmacist tutors were able to answer any questions about the way the case was to be presented or the clinical scenario. The standardised patient was encouraged to use their own personal history to increase the fluid nature of the interaction where the details were not critical to achieving the key feature(s) of the case. For example, where diet was not expected to influence the outcome of the intervention, the standardised patient was encouraged to report their own diet if comfortable in doing so. An example scenario used (in this case) with volunteer standardised patient can be found in Appendix 4-1.

4.3.2.11 Case development. The researcher developed an initial list of potential case scenarios. This list was reviewed by 2 pharmacist academics based and a selection of case topics was made based on relevance to graduates practice and case relationship to theoretical content taught in the subject. The case scenarios were developed and reviewed by one or more current practicing pharmacist for face validity and modification to the case made where appropriate.

4.3.2.12 Assessment. In both sub-cases, a practising registered pharmacist formatively assessed students weekly on their interaction with the standardised patient and case scenario in two main areas: process (including the structure and technical content) and communication proficiency. This simulated interaction with a standardised patient was scored using a prescriptive standardised assessment criteria (Appendix 4-8) that assessed student performance and guided feedback by the pharmacist tutor.

4.3.2.13 Feedback. Students received feedback from three potential sources, pharmacist tutor, other student peers and the standardised patient. A single pharmacist tutor provided the majority of feedback to students immediately at the conclusion of the

standardised patient intervention. Tutors were instructed to use the structure of the prescriptive standardised assessment criteria as a guide to providing feedback. The feedback included observations on communication, structure and order of the intervention and technical content of the intervention. Student peers and the standardised patient were invited to share their broad observations and comments as part of the feedback provided by the tutor pharmacist. The feedback component lasted between three and ten minutes depending on the complexity of the scenario and the students' performance.

4.4 Sample

The researcher in this study used purposeful and convenience sampling to recruit participants from the third-year (sub-case one) and fourth-year (sub-case two) undergraduate pharmacy classes. The total target sample was 133 undergraduate pharmacy students, consisting of 59 third-year and 74 fourth-year students.

4.5 Research Methods

The researcher employed a multiple methods design to collect both qualitative and quantitative data from a number of primary sources. The Case was investigated using five main data sources:

1. a student demographics questionnaire
2. two questionnaires, both employing a six-point Likert scale to assess student perceptions of confidence and difficulty in undertaking a patient intervention
3. a prescriptive standardised assessment criteria sheet to evaluate student performance in undertaking a patient intervention
4. focus groups to understand student perceptions of the use of volunteer standardised patients in undergraduate teaching and assessment, conducted immediately after exposure to the standardised patient teaching intervention

5. individual follow-up interviews with participants post-graduation to explore the effect of simulation as a teaching strategy on graduates' transition to practice.

The case in question was explored using a single embedded case study with the two variants of standardised patient teaching strategy to define each embedded sub-case, as well as the five data collection methods described above. Figure 4.4 provides a diagrammatical overview of the research design of the study. Figure 4.5 describes the study timeline and related data collection methods.

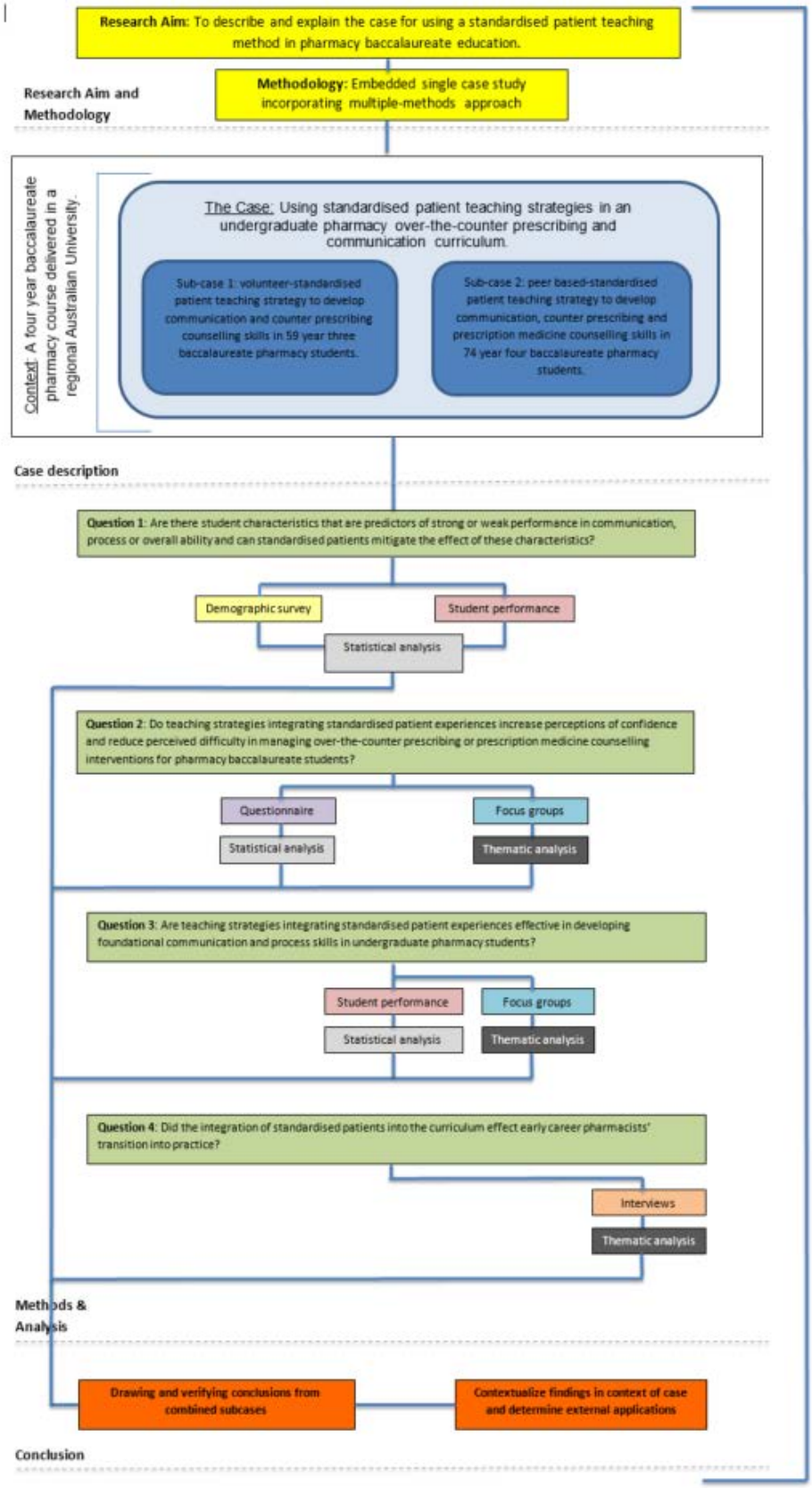


Figure 4.4. Diagrammatical representation of the research design.

4.5.1 Overview or research methods. In this chapter a range of qualitative and quantitative data collection and related analytical methods have been described. A summary of the research methods organised by research question can be found in Appendix 4-1. Figure 4.5 describes the study timeline and related data collection methods.

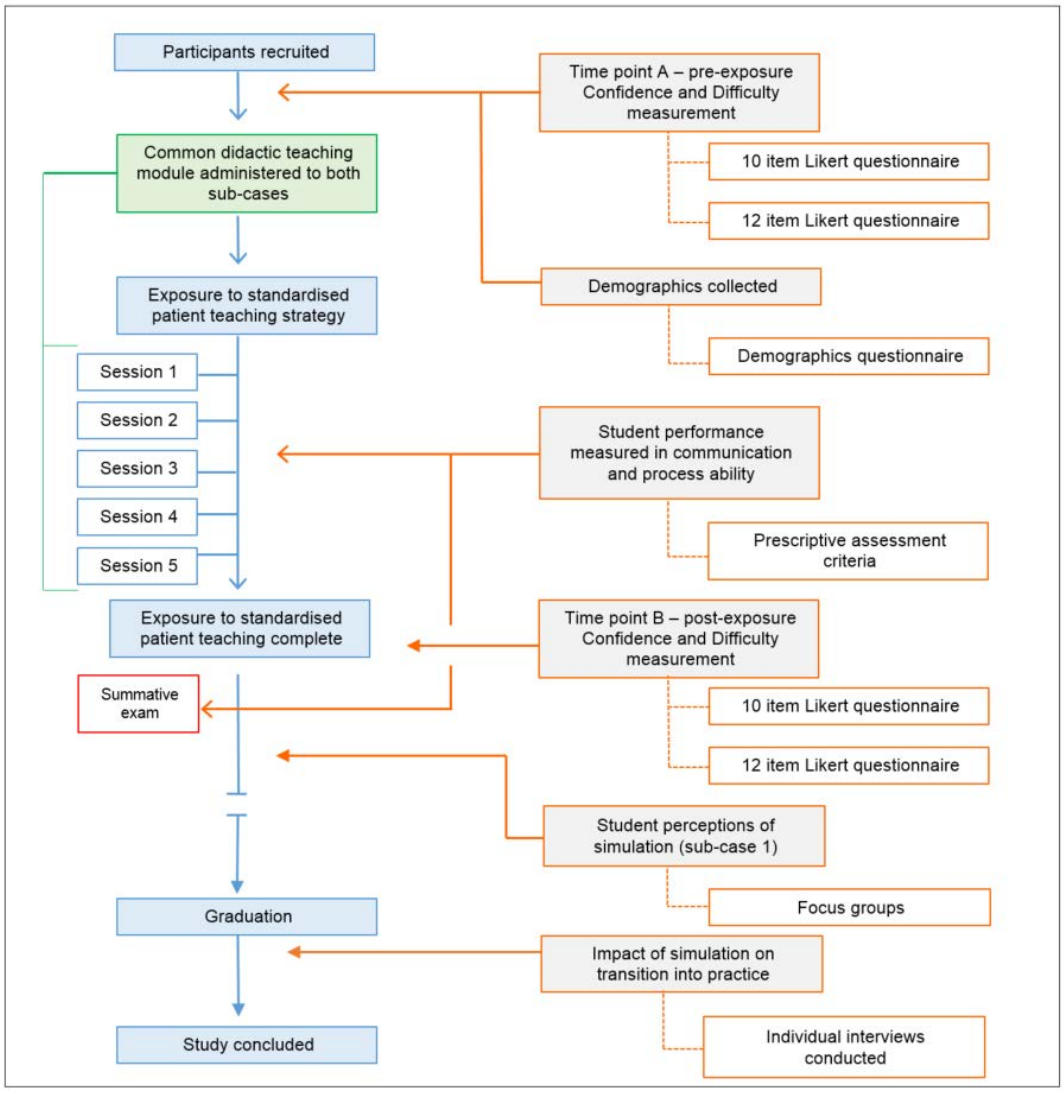
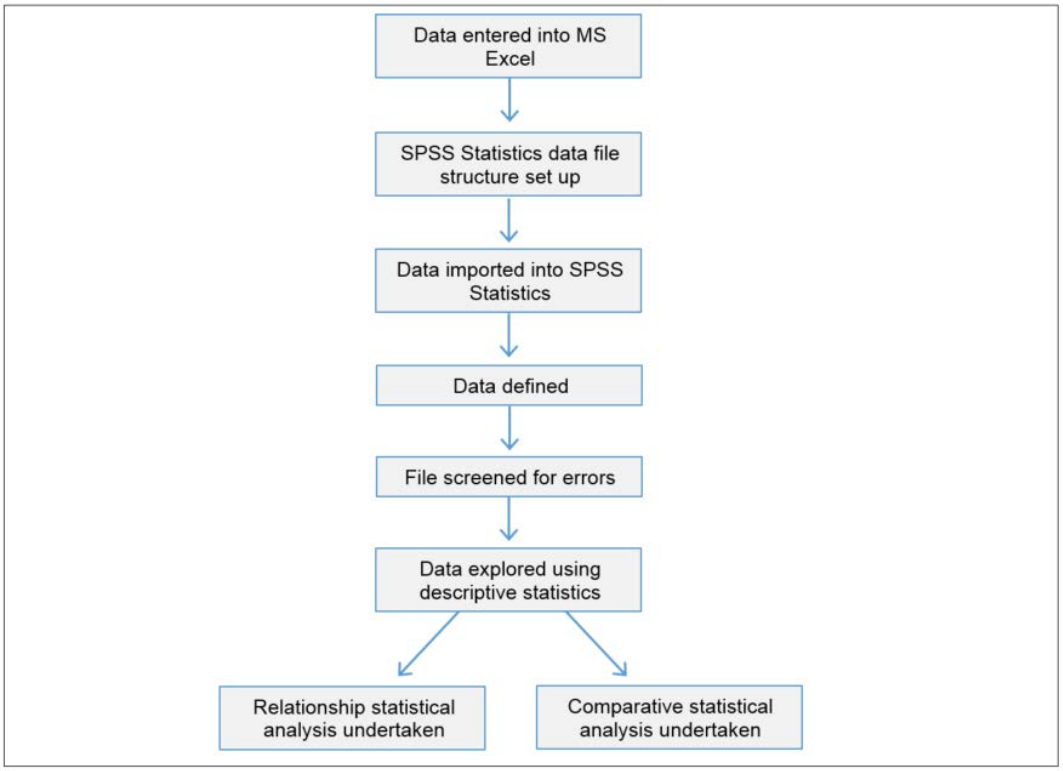


Figure 4.5. Study timeline and related data collection methods.

4.5.2 Quantitative data. All quantitative data were collated, organised and prepared using Microsoft Excel 2010 and 2013. All quantitative data analysis was undertaken using IBM SPSS® (Statistical Package for Social Sciences) Statistics version 22 and Social Science Statistics package (http://www.socscistatistics.com/tests/ztest/Default2.aspx). Visual representation of data (graphs) was prepared using Microsoft Excel 2013. Data preparation was undertaken following the process described by Pallant (2011). Figure 4.6 describes the process used to prepare the quantitative data for analysis in this study.



Note: Figure adapted from Pallant (2011).

Figure 4.6. Flowchart describing process of data preparation and analysis.

Quantitative data were first defined as either scale, nominal or ordinal, according to their nature. The data were then checked for errors. Categorical variables (such as

male/female and education category) were checked using a frequency count. The frequency count was reviewed for the number of valid and missing cases, as well as cumulative per cent. Continuous variables were checked using descriptive statistics. The descriptive statistics were reviewed for the number of variables, minimum and maximum values, and mean score. Potential errors were identified by sorting the data—a process that highlighted obvious data inaccuracies. Once identified, the data were corrected by returning to the original data collection tools and either entering correct values or (where the correct values could not be obtained) replacing the incorrect data with the 'system missing code', consistent with the process described by Pallant (2011, p. 43).

4.5.2.1 Demographic information. The demographics of study participants were collected for both sub-cases to assess for homogeneity and potential confounding factors that could influence participants' communication and process skills. The areas specifically examined were:

1. age (interval/ratio)
2. gender (nominal)
3. IDO (nominal)
4. presence of a FLOTE (nominal)
5. commencement of pharmacy degree immediately after leaving secondary school
6. full- or part-time work status prior to commencing pharmacy program
7. previous study exposure
8. highest level of education after secondary school
9. undergraduate pharmacy placement experience (experiential practicum experience) (ordinal)

10. paid or unpaid pharmacy work experience unrelated to university-organised clinical placement, including:
    a. community pharmacy-oriented holiday work (interval/ratio)
    b. regular community pharmacy-oriented pharmacy work (interval/ratio)
    c. hours worked in pharmacy employment
11. other non-pharmacy work experience, type of employment (nominal) and weekly number of hours worked in that employment
12. social club involvement
13. other significant life experience.

The questionnaire used to collect the demographic data from both sub-case populations is located in Appendix 4-3.

4.5.2.2 Statistical analysis of demographic data. Predominantly quantitative descriptive statistics of both population samples were derived from demographic data—a valid method to describe population demographics and trends. Where normality was assessed, a Kolmogorov-Smirnov test was used to assess normality in conjunction with histograms and Q-Q plots. Table 4.1 describes the statistical tests used to analyse the demographic data.

Table 4.1

Statistics Used to Analyse Demographic Data

Data collected and used	Analysis used
Student demographics Assessment of normality of data	Kolmogorov-Smirnov test to assess normality
Student demographics Student demographic trends and differences	Descriptive statistics to describe each sub-case Graphical analysis and descriptive statistics to identify elements of demographic homogeneity and heterogeneity

4.5.2.3 Identification of relationship between demographic characteristics and performance. The difference between the means and bivariate correlation test was used to identify any demographic characteristics that influenced student success. Once demographic influences were identified, analysis of the mean scores and graphical analysis was used to determine the direction and duration of effect. Table 4.2 describes the statistical tests used to examine the influence of demographic parameters on student performance (score).

Table 4.2

Statistics Used to Analyse Influence of Demographic Parameters on Performance (Score)

Data collected and used	Analysis used
Student performance Using standardised assessment criteria and student demographics. Assessed performance in process, communication and total score. Continuous variables: age, number of hours worked in paid or unpaid pharmacy work each week, total hours worked in non-pharmacy employment.	Bivariate correlations test to identify demographic characteristics that influence performance at session one, and to understand if effect persists at session three and the final session (session five).
Student performance Using standardised assessment criteria and student demographics. Assessed performance in process, communication and total score. Continuous variables: gender, IDO, holiday pharmacy work experience, weekly pharmacy work experience, other employment type work experience, total work experience, FLOTE, commenced pharmacy immediately after secondary school, other types of employment, participation in full- or part-time work before commencing pharmacy degree, highest level of previous study, significant travel, participation in a social group, significant family commitments.	Difference between means test used for categorical variables (such as gender and IDO) to identify demographic characteristics that influence performance at session one, and to understand if effect persists at session three and the final session (session five).

4.5.2.4 Student self-reported perceptions of confidence and difficulty. Two structured Likert questionnaires were administered to students in both sub-cases to measure student perceptions of *confidence* and *difficulty* when delivering an OTC prescribing consultation or patient intervention. The questionnaires were named the *Pharmacy*

Student Perception of Confidence (PS-PoC) Questionnaire and *Pharmacy Student Perception of Difficulty (PS-PoD) Questionnaire*, respectively. Participants were asked to rank agreement with 11 to 12 statements on a six-point Likert scale (ranging from 'strongly agree' to 'strongly disagree' to rate confidence and 'very easy' to 'very hard' to rate difficulty). The PS-PoC and PS-PoD were administered before and after exposure to standardised patients to assess changes in student perceptions of confidence and difficulty in conducting a patient intervention. The Likert questionnaires were developed with reference to one described by James et al. (2001), who reported on a study that evaluated a teaching program that aimed to develop the consultation skills of undergraduate pharmacy students. However, to respond to the Australian context, the current study included additional questions relating to important elements identified in the *Competency Standards for Pharmacists in Australia* (Pharmaceutical Society of Australia, 2003) and the *Standards for the Provision of Pharmacy Medicines and Pharmacist Only Medicines in Community Pharmacy* (Pharmaceutical Society of Australia, 2006). Face validity of the tools was tested through review by two experienced researchers and two practicing clinical pharmacists. The tool was then piloted in a small group of volunteers who were not in the target population, subsequent adjustments made to improve instruction and question clarity and resubmitted with the original four reviews to re-establish face validity.

4.5.2.5 Internal consistency (validation) of Likert questionnaires. Scale or instrument reliability was not addressed from the perspective of reproducibility of results, but from the reproducibility of the process that obtained the results originally in the circumstance of qualitative data gathered in a social research context (Silverman, 2011), and by statistical methods to assess internal consistency. The confidence (PS-PoC) and

difficulty (PS-PoD) Likert questionnaires were administered in the same manner for both control groups in terms of:

- question type and formulation
- time of administration of scale
- student anonymity
- instructions to participants
- consent.

Reverse questions were used to validate responses where possible. Scales were reversed for the perception of confidence and difficulty questionnaire to highlight corrupt entries. The two Likert questionnaires were piloted prior to use in the full study population.

The confidence (PS-PoC) and difficulty (PS-PoD) surveys were assessed for internal consistency using Cronbach's alpha. Cronbach's alpha is a measure of how closely related a set of items are as a group—that is, how each item compares simultaneously with all other items. A reliability coefficient (alpha) of 0.70 or greater is considered acceptable, and an alpha coefficient greater than is 0.80 is considered to have relatively high internal consistency (Gliem & Gliem, 2003; Harding & Whitehead, 2013; Tavoakol & Dennick, 2011). The individual Likert-type items in the confidence and difficulty surveys were grouped according to their association with process or communication, before being analysed. Both scales for confidence and difficulty were found to have good internal reliability. The statistics for internal reliability are provided in Chapter 6.

4.5.2.6 Perception of confidence (PS-PoC) questionnaire. Before exposure to standardised patients, a perception of confidence questionnaire (PS-PoC) (Appendix 4-4) was administered to students in both sub-cases. The questionnaire consisted of 12 items, in which students reported their perceptions of confidence in relation to

conducting a patient intervention. Questions were developed to measure students' self-reported level of confidence in the global areas of process and communication ability. This questionnaire was administered to both sub-cases at time point A (see Figure 4.5), prior to exposure to standardised patients. A post-exposure perception of confidence questionnaire (Appendix 4-5) with one additional item was administered to both sub-cases after exposure to standardised patients (time point B) (see Figure 4.5). The additional item asked students to report their perceptions of the effect of the simulation method on their confidence in interacting with patients.

4.5.2.7 Perception of difficulty (PS-PoD) questionnaire. The pre-intervention perception of difficulty (PS-PoD) questionnaire (Appendix 4-6) consisted of 10 questions and measured students' perceived level of difficulty in relation to conducting a patient intervention in the global areas of process and communication ability. This questionnaire was administered to both sub-cases at time point A, prior to exposure to standardised patients (see Figure 4.5). A post-exposure (PS-PoD) questionnaire (Appendix 4-7) consisting of the 10 original items, plus one additional item, was administered after exposure to the intervention (time point B) (see Figure 4.5). The additional item asked students to report their perceptions of the effect of the simulation method on the perceived level of difficulty involved in conducting a patient intervention.

Both the perception of confidence and perception of difficulty questionnaires were administered anonymously and in both sub-case populations at the same relative time points—prior to the delivery of the educational module (time point A) and after exposure to the standardised patient sessions (time point B). The perception of confidence and perception of difficulty questionnaires were identical for both sub-cases.

4.5.2.8 Statistical analysis of perception of confidence and difficulty questionnaires.

Of interest were the changes in perceptions of confidence and in the difficulty of conducting an intervention at the two time points pre-exposure (A) and post-exposure (B) for each sub-case, and the differences in response between the two sub-cases at the two time points, A and B.

The responses on the six-point Likert for both the confidence and difficulty questionnaires were collapsed into four main analysis categories to improve sensitivity. A description of the new collapsed analysis categories is contained in Tables 4.3 and 4.4. Where reverse questions were used to assess for internal consistency, the scale was reversed prior to analysis.

Table 4.3

Association between the Original Data Categories and Analysis Categories for Confidence Scale Data

Numerator	Original data category	Numerator	New analysis category
6	Strongly agree	4	Conclusive agreement
5	Agree		
4	Somewhat agree	3	Weak agreement
3	Somewhat disagree	2	Weak disagreement
2	Disagree	1	Conclusive disagreement
1	Strongly disagree		

Table 4.4

Association between the Original Data Categories and Analysis Categories for Difficulty Scale Data

Numerator	Original data category	Numerator	New analysis category
6	Very difficult	1	Conclusively difficult
5	Difficult		
4	Somewhat difficult	2	Somewhat difficult
3	Somewhat easy	3	Somewhat easy
2	Easy	4	Conclusively easy
1	Very easy		

The effect of the intervention on student perceptions of confidence and difficulty for both sub-case populations (both inter- and intra-population differences) was determined using a count-based analysis and z-test for two population proportions.

4.5.2.9 Student competence in undertaking a patient intervention. Registered pharmacist tutors and pharmacy faculty staff (the assessors) measured student competency in undertaking a patient intervention and communication ability. Assessment of each student's performance was standardised using three methods:

a. the use of prescriptive standardised assessment criteria (Appendix 4-8)
b. a brief training session conducted with the assessors on the use of the assessment tool
c. post-assessment moderation conducted by the investigator, with feedback to the assessors.

The prescriptive standardised assessment criteria was initially developed as a student performance measurement tool in the conduct of OTC prescribing interventions and prescription medicine counselling and to guide pharmacist tutor feedback. It was then adapted for use as a data collection tool for this study. The primary design of the tool was undertaken by the researcher and based on the Standards for the Provision of

Pharmacy Medicines and Pharmacist Only Medicines in Community Pharmacy (Pharmaceutical Society of Australia, 2006) and discussions with pharmacist academics and community pharmacists. Like the confidence (PS-PoC) and difficulty (PS-PoD) Likert questionnaires, the prescriptive standardised assessment criteria underwent face validity prior to use in the target population.

Students in sub-case one were assessed weekly for each of the five sessions of exposure to volunteer-type standardised patients, representing approximately 295 assessments over that period. A modified version of the assessment tool (the addition of a prescription protocol in the category of 'Information Gathering Process') was used to assess level-four students' (sub-case two) competence in undertaking an OTC prescribing and prescription counselling interventions. Participants in sub-case two were assessed weekly for five sessions, where peers were used to play the role of patient. This represented approximately 370 assessments over a five-week period. The assessment criteria considered 21 individual items grouped into six core elements:

1. history taking (information gathering process)
2. language
3. patient participation
4. diagnosis or problem identification
5. information delivery to patient
6. overall organisation.

Assessors were asked to score student ability using simplified grading criteria for each of the 21 individual items, with the following scoring system:

- **one mark:** the item in question was substantially or entirely correctly achieved by the student, and the performance would be considered adequate

or better for an intern pharmacist with either no or minor modification of strategy or content

- **half mark:** there was an attempt to satisfy the item in question, but the attempt required modification of strategy or content to be considered adequate at the level of intern pharmacist
- **no mark:** there was a wholly inadequate or absent attempt to satisfy the item in question.

Five of the six core elements were designed to measure performance on either process or communication, and were classified accordingly. A sixth element (diagnosis or problem identification) was not used in the analysis, as students had significant cues regarding the patient's presenting problem based on the delivery of theoretical material prior to that session. The three elements related to communication were combined to produce a communication score. The two elements related to process were combined to produce a process score. The process and communication scores were combined to produce a total intervention score. Combining these scores pooled 20 individual criteria to produce three global scores: a process score, communication score and combined total intervention score. Figure 4.7 pictorially describes the grouping of the elements to form the three scores of interest—communication, process and total intervention scores.

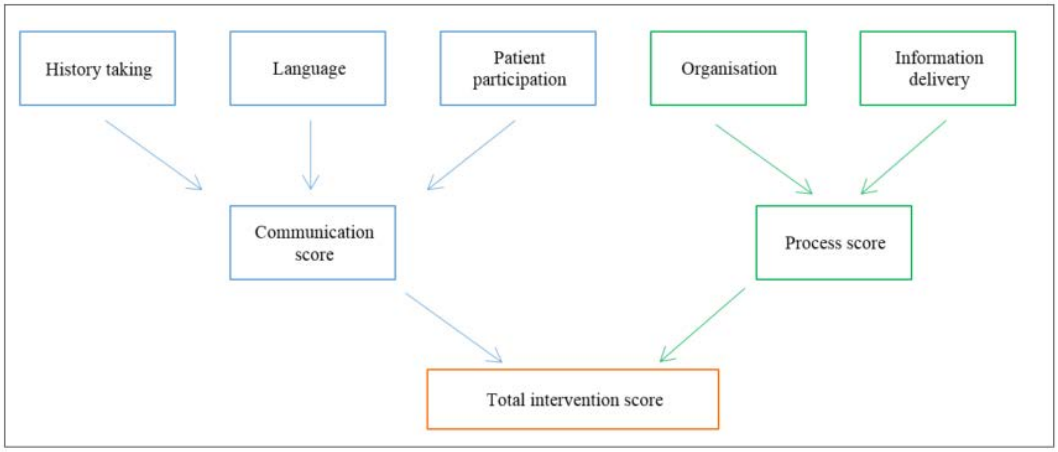


Figure 4.7. Diagrammatical representation of the compilation of the communication, process and total intervention scores.

The collected data on student performance were de-identified (except for sub-case) and examined and contrasted in terms of:

1. baseline performance
2. change over time
3. the measured end-points for each population
4. the influence of student demographics on outcome.

4.5.2.10 Statistical analysis of student competence in undertaking a patient intervention. The following statistical measures were employed to assess and compare student competence in undertaking a patient intervention at multiple time points:

- changes in ability over time at selected time points—paired-samples t-test
- comparison between sub-cases one and two at sessions one, three and five—repeated measures analysis of variance (ANOVA)
- graphical representation of mean scores over time, including difference in mean score
- profile plot to assess trends in ability for individual cases over time.

4.5.3 Qualitative data.

The focus groups and interviews were incorporated to better understand the student experience of the teaching intervention and their impressions of its effectiveness. Focus groups were conducted to develop an understanding of students' perceptions of the standardised patient teaching method immediately after exposure. These findings were used to support the quantitative findings of self-reported perceptions of confidence and difficulty. Interviews conducted with graduates were used to understand the longer-term impact of standardised patient teaching on the graduates' transition to practice. The use of qualitative methods is reasonable to develop a more complete understanding of the experience of students and graduates and complements the quantitative methods appropriately.

4.5.3.1 Interviewing theory. Kvale (2007, p. 14) described interviewing as a 'professional conversation'. During this interaction, in which questions are posed and answered and experiences and feelings are shared, knowledge is constructed in the interaction between interviewer and participant (Kvale, 2007). Interviews are well suited to experience-type research questions because they aid in the exploration of participant understanding and perceptions (Braun & Clarke, 2013). Yin (2014, p. 110) described the interview as one of the most important sources of case study evidence. Thus, it was an appropriate inclusion in the current investigation. The researcher (also described as the interviewer in the following paragraphs) entered the interview process with the following assumptions:

- the interview structure and process used in this research was influenced by the researcher's philosophical view of post-positivism

- the topic was clearly defined and participants were selected because they could contribute information relevant to answering the research questions
- the interviewee and researcher had a shared understanding of the meaning of the interview questions
- all interviewees were willing participants
- all responses to questions were valid, though not all would contribute to understanding the research question
- the researcher could reduce introducing bias through taking a neutral stance
- the findings from one interview could be meaningfully compared with those derived from other interviews conducted at the same time, and used in conjunction with other collected data to produce more meaningful understandings.

Interviews may be conducted in a variety of formats and by a variety of means; however, irrespective of the format or means, the fundamental basis of the interview process is the question–answer sequence (Roulston, 2010). To achieve the often-sought sequence in an interview—that of the interviewer asking a question and the participant answering the question—is dependent on a number of factors. One such factor is question type. There are two broad types of question: closed and open. The use of different question types will generate different responses.

Closed-ended questions often generate a binary response (generally in the form or agreement or disagreement with the statement or proposition) or a factual response (for example: *Question*—What was your grade point average in pharmacy? *Response*—It was around six). Closed-ended questions can collect important background information and allow the interviewee time to get comfortable with the interview process, before asking broader or more sensitive questions (Harrell & Bradley, 2009). A

negative or disagreement-type response is not always accompanied by an account or explanation. Therefore, by their nature, closed-ended questions typically restrict the participants' response in some manner. This does not mean that closed-ended questions should be avoided in an interview—just that the interviewer should be aware of their limitations and plan for their best use. That best use might be to clarify the answer to a previous question (often an open-ended question) or to gather specific information. In this manner, closed-ended questions allow the interviewer further clarification of the detail or meaning of interviewee statements during the interview.

In contrast, open-ended question provide a much broader scope of response construction. Open-ended question may be constructed to probe a topic or even to respond to a previous question. Open-ended probing questions often use the participant's own words to elicit deeper understanding of meaning or clarification of the response. Using the interviewee's own words also avoids the interviewer imposing words on the participant or introducing bias (Reja, Manfreda, Hlebec, & Vehovar, 2003; Roulston, 2010). Another factor that affects interview success is participants' understanding of the topic and terminology. As well as providing the participant with an understanding of the topic and terminology, the questions must be suitably specific. An absence of one or both of these factors will mean the participant will have difficulty answering the more interesting open-ended questions (Roulston, 2010).

The structure of the interview will determine the interviewer's preparation, as well as the predicted result. As briefly discussed in Chapter 3, there are three main types of interview structure: structured, semi-structured and unstructured interviews (Braun & Clarke, 2013; DiCicco-Bloom & Crabtree, 2006; Mills & Birks, 2014; Roulston, 2010). Structured interviews closely follow a question script. The researcher uses this script in a particular sequence, and the participant typically selects from a range of fixed

responses provided by the interviewer. The analysis of this type of interview structure is often deductive analysis for hypothesis testing (Roulston, 2010). At the other end of the spectrum is the unstructured interview. In this format, both interviewer and participant initiate and respond to questions. The conversation is generally free flowing and can be described as a 'guided conversation' (DiCicco-Bloom & Crabtree, 2006). In the middle of this spectrum is the semi-structured interview. In this format, the interviewer uses an interview schedule as a guide. While questions may be followed sequentially, strict observance of order is unnecessary (Braun & Clarke, 2013, Johnson & Turner, 2003). The interviewer may initiate probing questions in reply to participants' responses, and, while participants' responses are guided by the interview schedule, the terms they use and construction of their answers are their own (Roulston, 2010). Semi-structured interviews enable the question format to respond to the contextual elements inherent in the interview (Braun & Clarke, 2013), which allows a narrative to unfold, while including questions informed by the research question (Galletta, 2013). Despite the inferences taken from the labels of the different types of interviews, all have some sort of structure at their core (Braun & Clarke, 2013) and none are entirely unstructured (DiCicco-Bloom & Crabtree, 2006). Like unstructured interviews, semi-structured interviews lend themselves well to thematic analysis. The interviews in this research were conducted using a semi-structured format.

Equally important to interview structure is interview form. There are a number of recognised interview forms: ethnographic, feminist, oral history, life history, dialogic and phenomenological interviewing. This study used the phenomenological interview form. This form seeks to understand the lived experience of the participants in order to generate an in-depth understanding of their experience (Englander, 2012; Roulston,

2010). This type of interview requires the recruitment of participants who have experienced the phenomenon of interest and are able to talk about it (Roulston, 2010).

4.5.3.2 Focus group. Further in-depth understanding of the main issues identified from the questionnaires and intervention assessment criteria was attained via focus groups that included a sample from sub-case one. Students from sub-case one were recruited to participate in three planned focus groups. The focus group participants were recruited by indicating willingness to participate in an earlier survey. A random selection of survey participants were contacted and allocated to either focus group one or two. This study also planned a third focus group comprised of students who indicated they had a FLOTE; however, no students contacted for this group agreed to participate in a focus group. Participants from sub-case two were not available at the time of data collection to participate in the focus groups. The principle researcher moderated the focus groups.

As a method, focus groups were chosen because they can enable access to data that other methods cannot, and they can generate unexpected or novel knowledge (Braun & Clarke, 2013). The method mimics 'real life' in terms of natural conversation; thus, focus groups can result in in-depth dialogue that produces detailed accounts of an event (Braun & Clarke, 2013). They are useful in eliciting a wide range of views, can be used as an exploratory tool, and can increase representation of minority or marginalised social groups because they may feel less intimidated to speak as part of a group (Braun & Clarke, 2013). Focus groups can also safely engage sensitive topics that might be unsuited to one-on-one interviews.

The focus groups were conducted using a semi-structured schedule (see Appendix 4-9). The interviews were recorded using digital audio equipment and transcriptions produced in an orthographic (or verbatim) style using Microsoft Word in

preparation for analysis. Computer-assisted qualitative data analysis software—specifically NVivo 10®—was used to code and analyse the data.

4.5.3.3 Individual interviews. A final nine individual interviews were undertaken with a convenience sample of practising pharmacists who had completed their undergraduate pharmacy program at James Cook University during the previous seven years, and had experienced standardised patient teaching methods. Recruitment was via existing alumni contacts, emails, social media and snowball methods. Survey participants were contacted and interviewed either in person, by telephone or by other electronic means. Participants were invited to answer follow-up questions after the interview for the purpose of clarification. The first round of individual interview groups was conducted using a semi-structured schedule (see Appendix 4-10). Like the focus groups, the individual interviews were recorded using digital audio equipment transcribed in an orthographic style in preparation for analysis using NVivo 10®, which was used to code and analyse the data. Follow-up individual interviews groups were conducted three months later in a similar manner, using the semi-structured schedule described in Appendix 4-11.

4.5.3.4 Method of analysis of focus group and individual interviews. Thematic analysis (TA) of the transcribed interviews was undertaken. All qualitative data analysis has three core elements: coding data, combining codes into broader themes, and making comparisons within and observations about the data using some type of display method (Creswell, 2013). Thematic analysis is useful to identify themes and patterns of meaning across a dataset in relation to a research question. Thematic analysis aims to generate analysis from the data in the absence of an existing theory (the important point being that the analysis of the transcript data is not shaped by any existing theory). Thematic analysis is possibly the most widely used qualitative data analysis method

(Braun & Clarke, 2013). Thematic analysis offers only a method for data analysis, and is subsequently silent on data collection methods or theoretical frameworks through which to view the process of analysis (Braun & Clarke, 2013). Table 4.5 describes the relative strengths and weaknesses of thematic analysis.

Table 4.5

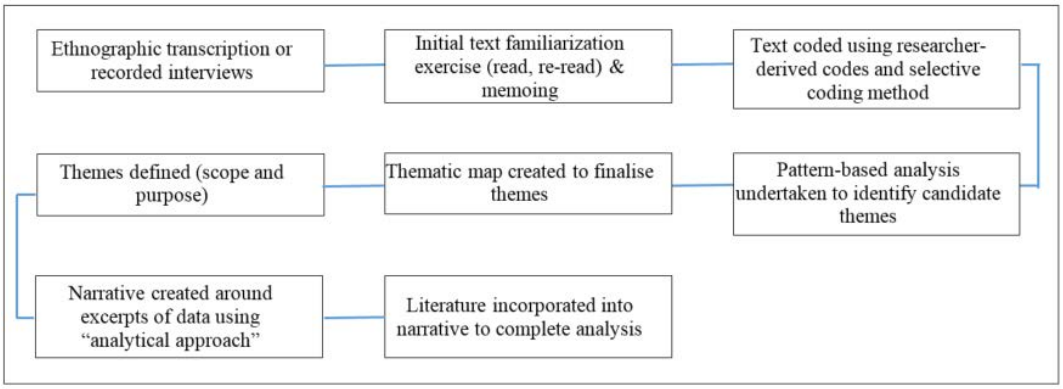
Strengths and Weaknesses of Thematic Analysis

Strengths	Weaknesses
Freedom to choose theoretical framework or data collection strategy can be applied to a range of research question types, methods for data collection and sample sizes.	Can be perceived by users of other more theoretically driven approaches (such as grounded theory and interpretative phenomenological analysis) as lacking substance.
Suitable for novice qualitative researchers, as principles and methods are easily to learn.	Has limited interpretative power if not used within an existing theoretical framework.
Focus on patterns across datasets.	The flexibility of the approach lacks concrete guidance for higher-level, more interpretative analysis.
	Because of the focus on pattern across datasets, it cannot provide any sense of the continuity and contradictions within individual accounts.
	Cannot make claims about the effects of language use.

Note: Adapted from Braun and Clarke (2013, p. 180).

Braun and Clarke (2013) described seven steps of coding and analysis using thematic analysis. Figure 4.8 presents a diagrammatical representation of the process adapted from Braun and Clark to undertake the qualitative analysis of the focus group and interview data. The recordings were transcribed in an orthographic style in an electronic form to organise and prepare the data for analysis, as described by Creswell (2013). The researcher then became familiar with the data by reading and re-reading each transcript item to gain a loose overall impression of the data. These initial impressions were recorded using memos in a research journal, as described by various authors (Agar, 1996; Birks, Chapman, & Francis, 2008; Creswell, 2013; Saldana, 2010;

Yin, 2014), and significant participant quotations or passages were identified and marked—a process described as 'pre-coding' by Saldana (2010). This first engagement with the data was not intended to be systematic, but only to form major organising ideas and thoughts, and to inform a short list of tentative codes (Creswell, 2013) to facilitate the commencement of the coding exercise to follow. Coding was then undertaken to identify the aspects of the data that related to the research question.



Note: Adapted from Braun and Clarke (2013, pp. 202–203).

Figure 4.8. Diagrammatic representation of stages used in thematic analysis of qualitative focus group and individual interviews.

According to Braun and Clarke (2013), there are two major types of coding used in pattern-based forms of qualitative research: complete coding and selective coding. The complete coding method does not rely on a pre-existing theoretical framework or concept and 'aims to identify anything and everything of interest or relevance to answering the research question, within the entire dataset' (Braun & Clarke, 2013, p. 206). Selective coding uses pre-existing theoretical and analytical concepts to identify the elements of interest in the data (Braun & Clarke, 2013; Harding & Whitehead, 2013; Yin, 2014). This process is often used for narrative, discursive and conversation analytic approaches and pattern-based discourse analysis (Braun & Clarke, 2013), and is a useful

method of coding when studying a case study. In this study, the research questions and literature review provided the guiding analytical framework and subsequent selection of elements of interest for analysis. Thus, selective coding was used to analyse the data in this study.

Coding involves aggregating evidence from across the dataset and assigning data of interest with a label (or code) (Creswell, 2013; Saldana, 2013). In this manner, coding is used to label relevant features of the data. Codes usually take the form of a word or brief phrase. The process of coding not only summarises a particular section of the data, but can also capture the essence of relevance of the coded data (Braun & Clarke, 2013; Saldana, 2013). Coding also allows for the same piece of data to be coded more than once in different ways. This acknowledges the multiple meanings that a particular select dataset may have. There are two main approaches to determining code names or labels: (i) data-derived or semantic codes (described as '*in vivo* codes' by John Creswell) and (ii) researcher-derived codes—sometimes referred to as 'latent codes' (Braun & Clarke, 2013; Creswell, 2013). In reality, there is overlap between these two coding approaches, and this is reflected in the approach to coding in this study. Data-derived codes reflect the semantic content of the data, and subsequently provide a succinct summary of the explicit content of the data (Braun & Clarke, 2013). This type of coding method tends to use participants' language and concepts as a basis for the coding (Creswell, 2013). Researcher-derived codes reflect a more conceptual or theoretical interpretation of the data and identify implicit meanings within the data, relying on the theoretical and knowledge frameworks of the researcher and his or her assumptions to make sense of the data (Braun & Clarke, 2013). The coding method used in this study more closely reflects a researcher-derived coding scheme. After the

coding of all datasets was complete, all instances of text aligned with each code were collated along with their origin in preparation for pattern-based analysis.

Pattern-based analysis or pattern coding identifies larger patterns across the entire dataset. Pattern-based analysis allows for the systematic identification of emergent or prominent features in the dataset (patterns), and interprets the identified patterns in a meaningful way (Braun & Clarke, 2013; Saldana, 2010). Pattern-based analysis relies on the assumption of 'ideas that recur across a dataset capture something psychologically or socially meaningful' (Braun & Clarke, 2013, p. 223), and is a suitable method to develop major themes from the dataset. The themes may be identified based on frequency or saliency. Themes (in qualitative research) are broad units of information that aggregate repeating ideas (in the form of multiple codes) to form a common idea or central organising concept (Braun & Clarke, 2013; Creswell, 2013; Saldana, 2010). Themes are typically broader than codes, are distinct from the 'features' of the data that lack a central organising concept (Braun & Clarke, 2013), and can have a hierarchical structure with subthemes (Braun & Clarke, 2013; Creswell, 2013). Themes characteristically give a description to the 'how' and 'in what way' the concept appears in the data. In this manner, the development of themes organises and deepens the analysis of the available dataset.

In this study, the development of themes was an active process in which the codes and coded data were observed for potential patterns. These patterns were the result of active decisions made by the researcher, facilitated by the researcher-derived codes and memoing. Memoing helps researchers make conceptual leaps from the (more raw) data to abstract concepts (Birks et al., 2008). Initially, candidate themes were developed by identifying similarities and overlap in the codes. These candidate themes were revised, and unsuitable themes were rejected when one or more of three criteria

were met: (i) data patterns exposed irrelevant codes and subsequent themes as unsuitable, (ii) the theme failed to fit the data well or (iii) the theme made no significant contribution to answering the research question. The process of developing candidate themes ceased once most salient patterns in the data were captured. Finally, the relationship (hierarchical and non-hierarchical) between themes was considered and a visual map of the themes was created. This visual map explored the connections between themes to help revise the candidate themes (with a view to forming the final themes) to check that the proposed themes 'fit' the coded data and the dataset, and that the overall story described by the themes 'rang true' (Braun & Clarke, 2013).

Analysis and interpretation of patterns across the data were undertaken as described by Braun and Clarke (2013), Creswell (2013) and Saldana (2010). Following finalisation of the themes, theme definitions were developed to discretely define theme scope and purpose. A narrative was then written around extracts from the data relevant to each theme. Ultimately, this narrative formed the analysis of the dataset. To produce and provide exemplars in the narrative, extracts from the data were carefully chosen based on their ability to best illustrate the analytic point being argued—a method explained by Braun and Clarke (2013). An analytical approach was used to produce the narrative. An analytical approach allows for 'specific interpretative claims about the particular extracts you present—as well as making more general descriptive or interpretative comments about the patterns in the data overall' (Braun & Clarke, 2013, p. 252). This approach is conceptual and interpretative, with a focus on latent meanings in the selected extracts (Braun & Clarke, 2013), and 'develops naturalistic generalisations of what was learned' (Creswell, 2013, p. 191). These naturalistic generalisations developed from the analytical process enable application of the 'learnings' from this case to other populations (Creswell, 2013). A thorough picture of

the case was developed using narrative, tables and figures. This process was further supported by incorporating scholarly literature in order to link the interpretation of the dataset with existing evidence from contemporary sources.

4.5.3.5 Trustworthiness of qualitative analysis. Most approaches to qualitative data analysis recognise the role of the researcher in shaping both data collection and analysis (Whitehead, 2014) and acknowledge rigour as a necessary element of quality qualitative research. Rigour in quantitative research is commonly measured using concepts of reliability and validity. Trustworthiness is the qualitative research equivalent to rigour and is critical to research credibility (Harding & Whitehead, 2013; Saldana, 2013; Whitehead, 2014). There are a number of broad positions that describe criteria for making judgements about trustworthiness. This study developed criteria based on creating an audit trail and using peer analysis checking or team coding.

This study's criteria for making judgements about the trustworthiness of analysis of the qualitative data were based on four main elements. These criteria were adapted from a range of options identified by Saldana (2013), Whitehead (2014) and Harding and Whitehead (2013). The four main elements used to develop trustworthiness in the qualitative component of this research were:

- **Audit trail:** Documenting each decision of the analysis process created an audit trail. This provided transparency of the analysis process and enabled evaluation of the analysis process.
- **Transcription of data:** Interviews were transcribed. Transcription reduces reliance on selective memory and the accuracy of written notes during the interview process. It also enables sharing of data between researchers to enhance the consistency of data analysis.

- **Use of qualitative data analysis computer software:** NVivo 10® qualitative data analysis program was used to increase ease of sharing the data and coding framework.
- **Peer analysis checking or team coding:** An internal peer coder was used to verify the quality of the research process overall, and check the acceptability of the data analysis. In this way, the peer analysis served to 'audit' the analysis. An independent coder was given the research objectives, themes and description of themes, and a sample of raw text. The peer coder was asked to code the sample text using the themes. This process is sometimes called 'team coding'. To ensure harmonisation of coding efforts, the primary researcher was the only person responsible for edits to the codebook.

4.6 Recruitment and Ethics

Ethical treatment of research participants in this study was based on four principles: research merit and integrity, respect for human beings, justice, and beneficence as described by the National Health and Medical Research Council (NHMRC) National Statement on Ethical Conduct in Human Research (2007).

4.6.1 Research merit and integrity.

The study was designed in response to an identified need to measure the impact of standardised patient teaching methods in the context of one Australian regional university and a preliminary review of existing literature. The study merit was reviewed by the research supervisors and the University research advisory panel as part of the confirmation process. A justification for this study is outlined in Chapter 1, Section 1.4: Justification for the study. This research also developed the researchers' knowledge and skill of conducting research studies.

The research was designed using complementary methodologies and methods suitable for the context of the research, to achieve the aims of the study and assure respect for the participants (in terms of risk to participants, burden on participants, fairness and potential benefits). The study was supervised by appropriately experienced and qualified research academics. The research proposal reviewed and monitored by an established University research governance system.

4.6.2 Justice.

The study sample was purposeful to achieve the aims of the research. The original research proposal identified the recruitment strategy for the research and the study was conducted in strict accordance with the approved proposal. Methods for assuring rigour of the study are described in Chapter 10. The participant inclusion and exclusion criteria was fair and established to meet the intended outcomes of the study. The inclusion criteria were informed by the context and are described in Chapter 1, 1.5 – Research Design, and Chapter 4, 4.3 – The Case. No participant who met the inclusion criteria (that being from one of the 2 sub-cases identified in Chapter 4) was excluded from the study. To ensure participants were not coerced or exploited, ethics approval was sought from and granted by the James Cook University Human Research Ethics Committee for both stages of this study and the study was carried out according to the description of the study in the ethics application.

Study participants from the level-three group (sub-case one) who indicated willingness were invited to participate in subsequent focus groups held upon completion of the teaching module. Focus group participants were read the ethics statement and asked not to use their own names or names of others in the focus groups to maintain anonymity in the recordings. Recruitment for the individual interviews was via existing alumni contacts, email, social media and snowball methods. After the analysis of the

first individual interviews, the participants were invited to participate in a follow-up interview according to the instructions in the original information sheet provided to participants. Where an invitation to participate was not accepted, no adverse consequences were experienced by an individual. The research was designed to minimise burden on participants.

Letters of approval from the University Human Research Ethics Committee are attached in Appendix 4-12. The letters of approval covered both the data collection and data analysis phases of this study.

4.6.3 Beneficence.

This study presented a very low risk to participants in terms or harm or discomfort. This research would likely not directly benefit the participants except for access to the research through publication of results. Benefits of this research will be experienced by the broader academic and future student community.

4.6.4 Respect.

An explanation of the study and an initial invitation to participate in the study were sent to all enrolled students prior to the subject introduction, and again at the commencement of the intervention. Participants were provided with an information sheet detailing the study and inviting them to participate in subsequent surveys, questionnaires and focus groups. They were informed that their participation in surveys, questionnaires or focus groups (the study) was voluntary, anonymous and confidential, and that they could withdraw from the study at any time without explanation or prejudice. Where the data collection method potentially compromised anonymity (focus group and interviews), analysis was conducted with source codes or text omissions (text blanks) that de-identified the source.

4.6.5 Consent, influence and conflict of interest.

Conducting research with students can pose an ethical dilemma – either real, potential or perceived conflict between the researchers aim and participants rights. When a researcher is also a teacher of participants, the potential for conflict must be acknowledged and addressed. This study considered consent, influence and conflict of interest when responding to the dilemma posed by a researcher who and teacher of participants. Consent was considered from two perspectives. The first, that participants gave consent freely and that there was no cohesion to participate in the study (see discussion of justice in previous section). Students received advice as part of the consent process that their participation or otherwise is the study would have no impact on the rating of their academic performance. They were also advised participation was voluntary and participants could withdraw from the study at any without explanation or prejudice.

There is potential for a conflict of interest to arise when measuring the impact of a teaching intervention undertaken by the principle researcher. There may be a bias created by a conscious or unconscious desire to demonstrate the educational intervention was successful. This may also be introduced by the researcher is they attempt to exert undue influence on participants facilitated by a power differential introduced by the teacher-student relationship that concurrently exists. Conflict was considered from 2 perspectives – bias and undue influence.

Bias. Bias may be introduced during the design, data collection and analysis phase of the study, or when interpreting findings phase of the research study. To minimise the impact of bias and conflict of interest, this study was designed and reviewed by a University panel of expert reviewers and independently by the University research ethics committee. When qualitative data was analysed, peer analysis (with one supervisor) was used to ensure the 'truthfulness' of the finding. Quantitative data

analysis methods and subsequent findings was reviewed by a different researcher. The quantitative data was collected by a number of experienced pharmacists as well as the principle researcher.

Undue influence. For all interactions between researcher and participants, participants were asked to provide truthful responses. Where participants were asked to provide anonymous surveys, the surveys were distributed and collected by a third party to reduce the researchers influence on participants – participating in the research. Where participant identify was known, for example in interviews, the participant was informed of their right to participate freely and withdraw at any time without prejudice.

Finally, there is a duty to maintain confidentiality of participant responses. Where possible, collected data was de-identified prior to review or analysis. For the qualitative data, participants were warned their confidentiality may be compromised during the interview process. Participants provided consent with this knowledge. Before qualitative data was analysed, transcripts were made from recording and participant identifiers were removed. For quantitative data, identifying data was removed from the data set prior to use for analysis.

4.7 Chapter Summary

In this chapter, a detailed characterisation of the embedded case (the Case) and its two individual units of analysis (the sub-cases) that formed the study's foci was provided. The chapter contains a description of the quantitative statistical methods used for data collection and analysis, as well as the methods to collect and analyse the qualitative data from the focus groups and interviews. This chapter is concluded with a description of the recruitment processes and the procedure followed to ensure

compliance with ethics requirements. Chapter 5 reports the researcher's findings from this analysis in response to the first research question.

Chapter 5: Research Question One—Results

5.1 Introduction

In this chapter the researcher describes the relevant findings relating to research question one: *Are there student characteristics that are influencers of strong or weak performance in communication or process ability, and can standardised patient teaching methods mitigate the effects of these characteristics?* The chapter begins with a summary of the most significant findings, followed by a description of the most salient population demographics. The researcher then identifies the demographic influencers of strong or weak performance for session one (first session) and session five (last session).

The results are presented by sub-case because the differences and similarities between sub-cases were of as much interest as the overall effect. As described in Chapter 4, sub-case one used volunteer standardised patients to teach OTC prescribing process and communication skills to 59 third-year undergraduate pharmacy students. Sub-case two is used to examine the use of peer-based standardised patient instruction to teach OTC prescribing, prescription medicine counselling processes and communication skills with 74 fourth-year undergraduate pharmacy students using a similar content and structure.

5.2 Summary of Chapter Findings

5.2.1 Demographics. Collectively, students in sub-cases one exhibited similar demographic characteristics to those in sub-case 2. The sub-cases were statistically similar in the following parameters:

- gender distribution ($p > 0.05$)

- IDO distribution ($p > 0.05$)
- full- or part-time work experience ($p > 0.05$)
- social or sporting group involvement ($p > 0.05$)
- IDO ($p > 0.05$)
- undertaking previous significant travel ($p > 0.05$)
- significant family commitments ($p > 0.05$)
- amount of extracurricular pharmacy work experience ($p > 0.05$)
- prior study ($p > 0.05$).

Sub-cases one and two exhibited dissimilar student demographic characteristics in three categories:

- median age ($p < 0.001$)
- pharmacy placement experience ($p < 0.001$)
- number of students who reported English as a second language ($p = 0.016$).

5.2.2 Demographics showing a difference in performance—Summary. Two demographic parameters were associated with a difference in performance in the first session, as measured by significant differences in the mean score, and one demographic parameter was associated with differences in performance in the fifth session. They were:

- international status (session one)
- any extracurricular work in a pharmacy (session one)
- gender (session five).

5.2.2.1 International status. Students from an international origin performed significantly worse in communication and total scores in session one. This was consistent for both sub-cases for total score (international status: sub-case one, $p = 0.048$; sub-case two, $p < 0.001$). There was no significant difference between domestic

and international student performance at the final session (session five) or in sessions two, three or four. There was no significant difference in performance between students with English as a first language and students reporting a FLOTE in any of the sessions. FLOTE status was not found to influence performance in this study. International status was found to influence performance; however, the influence of international status on performance was not significant after the first session.

5.2.2.2 Any extracurricular work in a pharmacy. Students who undertook some type of extracurricular pharmacy-related work performed significantly better in session one. For sub-case one, students who undertook any type of pharmacy-related extracurricular work performed significantly better in all three categories (communication, process and total scores). There was a sporadic difference in scores until session three. The difference in scores was not significant by session five. For sub-case two, students who undertook any type of pharmacy-related extracurricular work performed significantly better in all three categories (communication, process and total scores) in session one. This trend persisted for sessions two, three and four. The difference in scores was not significant by session five. There was no difference in mean scores based on the number of hours worked per week in a pharmacy. There was also no difference in mean scores between students who participated in regular extracurricular non–pharmacy related work and those who did not. The effect seemed to be related to the type of work—that is, the effect was confined to students exposed to pharmacy-type work experiences, not the extent of exposure (measured by hours employed in a pharmacy) or exposure to any type of workplace. The influence of extracurricular pharmacy-related employment was not evident in the final session for either sub-case, which suggests that simulation teaching can reduce the performance difference between students who experience extracurricular pharmacy work and those who do not.

5.2.2.3 Gender. There was no significant difference in student performance in session one for either sub-case by gender. A significant difference in performance emerged in both sub-cases as the students progressed towards the later sessions. For sub-case one, females performed significantly better in process score ($p = 0.014$) and total score ($p = 0.013$) and bordered on statistical significance for communication score ($p = 0.067$) in session five, when compared with male students. A similar trend was observed in sub-case two, where females performed significantly better in process score ($p = 0.045$) and bordered on statistical significance for total score ($p = 0.062$) in session five, compared with male students. Gender did not influence performance in session one, but did show an effect in the final session. The effect was more apparent for students in sub-case one.

5.3 Population Demographics

The Case (both sub-cases) comprised 133 students—59 level-three (sub-case one) and 74 level-four (sub-case two) undergraduate pharmacy students. Students in both sub-cases exhibited similar demographic characteristics in general. A summary of the population demographics is located in Appendix 5-1. The Case population was characterised by a younger age (median age = 21 years). The median ages for each sub-case were statistically dissimilar ($p = 0.000$), with median age being 20 years and 22 years for sub-cases one and two, respectively. Both sub-cases demonstrated similar asymmetrical clustering at the lower age values. Figure 5.1 shows the distribution of age of students for each sub-case.

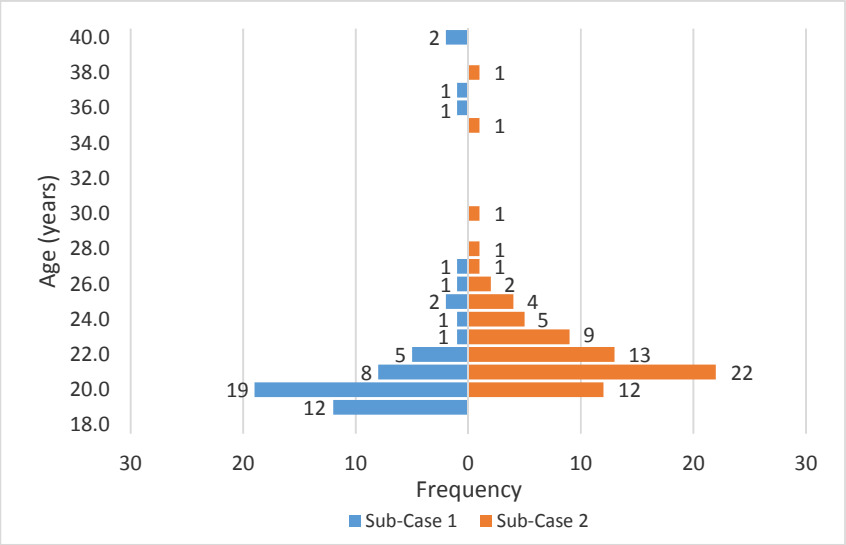


Figure 5.1. Distribution of age for each sub-case.

Approximately 70% of students were female in both sub-cases (see Figure 5.2). Approximately 6% of the Case identified as having an international origin (see Figure 5.3) and 3.7% (n = 5) identified a FLOTE (see Figure 5.4). All students who identified a FLOTE originated from sub-case one. Around 37.6% of students in both sub-cases worked in a pharmacy on a weekly basis (see Figure 5.5), with an additional 9% of the Case population reporting working in a pharmacy only during semester holiday breaks. On average, students who undertook extracurricular pharmacy work from both sub-cases worked 11.98 hours per week in a pharmacy (mean hours worked: sub-case one = 10.7 hours; sub-case two = 12.8 hours) (see Figure 5.6). There was a statistically significant difference between students in sub-cases for exposure to university placement experience, with 5.1% of students from sub-case one and 100% students from sub-case two having experienced university placement experience (see Figure 5.7).

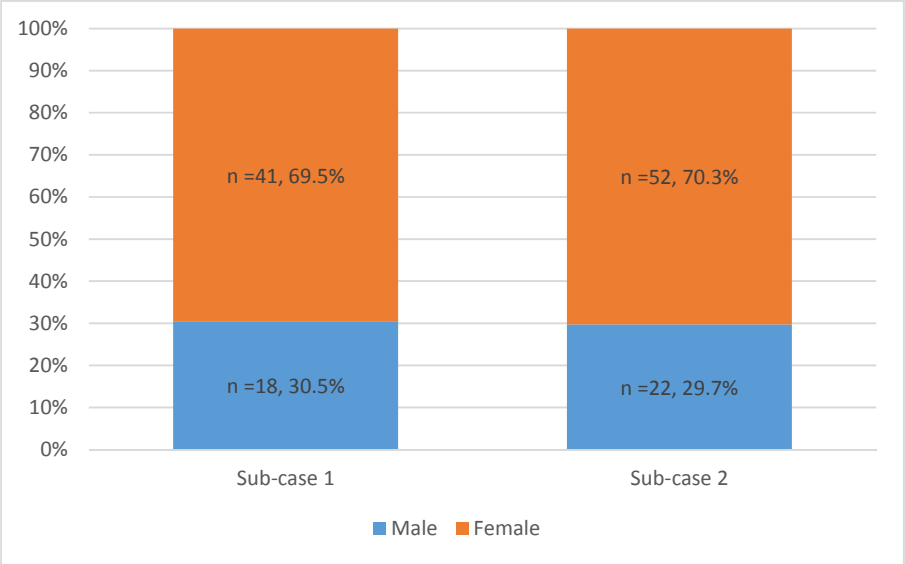


Figure 5.2. Distribution of gender for each sub-case.

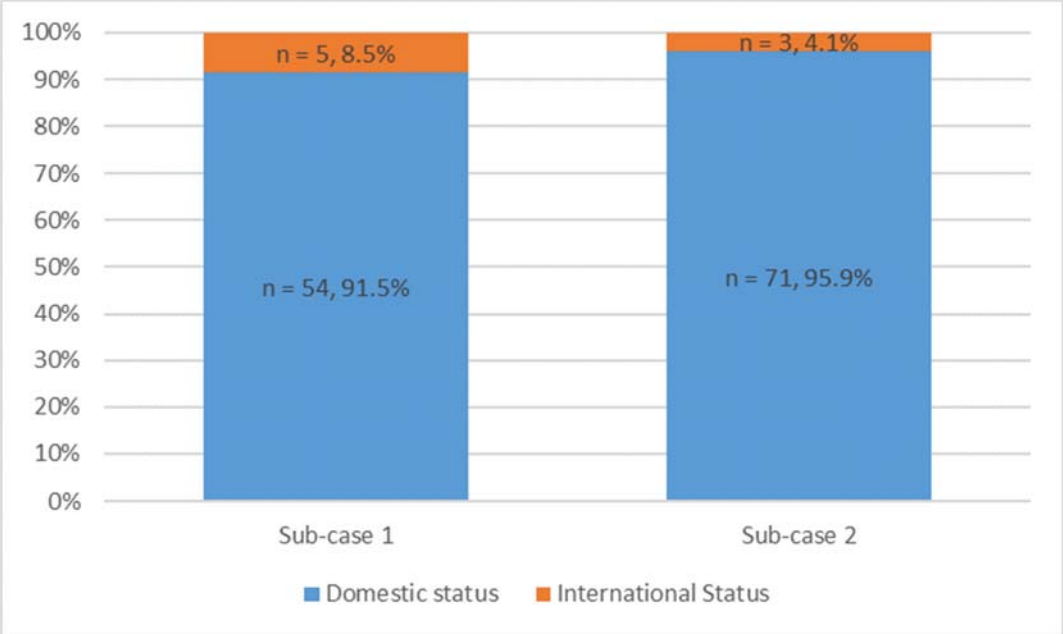


Figure 5.3. Students' domestic or international status by sub-case.

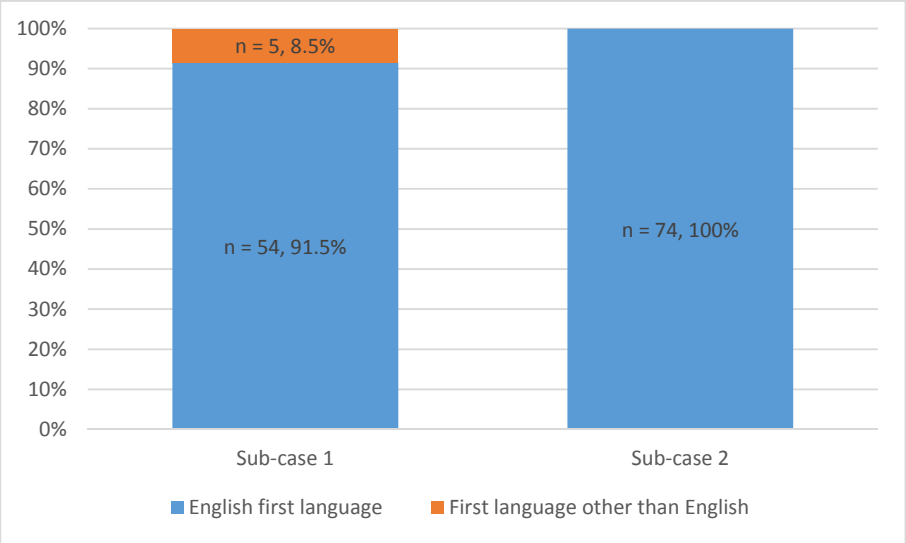


Figure 5.4. Students with a FLOTE.

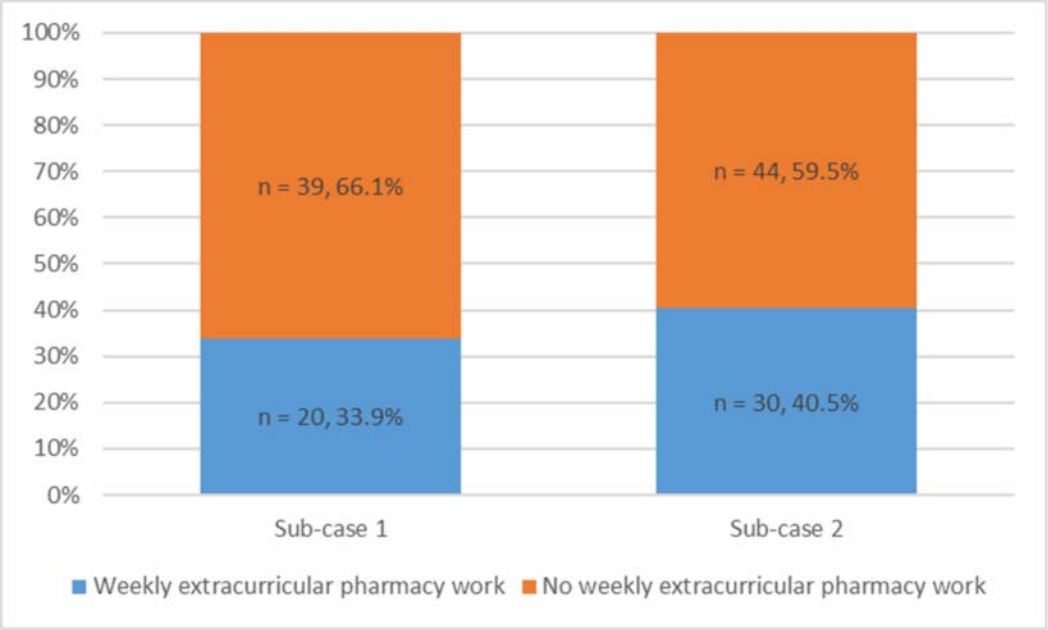


Figure 5.5. Students who undertook weekly extracurricular pharmacy work by sub-case.

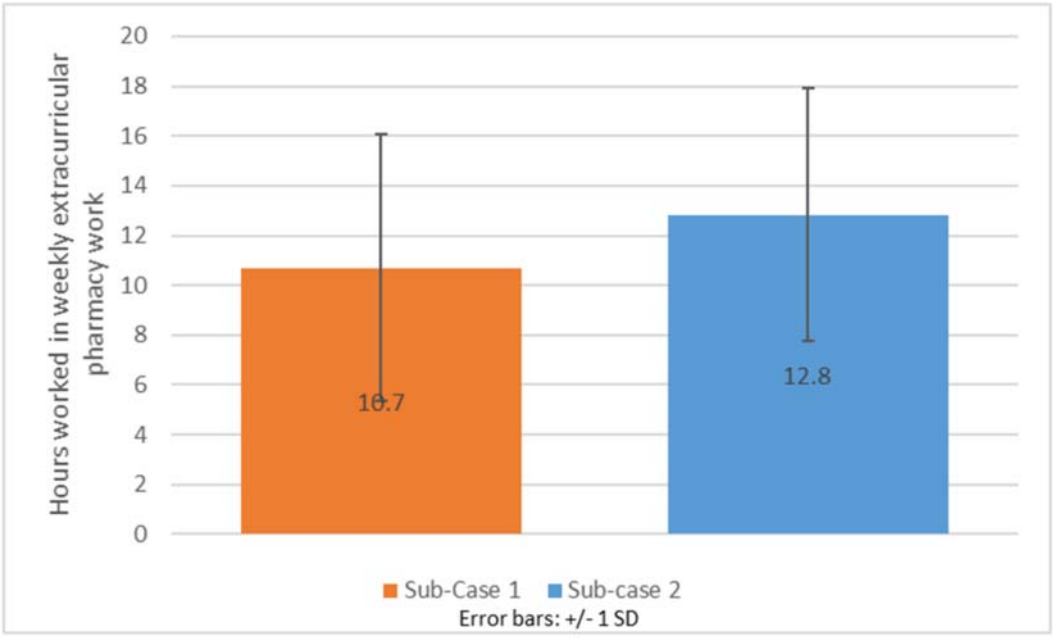


Figure 5.6. Mean extracurricular hours worked in a pharmacy by sub-case.

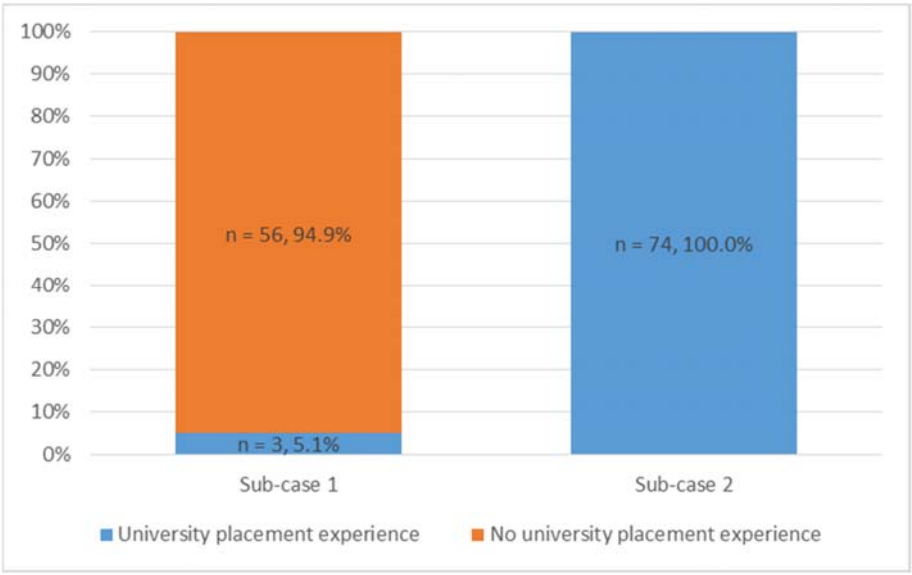


Figure 5.7. Student exposure to university placement experience by sub-case.

Approximately one-third (34.6%) of students worked in non–pharmacy related employment, working an average of 11.6 hours per week. Approximately two-thirds (64.7%) of students worked in some form of part-time work, while studying pharmacy.

The majority (60.9%) of students transitioned from high school to university, with a little over one-quarter (28.6%) undertaking either full- or part-time work prior to commencing study. Approximately one-third (30.8%) undertook study after leaving high school prior to commencing their pharmacy degree. Eleven per cent reported undertaking significant travel, and 6% reported having significant family responsibilities. Over one-third (36.8%) reported participation in an organised social group of some kind. The student population in both sub-cases were largely homogenous, with statistically significant differences in sub-cases appearing in age (sub-case one: $Md = 20$; sub-case two: $Md = 22$), FLOTE status (sub-case one: $N = 5$; sub-case two: $N = 0$) and exposure to university pharmacy placement experience (sub-case one: $N = 3$; sub-case two: $N = 74$).

5.4 Identification of Demographic Factors that Influenced Student Performance

The difference between the means test and correlations (bivariate) were determined to identify differences in performance between demographic groups. This approach was taken to identify demographics that could influence student success after initial and repeated exposure to standardised patient teaching intervention. For categorical variables (such as male/female and domestic/international), the difference between means was used to identify performance differences between demographic-based groups. For continuous variables (such as age and hours worked), bivariate correlations were used. Performance was measured using a prescriptive standardised marking schedule, and the performance data were analysed at two time points: the first session (session one) and last session (session five). When differences were found in either the first or last sessions, data from session's two to four were analysed to establish trends. Data from the final examination (a sixth session) were not used for this

analysis because a different method of standardised patient was used (faculty staff as standardised patients). Performance was measured in three distinct areas: communication, process and overall performance (total score), and is described in more detail in the following paragraphs.

5.4.1 Measurement of student performance. The performance measured was that of the students' competency in undertaking a patient intervention. It was measured using prescriptive standardised assessment criteria (described in Appendix 4-8). The assessment criteria considered six core elements:

1. history taking (information gathering process)
2. language
3. patient participation
4. diagnosis or problem identification
5. information delivery to patient
6. overall organisation.

Five of the six core elements were designed to measure performance on either process or communication, and were classified accordingly. The process score and communication score combined to produce a total score. Figure 5.8 describes the grouping of the elements to form the three scores of interest—the communication, process and total scores. A sixth element (diagnosis or problem identification) was not used in the analysis because students had significant cues to the problem based on the delivery of didactic material prior to that session.

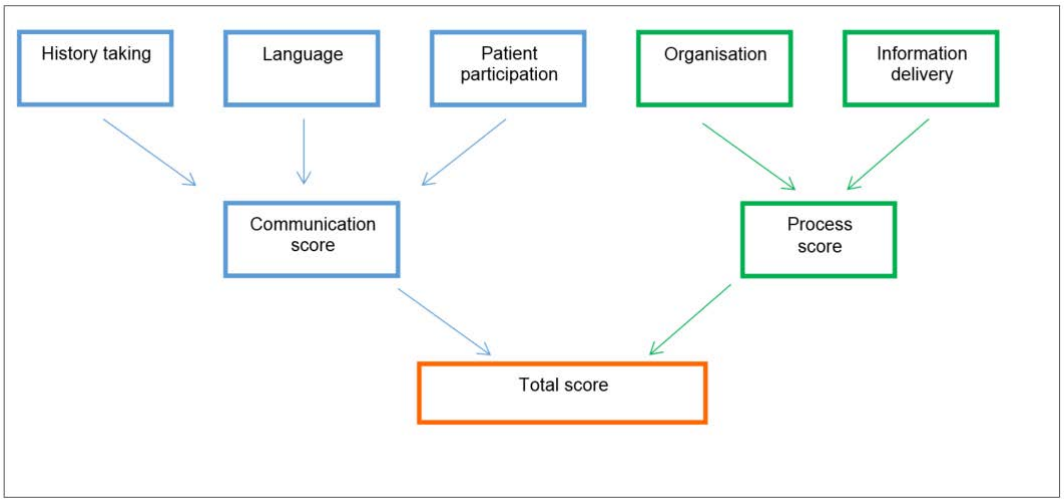


Figure 5.8. Diagrammatical representation of the compilation of the communication, process and total intervention scores.

Of the 14 demographic characteristics measured, 11 demographic parameters showed no overall association with performance for either sub-case at sessions one and five. The demographic characteristics that were not related to performance, as measured by difference in mean score or correlations, were:

- age ($p > 0.05$)
- FLOTE ($p > 0.05$)
- full- or part-time non-pharmacy work experience ($p > 0.05$)
- number of hours worked in a pharmacy as part of extracurricular paid work ($p > 0.05$)
- commencement of pharmacy course immediately after secondary school ($p > 0.05$)
- social group involvement ($p > 0.05$)
- undertaking significant travel ($p > 0.05$)

- other significant life experience ($p > 0.05$)
- number of hours worked in extracurricular pharmacy work ($p > 0.05$)
- significant travel ($p > 0.05$)
- amount of prior study ($p > 0.05$).

Appendix 5-2 lists the demographics and statistics in which no association was found between demographic parameter and performance. A difference in mean scores in student performance was seen for two demographic parameters at session one: student origin (IDO status total score: sub-case one, $p = 0.048$; sub-case two, $p < 0.001$) and any extracurricular work in a pharmacy (weekly or holiday) (total score: sub-case one, $p = 0.005$; sub-case two, $p = 0.009$). A third demographic parameter of gender demonstrated an association in the final (fifth) session (total score: sub-case one, $p = 0.014$; sub-case two, $p = 0.062$). The following section presents the analysis for international status, any extracurricular work in a pharmacy and gender.

5.4.2 Effect of student origin (international or domestic) on performance. An independent samples t-test was used to examine both sub-cases for difference in means between domestic and international students. When both sub-cases were analysed independently, the trend for differences in means for domestic and international students was similar for the two sub-cases. For sub-case one, international students performed significantly worse in session one in communication (domestic students: $N = 52$, $M = 6.65$, $SD = 1.8$; international students: $N = 5$, $M = 4.6$, $SD = 2.88$, $t\ [55] = 2.31$, $p = 0.025$, two-tailed) and total score (domestic students: $N = 52$, $M = 11.1$, $SD = 3.04$; international students: $N = 5$, $M = 8.1$, $SD = 4.41$, $t\ [55] = 2.02$, $p = 0.045$, two-tailed).

The trend was similar for sub-case two. International students performed significantly worse in session one in total score (domestic students: $N = 66$, $M = 15.17$, $SD = 3.15$; international students: $N = 3$, $M = 12.83$, $SD = .289$, $t\ [43.29] = 5.53$, $p <$

0.001, two-tailed). Like sub-case one, there was no significant difference in means between domestic and international students in session's two to five. Figures 5.9, 5.10 and 5.11 show the mean scores and difference in mean scores for the communication, process and total scores for sub-case one. Figures 5.12, 5.13 and 5.14 show the mean scores and difference in mean scores for the communication, process and total scores for sub-case two.

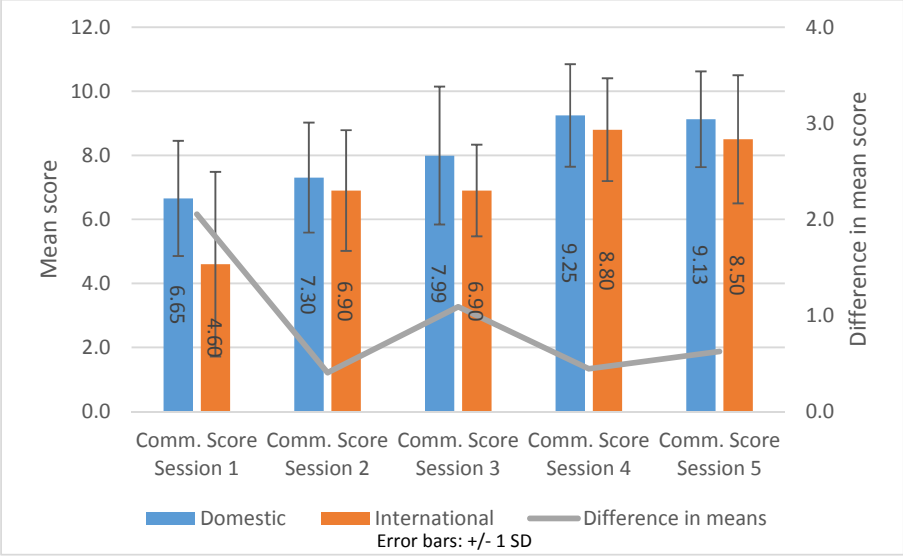


Figure 5.9. Mean communication score for sub-case one.

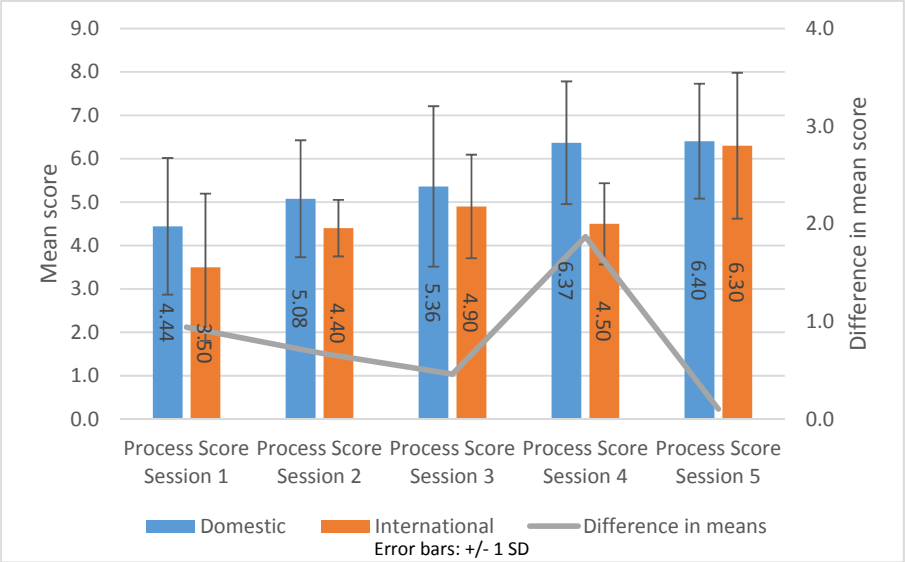


Figure 5.10. Mean process score for sub-case one.

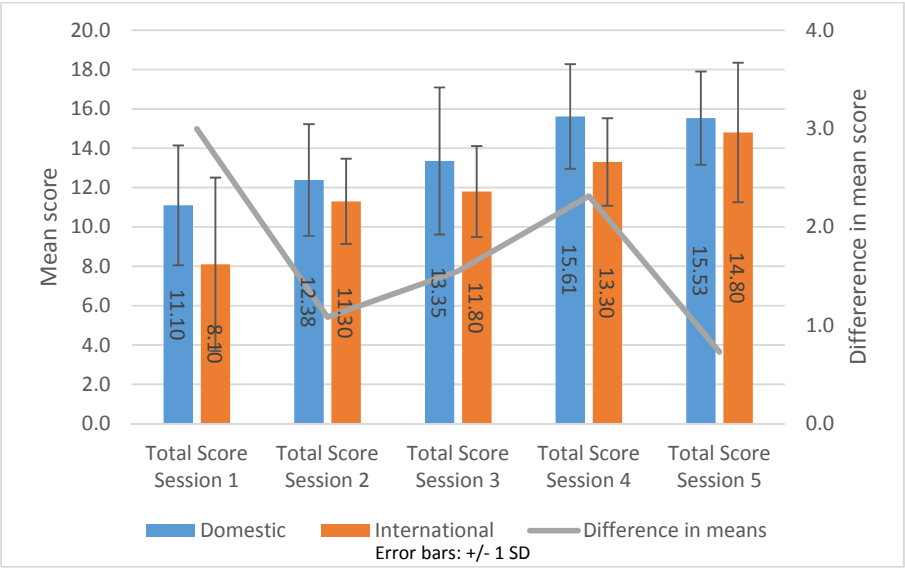


Figure 5.11. Mean total score for sub-case one.

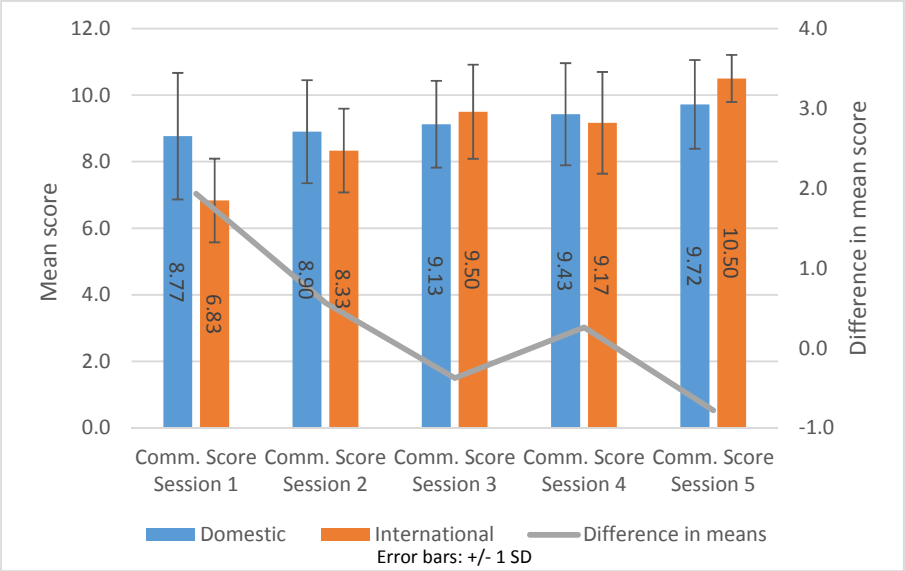


Figure 5.12. Mean communication score for sub-case two.

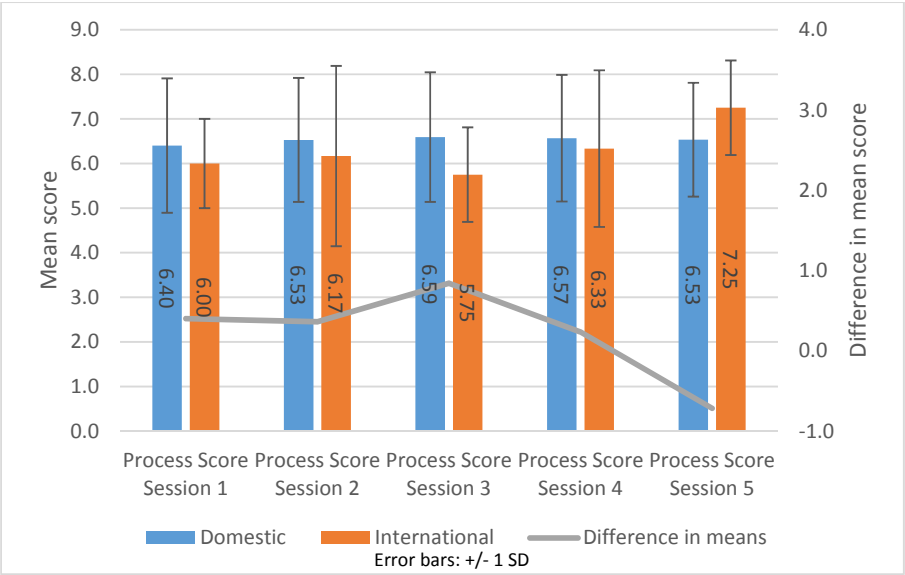


Figure 5.13. Mean process score for sub-case two.

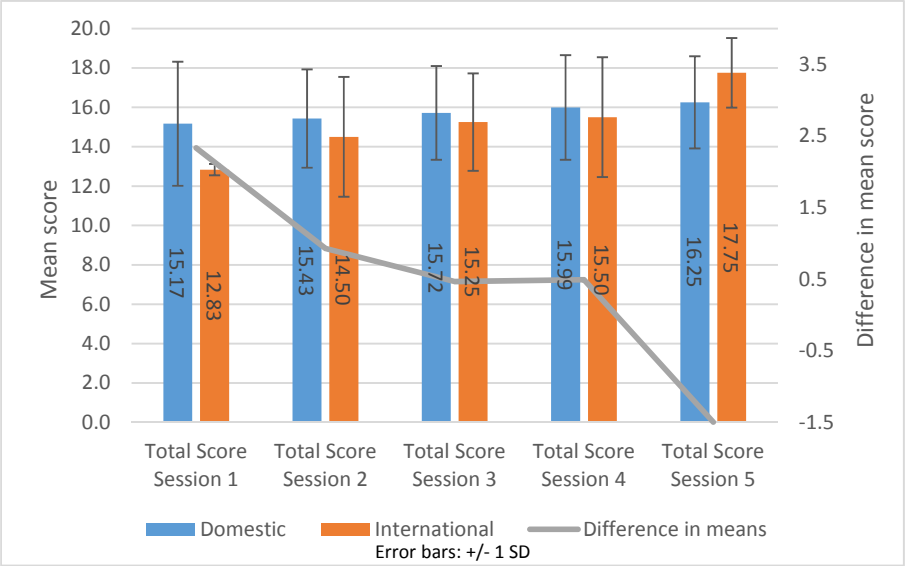


Figure 5.14. Mean total score for sub-case two.

Figures 5.15 and 5.16 illustrate the difference between international and domestic origin students organised by sub-case. Values above zero indicate higher domestic student scores. Values below zero indicate higher international student scores. These figures show a picture consistent with the whole case analysis—an overall decline in the difference between mean total scores between sessions one and five. As already stated, while international students in both sub-cases performed worse than their domestic counterparts at the first session, there was no significant difference in performance between international and domestic students in session's two to five ($p > 0.05$).

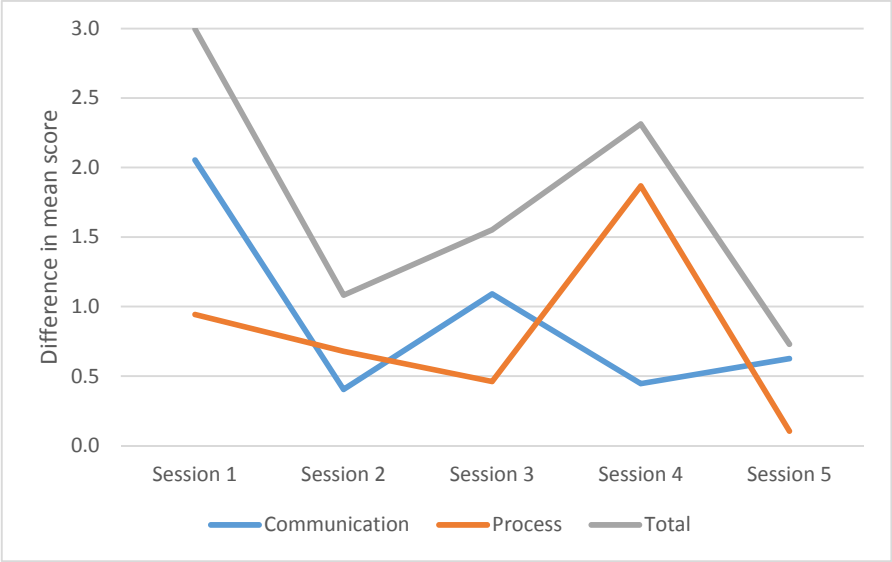


Figure 5.15. Difference in international and domestic mean scores for communication, process and total scores for sub-case one.

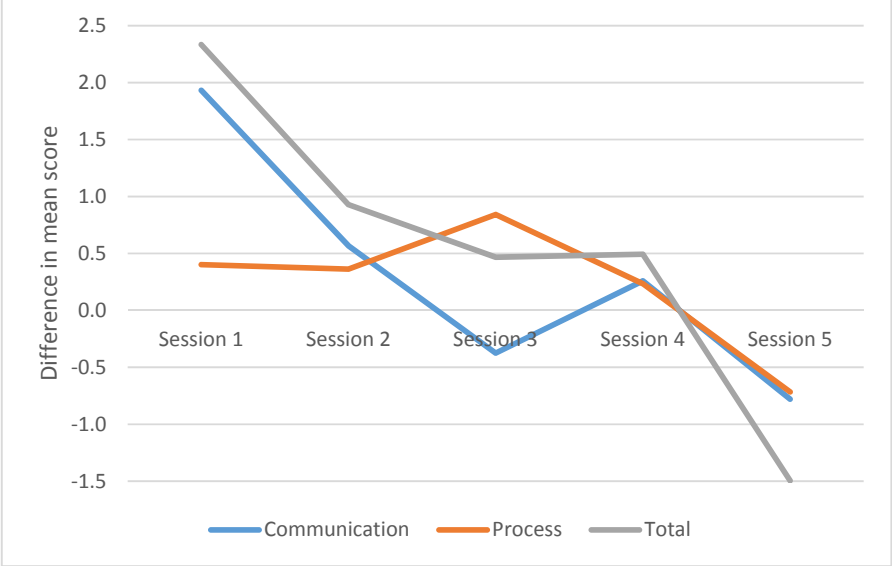


Figure 5.16. Difference in international and domestic mean scores for communication, process and total scores for sub-case two.

As Figures 5.15 and 5.16 show, the international students performed significantly worse in session one, as evidenced by a lower mean total score; however,

the difference in score declined with greater exposure to standardised patients. The difference in scores was more pronounced for the communication score than the process score in the first session. Given the large influence of communication score on total score (total score being a function of both communication [11 of 19 possible points] and process [eight of 19 possible points]), the question arose: did language contribute to the difference?

To answer this, an independent samples t-test was conducted to look for differences in student performance based on the students' first language status (FLOTE). The analysis was undertaken for sub-case one only, as no students in sub-case two reported FLOTE status. There was no significant difference in scores ($p > 0.05$) for any category or session for sub-case one. It is of interest that the data obtained in this study suggest that FLOTE status does not influence performance. This suggests that the influence is more than a simple matter of English language proficiency. Figures 5.17, 5.18 and 5.19 show the mean communication, process and total scores for sub-case one for sessions one to five, organised by FLOTE status. While students with a FLOTE had lower mean scores than students with English as a first language, the differences were small, statistically non-significant and changed little over the five sessions.

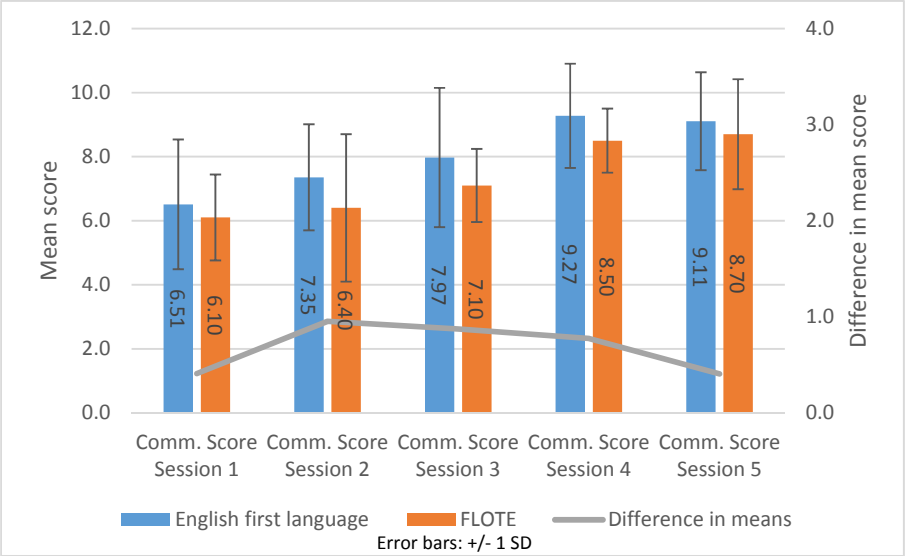


Figure 5.17. Mean communication score for sub-case one—FLOTE status.

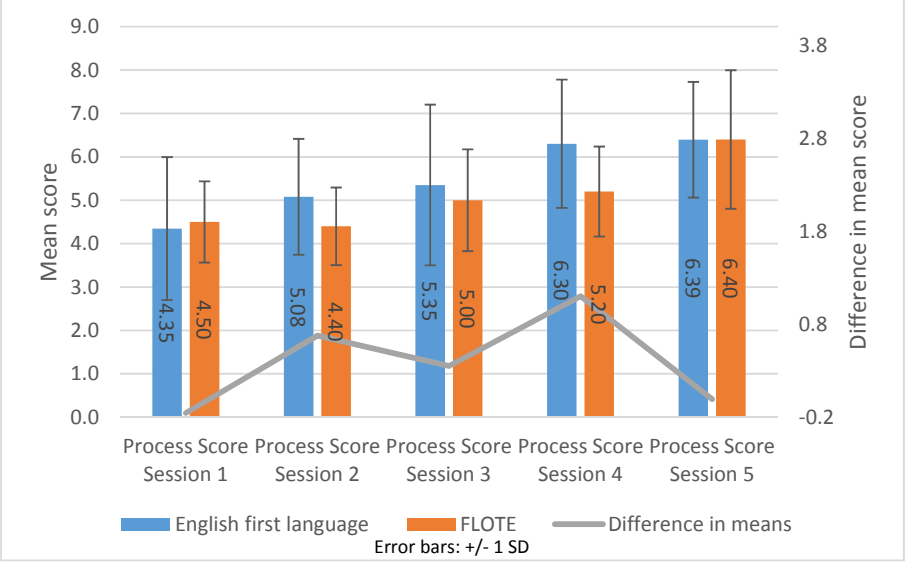


Figure 5.18. Mean process score for sub-case one—FLOTE status.

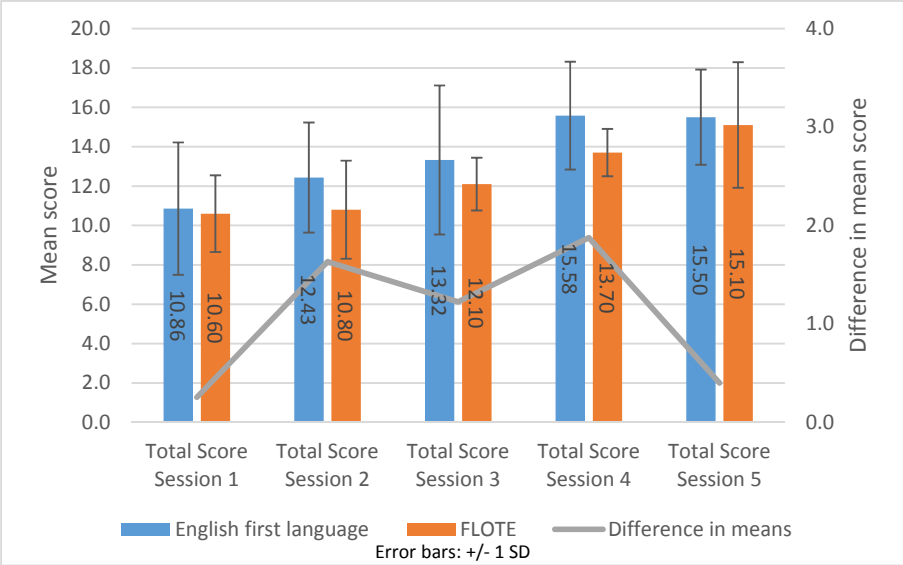


Figure 5.19. Mean total score for sub-case one—FLOTE status.

5.4.3 Gender.

5.4.3.1 Sub-case one. An independent samples t-test was used to examine differences in the mean scores of male and female students for sub-case one (N = 59). There was no pattern of significant difference in the mean scores for communication or process scores for sessions one to three ($p > 0.05$). Female students performed significantly better in sessions four and five for the total score than did male students. In session five, female students performed significantly better (higher total score) (female students: N = 40, M = 15.99, SD = 2.19; male students: N = 17, M = 14.24, SD = 2.69, t [55] = −2.581, p = 0.013, two-tailed). Female students also performed significantly better in communication and total scores in session four, and process score (and total score) in session five. Figures 5.20, 5.21 and 5.22 show the mean score for the communication, process and total scores for sub-case one, respectively.

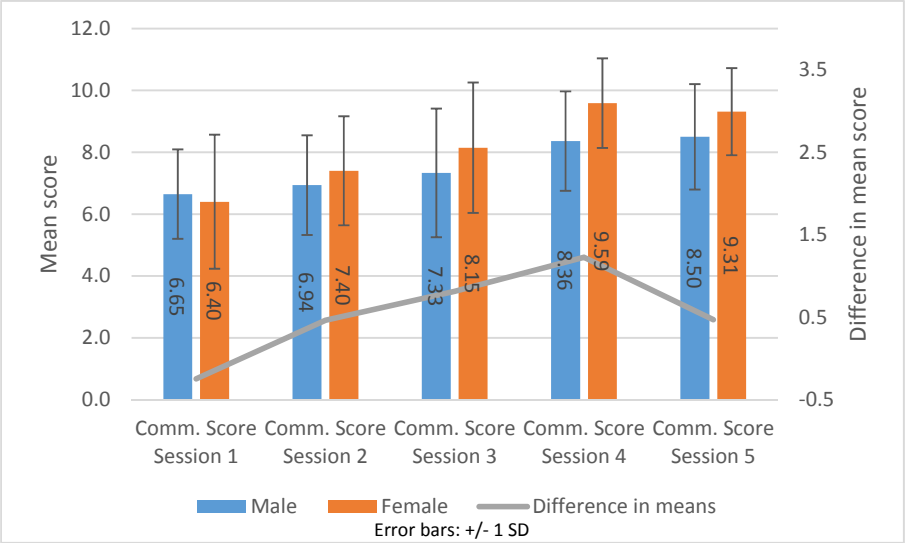


Figure 5.20. Mean communication score for sub-case one by gender.

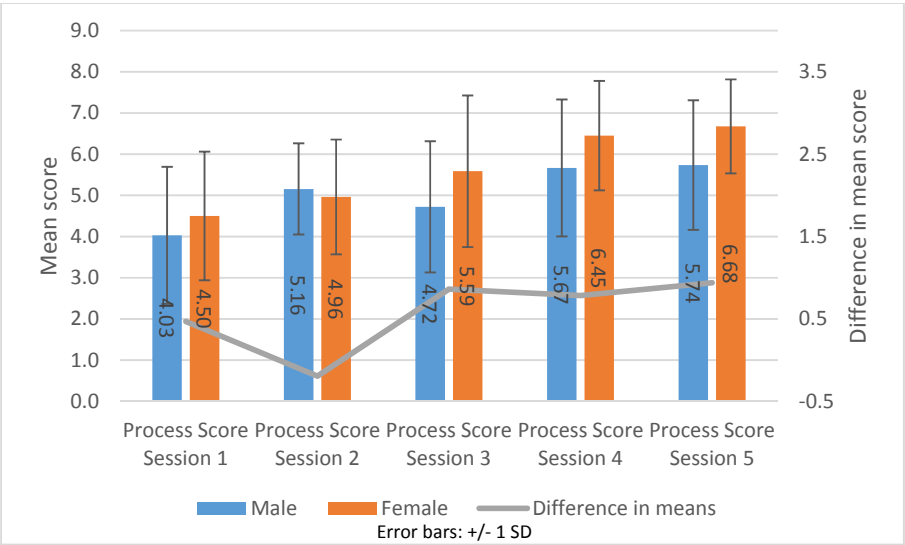


Figure 5.21. Mean process score for sub-case one by gender.

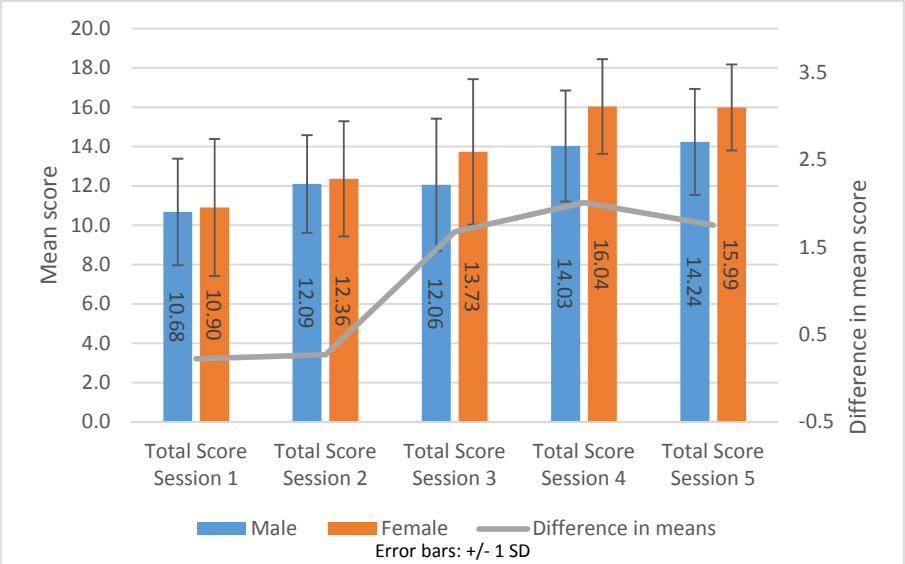


Figure 5.22. Mean total score for sub-case one by gender.

5.4.3.2 Sub-case two. An independent samples t-test was used to examine differences in performance between female and male students in sub-case two (N = 74). The pattern of difference between genders for sub-case two was lower than that in sub-case one. Like sub-case one, there was no pattern of significant difference in mean scores for the communication, process or total scores for sessions one to three ($p > 0.05$). A difference in means between male and female students emerged in session four, where females performed significantly better in communication score (female students: N = 48, M = 9.67, SD = 1.12; male students: N = 22, M = 8.86, SD = 2.09, t [68] = −2.095, p = 0.040, two-tailed). Session four's process score bordered on statistical significance (p = 0.063). Female students performed significantly better in process scores in session five (female students: N = 43, M = 6.77, SD = 1.18; male students: N = 18, M = 6.06, SD = 1.36, t [59] = −2.052, p = 0.045, two-tailed). The difference in total score performance for session five bordered on significant (p = 0.062), with female students performing slightly better. Figure 5.23 shows the mean total scores for sessions one to five for sub-case two. This figure shows the relatively close mean scores for female and male

students and the relatively unchanged difference in means over the five sessions. When compared with sub-case one in Figure 5.22, the effect of gender does not seem as strong in sub-case two (Figure 5.23).

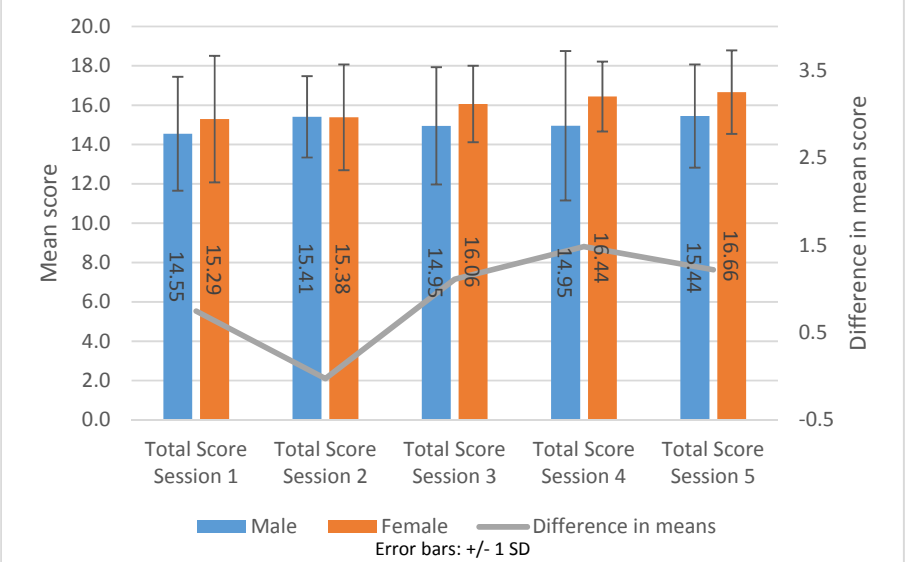


Figure 5.23. Mean total score for sub-case two by gender.

5.4.4 Extracurricular work in a pharmacy. An independent samples t-test was conducted to detect differences in the performance mean scores for students who undertook extracurricular work in a pharmacy, compared with those students who did not (students who undertook either non–pharmacy related work or no work at all). The analysis was initially undertaken for two categories: (i) 'holiday extracurricular pharmacy work' and (ii) regular 'weekly extracurricular pharmacy work'. When the sub-cases were analysed separately, there was suggestion of effect, although there was insufficient consistency in the results to draw a conclusion. To increase sensitivity, a third category was created by combining students who reported extracurricular holiday pharmacy work, extracurricular weekly pharmacy work or both into a consolidated category titled 'any extracurricular pharmacy work'. This category was analysed to

detect differences in the mean scores for the categories of communication, process and total scores for each sub-case for sessions one and five.

5.4.5 Any extracurricular pharmacy work.

5.4.5.1 Sub-case one. There was a significant difference in means (the 'any extracurricular pharmacy work' category students performed significantly better) in session one for:

- communication score—students who undertook any extracurricular pharmacy work: $N = 22$, $M = 7.25$, $SD = 1.46$; students who did not undertake any extracurricular pharmacy work: $N = 35$, $M = 5.99$, $SD = 2.11$, $t\ (55) = -2.46$, $p = 0.017$, two-tailed
- process score—students who undertook any extracurricular pharmacy work: $N = 22$, $M = 5.07$, $SD = 1.09$; students who did not undertake any extracurricular pharmacy work: $N = 35$, $M = 3.91$, $SD = 1.70$, $t\ (55) = -2.826$, $p = 0.007$, two-tailed
- total score—students who undertook any extracurricular pharmacy work: $N = 22$, $M = 12.32$, $SD = 2.29$; students who did not undertake any extracurricular pharmacy work: $N = 35$, $M = 9.90$, $SD = 3.44$, $t\ (55) = -2.913$, $p = 0.005$, two-tailed.

There was no significant difference in mean scores between students who undertook any extracurricular pharmacy work in session five for the communication ($p > 0.05$), process ($p > 0.05$) and total ($p > 0.05$) scores. Figures 5.24, 5.25 and 5.26 show the difference in the mean scores for the communication, process and total scores, respectively, for any extracurricular pharmacy work for sub-case one.

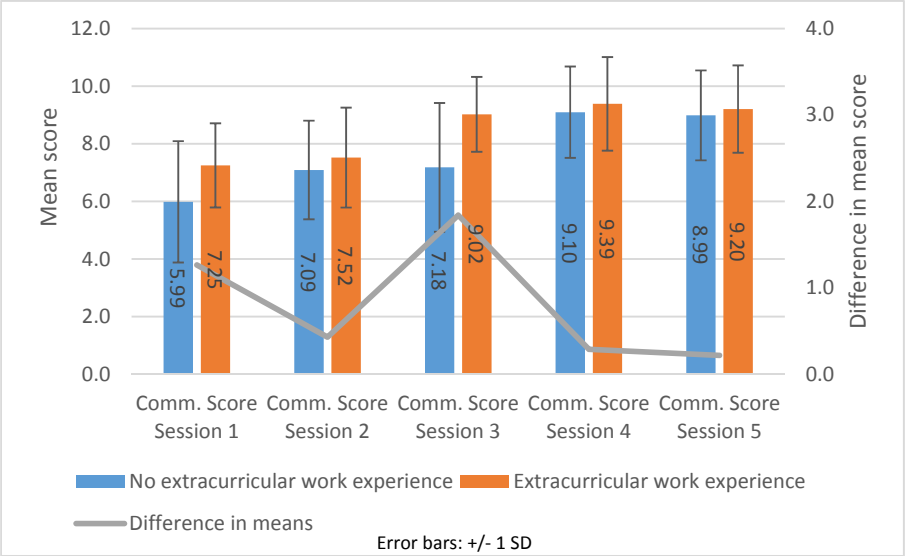


Figure 5.24. Mean communication score for sub-case one by any extracurricular pharmacy work.

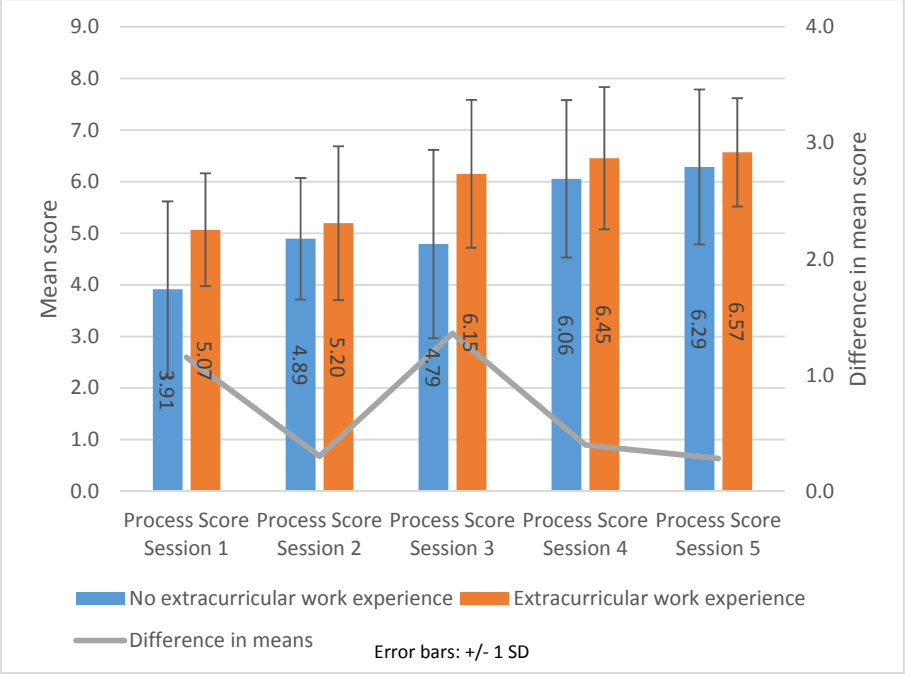


Figure 5.25. Mean process score for sub-case one by any extracurricular pharmacy work.

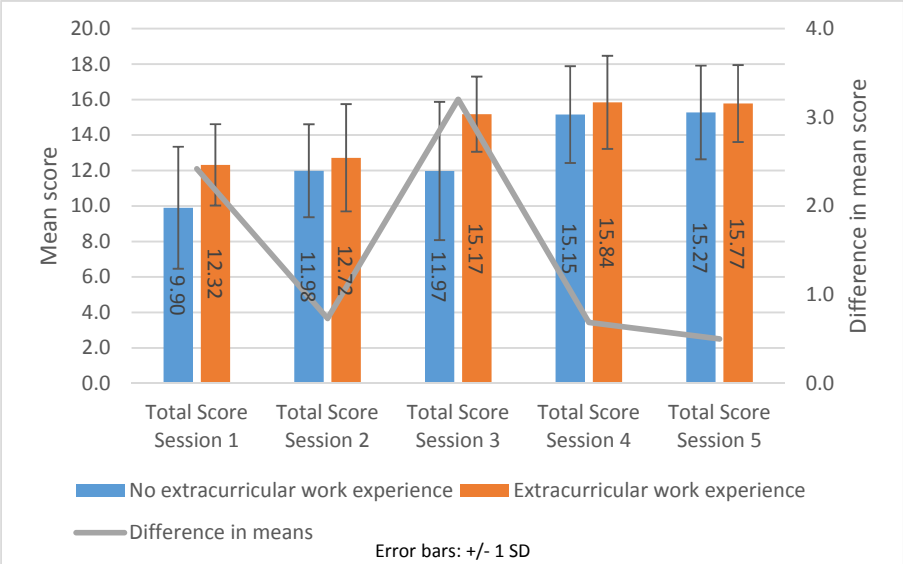


Figure 5.26. Mean total score for sub-case one by any extracurricular pharmacy work.

5.4.5.2 Sub-case two. Students in sub-case two demonstrated a similar pattern. There was a significant difference in means (any extracurricular pharmacy work performed significantly better) in session one for:

- communication score—students who undertook any extracurricular pharmacy work: $N = 37$, $M = 9.16$, $SD = 1.82$; students who did not undertake any extracurricular pharmacy work: $N = 32$, $M = 8.13$, $SD = 1.981$, $t\ (67) = -2.319$, $p = 0.023$, two-tailed
- process score—students who undertook any extracurricular pharmacy work: $N = 37$, $M = 6.80$, $SD = 1.32$; students who did not undertake any extracurricular pharmacy work: $N = 32$, $M = 5.91$, $SD = 1.54$, $t\ (67) = -2.586$, $p = 0.012$, two-tailed
- total score—students who undertook any extracurricular pharmacy work: $N = 37$, $M = 15.96$, $SD = 2.82$; students who did not undertake any extracurricular pharmacy work: $N = 32$, $M = 14.03$, $SD = 3.17$, $t\ (67) = -2.674$, $p = 0.009$, two-tailed.

The difference in mean scores continued to be significant for the total scores for sessions two ($p = 0.040$), three ($p = 0.041$) and four ($p = 0.004$). For students in sub-case two, there was no significant difference in session five for communication score ($p > 0.05$), process score ($p > 0.05$) or total score ($p > 0.05$). Figures 5.27, 5.28 and 5.29 show the difference in mean student scores for the communication, process and total scores, respectively, for any extracurricular pharmacy work for sub-case two.

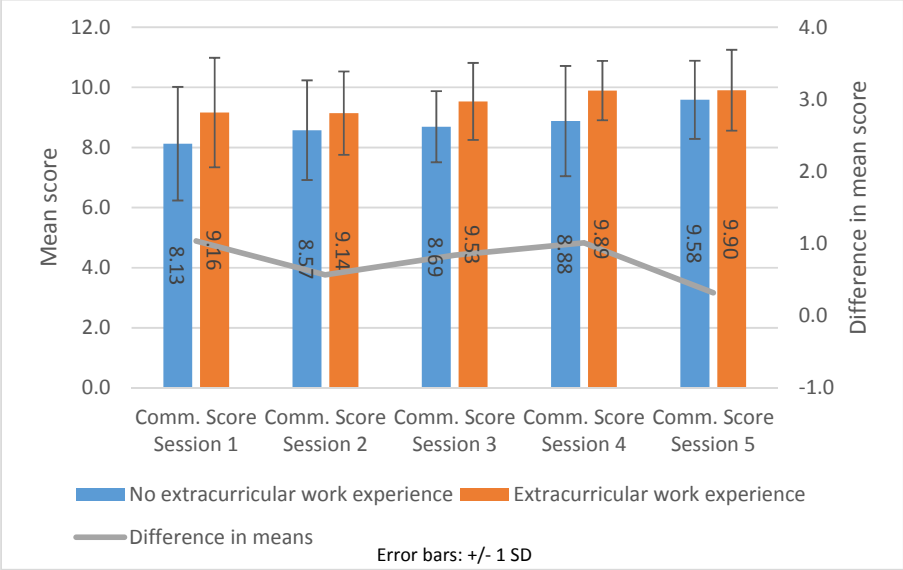


Figure 5.27. Mean communication score for sub-case two by any extracurricular pharmacy work.

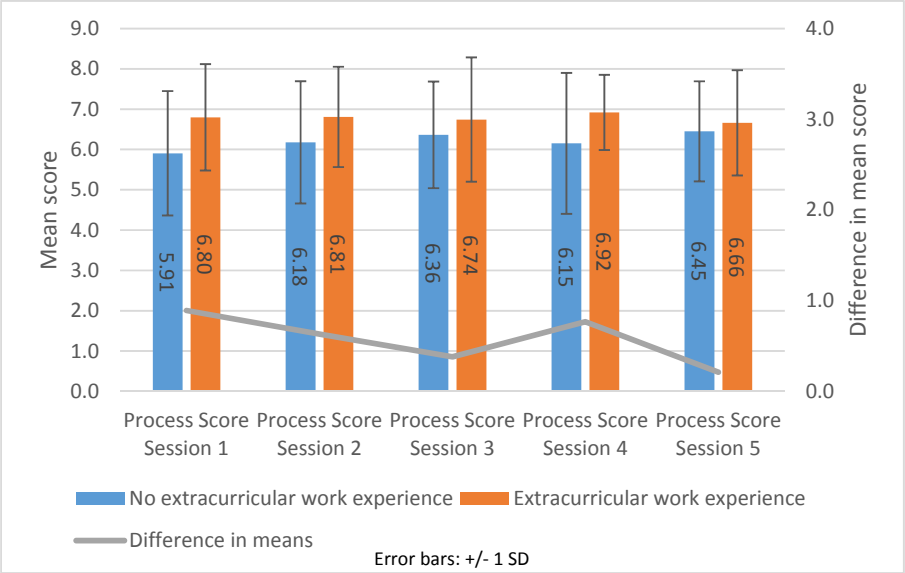


Figure 5.28. Mean process score for sub-case two by any extracurricular pharmacy work.

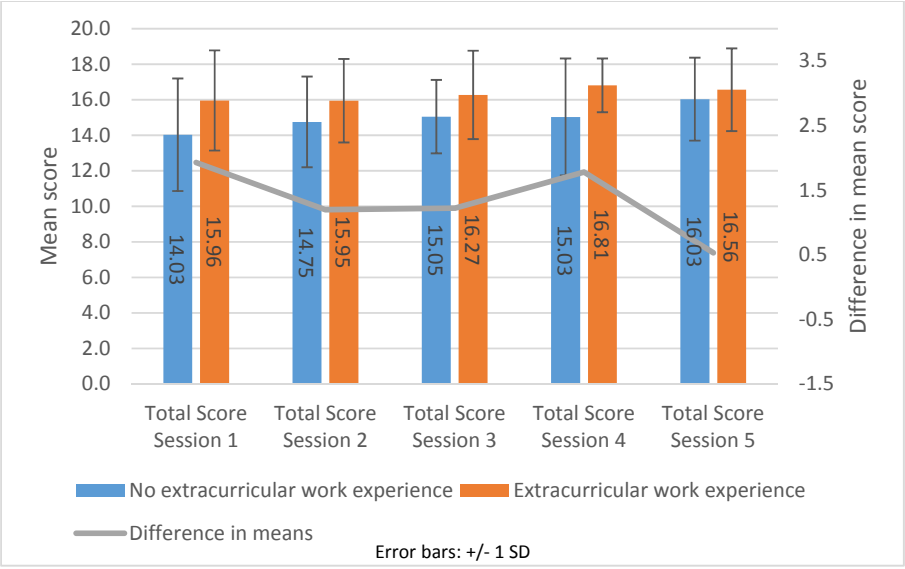


Figure 5.29. Mean total score for sub-case two by any extracurricular pharmacy work.

Students who undertook any type of extracurricular pharmacy work performed significantly better than did students who did not (either non–pharmacy related extracurricular work or no extracurricular work at all) in the early sessions. The effect

of undertaking any type of extracurricular pharmacy work was not significant after two and four sessions for sub-cases one and two, respectively, and was not significant in session five for either sub-case. Once this association was determined, two new questions arose. First, did the number of hours per week in pharmacy-related work influence student performance? Second, excluding students who did not work at all, was there a performance difference between students who undertook pharmacy-related extracurricular work and those who undertook non–pharmacy related extracurricular work?

To understand if the number of hours per week in pharmacy-related work influenced student performance, a bivariate analysis was used to assess the effect of hours in extracurricular pharmacy work on performance. Both sub-cases were analysed separately. While there was a significant range of hours worked in each sub-case (sub-case one: *range* = 3 to 25 hours, $M = 10.7$; sub-case two: *range* = 6 to 35 hours, $M = 12.8$), there was no statistically significant difference in performance based on hours worked for total score for sessions one to five ($p > 0.05$). For sub-cases one and two, this suggests that it does not matter how many hours the student worked in a pharmacy—only that they were exposed to pharmacy practice.

To understand if there was a performance difference between students who undertook pharmacy-related extracurricular work compared with those who undertook non–pharmacy related extracurricular work, this study created a category that identified students as either participating in pharmacy-related work or non–pharmacy related work. In sub-case one, 23 students participated in pharmacy-related work and 20 students participated in non–pharmacy related work ($N = 43$). Sixteen students in sub-case one reported undertaking no extracurricular work at all. An independent samples t-test was conducted to assess the difference in mean scores of two groups: students who

undertook pharmacy-related work and students who undertook non–pharmacy related work. There was a significant difference in means (extracurricular pharmacy-related work performing significantly better) for total score in session one (students who undertook any extracurricular pharmacy-related work: $N = 23$, $M = 12.32$, $SD = 2.29$; students who undertook extracurricular non–pharmacy related work: $N = 20$, $M = 10.21$, $SD = 3.99$, $t\ [39] = 2.111$, $p = 0.041$, two-tailed). This difference was also evident in session three ($p = 0.01$). There was no difference between these groups for any score (communication, process or total) after session three. Figures 5.30, 5.31 and 5.32 show the differences in sub-case one's mean score for communication, process and total scores, respectively, for students undertaking extracurricular pharmacy-related work versus students undertaking non–pharmacy related work for sub-case one.

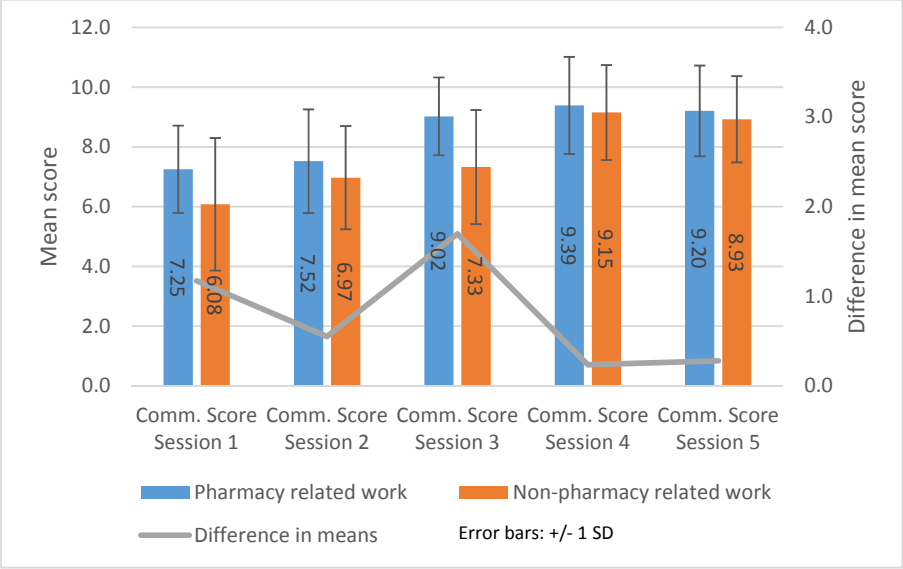


Figure 5.30. Mean communication score for sub-case one by type of work (pharmacy related/non-pharmacy related).

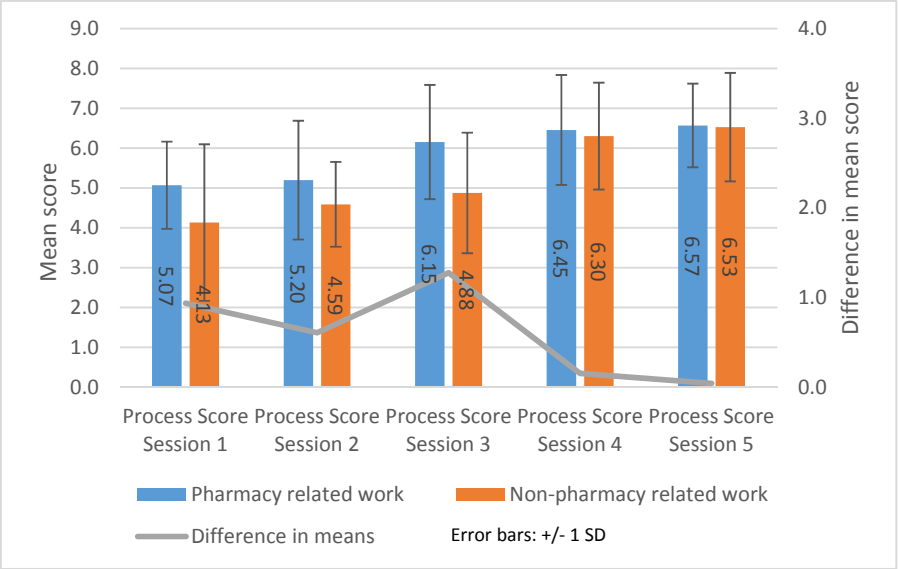


Figure 5.31. Mean process score for sub-case one by type of work (pharmacy related/non-pharmacy related).

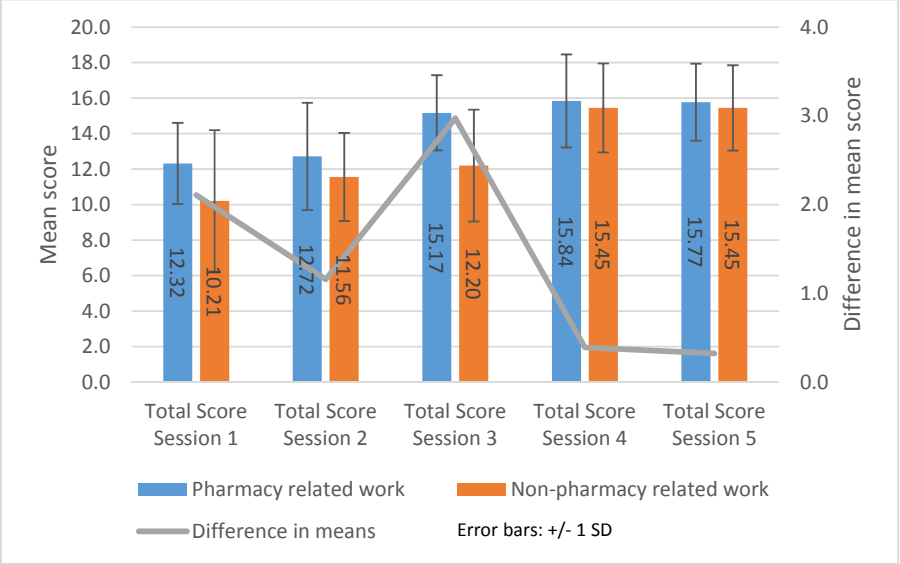


Figure 5.32. Mean total score for sub-case one by type of work (pharmacy related/non-pharmacy related).

This analysis was repeated for sub-case two. Thirty-nine students participated in pharmacy-related work and 16 students participated in non–pharmacy related work (*n* =

55). There was no significant difference in means between groups for communication, process or total scores in session one ($p > 0.05$) or session five ($p > 0.05$). Figures 5.33, 5.34 and 5.35 show the differences in mean scores for communication, process and total scores, respectively, for students undertaking extracurricular pharmacy-related work versus students undertaking non–pharmacy related work for sub-case two. The effect of pharmacy-related work was greater in sub-case one. In sub-case one, the effect of employing standardised patients may be to reduce the difference in performance between students who are and are not exposed to pharmacy-related extracurricular work.

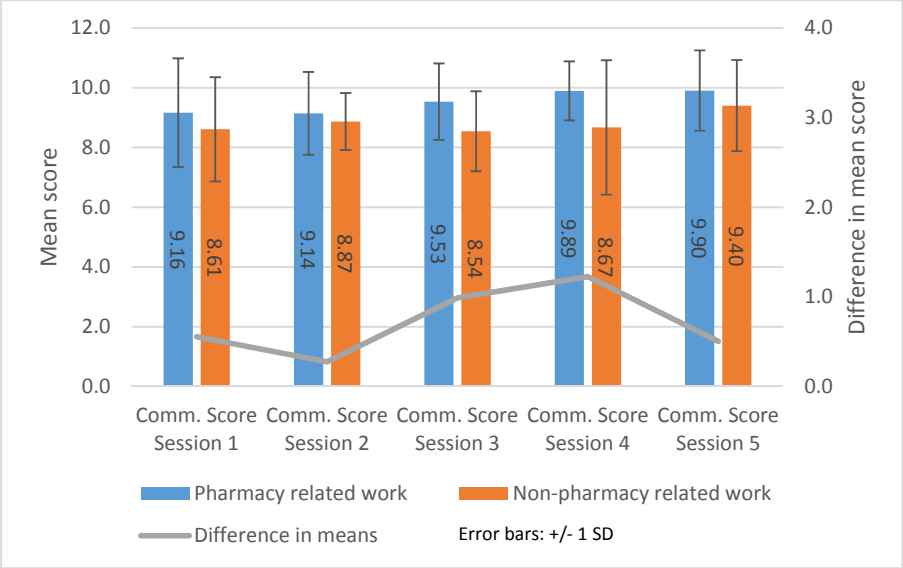


Figure 5.33. Mean communication score for sub-case two by type of work (pharmacy related/non-pharmacy related).

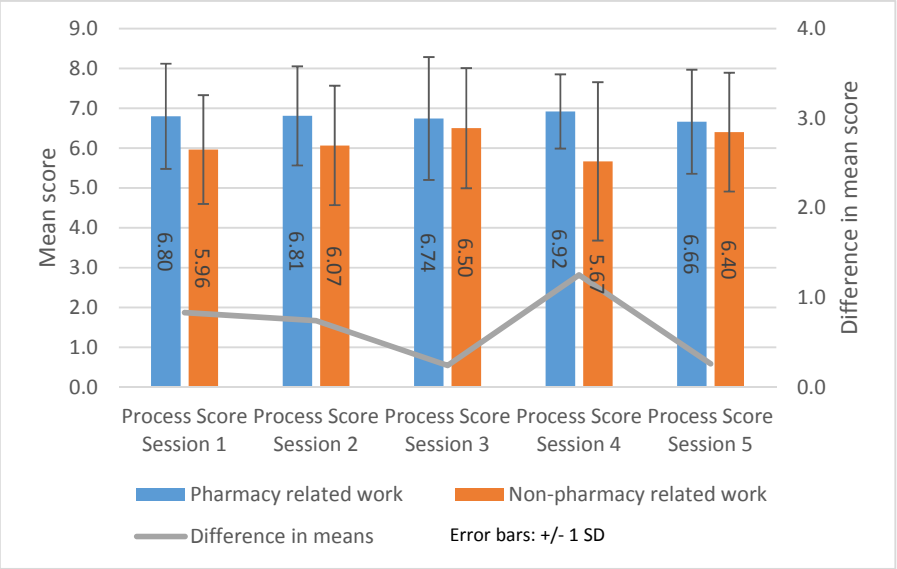


Figure 5.34. Mean process score for sub-case two by type of work (pharmacy related/non-pharmacy related).

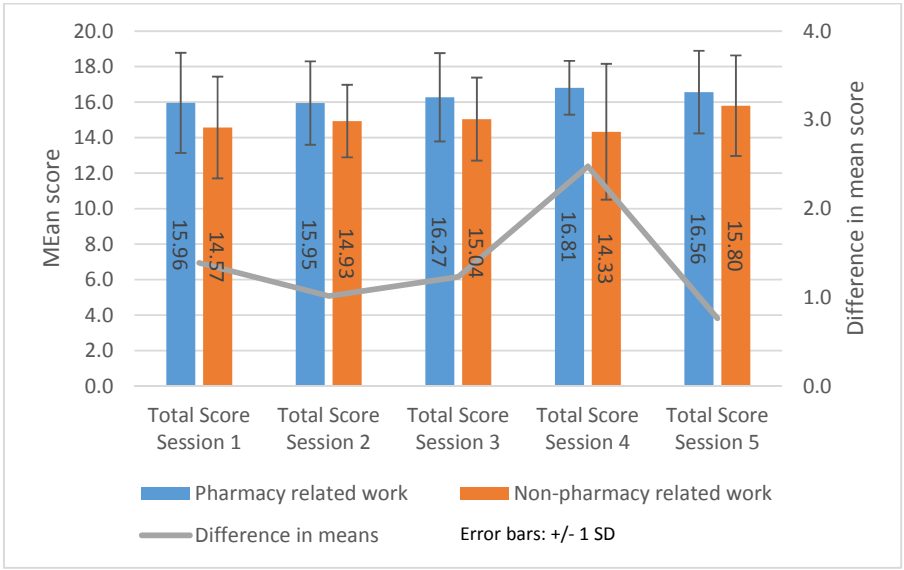


Figure 5.35. Mean total score for sub-case two by type of work (pharmacy related/non-pharmacy related).

5.5 Summary

In this chapter, the researcher has described the demographic characteristics of both sub-cases. The demographic characteristics that influenced performance were then examined. The researcher concludes the majority of demographics had little influence on student performance. It appears that the most significant elements that influenced student performance were:

- international status (for both sub-cases for the first session), but not FLOTE
- gender, with greater effect in the later sessions, and a more pronounced effect for sub-case one
- extracurricular pharmacy-related work—in general, students who undertook extracurricular pharmacy-related work performed better in the earlier sessions than those who did not. The effect of students' exposure to extracurricular pharmacy work had a greater influence for sub-case one than for sub-case two. That is, the effect was greater in students who were less progressed in the pharmacy course. The actual number of hours worked in pharmacy-related work did not seem to affect performance. There was a significant difference in performance for students who worked in pharmacy-related employment (better performance) than those who worked in non–pharmacy related employment. This effect was more pronounced for sub-case one; thus, it again appeared that the benefit was greater for students who were less progressed through the course. These findings also suggest that the type of extracurricular work (specifically, pharmacy-related extracurricular employment) is more important than non–pharmacy related extracurricular employment.

In chapter 6, the researcher reports the findings from this analysis in response to the second research question: Do teaching strategies integrating standardised patient teaching methods increase perceptions of confidence and reduce perceptions of difficulty in managing OTC prescribing or prescription medicine counselling interventions for pharmacy undergraduate students? In this chapter a detailed examination of the effect of standardised patient teaching methods on students' perceptions of confidence and difficulty in conducting a patient intervention is provided.

Chapter 6: Research Question Two—Results

6.1 Introduction

In this chapter, the researcher describes the relevant findings relating to research question two: *Do teaching strategies integrating standardised patient teaching methods increase perceptions of confidence and reduce perceptions of difficulty in managing OTC prescribing or prescription medicine counselling interventions for pharmacy undergraduate students?* This chapter begins with a description of how the data were treated and analysed. This is followed by a summary of the most significant findings, and then a detailed examination of the effect of standardised patients teaching methods on students' perceptions of confidence and difficulty.

The results are presented for each sub-case population. As described in previous chapters, sub-case one used volunteer standardised patients to teach OTC prescribing and communication skills to 59 third-year undergraduate pharmacy students. Sub-case two examined the use of peer-based standardised patient instruction with 74 fourth-year undergraduate pharmacy students using a similar content and structure.

Note: Tables reporting on self-reported perceptions of confidence are identified with yellow headers.

Tables reporting on self-reported perceptions of confidence are identified with green headers.

6.2 Data Management

6.2.1 Likert scale analysis. As described in Chapter 4, two structured questionnaires were administered in both sub-cases to measure perceptions of *confidence* and *difficulty* when delivering an OTC prescribing consultation or prescription medicine counselling. Students were asked to rank agreement with 10 to 12 statements on a six-point Likert scale (ranging from 'strongly agree' to 'strongly disagree' for rating confidence and

'very easy' to 'very hard' for rating difficulty). The questionnaires were administered pre- (time point A) and post- (time point B) exposure to standardised patients (see Figure 4.5 in Chapter 4) to assess changes in students' perceptions of confidence and difficulty in conducting an OTC prescribing patient intervention. The responses were analysed to detect changes in perceptions of *confidence* and *difficulty* when conducting an intervention at the two time points pre-exposure (A) and post-exposure (B) for each sub-case, as well as the differences between the two sub-cases at the two time points, A and B.

The responses on the six-point Likert scale for both the confidence and difficulty questionnaires were collapsed into four main analysis categories to improve sensitivity. A description of the new collapsed analysis categories is contained in Tables 6.1 and 6.2. Where negatively-keyed items were used, the item was reverse-scored (re-coded) prior to analysis. Note that tables reporting on self-reported perceptions of confidence are identified with yellow headers, while tables reporting on self-reported perceptions of confidence are identified with green headers.

Table 6.1

Association between the Original Data Categories and Analysis Categories for Confidence Scale Data

Numerator	Original scale category		Numerator	New scale category for analysis
6	Strongly agree	→	4	Conclusive agreement
5	Agree			
4	Somewhat agree	→	3	Weak agreement
3	Somewhat disagree	→	2	Weak disagreement
2	Disagree	→	1	Conclusive disagreement
1	Strongly disagree			

Table 6.2

Association between the Original Data Categories and Analysis Categories for Difficulty Scale Data

Numerator	Original scale category		Numerator	New scale category for analysis
6	Very difficult	→	1	Conclusively difficult
5	Difficult			
4	Somewhat difficult	→	2	Somewhat difficult
3	Somewhat easy	→	3	Somewhat easy
2	Easy	→	4	Conclusively easy
1	Very easy			

The Likert-type items relating to confidence in communication and process were grouped, and a composite score was created from the five Likert-type items, as described in Table 6.3. This same approach was used for the difficulty questionnaire (see Table 6.4). The Likert-type items used to create each Likert scale and the corresponding Cronbach's alpha are described in Table 6.3 (confidence) and Table 6.4 (difficulty). Cronbach's alpha and other techniques described in Chapter 4 were used to provide an indication of the internal validity of both surveys. The change in self-reported perceptions of confidence and difficulty (both inter- and intra-population differences) was analysed using a count-based analysis and z-test for two population proportions. This test identifies any significant difference between two groups on a single characteristic, based on categorical data (in this case, the four scale categories for confidence described in Table 6.1 and the four scale categories for difficulty described in Table 6.2).

Table 6.3

Likert-type Item Grouping for Confidence Questionnaire

Item	Likert-type item question	Category/group	Cronbach's alpha
1	I am confident that I am able to communicate effectively with patients.	Communication-related Likert-type items form **communication confidence scale**	0.799
3	I feel I have sufficient communication skills to enable the gathering of necessary information from a patient.		
4	I do not feel confident in my ability to interview the patient.		
5	I do not feel comfortable with my ability to discuss sensitive topics with patients.		
11	I feel confident with my ability to discuss potentially sensitive topics with patients in an appropriate way.		
6	I feel comfortable with the structured approach I use to gather and deliver information with patients.	Process-related Likert-type items form **process confidence scale**	0.779
7	I am confident I am able to deliver complete information to the patient in a clear and logical manner.		
8	I do not feel confident in my ability to counsel a patient.		
9	I feel comfortable with my ability to answer questions the patient may have during a consultation.		
10	I feel confident in my ability to make an appropriate referral of a patient to a health provider other than a pharmacist.		

Table 6.4

Likert-type Item Grouping for Difficulty Questionnaire

Item	Likert-type item question	Category/group	Cronbach's alpha
1	I would find communicating with patients …	Communication-related Likert-type items form **communication difficulty scale**	0.760
3	I would find gathering clinical information about the patient …		
6	I would find delivering potentially sensitive information to a patient about a disease or proposed therapy …		
9	I would find identifying the patient's therapeutic needs …		
10	I would find concluding or ending a patient consultation …		
2	I would find treating minor self-limiting conditions over the counter …	Process-related Likert-type items form **process difficulty scale**	0.794
4	I would find delivering information about a therapy or disease to a patient …		
5	I would find referring a patient to another health professional, such as a general practitioner …		
7	I would find meeting the patient's information needs …		
8	I would find implementing a structured interview and counselling process during a patient consultation …		

Four major analyses were conducted for both the confidence and difficulty Likert scales:

1. **Likert analysis one:** Sub-case one pre-exposure to volunteer standardised patient teaching method (time point A) versus sub-case one post-exposure to volunteer standardised patients (time point B)
2. **Likert analysis two:** Sub-case two pre-exposure to peer standardised patient teaching method (time point A) versus sub-case two post-exposure to peer standardised patients (time point B)
3. **Likert analysis three:** Sub-case one pre-exposure to volunteer standardised patient teaching method (time point A) versus sub-case two pre-exposure to peer standardised patients (time point A)

4. **Likert analysis four:** Sub-case one post-exposure to volunteer standardised patient teaching method (time point B) versus sub-case two post-exposure to peer standardised patients (time point B).

6.2.2 Focus group and interview analysis. Qualitative data was collected at two points in this study and with two separate groups of participants. Initially, data was obtained via focus groups conducted with students from sub-case one immediately after the final exposure to standardised patients. The second data collection point was with graduate pharmacists who had been exposed to standardised patient teaching methods as described in Chapter 4. Data set 1 consisted of the focus group transcripts. Data set 2 consisted of the transcribed interviews. Both sets of data were analysed separately using methods of thematic analysis and the computer software program NVivo 10®. A description of how the thematic analysis was undertaken is contained in Chapter 4. Themes from each set of data are tabulated in Table 6.5 and are reported in Chapters 6, 7 and 8 as appropriate.

Table 6.5 Themes from qualitative data analysis

Undergraduate themes (data set 1)	Graduate themes (data set 2)
(1) Confidence - Recognising overconfidence - Improving confidence - Easing transition to placement	**(1) Prepared for practice** - Learn & reflect - Multi-source feedback - Nearly authentic - Time efficient learning
(2) Developing therapeutic communication and intervention skills - Improving confidence - Easing transition to placement	**(2) Adjusting to reality**

6.3 Summary of Chapter Findings

Both the confidence and difficulty questionnaires and communication- and process-related question groups had a high level of internal consistency, as indicated by a Cronbach's alpha score above 0.7. Students in both sub-cases reported significant improvements in confidence and reduced perceptions of difficulty related to conducting a patient intervention after exposure to standardised patients. Specifically:

- **Likert analysis three:** Students in sub-case two reported higher initial levels of confidence in communication- and process-related items, and lower levels of difficulty in communication- and process-related items compared with sub-case one at time point A.
- **Likert analyses one and two:** Students in sub-cases one and two reported higher levels of confidence and reduced perceptions of difficulty in communication after exposure to standardised patients (time point B). Sub-case one interviews revealed that students found confidence grew on repeated exposure to standardised patients. This confidence also transferred to the clinical placement, where students reported elevated levels of confidence.
- **Likert analyses one and two:** Students in sub-cases one and two reported higher levels of confidence and reduced perceptions of difficulty in process-related elements of conducting a patient intervention after exposure to standardised patients (time point B).
- **Likert analysis four:** There were no significant differences between students in sub-cases one and two in confidence in communication- and process-related items, and difficulty in communication- and process-related items at time point B. That is, both groups had similar levels of confidence

and perceptions of difficulty in conducting a patient intervention after five sessions with standardised patients. Both sub-cases were more confident and reported reduced difficulty after exposure to standardised patients.

Qualitative data collection and analysis was conducted to provide a secondary source of information in support of the quantitative findings for Chapters 6 and 7. The sub-themes of most relevance to this chapter (Chapter6) are improving confidence and nearly authentic. Students reported initial intimidation when interacting with standardised patients and acknowledged an over-estimation of confidence, knowledge and an ability to integrate this knowledge with other professionally important skills such as communication to achieve a successful outcome. With subsequent exposure, they reported confidence improved, as did the sense of competence and a more accurate understanding of their own ability in conducting a patient intervention. This led to greater confidence when interacting with a real patient while on clinical placement.

6.4 Scale Reliability and Trustworthiness of Analysis of Qualitative Data

6.4.1 Likert data. Scale or instrument reliability was addressed through the reproducibility of the process that obtained the results originally, and by statistical methods to assess internal consistency. The confidence and difficulty Likert scales were administered in the same manner for both sub-cases and at both time points (pre- and post-exposure to the two different standardised patient types). Questionnaires used reverse questions to validate responses. The confidence and difficulty questionnaires were initially piloted and then assessed for internal consistency using Cronbach's alpha after final data collection. Both questionnaires were analysed after grouping the

questions according to their association with communication and process, as described in Tables 6.3 and 6.4.

The reliability coefficient (Cronbach's alpha) for each of the combined question groups was found to be good (ranging between 0.760 and 0.799). The Cronbach's alpha for each question group is recorded in Tables 6.3 and 6.4.

6.4.2 Interviews. The trustworthiness of the interview analysis is described in Chapter 4. In brief, the four main elements to develop trustworthiness in the qualitative component in this chapter were the use of an audit trail, transcriptions of recorded interviews, the use of qualitative data analysis computer software and peer checking.

6.5 Sub-case One: Change in Perceptions of Communication and Process Confidence and Difficulty

A z-test for different population proportions was performed to examine the difference in number of responses for each response category for the pre- and post-test. This identified any significant shift in students' self-reported perceptions of confidence and difficulty. This was done for both communication and process by comparing pre-intervention and post-intervention Likert scale responses.

6.5.1 Change in communication confidence and difficulty for sub-case one. The data indicated a clear shift towards greater confidence (see Figure 6.1) and reduced difficulty (see Figure 6.2) after exposure to volunteer-type standardised patients. That is, there were significantly fewer students who were not confident and significantly fewer students who found communication difficult after the intervention involving volunteer-type standardised patients. Table 6.6 shows the z-score statistics for differences in responses pre- and post-intervention for communication confidence. The results indicated that 91.11% of students reported that they were confident in their communication after exposure to standardised patients, compared with 68.62% prior to

exposure to standardised patients. Complementing this, 90.53% of students found communication easier post-exposure to standardised patients (see table 6.7), compared with only 61.78 prior to exposure. Figure 6.1 shows the positive shift towards greater confidence in communication, and Figure 6.2 shows the corresponding shift towards less difficulty.

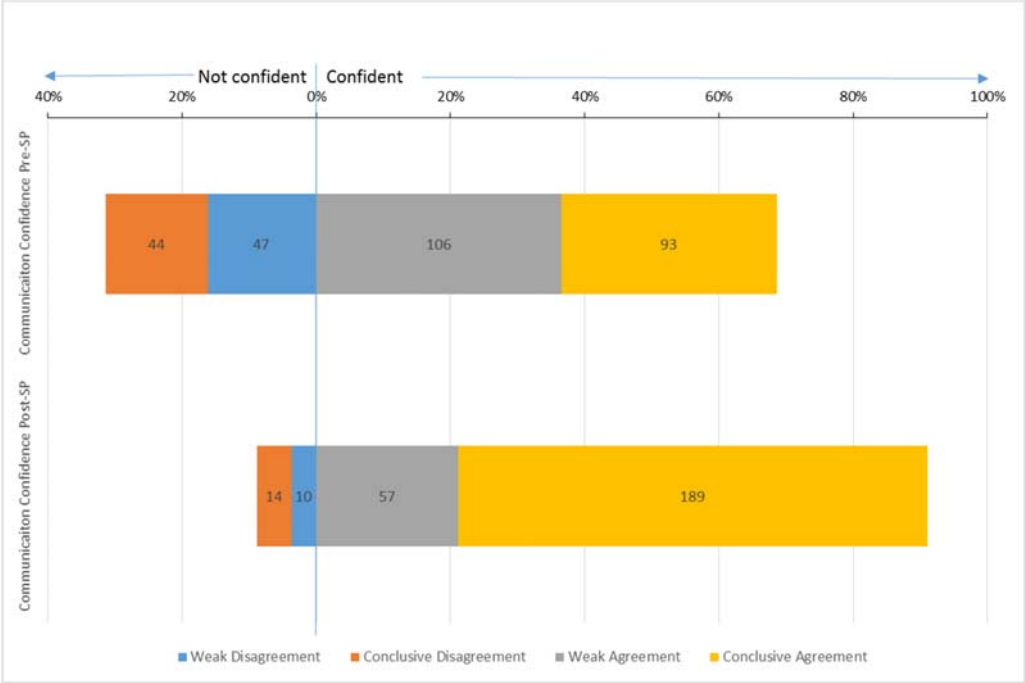


Figure 6.1. Change in student perceptions of confidence in communication for sub-case one.

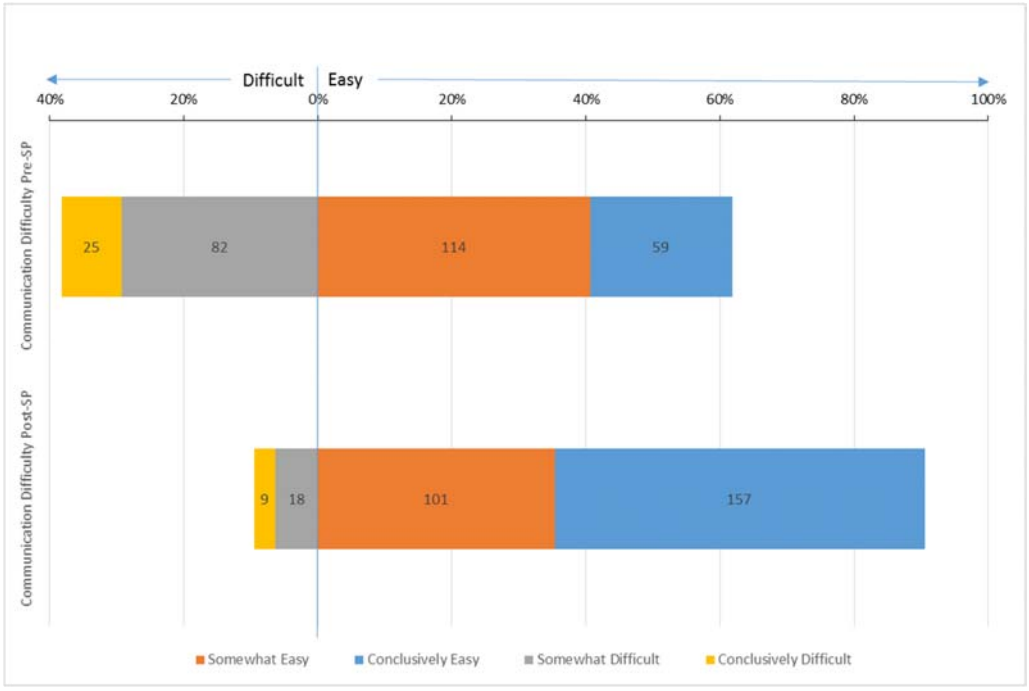


Figure 6.2. Change in student perceptions of difficulty in communication for sub-case one.

Table 6.6

Sub-case One Z-score Statistics for Differences in Responses Pre- and Post-intervention—Communication Confidence

	Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Pre-score	44	47	106	93	290
Proportion[#]	15.2%	16.2%	36.6%	32.1%	
Post-score	14	10	57	189	270
Proportion[#]	5.2%	3.7%	21.1%	70.0%	
Z-score	3.88	4.89	4.02	−8.97	
p value	**0.0001***	**0.0***	**0.0***	**0.0***	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

Table 6.7

Sub-case One Z-score Statistics for Differences in Responses Pre- and Post-intervention—Communication Difficulty

	Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Pre-score	59	114	82	25	280
Proportion[#]	21.1%	40.7%	29.3%	8.9%	
Post-score	157	101	18	9	285
Proportion[#]	55.1%	35.4%	6.3%	3.2%	
Z-score	−8.319	1.291	7.153	2.884	
p value	**0.0***	$p = > 0.5$	**0.0***	**0.0034***	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

These findings were confirmed in the analysis of the focus groups and interviews. Students initially found the process of conducting a patient intervention intimidating, and described trepidation. They also described an initial over-inflated sense of ability. That is, they reported an overestimation of their confidence in undertaking a patient intervention. This was reported by a number of students in the focus groups, who felt they had overestimated their clinical knowledge or ability to apply the knowledge alongside the range of other professional skills required for a successful interaction with the patient in the scenario:

> [F1-1]: Okay. Fair enough … yes, I was overconfident. I thought I had more clinical … knowledge, but just actually having the patient there and expecting an answer, that's sort of the professional side that really started to cloud what I knew … Two days ago or two hours ago when there was no pressure on me, I knew it. Actually being in there with a patient started to really sort of erode my confidence in what I knew, or I just couldn't think properly when there was

someone in front of me … And so, yes, I was overconfident in my clinical knowledge.

[F2-2]: I think I was just very unaware of, you know, the skills that you need to have … and the questioning protocols that you need to be following … to ensure that, you know, you're not missing out on critical things and critical information.

[M2-1]: I guess I had this confidence that I could talk to people, I can converse, I can ask questions and get to the point where I'm supposed to go. But after doing the first session, you realise that you can get flustered and make errors and mistakes like that. So I realise that, yeah, I have got a lot of places [that need] work … to improve. I sort of … I felt like I should have redone the first survey and sort of put my [responses] a bit back down because I was a bit overconfident, I think.

Students reported reduced confidence during the early exposure to standardised patient scenarios. This was particularly true for students who had no previous experience working in paid pharmacy employment as a pharmacy assistant:

[F1-2]: I think there's a lot of trepidation leading into it, especially for people who hadn't—like myself—I hadn't worked in a pharmacy as well, and that's why I was … quite nervous going in there, going, 'Oh my god, I've never counselled in my life before. I don't know what to expect'. And it was just a really eye-opening experience, just to get ourselves, I don't know, on the way.

Despite the initial lack of confidence, students reported a positive benefit to their confidence in undertaking a patient intervention, and reported improvements in their confidence with increased exposure to standardised patients:

[Facilitator]: The trepidation that you experienced—did that get better with time?

[F1-2]: Yes. I was still quite nervous going into every week, but I felt a lot more confident in my ability to ask the questions.

Students from sub-case one also reported a greater sense of their true competence, which made them comfortable with their personal skill level:

[Facilitator]: So you think at the end you [were] more confident?

[F2-1]: Oh, far more confident. And I think by the end, we had a much more realistic view of our own competencies as well, and having it over those repeated weeks, we were able to work on the shock from the first one where we thought, 'Ooh, we're really not as good as we thought we were', and actually build it up to a point where we were comfortable with our own skills.

Of considerable interest is the transferability of changes in confidence to the placement environment. At the time of the interview, students from sub-case one had just completed their first two-week clinical placement. Students reported the positive influence volunteer standardised patient teaching methods had on their confidence, and the positive effect this had on their placement experiences:

[F1-2]: Going into placement for the first time and encountering real patients … it felt so good to know that you've done this before. Even if it was a controlled environment, you've done it, rather than going in there and never having seen most of these OTC products and never having talked to a real patient in the sort of situation, never looking at questions to ask them. I think that would be extremely daunting.

[F2-2]: I think I just felt more confident on my own asking questions and, you know, actually ending up with a product based on the questions that I'd asked them and the responses they'd given me. Yeah, because you know much more

about the S2 and S3 products and differential diagnosis as well, so how you could rule out other conditions.

[F2-1]: Drawing information out of people, I think, was definitely valuable in … those things, rather than just answering the question—actually having to draw that question out.

[F2-2]: I think it's going to prepare me much better as a pharmacist, you know, because of that [practised accumulation of skills achieved from exposure to standardised patients].

Confidence endured in their transition from university to pharmacy practice. Graduates reported a greater sense of confidence in undertaking a patient intervention on transition to the clinical environment.

[M1-P]: because it is something that's difficult to talk to patients about. Even in the simulated environment, if you come up with different ways to ask certain questions, that might be a bit more sensitive … because if you don't really have that experience, then the first time you go to ask those questions, it might seem a bit rude or a bit abrupt, but if you've had a few times practising, then I guess you can formulate the question—especially if you get feedback from a [standardised] patient, you can formulate the question in a way that they want to hear it and that you feel comfortable asking.

6.5.2 Change in process confidence and difficulty for sub-case one. Analysis of the data showed a clear shift towards greater confidence (see Figure 6.3) and reduced difficulty (see Figure 6.4) in process after exposure to volunteer-type standardised patients. That is, there were significantly fewer students who were not confident and significantly fewer students who found the process aspects of a patient intervention difficult after the intervention involving volunteer standardised patients. Table 6.8

shows the z-score statistics for differences in responses pre- and post-intervention for process confidence. The results showed that 91.11% of students reported that they were confident in process-type elements after exposure to standardised patients, compared with 68.62% prior to exposure to standardised patients. Table 6.9 shows the z-score statistics for differences in responses pre- and post-intervention, where 90.74% of students found that process-related elements were easier when conducting a patient intervention post-exposure to standardised patients, compared with only 54.83% prior to exposure. Figure 6.3 shows the positive shift towards greater confidence in process ability and Figure 6.4 shows the corresponding shift towards greater ease.

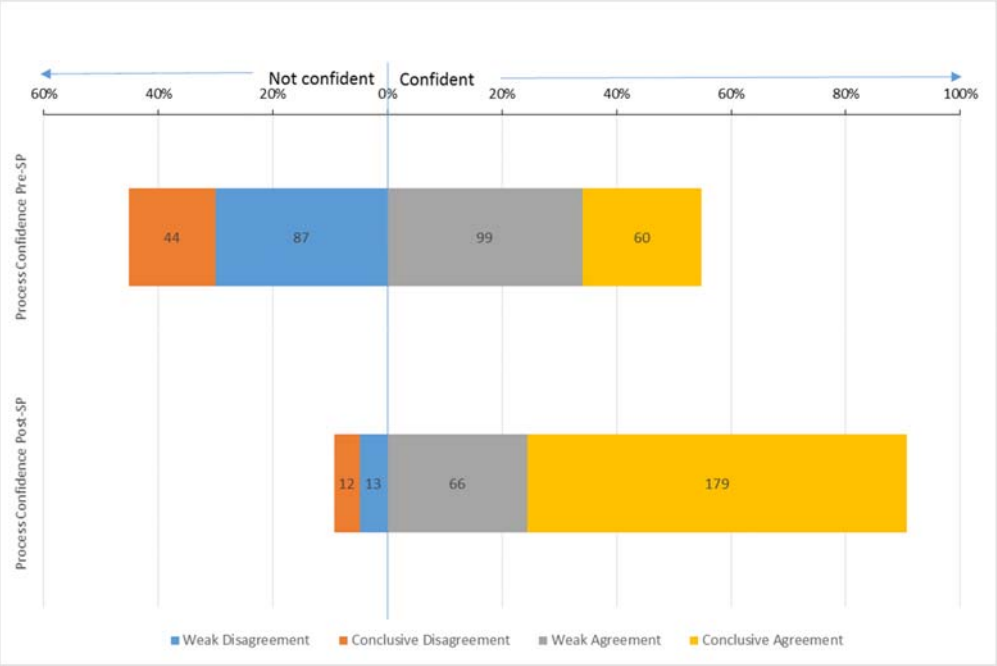


Figure 6.3. Change in student perceptions of confidence in process ability for sub-case one.

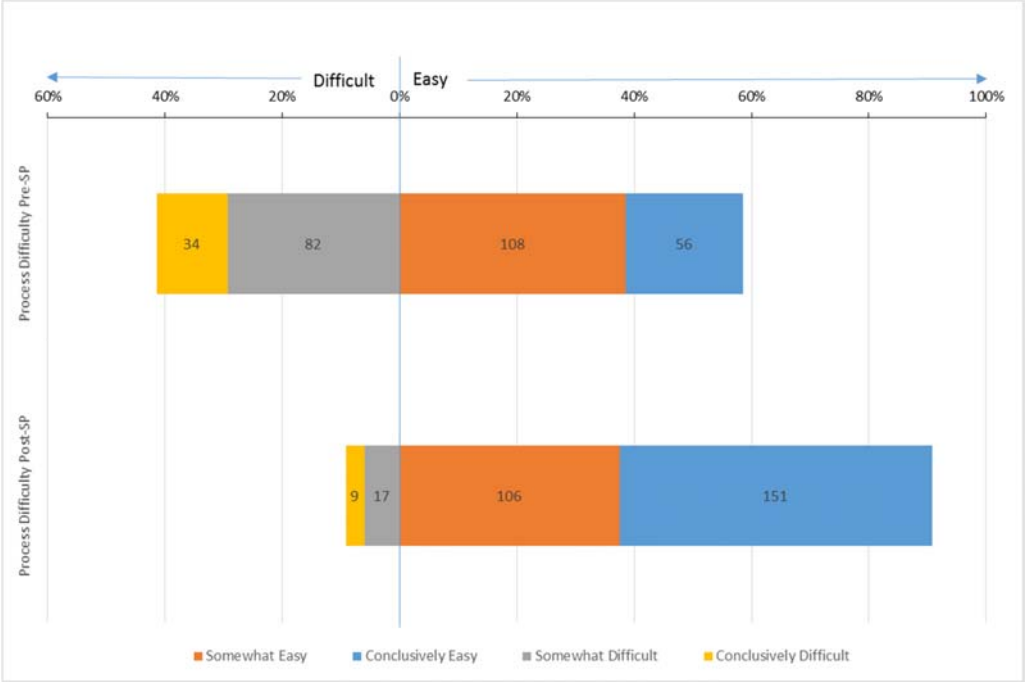


Figure 6.4. Change in student perceptions of difficulty in process for sub-case one.

Table 6.8

Sub-case One Z-score Statistics for Differences in Responses Pre- and Post-intervention—Process Confidence

	Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Pre-score	44	87	99	60	290
Proportion[#]	15.2%	30.0%	34.1%	20.7%	
Post-score	12	13	66	179	270
Proportion[#]	4.4%	4.8%	24.4%	66.3%	
Z-score	4.229	7.776	2.514	−10.903	
p value	**0.0***	**0.0***	**0.0121***	**0.0***	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

Table 6.9

Sub-case One Z-score Statistics for Differences in Responses Pre- and Post-intervention—Process Difficulty

	Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Pre-score	56	108	82	34	280
Proportion[#]	20.0%	38.6%	29.3%	12.1%	
Post-score	151	106	17	9	283
Proportion[#]	53.4%	37.5%	6.0%	3.2%	
Z-score	−8.207	0.273	7.255	4.003	
p value	**0.0***	$p = > 0.5$	**0.0***	**0.0***	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

Analysis of the focus group and interview data revealed that sub-case one students' ability to develop therapeutic communication and interventions was aided by exposure to standardised patients. The authentic nature of the learning strategy encouraged students to develop their own personal protocol when interacting with the (standardised) patient, which improved their process ability:

> [F1-3]: I found that if I went through things in a certain order, it made more sense to me, so then I wouldn't miss things that I shouldn't miss with the patient.

The interaction also encouraged sub-case one students to engage in a meaningful way with the task or presenting problem—much more than when presented with the same task in the form of a paper case. This had the unexpected benefit of improving students' own perceptions of their abilities, and improved their overall assessment of their own competence:

> [F1-4]: The workshops we're doing at the moment, there's a lot of 'what questions would you ask?', and you just sit there and you're like, [sigh] 'I sort of know this. Why do I have to write it?', whereas when you have [standardised]

patients there, you think about why you want to know it and all the questions that you need, and it sticks in your head a lot better than just writing on a sheet of paper.

[F2-1]: And I think by the end, we had a much more realistic view of our own competencies as well, and having it over those repeated weeks, we were able to work on the shock from the first one where we thought, 'Ooh, we're really not as good as we thought we were', and actually build it up to a point where we were comfortable with our own skills.

[M1-1]: I think the interaction with the patient actually gave us the ability to bring out the knowledge that we did have in a meaningful way. So not just saying, 'This is the information, this is the counselling points that I've got to give' [like in other subjects]—rather that it was meaningful to this patient's disease state and something that could actually help their life, and that meant that we could concentrate on that and what was specific to them a lot more, and adapt the information that we did give.

6.6 Sub-case Two—Change in Perceptions of Communication and Process Confidence and Difficulty

6.6.1 Change in communication confidence and difficulty for sub-case two. Like sub-case one, students from sub-case two reported a shift towards greater confidence (see Figure 6.5) and reduced difficulty (see Figure 6.6) after exposure to peer-type standardised patients. Tables 6.10 and 6.11 show the z-score statistics for differences in responses pre- and post-intervention for students' self-perceptions of communication confidence and communication difficulty, respectively. While sub-case two students commenced with a higher reported confidence (84.15% reporting confidence in communication) and lower difficulty (81.39% reporting communication as more easy),

there were significantly more students reporting confidence in communication ability (90.81%) after exposure to standardised patients. Similarly, sub-case two students found communication easier after the intervention (81.39% pre versus 92.17% post). Figure 6.5 shows the positive shift towards greater confidence in communication and Figure 6.6 shows the shift towards greater ease.

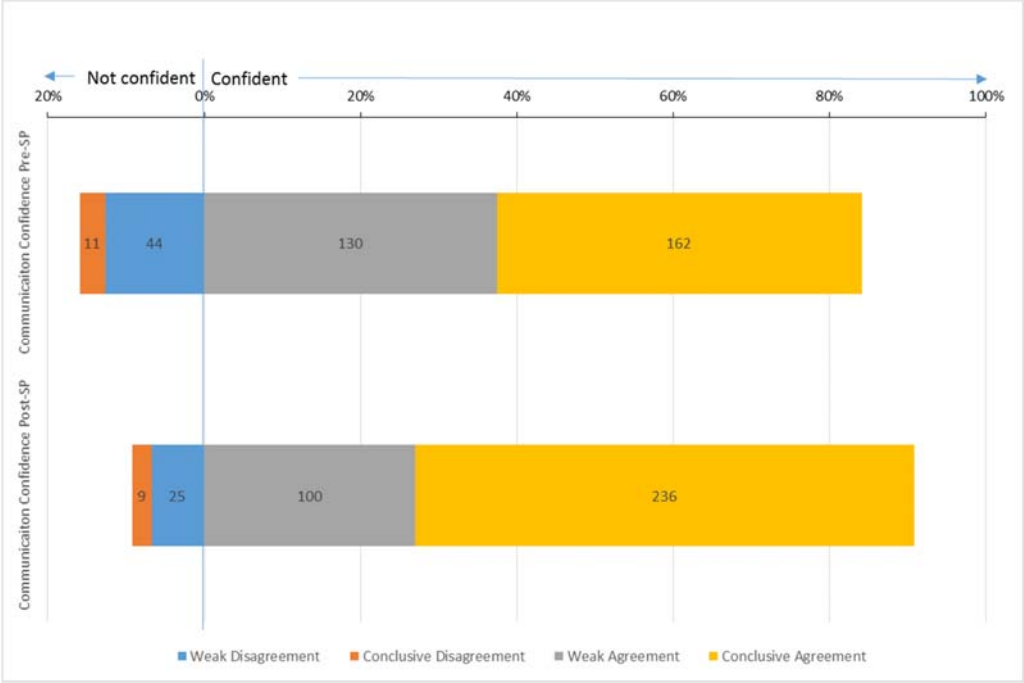


Figure 6.5. Change in student perceptions of confidence in communication for sub-case two.

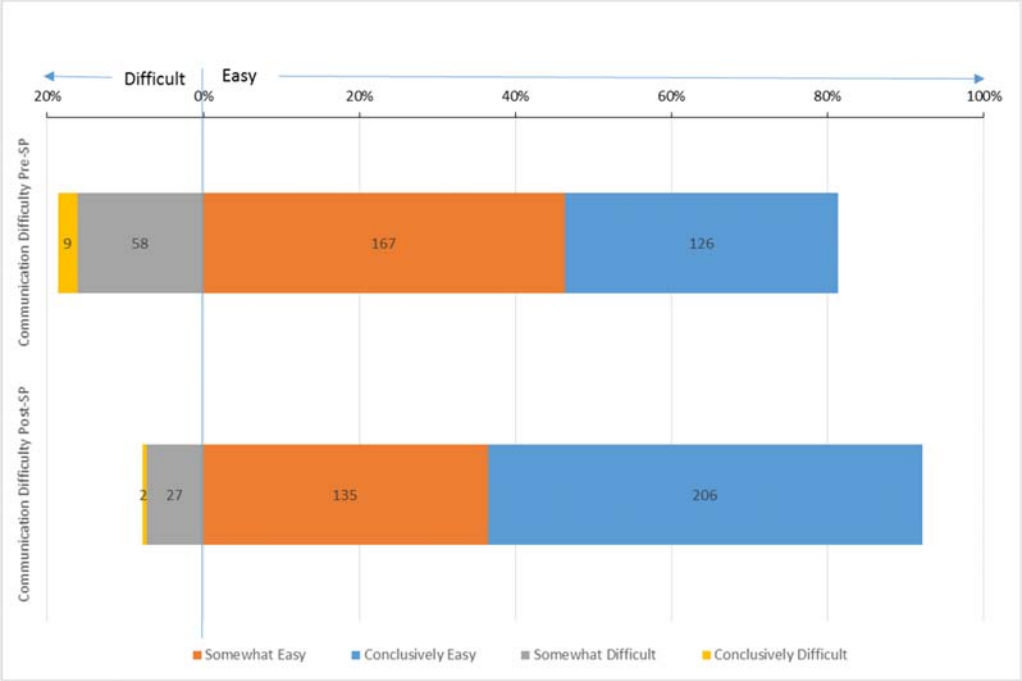


Figure 6.6. Change in student perceptions of difficulty in communication for sub-case two.

Table 6.10

Sub-case Two Z-score Statistics for Differences in Responses Pre- and Post-intervention—Communication Confidence

	Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Pre-score	11	44	130	162	347
Proportion #	3.2%	12.9%	37.5%	46.7%	
Post-score	9	25	100	236	370
Proportion #	2.4%	6.8%	27.0%	63.8%	
Z-score	0.599	2.688	2.992	−4.604	
p value	$p = > 0.5$	**0.00714***	**0.00278***	**0.0***	

Note: * Denotes significant difference at 0.05 (two-tailed); # denotes number rounded to nearest whole decimal.

Table 6.11

Sub-case Two Z-score Statistics for Differences in Responses Pre- and Post-intervention—Communication Difficulty

	Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Pre-score	126	167	58	9	360
Proportion[#]	35.00%	46.39%	16.11%	2.50%	
Post-score	206	135	27	2	370
Proportion[#]	55.68%	36.49%	7.30%	0.54%	
Z-score	−5.6087	2.716	3.7118	2.1726	
p value	**0.0***	**0.00652***	**0.0002***	**0.03***	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

6.6.2 Change in process confidence and difficulty for sub-case two. Similar to the changes seen for communication, a significantly greater number of students from sub-case two reported self-perceptions of greater confidence (see Figure 6.7) and reduced difficulty (see Figure 6.8) after exposure to peer-type standardised patients. Tables 6.12 and 6.13 show the z-score statistics for differences in responses pre- and post-intervention for students' self-perceptions of communication confidence and communication difficulty, respectively. While sub-case two students commenced with a higher reported confidence (82.17% reporting confidence in process ability) and lower difficulty (81.67% reporting process as increasing in ease), there were significantly more students reporting confidence in process ability (91.89%) after exposure to standardised patients. Similarly, sub-case two students found process easier (less difficult) after the intervention (81.67% pre versus 93.51% post). Figure 6.7 shows the positive shift towards greater confidence in communication and Figure 6.8 shows the positive shift towards greater ease.

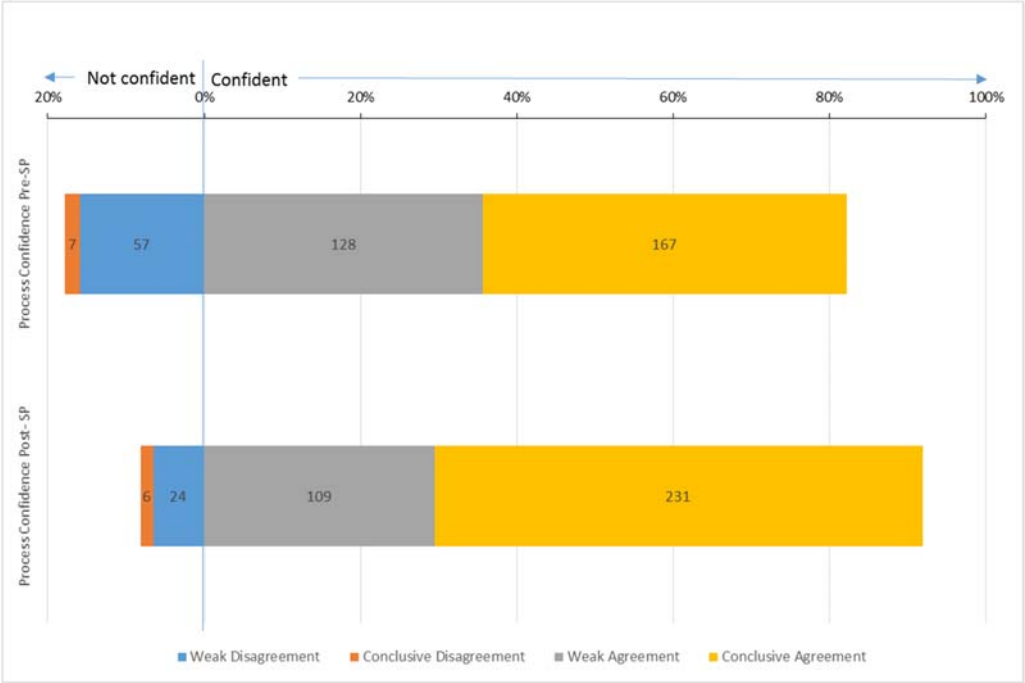


Figure 6.7. Change in student perceptions of confidence in process for sub-case two.

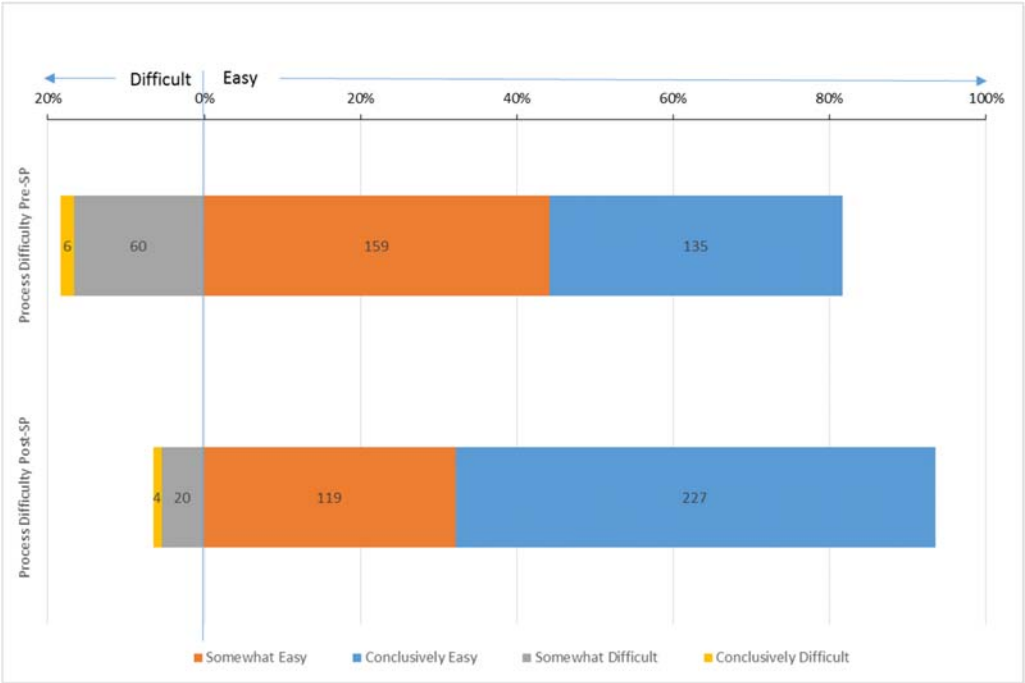


Figure 6.8. Change in student perceptions of difficulty in process for sub-case two.

Table 6.12

Sub-case Two Z-score Statistics for Differences in Responses Pre- and Post-intervention—Process Confidence

	Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Pre-score	7	57	128	167	359
Proportion[#]	2.0%	15.9%	35.7%	46.5%	
Post-score	6	24	109	231	370
Proportion[#]	1.6%	6.5%	29.5%	62.4%	
Z-score	0.339	3.627	1.785	−4.315	
p value	$p = > 0.5$	**0.00028***	$p = > 0.5$	**0.0***	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

Table 6.13

Sub-case Two Z-score Statistics for Differences in Responses Pre- and Post-intervention—Process Difficulty

	Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Pre-score	135	159	60	6	360
Proportion[#]	37.5%	44.2%	16.7%	1.7%	
Post-score	227	119	20	4	370
Proportion[#]	61.4%	32.2%	5.4%	1.1%	
Difference	−92	40	40	2	
Z-score	−6.444	3.339	4.870	0.681	
p value	**0.0***	**0.00084***	**0.0***	$p = > 0.5$	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

6.7 Difference between Sub-cases One and Two: Perceptions of Communication and Process Confidence and Difficulty Pre- and Post-intervention

The analysis of Likert scale items reported by students in both sub-cases showed significant differences in self-reported confidence and difficulty after exposure to standardised patients—within cases. In both sub-cases, students reported higher levels of confidence and reduced perceptions of difficulty in undertaking an OTC patient intervention in both communication and process. Given the significantly higher session one process and communication scores and pre-intervention confidence and difficulty scores of sub-case two, the question arose whether there was a difference in the students' self-perceptions of confidence and difficulty between sub-cases one and two after exposure to standardised patients.

The confidence and difficulty Likert scales of sub-cases one and two were compared using a similar statistical approach employed to detect changes (improvement) for the independent sub-cases. Tables 6.14 to 6.17 compare students in sub-case one and two in terms of confidence and difficulty Likert responses to the confidence and difficulty Likert items pre-exposure to standardised patients. Figures 6.9 to 6.12 compare sub-case one and two student responses pre- and post-intervention for communication confidence (Figure 6.9), communication difficulty (Figure 6.10), process confidence (Figure 6.11) and process difficulty (Figure 6.12). There was a significant difference in the responses, with students in sub-case two reporting both higher confidence and lower levels of difficulty compared with sub-case one, pre-exposure to standardised patients (time point A). There was no pattern of significant difference between sub-cases one and two after exposure to standardised patients. The analysis showed that students in sub-case one started less confident and reported higher

levels of difficulty in conducting a patient intervention, compared with sub-case two. The difference between sub-cases was not evident after exposure to standardised patients.

Table 6.14

Comparison of Sub-cases One and Two Communication Confidence Likert Responses before and after Exposure to Standardised Patients

		Likert communication	Confidence item statistics—Pre-intervention			
		Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Communication confidence	**Sub-case 1**	44	47	106	93	290
	Proportion[#]	15.2%	16.2%	36.6%	32.1%	
	Sub-case 2	11	44	130	162	347
	Proportion[#]	3.2%	12.7%	37.5%	46.7%	
	Z-score	0.599	2.688	2.992	−4.604	
	p value	$p = > 0.5$	**0.00714***	**0.00278***	**0.0***	
		Likert communication	Confidence item statistics—Post-intervention			
		Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Communication confidence	**Sub-case 1**	14	10	57	189	270
	Proportion[#]	5.2%	3.7%	21.1%	70.0%	
	Sub-case 2	9	25	100	236	370
	Proportion[#]	2.4%	6.8%	27.0%	63.8%	
	Z-score	1.848	−1.678	−1.718	1.644	
	p value	$p = > 0.5$	$p = > 0.5$	0 $p = > 0.5$	$p = > 0.5$	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

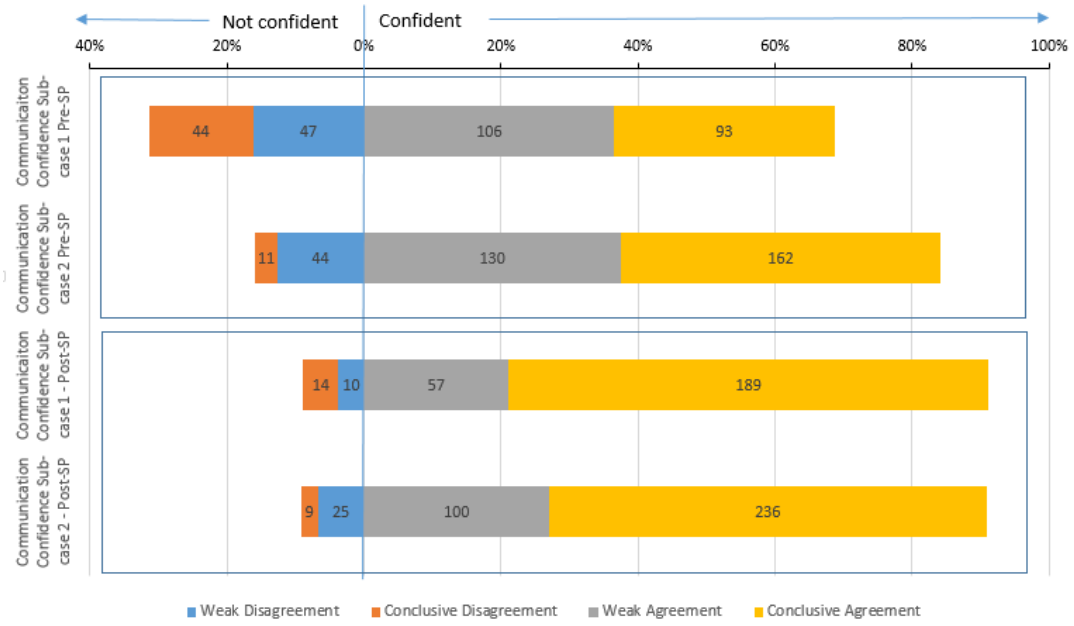


Figure 6.9. Difference in communication confidence for sub-cases one and two, pre- and post-exposure to standardised patients.

Table 6.15

Comparison of Sub-cases One and Two Communication Difficulty Likert Responses before and after Exposure to Standardised Patients

Likert communication difficulty item statistics—Pre-intervention						
		Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Communication difficulty	**Sub-case 1**	59	114	82	25	280
	Proportion[#]	21.1%	40.7%	29.3%	8.9%	
	Sub-case 2	126	167	58	9	360
	Proportion[#]	35.0%	46.4%	16.1%	2.5%	
	Z-score	−3.86	−1.44	4.0	3.597	
	p value	**0.00012***	$p = > 0.5$	**0.00006***	**0.00032***	
Likert communication difficulty item statistics—Post-intervention						
		Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Communication difficulty	**Sub-case 1**	157	101	18	9	285
	Proportion[#]	55.1%	35.4%	6.3%	3.2%	
	Sub-case 2	206	135	27	2	370
	Proportion[#]	55.7%	36.5%	7.3%	0.6%	
	Z-score	−0.150	−0.277	−0.492	2.584	
	p value	$p = > 0.5$	$p = > 0.5$	$p = > 0.5$	**0.00988***	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

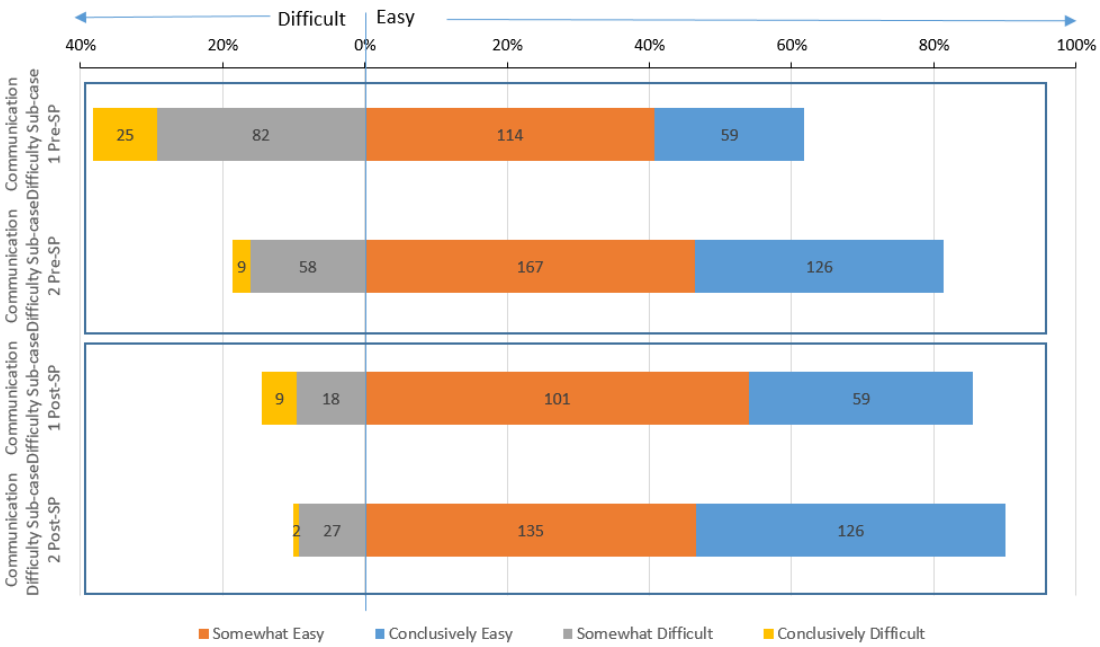


Figure 6.10. Difference in communication difficulty for sub-cases one and two, pre- and post-exposure to standardised patients.

Table 6.16

Comparison of Sub-cases One and Two Process Confidence Likert Responses before and after Exposure to Standardised Patients

	Likert process	Confidence item statistics—Pre-intervention				
		Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Process confidence	**Sub-case 1**	44	87	99	60	290
	Proportion[#]	15.2%	30.0%	34.2%	20.7%	
	Sub-case 2	7	57	128	167	359
	Proportion[#]	2.0%	15.9%	35.7%	46.5%	
	Z-score	0.335	3.627	1.785	−4.315	
	p value	$p = > 0.5$	**0.00028***	$p = > 0.5$	**0.0***	
	Likert process	Confidence item statistics—Post-intervention				
		Conclusive disagreement	Weak disagreement	Weak agreement	Conclusive agreement	N
Process confidence	**Sub-case 1**	12	13	66	179	270
	Proportion[#]	4.4%	4.8%	24.4%	66.3%	
	Sub-case 2	6	24	109	231	370
	Proportion[#]	1.6%	6.5%	29.5%	62.4%	
	Z-score	2.133	−0.895	−1.406	1.006	
	p value	**0.03318***	$p = > 0.5$	$p = > 0.5$	$p = > 0.5$	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

Figure 6.11. Difference in process confidence for sub-cases one and two, pre- and post-exposure to standardised patients.

Table 6.17

Comparison of Sub-cases One and Two Process Difficulty Likert Responses before and after Exposure to Standardised Patients

		Likert process difficulty item statistics—Pre-intervention				
		Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Process difficulty	**Sub-case 1**	56	108	82	34	280
	Proportion[#]	20.0%	38.6%	29.3%	12.1%	
	Sub-case 2	135	159	60	6	360
	Proportion[#]	37.5%	44.2%	16.7%	1.7%	
	Z-score	−4.8	−1.424	3.811	5.432	
	p value	**0.0***	$p = > 0.5$	**0.00014***	**0.0***	
		Likert process difficulty item statistics—Post-intervention				
		Conclusively easy	Somewhat easy	Somewhat difficult	Conclusively difficult	N
Process difficulty	**Sub-case 1**	151	106	17	9	283
	Proportion[#]	53.4%	37.5%	6.0%	3.2%	
	Sub-case 2	227	119	20	4	370
	Proportion[#]	61.4%	32.2%	5.4%	1.1%	
	Z-score	−2.050	1.411	0.330	1.90	
	p value	**0.04036***	$p = > 0.5$	$p = > 0.5$	$p = > 0.5$	

Note: * Denotes significant difference at 0.05 (two-tailed); [#] denotes number rounded to nearest whole decimal.

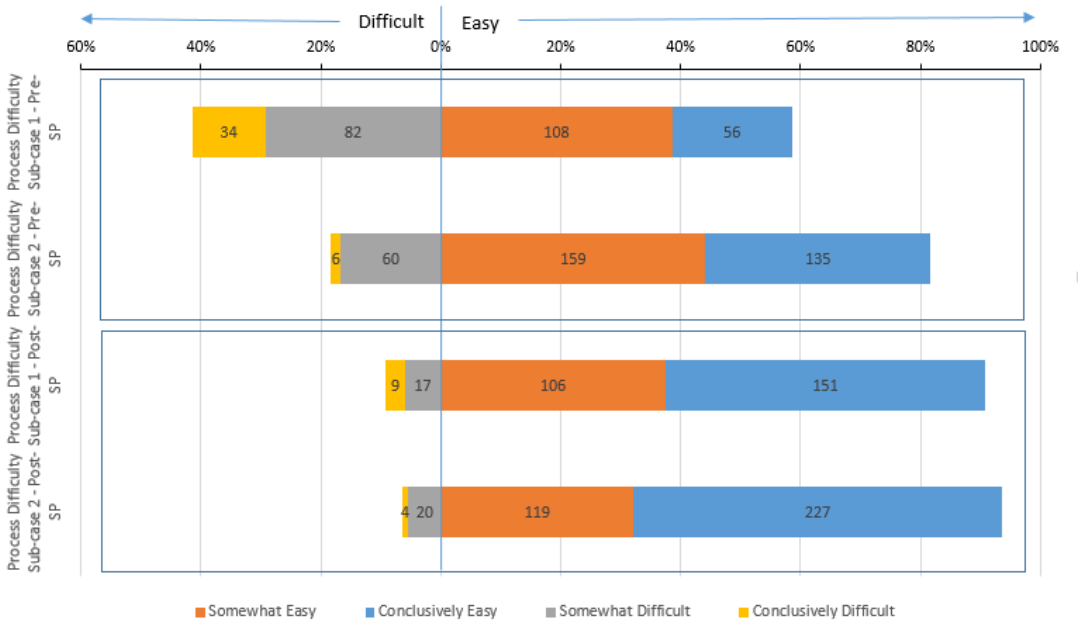


Figure 6.12. Difference in process difficulty for sub-cases one and two, pre- and post-exposure to standardised patients.

6.8 Summary

In this chapter, the researcher analysed the change in students' self-reported levels of confidence and difficulty in conducting a patient intervention before (time point A) and after (time point B) exposure to standardised patients. Students in sub-case one reported lower levels of confidence and higher levels of difficulty than in sub-case two before exposure to standardised patients. Students in both sub-cases one and two experienced statistically significant improvements in communication and process confidence, and statistically significant reductions in perceptions of difficulty conducting a patient intervention. These findings were supported by findings from the focus group data analysis. Of significant interest is the finding that there was no significant difference between perceptions of confidence and difficulty in conducting a patient intervention between sub-cases after five sessions with standardised patients.

Standardised patients improved students' self-reported levels of confidence in communication- and process-related elements, and reduced perceptions of difficulty. There was a greater degree of change for sub-case one.

In chapter 7, the researcher reports on findings from this study in response to the third research question: Are teaching strategies integrating standardised patient teaching methods effective in developing foundational communication skills in undergraduate pharmacy students?

Chapter 7: Research Question Three—Results

7.1 Introduction

In this chapter, the researcher describes the relevant findings relating to research question three: *Are teaching strategies integrating standardised patient teaching methods effective in developing foundational communication and process skills in undergraduate pharmacy students?* The chapter begins with a summary of the most significant findings, followed by a comparison of the baseline performance of both sub-case populations. An examination of the effect of standardised patients teaching methods on students' communication and process skills is then provided. The chapter is concluded with a comparison between performance in communication, process and total scores in the final session (session five) by sub-case.

The findings are presented for each sub-case. As described in previous chapters, students in sub-case one were exposed to a simulation teaching strategy using volunteer standardised patients, while students in sub-case two experienced peer-based standardised patient instruction methods. At the time of exposure to the standardised patient teaching, sub-case one students had completed two years of a four-year undergraduate pharmacy degree, while sub-case two students had completed almost 3.5 years of the same program. The assessment of both sub-cases was undertaken with a similar prescriptive standardised marking schedule as described in Chapter 4 and Appendix 4-8.

Note: Tables and graphs reporting on changes in communication scores between sessions are identified with yellow headers or bars. Tables and graphs reporting on changes in process scores between sessions are identified with green headers or bars. Tables and graphs reporting on changes in total scores between sessions are identified with blue headers or bars.

7.2 Summary of Chapter Findings

In general, students in both sub-cases exhibited significant improvement in performance in communication, process and total scores, though the improvement was more gradual for sub-case two than sub-case one. Specifically, the analysis showed:

- Students in sub-case one started at a significantly lower level of ability in communication, process and total scores than did the more experienced sub-case two population.
- Students in sub-case one demonstrated a greater magnitude of improvement, starting with a lower baseline level and finishing with near equivalent performance by the final session.
- Students in sub-case one realised improvements in the first three comparisons (sessions one and two, sessions two and three, and sessions three and four). However, there was no significant improvement between sessions four and five, which suggests that sub-case one experienced the maximum benefit after four sessions with volunteer standardised patients.
- Students in sub-case two did not exhibit significant improvements between any concurrent sessions. There was improvement in communication and total scores when sessions five and one were compared. This suggests that the more seasoned sub-case two students experienced a significant, yet more gradual, improvement over the five sessions—the magnitude of which was not significant between concurrent sessions.
- The mean process and total scores for students in sub-cases one and two did not differ significantly in the last session. Sub-case two had a significantly higher score for communication in session five. Despite the substantial differential in time spent in the course and exposure to clinical placement,

sub-case one performed at a similar level to sub-case two in two of the three categories (process and total score).

- The greatest benefit for improvement seems to be for the less experienced student population (sub-case one). Four sessions seems an efficient balance between number of sessions and benefit in the form of continued improvement.

7.3 Sub-case Comparison (Sub-case One v. Sub-case Two): Session One

A repeated measures ANOVA was performed to examine the difference in student score between sub-cases one and two in session one in performance on the three areas: communication, process and total scores. This analysis was conducted to identify any difference in baseline ability in the first session in preparation for a similar analysis in the last session. Student scores from the prescriptive standardised assessment criteria (described in Chapter 4 and located in Appendix 4-8) were classified according to their contribution to either communication or process ability, as described in Chapter 5, Figure 5.8.

To contextualise differences in performance, it is useful to gain an understanding of how far the students in each sub-case had advanced through the undergraduate program. Table 7.1 highlights the most salient contextual differences between sub-cases. In this context, students in sub-case two were more experienced and advanced in their pharmacy undergraduate program than were students in sub-case one.

Table 7.1

Main Contextual Difference between Students in Sub-cases One and Two

	Sub-case one context descriptors	Sub-case two context descriptors
Year of program	3	4
Semesters completed	4	6.8
Placement experience	Nil	9 weeks

7.3.1 Difference in communication, process and total scores between sub-cases one and two for session one. In comparison to sub-case one, students in sub-case two performed significantly better in session one across all three categories. The data showed a significant difference between sub-cases one and two for communication, process and total scores. This suggests that students in sub-case one started with a significantly lower baseline level of ability than did those in sub-case two. Table 7.2 shows the statistics for session one for communication, process and total scores, comparing both sub-cases. Figure 7.1 shows a box and whisker plot for session one (communication, process and total scores).

Table 7.2

Independent Samples Statistics Comparing Sub-cases One and Two Mean Communication, Process and Total Scores at Session One

					Independent samples differences				
Session 1		Mean	N	Std. deviation	Mean difference	Std. error difference	*t*	*df*	Sig. (2-tailed)
Communication	Sub-case one	6.473684	57	1.96946	2.21	0.34687	−6.36	124	**< 0.001***
	Sub-case two	8.6812	69	1.91160					
Process	Sub-case one	4.36	57	1.592	2.02	0.2746	−7.371	124	**< 0.001***
	Sub-case two	6.38	69	1.486					
Total	Sub-case one	10.83	57	3.249	4.23	0.5689	−7.439	124	**< 0.001***
	Sub-case two	15.07	69	3.119					

Note: * Denotes significant difference at 0.05 (two-tailed).

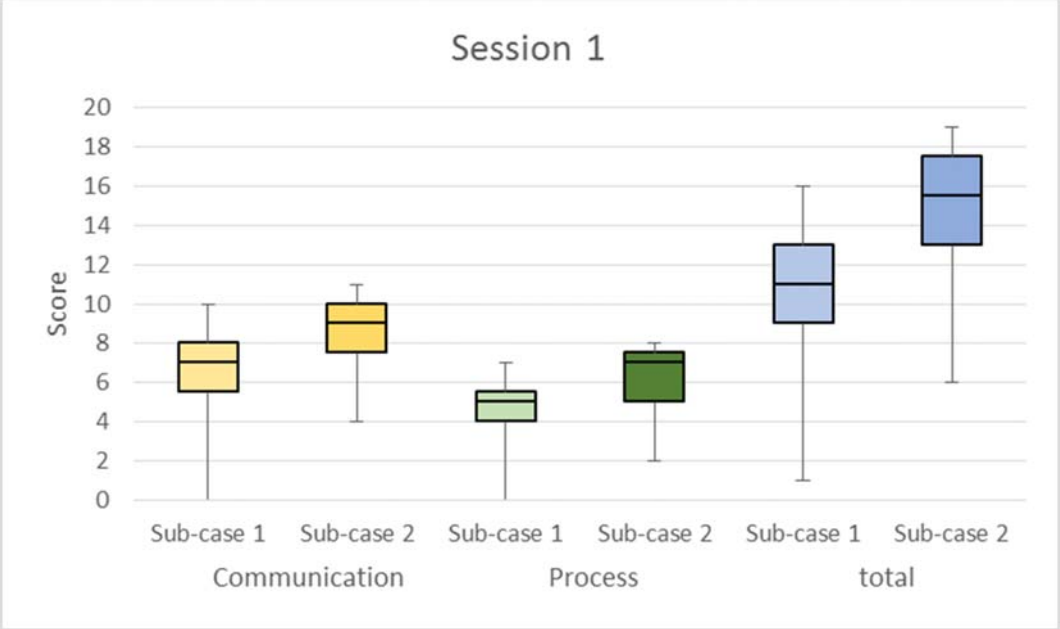


Figure 7.1. Box plot for communication, process and total scores for session one for sub-cases one and two.

7.4 Change in Performance Over Time

A paired-samples t-test was performed to examine the difference in scores across consecutive sessions to identify significant changes in student performance in the areas of communication, process and total scores. Four pairs of sessions were analysed for both sub-cases: sessions one and two, sessions two and three, sessions three and four, and sessions four and five (see Figure 7.2). The pair of sessions one and five was analysed for sub-case two only. Student scores from the prescriptive standardised assessment criteria (described in Chapter 4, criteria available in Appendix 4-8) were classified according to their contribution to either communication or process ability, as described in Chapter 5, Figure 5.8. The analysis was undertaken for both sub-cases one and two independently.

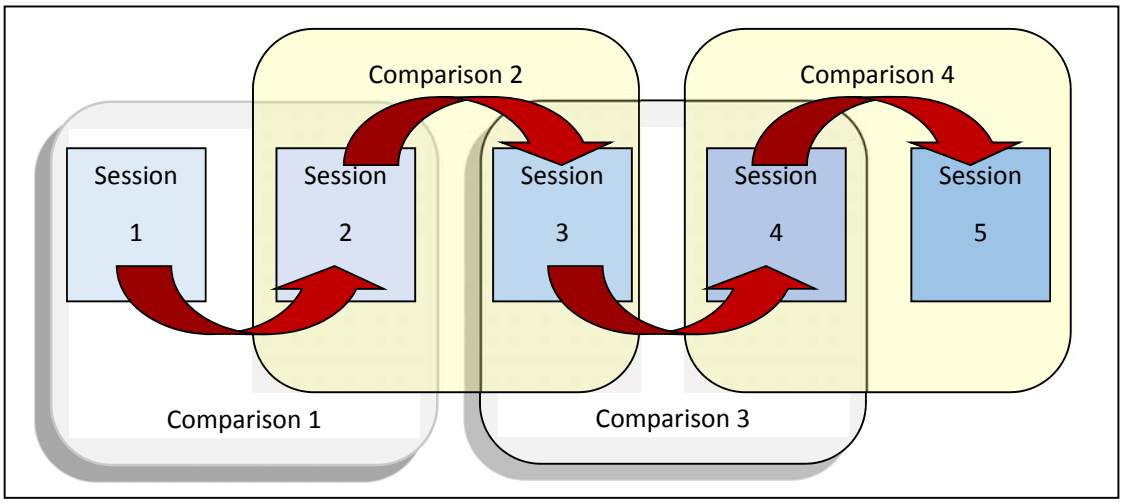


Figure 7.2. Representation of comparison of sessions.

7.5 Improvement between Sessions: Sub-case One

A paired-samples t-test was performed on sub-case one data generated by the prescriptive standardised assessment criteria to identify significant changes in student performance between concurrent sessions.

7.5.1 Communication score: Sub-case one. The analysis showed a progressive significant improvement in communication score between sessions one and two, sessions two and three, and sessions three and four, and a non-significant change in score between sessions four and five. The analysis also suggested that students achieved maximum benefit after exposure to four sessions of volunteer standardised patients. Table 7.3 describes the statistics for each paired session for communication for sub-case one. Figure 7.3 shows the mean communication score for each of the five sessions (bar plot, right axis) and tracks each individual student over the five sessions (line plot, left axis). Note the difference in range of scores between sessions one and five, the gradual improvement in mean score and the upward trend in individual cases. Successive reporting of statistics is restricted to the relevant tables to improve readability.

Table 7.3

Paired Differences between Sessions for Communication Score for Sub-case One

					Paired differences					
Communication		Mean	N	Std. dev.	Mean diff.	Std. dev.	Std. error mean	*t*	*df*	Sig. (2-tailed)
Pair 1	Session 2	7.2727	55	1.73424	0.7181	2.4186	0.3261	2.202	54	**0.032***
	Session 1	6.5545	55	1.94287						
Pair 2	Session 3	8.0089	56	2.10948	0.7411	2.4140	0.3226	2.297	55	**0.025***
	Session 2	7.2679	56	1.71878						
Pair 3	Session 4	9.2069	58	1.59229	1.3276	2.2135	0.2906	4.568	57	< **0.001***
	Session 3	7.8793	58	2.12815						
Pair 4	Session 5	9.0893	56	1.54068	−0.1875	1.9083	0.2550	−0.735	55	0.465
	Session 4	9.2768	56	1.51633						

Note: * Denotes significant difference at 0.05 (two-tailed).

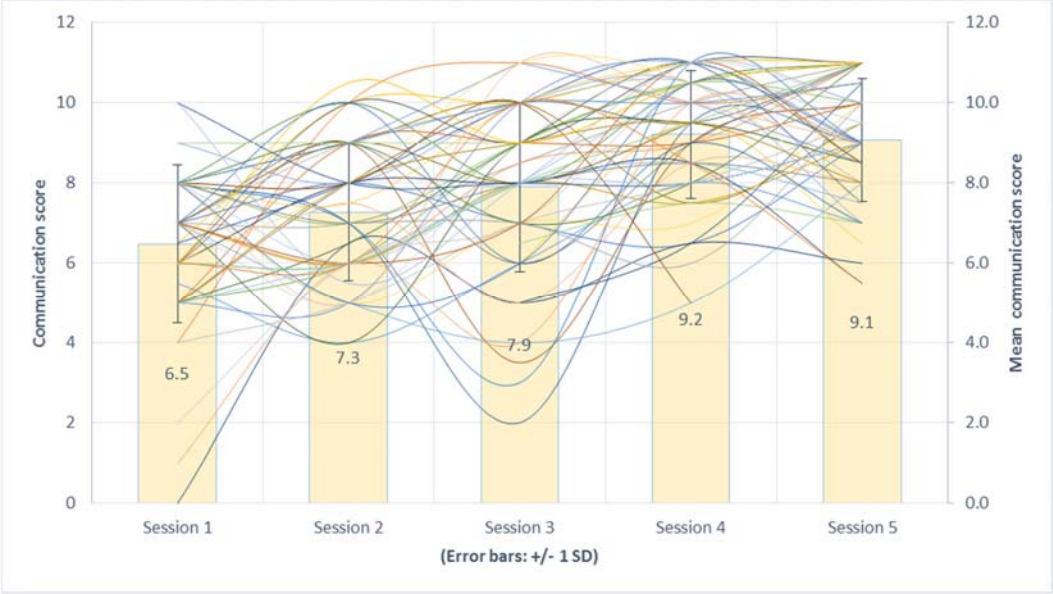


Figure 7.3. Progressive communication score for sessions one to five for sub-case one.

The qualitative focus group data from sub-case one supported the quantitative findings. A summary of themes from the qualitative analysis is contained in Table 6.5 in Chapter 6. Similar to the analysis for confidence and difficulty reported in Chapter 6,

focus group data was used as a secondary source of information to support the quantitative findings of this chapter.

The analysis of the focus group data suggested that students found benefit to their therapeutic communication development with standardised patients, which was partly attributed to the need to have to actively draw information out of the standardised patient. Additionally, students reported increased capacity to engage in more productive communication exchanges with standardised patients, alongside lower anxiety (improved confidence) for the student. This correlates with the finding from Chapter 6, where students reported higher confidence and lower perceptions of difficulty in communication after exposure to standardised patients.

> [F1-1]: Drawing information out of people, I think, was definitely valuable in [the standardised patient interaction], rather than just answering the question—actually having to draw that question out.
>
> [F1-4]: You know, sometimes you can sort of keep trying to pull people back on topic, but if you actually let the conversation flow, you can get the information that you need and it's a lot more organic for the patient.
>
> [M1-1]: And talking to patients … if I hadn't have had that [standardised patient] experience at all, I wouldn't know where to start with questions. I would have been that kid at the front counter that grabs a script (prescription) and comes back and has to go back and ask them several more questions and then back and forward, whereas now I've sort of got more of a collective set of at least three or four questions that I've got to ask, and maybe if I miss one, the pharmacist will pick it up; you know, things like that. But I'm at least a bit more rounded.

7.5.2 Process score: Sub-case one. Similar to the trend in communication score, sub-case one students' process scores generally improved over the first four sessions (first three pairs) and plateaued between sessions four and five. Table 7.4 shows a progressive significant improvement in process score between sessions one and two and sessions three and four for students in this sub-case. There was no significant improvement between sessions two and three and sessions four and five. Despite the absence of the convincing pattern demonstrated with sub-case one students' communication score, there was a general trend for overall improvement over the first four sessions, with a plateau between sessions four and five. Figure 7.4 shows the mean process scores for each of the five sessions (bar plot, right axis) and tracks each individual student over the five sessions (line plot, left axis). Note the difference in range of scores between sessions one and five, the gradual improvement in mean score and the upward trend in individual cases.

Table 7.4

Paired Differences between Sessions for Process Score for Sub-case One

					Paired differences					
Process		Mean	N	Std. dev.	Mean diff.	Std. dev.	Std. error mean	*t*	*df*	Sig. (2-tailed)
Pair 1	Session 2	5.0273	55	1.32084	0.6091	1.8701	0.2522	2.416	54	**0.019***
	Session 1	4.4182	55	1.49927						
Pair 2	Session 3	5.4018	56	1.81263	0.3839	2.1846	0.2919	1.315	55	0.194
	Session 2	5.0179	56	1.31067						
Pair 3	Session 4	6.2069	58	1.47206	0.9138	2.1707	0.2850	3.206	57	0.**002***
	Session 3	5.2931	58	1.80164						
Pair 4	Session 5	6.4196	56	1.34088	0.2143	1.8509	0.2473	0.866	55	0.390
	Session 4	6.2054	56	1.49173						
Pair 5	Session 5	6.3909	55	1.33573	2.0546	1.8147	0.2447	8.396	54	< **0.001***
	Session 1	4.3364	55	1.60455						

Note: * Denotes significant difference at 0.05 (two-tailed).

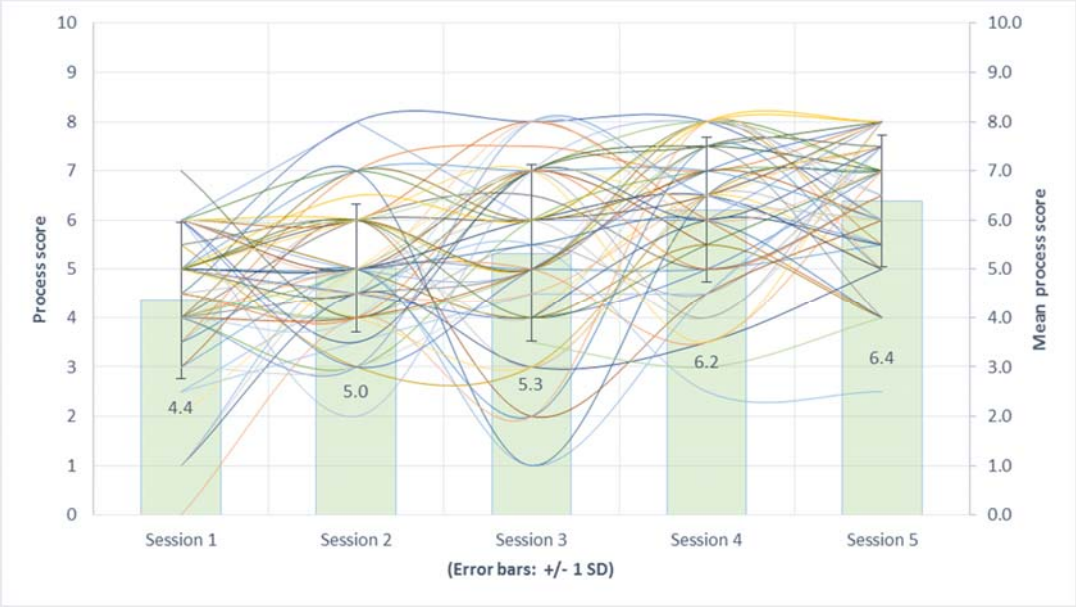


Figure 7.4. Progressive process score for sessions one to five for sub-case one.

The focus group analysis supported the findings from the quantitative analysis. Sub-case one students found exposure to standardised patients beneficial to developing their process (intervention) skills. It also helped students begin to modify and adapt existing protocols to develop the beginning of their own approach to conducting an OTC prescribing intervention:

> [F1-3]: Or even developing your own protocol. Like, yes, there was a basis of you needed to work out the type of pain, so you did the intensity … but for myself, I found that if I went through things in a certain order, it made more sense to me, so then I wouldn't miss things that I shouldn't miss with the patient, and then it still followed them in some way, but it also followed what you were ready for in your head as well.

7.5.3 Total score (performance: Sub-case one). As predicted from the analysis of the communication and process results, sub-case one students' total score showed

significant improvement over the first four sessions, with a plateau between sessions four and five. Table 7.5 shows a progressive and significant improvement in total scores between sessions one and two, two and three, and three and four. There was no significant improvement between sessions four and five. Figure 7.5 shows the mean total score for each of the five sessions (bar plot, right axis) and tracks each individual student over the five sessions (line plot, left axis). Note the difference in range of scores between sessions one and five, the gradual improvement in mean score and the upward trend in individual cases.

Table 7.5

Paired Differences between Sessions for Total Score for Sub-case One

					Paired differences					
Total score		Mean	N	Std. dev.	Mean diff.	Std. dev	Std. error mean	*t*	*df*	Sig. (2-tailed)
Pair 1	Session 2	12.3000	55	2.81135	1.32727	3.81908	0.51496	2.577	54	**0.013***
	Session 1	10.9727	55	3.12904						
Pair 2	Session 3	13.4107	56	3.64954	1.12500	4.23218	0.56555	1.989	55	0.052**
	Session 2	12.2857	56	2.78773						
Pair 3	Session 4	15.4138	58	2.68710	2.24138	3.91941	0.51464	4.355	57	< **0.001***
	Session 3	13.1724	58	3.66414						
Pair 4	Session 5	15.5089	56	2.45966	0.02679	3.16432	0.42285	0.063	55	0.950
	Session 4	15.4821	56	2.64912						

* Denotes significant difference at 0.05 (two-tailed); ** denotes bordering on significant difference at 0.05 (two-tailed).

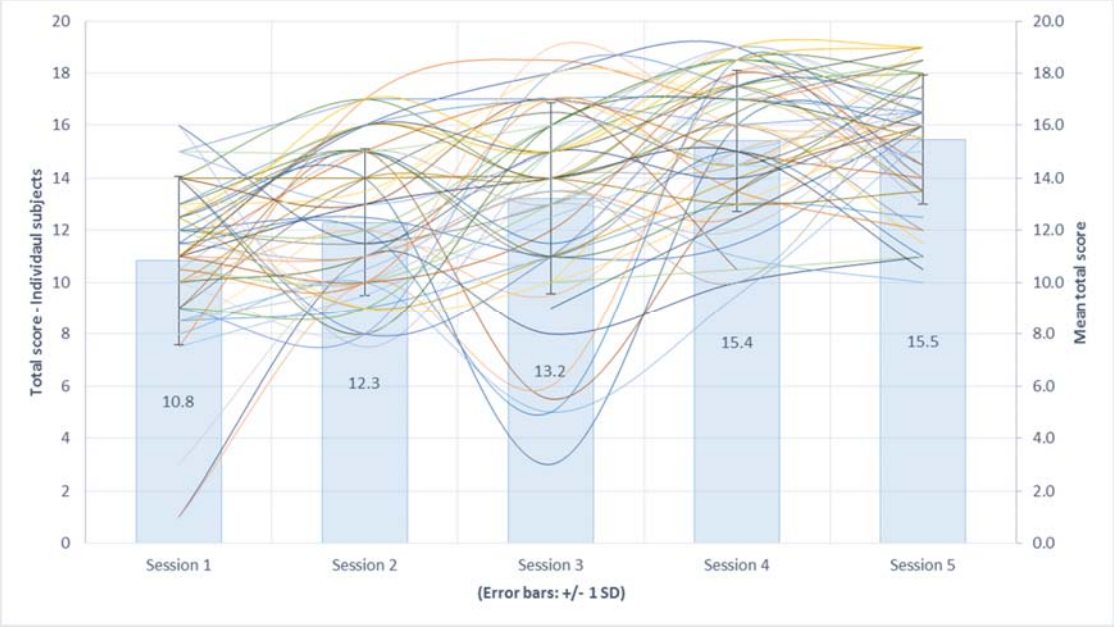


Figure 7.5. Progressive total score for sessions one to five for sub-case one.

The focus group analysis suggested that exposure to standardised patients assisted students with 'putting together' the necessary process and communication skills with the knowledge in a way that could be applied in practice. It assisted them to reflect on their skills and knowledge, and refine their approach accordingly. This ability to integrate a range of skills and apply them to a practice-related context was a particular value for students in sub-case one:

> [F1-2]: You have all the products in the pharmacy, so a lot of the time or—I don't know if 'a lot of the time' is the right wording—but, you go, 'Okay, this person presents with this'. Straight away, you think of a product that is usually used for that and, rather than asking all the questions you should, you might just go straight for the product and then, once you have the product, you might get distracted, talk about that and then forget about the non-pharmacological advice. So these role plays, I think, really [reinforced that] you need to do all of it and helped you remember that in another situation, when you were in a pharmacy.
>
> [F2-1]: I think it was a very refining process because I know for myself, in the first one, I gave this huge information dump. It was absolutely everything I knew on every possible aspect of this person's particular problem … it was like trying to get everything in there. But by the end, in the last week, it was down to its 10 minutes, relevant points. Still the communication skills, but that refined clinical knowledge, rather than just an information dump.
>
> [F2-2]: I thought it incorporated your clinical knowledge and also communication skills really well because you had to use both of those skills in order to interact with the patient and extract information from them and to deliver your message and, you know—and how to use the product and that sort

of thing so—and you were gaining that clinical knowledge about the different S2 and S3 products that you could recommend to the patient.

[M1-1]: I know that often I went home from here and I'd pop into the pharmacy on the way and I might have to serve if they were quite busy, and I actually faced all three scenarios directly afterwards, and obviously I could counsel quite appropriately … including the non-pharmacological advice. That was a lot more of a focus in a number of these OTC counselling sessions, which I got pulled up on.

7.6 Improvement between Sessions: Sub-case Two

A paired-samples t-test was performed on sub-case two data from the prescriptive standardised assessment criteria to identify significant changes in student performance from session to session.

7.6.1 Communication, process and total scores: Sub-case two. There was no significant improvement for communication ($p > 0.05$), process ($p > 0.05$) or total score ($p > 0.05$) between any concurrent session for students in sub-case two. There was a significant difference (improvement) for communication score between session five ($N = 57$, $M = 7.75$, $SD = 1.31$) and session one ($N = 57$, $M = 8.59$, $SD = 2.01$, t [56] = 3.80, $p < 0.001$, two-tailed), and total score between session five ($N = 57$, $M = 16.26$, $SD = 2.33$) and session one ($N = 57$, $M = 14.99$, $SD = 3.23$, t [56] = 2.50, $p = 0.015$, two-tailed). There was no significant improvement in process scores between sessions one and five ($p > 0.05$).

Tables 7.6, 7.7 and 7.8 show the statistics for the change in scores for the communication, process and total scores over the five sessions, and the statistics relating to the change in score between sessions one and five. Figures 7.6, 7.7 and 7.8 show the mean score for each of the five sessions (bar plot, right axis) for the

communication, process and total scores, respectively, and track each individual student over the five sessions (line plot, left axis). The tables and figures show the relatively high initial score that explained the absence of significant change between concurrent sessions observed in sub-case one. Despite the absence of any significant change over concurrent sessions, the improvement in communication and total scores between sessions one and five is noteworthy. This suggests that, while the change in performance was more gradual, there was still a significant change over the investigation period.

Table 7.6

Paired Differences between Sessions for Communication Score for Sub-case Two

					Paired differences					
Communication		Mean	N	Std. dev.	Mean diff.	Std. dev.	Std. error mean	*t*	*df*	Sig. (2-tailed)
Pair 1	Session 2	8.9783	69	1.50107	0.29710	2.14599	0.25835	1.150	68	0.254
	Session 1	8.6812	69	1.91160						
Pair 2	Session 3	9.1721	61	1.27765	0.22131	1.75956	0.22529	.982	60	0.330
	Session 2	8.9508	61	1.47395						
Pair 3	Session 4	9.4746	59	1.44563	0.37288	1.76067	0.22922	1.627	58	0.109
	Session 3	9.1017	59	1.29914						
Pair 4	Session 5	9.7632	57	1.31647	0.41228	1.89247	0.25066	1.645	56	0.106
	Session 4	9.3509	57	1.61733						
Pair 5	Session 5	9.7544	57	1.30973	1.16667	2.31519	0.30665	3.804	56	**< 0.001***
	Session 1	8.5877	57	2.00918						

Note: * Denotes significant difference at 0.05 (two-tailed).

Table 7.7

Paired Differences between Sessions for Process Score for Sub-case Two

		Paired differences								
Process		Mean	N	Std. dev.	Mean diff.	Std. dev.	Std. error mean	*t*	*df*	Sig. (2-tailed)
Pair 1	Session 2	6.5870	69	1.39315	0.20290	2.0388	0.24544	0.827	68	0.411
	Session 1	6.3841	69	1.48558						
Pair 2	Session 3	6.5738	61	1.45441	0.04098	1.8241	0.23356	0.175	60	0.861
	Session 2	6.5328	61	1.41383						
Pair 3	Session 4	6.6525	59	1.38419	0.07627	2.0695	0.26943	0.283	58	0.778
	Session 3	6.5763	59	1.46456						
Pair 4	Session 5	6.5088	57	1.27997	−0.03509	1.8942	0.25089	−0.140	56	0.889
	Session 4	6.5439	57	1.49188						
Pair 5	Session 5	6.5088	57	1.28345	0.10526	1.9057	0.25241	0.417	56	0.678
	Session 1	6.4035	57	1.51315						

Note: * Denotes significant difference at 0.05 (two-tailed).

Table 7.8

Paired Differences between Sessions for Total Score for Sub-case Two

					Paired differences					
Total score		Mean	N	Std. dev.	Mean diff.	Std. dev	Std. error mean	*t*	*df*	Sig. (2-tailed)
Pair 1	Session 2	15.5652	69	2.43430	0.50000	3.61472	0.43516	1.149	68	0.255
	Session 1	15.0652	69	3.11886						
Pair 2	Session 3	15.7459	61	2.35695	0.26230	3.13130	0.40092	0.654	60	0.515
	Session 2	15.4836	61	2.57871						
Pair 3	Session 4	16.1271	59	2.58409	0.44915	3.24926	0.42302	1.062	58	0.293
	Session 3	15.6780	59	2.38125						
Pair 4	Session 5	16.2719	57	2.34534	0.37719	3.47090	0.45973	0.820	56	0.415
	Session 4	15.8947	57	2.80741						
Pair 5	Session 5	16.2632	57	2.33396	1.27193	3.84065	0.50871	2.500	56	**0.015***
	Session 1	14.9912	57	3.23415						

Note: * Denotes significant difference at 0.05 (two-tailed).

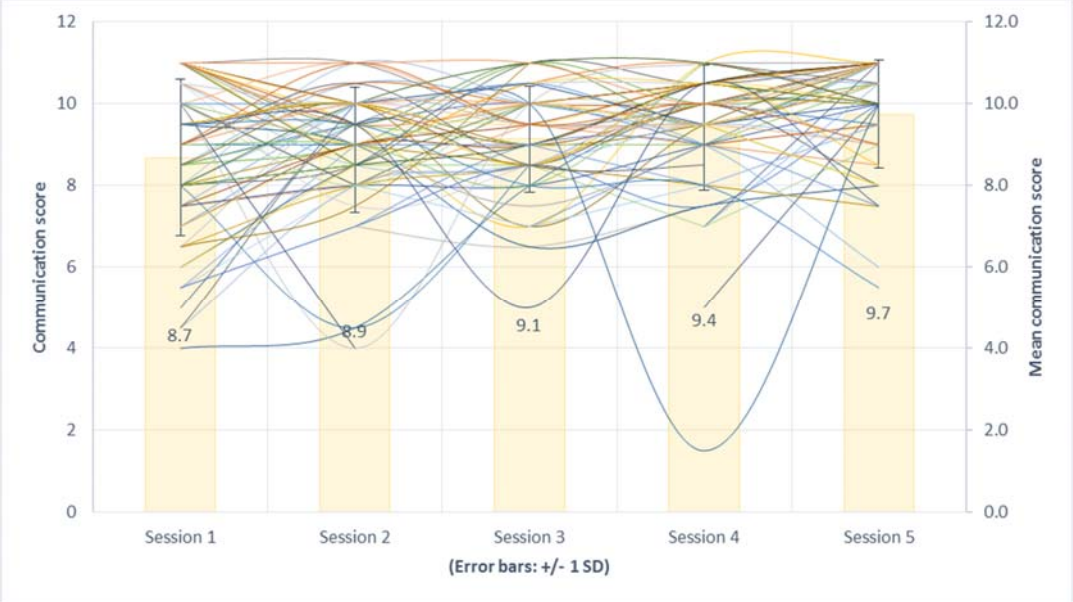


Figure 7.6. Progressive communication score for sessions one to five for sub-case two.

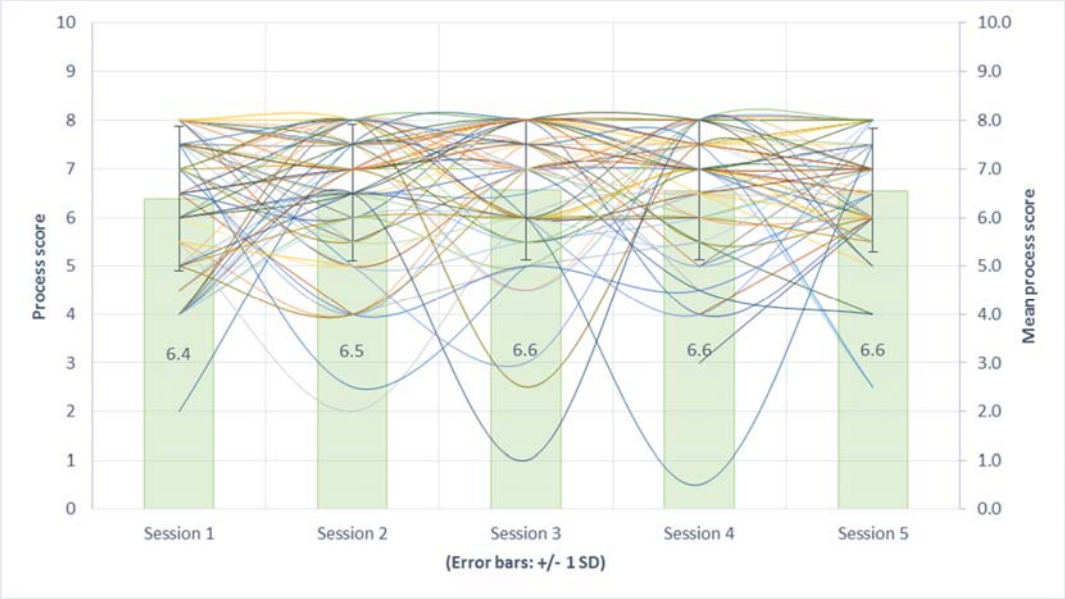


Figure 7.7. Progressive process score for sessions one to five for sub-case two.

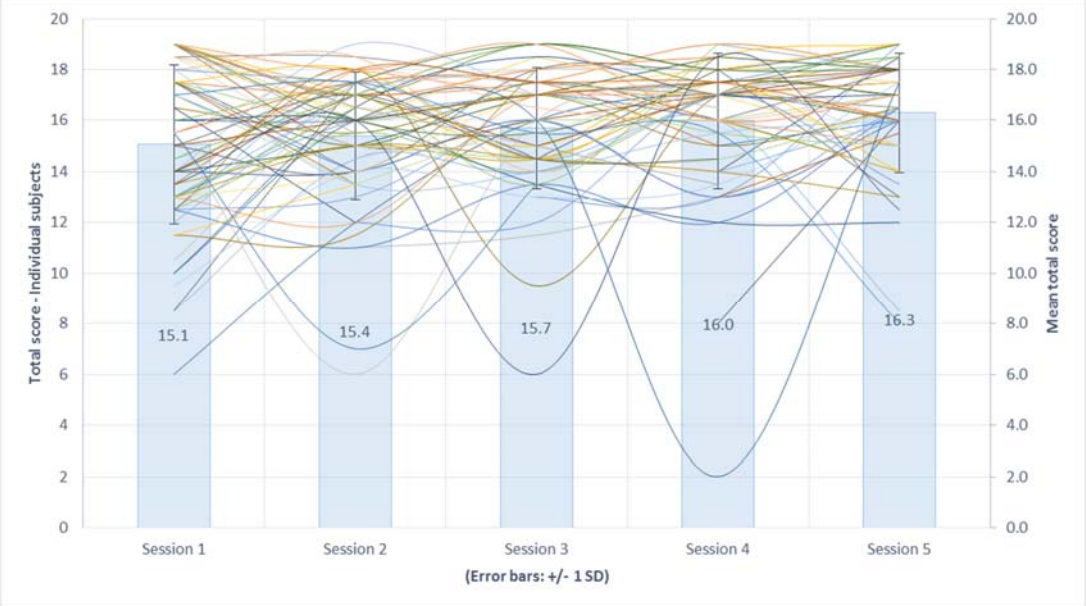


Figure 7.8. Progressive total score for sessions one to five for sub-case two.

7.7 Sub-case Comparison (Sub-case One v. Sub-case Two): Session Five

Similar to the analysis undertaken in the first session to establish a comparative baseline, a repeated measures ANOVA test was performed to examine the difference in score between sub-cases one and two students' scores in session five in the three categories (communication, process and total scores). This chapter earlier described the significant differences in performance at baseline between sub-cases one and two (sub-case one performing significantly worse—see Table 7.2) and the main contextual differences between sub-cases (see Table 7.1). After five sessions, the difference between sub-cases one and two mean scores diminished considerably. Table 7.9 shows the statistics for the difference in means between the two sub-cases in session five. There was no significant difference between sub-cases one and two for the process and total scores, with a significant difference remaining only for the communication score (although the magnitude of difference between means was much smaller). Figure 7.9 shows the plot for session five for the two sub-cases. Note the similarity of the plot for all three and the comparative difference when viewed with Figure 7.1. This suggests that students in sub-case one started at a lower level than those in sub-case two, yet achieved similar proficiency by session five.

Table 7.9

Independent Samples Statistics Comparing Sub-cases One and Two Mean Communication, Process and Total Scores in Session Five

					Independent samples differences				
Session 1		Mean	N	Std. dev.	Mean difference	Std. error difference	*t*	*df*	Sig. (2-tailed)
Communi-cation	Sub-case 1	9.07	57	1.534	0.676	0.263	−2.569	116	**0.011***
	Sub-case 2	9.75	61	1.322					
Process	Sub-case 1	6.39	57	1.342	0.163	0.240	−0.677	116	0.500
	Sub-case 2	6.58	61	1.269					
Total	Sub-case 1	15.46	57	2.460	0.838	0.4408	−1.902	116	0.060
	Sub-case 2	16.30	61	2.329					

Note: * Denotes significant difference at 0.05 (two-tailed).

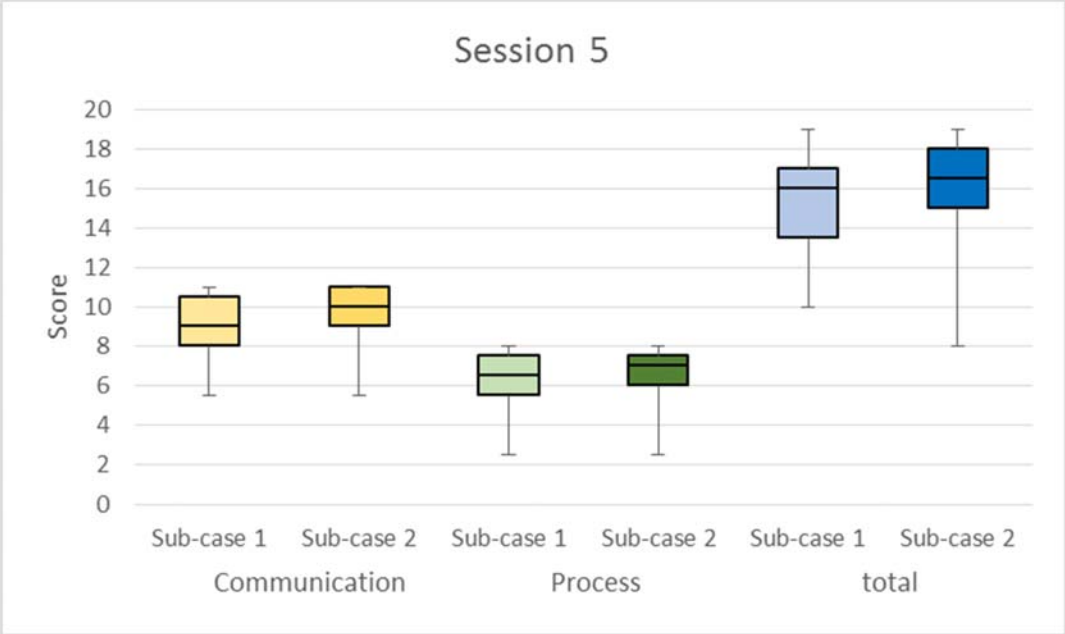


Figure 7.9. Box plot for communication, process and total scores for session five for sub-cases one and two.

7.8 Graduate Interview Results

As described in Chapter 6, the researcher conducted follow-up interviews with graduates. The themes generated as a result of the analysis can be found in Table 6.5 (Graduate themes (data set 2)). The graduates reported that the standardised patient learning experiences allowed them to practice, reflect on and adapt approaches that enabled greater success in preparing for transition to practice. This affected the practice environment during their clinical placement, and (more importantly) their transition from university to clinical practice in their intern year.

The interviewed graduates apportioned a degree of the benefit to the 'near-authentic' nature of the interaction with the standardised patients, as well as the repeated and successive exposure to different scenarios and standardised patients. The graduates were able to take advantage of the transformative potential of the learning strategy offered through the near-authentic environment, and were allowed to be reflexive in subsequent exposures:

> [M3-A]: I think when we were having that simulation with either the lecturers or our peers, we were all going along the same vein. Whereas if we do it with actual live [standardised] patients, we don't really know what they're going to say or what they're going to throw at us. It's definitely better in that respect because you're going to get a more authentic experience than what you'd get if I was doing it with [a lecturer] or if I was doing it with [a peer].
>
> [M1-P]: I think it was probably a good experience to broach those sensitive topics—things like thrush and haemorrhoids and stuff—because it is something that's difficult to talk to patients about. Even in the simulated environment, if you come up with different ways to ask certain questions, that might be a bit more sensitive than—because if you don't really have that experience, then the

> first time you go to ask those questions, it might seem a bit rude or a bit abrupt —but if you've had a few times practising, then I guess you can formulate the question—especially if you get feedback from a patient—you can formulate the question in a way that they want to hear it and that you feel comfortable asking.

Instrumental in this learning by reflecting on doing was the multi-source feedback from peers, standardised patients and the pharmacist tutor. Graduates described the benefits of the different sources of feedback, which offered them different perspectives. The result was increased confidence, better understanding of their individual capability and a sense of being practically prepared for practice:

> [F4-D]: I guess the feel that I have from the feedback from the lecturer and the feedback from my peers were more about, I guess, the content of it: Was I giving enough advice? Did I forget anything? The feedback I was getting from the simulated patients was more, 'I didn't understand a word of what you said', 'You talk too fast' or 'You talk too slow' or 'You repeated too much the same thing' or 'There were too many technical terms that I didn't understand'. I feel maybe using peers or using other lecturers … may not be as good because we don't get that feedback of, 'You were talking "pharmacist", you weren't talking English'.
>
> [M1-P]: I guess the main benefit of the simulation was you get feedback from the actual patient themselves at the end, whereas in a working environment, you can't really ask a person, say, 'How do you think I went?'
>
> [F4-D]: think we had the [volunteer standardised patients] coming in. It was really helpful because we were talking to people who were essentially normal human beings, so we couldn't get away with talking [in a highly technical nature] or from a pharmacy student to another pharmacy student who could

> translate what we're saying. It was—for me, those experiences were the best in my memory, just being able to have somebody from the external world, I guess, to pharmacy, coming in and giving us feedback on how we went as well. So not only having the feedback from our peers and our lecturers, but also having that feedback from [a layperson].

Graduates also reported significant benefit from observing their peers interact with patients. The benefits included observing beneficial strategies to disclose sensitive information, and the effect of delivering information in unacceptable ways. It also prompted reflection and engagement with peers about improvement strategies:

> [M3-A]: It was a huge opportunity to see how other people do it and pick up, 'Hey, that's a great idea' or 'I don't like how they used that word, it has that negative connotation' … Observation's definitely a good component of it.
>
> [F5-S]: We would listen to each other and then afterwards, we'd have a discussion: 'This is what I think you did really good. This is what I think you could improve on'. And then listening to other people do things, if there was something I wasn't sure, like, 'I don't know how I would explain that to a patient' or 'I don't think my wording's really clear. I can't think of a better way', someone else would do a really good job and I'd be like, 'That's actually a really good way to explain that. It's a lot easier to understand than what I've been saying'. So I think it was good.
>
> [F6-E]: I think it gives you an opportunity to look critically at what your peers are doing and think, 'I might like to do that next time' or see how I can work that into my counselling technique. I think it does provide value.
>
> [F7-M]: I guess because while you're doing it, you don't know what you look like, so seeing what other people look like was really helpful to me too. I either

> saw that their body language was terrible, or they were very anxious, or they were either very confident—I think that that made me more mindful of how I presented myself when talking to other people and patients. I think that was really helpful for me—probably almost as helpful as doing it myself.

Graduates also found the strategy was a time-effective method of learning. In addition to the near-authentic nature of the interaction, the intervention supported kinaesthetic learners and allowed them to integrate a range of skills (such as communication, clinical and drug knowledge, counselling structures and processes), into the response to the presentation or problem, in comparison to more didactic or read–write style tasks:

> [F4-D]: In terms of time management and learning, yes, definitely when you are assessed every week and you have to learn the content, you will learn the content.
>
> [F7-M]: The simulation's definitely more effective because it's an entirely different experience to just simply recalling information. You've got to structure it, you've got to use the right language, no jargon, things like that. I guess it is—you definitely need the simulation to be able to learn it.
>
> [F6-E]: The three hours with the simulation is much more efficient at getting the message across, and working on that communication and clinical skills than if you sat three hours and did a paper-based assessment or case study.
>
> [M1-P]: I think for me it was definitely time effective. I'm more of a practical learner. I could sit there and read the textbook all day, but might not learn half of the things in there, whereas when you're doing it in practice —I find it was just a lot easier for me to learn it, remember it, because I was doing it with a real person, rather than sitting there talking to myself, or to my friend or whatever.

7.9 Summary

In this chapter, the researcher has reported on the comparative difference in performance across comparative sessions for each sub-case, as well as the baseline and final performance differences between sub-cases. It showed that sub-case one baseline student scores were significantly lower than those in sub-case two; however, the performance of students in sub-case one improved at a greater rate over the first four sessions. The mean scores of students in sub-case two did not demonstrate significant improvements between sessions, but did show a significant improvement in the final session compared with the baseline performance. The greatest effect was seen for the less experienced students (sub-case one). The qualitative data supported the quantitative findings, in that students found the intervention useful to develop both process and communication skills, and exposure to standardised patients allowed the integration of communication and process for it to be applied in a meaningful way. Based on the trends observed in sub-case one, four sessions appear to be sufficient exposure to the intervention to achieve results. The interviews with graduates indicated that the teaching strategy was effective in skill development and knowledge transfer, was an efficient method of learning, and allowed students to benefit from observation of peers. In the next chapter (Chapter 8), the effect of standardised patient teaching methods on graduates' transition from university to practice is discussed. This chapter is provided in the form of a manuscript submitted for publication.

Chapter 8: Research Question 4—Results and Discussion

MANUSCRIPT:

Effect of Simulation on Pharmacy Graduate Transition to Practice

8.1 Introduction

In this chapter, the researcher describes the relevant findings relating to research question four: *Does the use of standardised patients in an undergraduate curriculum affect early-career pharmacists' transition into practice?* This chapter is presented in the form of a manuscript prepared for the *International Journal of Pharmacy Practice*. The chapter (manuscript) begins with a summary of the most significant background issues situating the place of simulation in undergraduate pharmacy education. This is followed by the methods used to obtain and analyse the data. The results are organised by two themes: (i) prepared for practice and (ii) adjusting to reality. Finally, the discussion employs contemporary literature to situate the findings of this section of the study in the broader literature.

Qualitative data was collected with graduate pharmacists who had been exposed to standardised patient teaching methods, and as described in in Chapter 4, analysed using methods of thematic analysis. The interviews were the primary data source for this chapter. Themes generated from the graduate interviews – Graduate themes (data set 2) are tabulated in Table 6.5.

The two major themes relevant to this chapter are 'prepared for practice' and 'adjusting to reality' In 'prepared for practice' students found benefit in the learning strategy that allowed them to learn, reflect and adapt their strategies in a near authentic

context. The reflection was facilitated by purposeful feedback. Students reported this smoothed their later transition to practice. The second theme, 'adjusting to reality' acknowledged the conflict students faced between the best practice solutions taught at university and the realities they faced in practice. These themes are expanded and discussed in this chapter.

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JS conducted the study, collected and analysed the data, and drafted and edited the manuscript.

MB supervised the conduct of the study and edited the manuscript.

JM supervised the conduct of the study, supervised data collection and analysis, and edited the manuscript.

8.2 Abstract

Background. Transition to practice is a significant milestone for pharmacy graduates, yet this transition can be highly challenging. These challenges result from highly variable practice roles, and divergence between the graduates' personal understanding and expectations of the pharmacist role developed during the undergraduate education, and the realities they face in real practice. Various simulation strategies exist to prepare graduates for this transition to practice. Despite significant literature on simulation and standardised patient teaching methods, few studies have reported on the effect of standardised patients on graduate preparation and transition to practice.

Aim. This manuscript reports on qualitative findings from a larger, predominantly quantitative study that investigated the effect of standardised patient simulation teaching strategies on pharmacy students' knowledge and skill acquisition, and transition from university to clinical practice.

Method. Semi-structured interviews were conducted with a convenience sample of nine graduates of a regional Australian undergraduate pharmacy program. Interviews were thematically analysed using selective coding method.

Results. Two themes were developed: 'prepared for practice' and 'adjusting to reality'. 'Prepared for practice' describes graduates' increased ease and confidence in conducting a patient intervention during transition to practice, as a result of standardised patient learning experiences. In contrast, 'adjusting to reality' found that, while graduates developed an understanding of best practice resulting from application of skills and knowledge in a 'near-authentic' practice scenario, the resultant learnings and strategies were not always fit for 'real practice'.

Conclusion. Standardised patient teaching strategies can have positive effects on pharmacy graduates' transition, even under idealistic near-authentic practice situations. However, to maximise the value of standardised patient teaching for transition, students should be exposed to scenarios that introduce the often-conflicting work context pressures associated with real clinical practice.

Key words: Transition to practice, pharmacy practice, intern year, intern practice year, feedback, learning and teaching, simulation, standardised patient.

Conflict of interest and financial disclosure statements: We wish to confirm that there are no known conflicts of interest associated with this publication, and this research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

8.3 Introduction

The higher education sector has provided pharmacist training in Australia since its transition from an apprenticeship-based training scheme in 1960 (Bryant, 2012). Despite graduates' successful completion of their respective courses of study, the international medical, nursing and pharmacy literature evidences the difficulty faced by new graduates when first transitioning into practice (Casey, Fink, Krugman, & Propst, 2004; Chunta & Edwards, 2013; Edwards, Hawker, Carrier, & Rees, 2015; Laack, Newman, Goyal, & Torsher, 2010; Noble, Coombes, Nissen, Shaw, & Clavarino, 2014). Pharmacy students' transition to practice can be particularly challenging because of the highly variable practice roles that may conflict with the real workplace (Burke, Jones, & Doherty, 2005; Noble, Coombes, Shaw, Nissen, & Clavarino, 2014). These transition difficulties are replicated across the broader spectrum of university graduates, yet, despite this broadly acknowledged phenomenon, it remains poorly understood by tertiary institutions, scholars and employer groups (Perrone & Vickers, 2003).

This phenomenon makes graduate work readiness and transition to practice an important issue in higher education. Employers and organisations are placing increasing importance on graduate 'work readiness', as it is seen as indicative of their future potential performance (Bjerknes & Bjork, 2012; Caballero & Walker, 2010; Fejzic & Barker, 2015b). A key distinguishing feature of any group of new graduates entering the workforce is their lack of significant practical experience in the workforce and workplace (Keenan, 1995; Raybould & Wilkins, 2005). Industry employers acknowledge graduates' high level of discipline knowledge and technical skills, yet identify deficits in the generic employability skills desired by employers (McLennan & Keating, 2008).

Clinical placement or practicum is a valid method of increasing student exposure to the workplace and providing valuable experience. It is broadly accepted as a means to facilitate students' transition to practice (Diack, Gibson, Munro, & Strath, 2014). Clinical placement allows students to integrate theory under authentic work conditions, with supervision (Katajavuori, Lindblom-Ylänne, & Hirvonen, 2006; Martin, Rees, Edwards, & Paku, 2012). While valuable, this approach presents its own unique challenges for the student, mentor pharmacist and course team attempting to provide safe and authentic exposure to the pharmacy workplace. These challenges include the financial costs to students and educational institutions, loss of workplace productivity, patient safety effects (Diack et al., 2014), increasingly limited volume of placement opportunities (Hall, 2006; Kassam, Kwong, & Collins, 2013; McKenna & Wellard, 2004; Peters, Halcomb, & Mcinnes, 2013), and inconsistent exposure to unusual or uncommon diseases or presentations. Given the limitations of clinical placement and employers' eagerness for work-ready graduates, simulation strategies are increasingly important features of university curriculums.

The use of patient simulation is widespread in undergraduate medical and nursing education in Australia and overseas, and is increasingly used in pharmacy education (Smithson et al., 2015). A wide body of peer-reviewed literature in the field of medicine and nursing education practice complements the comparatively smaller volume of evidence in pharmacy education that supports simulated patient interactions as an effective teaching and assessment strategy (Nestel, Calandra, & Elliott, 2007; Ragan, Virtue, & Chi, 2013; Rao, 2011; Rickles et al., 2009; Smithson et al., 2015; Vyas, McCulloh, Dyer, Gregory, & Higbee, 2012). In the context of clinical teaching, simulation covers a number of teaching strategies in which real patients or clinical procedures are substituted for virtual-reality computer simulations, task trainers, computer-aided mannequins or standardised patients—live actors enacting a patient scenario. Standardised patients, the focus of this study, complement contemporary pharmacy undergraduate curriculums because of their ability to engage learners in an environment that reflects an applied context, flexibility, feedback potential and benefits to patient safety.

A standardised patient is an actor, peer or faculty staff member who has been trained to portray a character or patient problem as described in a partially scripted case scenario, and who can consistently deliver a similar performance student to student (Fiscella et al., 2007; Monaghan et al., 1997; Rickles et al., 2009; Smithson et al., 2015; Woodward et al., 1985). Standardised patients act out the part of a patient in a predetermined scenario to give trainee practitioners experience in a comfortable and predictable learning environment. Standardised patients often follow a script or partial script that allows for varying levels of improvisation, creating a more fluid environment that emulates clinical practice scenarios. This teaching method is often used to develop communication, clinical reasoning and intervention skills in pharmacy education.

Patient simulation strategies have emerged as an important response, as they are able to bridge the gap between university and practice (Chunta & Edwards, 2013) and subsequently prepare students for transition to practice. While recent nursing and medical studies have reported on simulation and its role in preparing graduates for transition to practice (Chunta & Edwards, 2013; Horsley, Bensfield, Sojka, & Schmitt, 2014; Laack et al., 2010), there is comparatively limited evidence of its effect on pharmacy graduates' transition to practice. This manuscript reports on the qualitative findings from a larger, predominantly quantitative study that investigated the effect of standardised patient simulation teaching strategies on pharmacy students' knowledge and skill acquisition, and transition from university to clinical practice.

8.4 Methods

This study conducted interviews with pharmacy graduates from one regional Australian university who had experienced standardised patient teaching during their undergraduate degree. An integrated program of education was designed to teach and assess over-the-counter (OTC) prescribing and prescription medicine counselling in a four-year undergraduate pharmacy course. The program developed students' skills in communication, counter prescribing and prescription medicine counselling. Over the duration of the program's sessions, each student participated in a minimum of five simulation scenarios and directly observed their peers managing an additional 15 scenarios in the final two years of the program. This educational intervention was originally influenced by David Kolb's experiential learning cycle (Kolb, 1984). The larger study is positioned within a pragmatist theoretical framework (Denzin, 2012; Morgan, 2014; Stumph & Fieser, 2015) and used an embedded case study approach as described by Yin (2012). Multiple methods were used to investigate the effect of a standardised patient teaching strategy on undergraduate pharmacy students'

performance in the management of over-the-counter and prescription medicine counselling presentations and (as reported in this manuscript) explored early-career pharmacists' reflections on the transferability of knowledge and skills acquired during learning sessions with standardised patients, and the effect of this on their transition to practice as new graduates.

The researcher recruited for interviews a convenience sample of nine practising early-career pharmacists who had completed their undergraduate pharmacy program at a regional Australian university in the last five years, and experienced standardised patient teaching methods. At the time of the first interview, six graduates were from community practice, one was from a professional pharmacy organisation, two were male, and eight had completed their intern year and were registered pharmacists. The mean post-registration experience of the interview participants was 2 years and four months. To ensure access to a broad sample of participant's, recruitment was conducted using existing alumni contacts, email and social media. The surveyed graduates were interviewed either in person or by telephone, with each interview lasting an average of 20 minutes (range 14 to 29 minutes). A follow-up interview lasting on average 10 minutes (range 8 to 12 minutes) was conducted with four graduates who responded to a request to participate. The follow-up interviews were used to further explore and develop themes and findings from the original interviews. The interviews generated 118 pages of data for analysis.

The interviews were semi-structured in format (Braun & Clarke, 2013; Mills & Birks, 2014; Roulston, 2010) and used an interview schedule as a guide. Thematic analysis (TA) using selective coding was employed to identify themes relevant to the research question. Rigour of analysis was assured using a standard interview guide, audit trail, interview transcriptions, qualitative data analysis software (NVivo 10®), and

peer analysis. Prior to each interview, graduates were asked to provide truthful responses to reduce moderator acceptance bias. Ethics approval was granted by the university's Human Research Ethics Committee (Human Ethics Approval Number H3238).

8.5 Results

Two important themes were developed from the interviews: 'prepared for practice' and 'adjusting to reality'. The first theme 'prepared for practice' described graduates' increased ease and confidence during transition to practice as a result of standardised patient learning experiences. Graduates reported greater confidence in skills and knowledge, which enabled a more proactive approach to the patient–pharmacist exchange in early practice. This resulted from two main elements of the standardised patient learning experience. First, the ability to apply, reflect on and adapt strategies in the context of relevant feedback. Second, the 'near-authentic' nature of the standardised patient interaction. As the second theme later revealed, the 'near-authentic' context had important limitations. Graduates felt particularly prepared when transitioning to their intern training program to manage scenarios involving common clinical presentations that required integration of professional skills with technical knowledge, but there was conflict with the structural, practical and organisational limitations or practice meaning graduates had to adjust their practice and personal expectations of the role.

8.5.1 Theme 1: Prepared for practice. Graduates reported that exposure to standardised patients gave them significant confidence and a sense of preparation upon transition to practice due to better developed professional skills, including communication and interpersonal skills, OTC prescribing and prescription medicine counselling skills. This was influenced by two major components of the standardised

patient encounter: (i) a reflective cycle (the ability to practice, reflect on and adapt approaches) facilitated by a purposeful feedback cycle and (ii) the 'near-authentic' nature of the standardised patient learning environment. As a result of standardised patients, graduates reported being more comfortable communicating with patients, and felt that they had enhanced ability to incorporate their professional and technical skills and knowledge simultaneously in a case context:

> [F5-19]: I think [standardised patients] did assist in the transition because the first day of your job … might be a bit daunting, but then you go down and talk to a patient … in my mind, for me, it was more like I'm back in a scenario, these are the questions I need to ask, these are the important things to establish, then we can determine what we need to do for the patient—follow your course of action and get the best outcome.

Instrumental in this reflective cycle was the multisource feedback from peers, standardised patients and the pharmacist tutor. Graduates acknowledged the value of feedback from multiple perspectives, as well as observing their peers interact with patients:

> [M1-16]: I guess the main benefit of the simulation was you get feedback from the actual patient themselves at the end, whereas in a working environment, you can't really ask a person, say, 'How do you think I went?'

Observing alternative strategies to their own practice and the outcomes of these strategies further prompted self-reflection. The result was increased confidence, better understanding of their individual capability and a sense of being practically prepared for practice. The 'near-authentic' nature of the standardised patient scenarios, repeated and successive exposure to multiple scenarios, and feedback maximised the transformative potential of the learning strategy:

> [F6-5]: I think it gives you an opportunity to look critically at what your peers are doing and think, 'I might like to do that next time' or see how I can work that into my counselling technique. I think it does provide value.

8.5.2 Theme 2: Adjusting to reality. Contextual realism of standardised patient scenarios is important. This theme uncovered limitations of standardised patient teaching methods as used in this study. Graduates developed an understanding of best practice resulting from applying skills and knowledge in a 'near-authentic' practice scenario; however, these strategies were not always fit for 'real practice'. Despite the benefit to confidence and skills, graduates reported that they needed to adjust the way they practised to accommodate the reality of the role of the pharmacist, and adjust their personal expectations of their role as a pharmacist:

> [F23-13]: In the OTC community pharmacy sense, simulation was spot on—you are involved in the whole process from patient presenting with symptoms, making a differential diagnosis, and you basically prescribe an OTC item to fix their condition. But when you are in a hospital or it is not an OTC product with a prescription item treating a chronic condition, you are not involved. With OTC simulation, my expectations were the same when I got out, but with the other content in the degree—you're not involved, it's very different.

The 'near-authentic' context did not fully prepare graduates for the structural, practical and organisational limitations faced by interns and newly registered pharmacists. Graduates reported the need to acknowledge the divergence between the learning environment with its idealised and distraction-free context, and the reality of practice experienced upon transition to practice. This conflict was lessened for graduates who had prior extracurricular pharmacy practice experience. Graduates who

had prior pharmacy experience attributed their more accurate impression of their role to this extracurricular pharmacy work experience:

> [F21-1]: Simulation helped guide the role of the pharmacist in being able to [for example] look at the script, identify any problems and counsel appropriately … but … in real life … they only want four key points … counselling is one of the biggest ones in real life—patients don't want to listen to you, they only want three or four key points out of the conversation. You do the best you can.

When dealing with this issue or other areas of uncertainty in practice during transition, graduates credited their pharmacist preceptor and other qualified pharmacists, as well as other experienced non-pharmacist staff with whom they worked, as more important to them in managing these situations:

> [F24-7]: [Simulation] had some impact [on dealing with uncertainty during transition to practice] … it does help with the unknown. Obviously your preceptor and others around you were a big support … even some of the other staff members who were experienced in the 'front shop' in areas such as wound care and babies … being able to rely on the staff members around you definitely helped.

8.6 Discussion

Transition from university to practice is a significant milestone for graduates, yet the difficulties faced by health graduates upon transition to practice are well documented (Duchscher, 2009; Edwards et al., 2015; Noble, Coombes, Nissen et al., 2014; Teo, Harleman, O'Sullivan, & Maa, 2011). Graduates' experience of the first months in a job can have a lasting effect on their perceptions of and commitment to the workplace (Perrone & Vickers, 2003), which explains the popularity of transition or capstone courses in a range of health disciplines (Teo et al., 2011). This also prompted

the subject of this study—the implementation of standardised patient teaching in an undergraduate pharmacy curriculum.

8.6.1 Prepared for practice. Reflective practice is an established component of pharmaceutical care models (Droege, 2003) and pharmacy education (Austin, Gregory, & Chiu, 2008; Lin, Travlos, Wadelin, & Vlasses, 2011; Tsingos, Bosnic-Anticevich, Lonie, & Smith, 2015). Experienced practitioners can develop responses to uncertain or unique situations through personal conscious reflection on their experience (Schön, 1983) as well as achieve professional development and patient care benefits from reflective learning opportunities (Black & Plowright, 2007). Like these experiences, pharmacy graduates in this study reported standardised patient experiences afforded them the opportunity to reflect, adapt and apply learnings. Key to this was timely and relevant multisource feedback which included observation of others' approaches as well as the ability to experiment with different solutions during similar simulation scenarios.

Structured work-based experiential learning involving patients has been found to smooth medical student transition to practice, thereby helping graduates deal with the uncertainty associated with 'real practice'(Bleakley & Brennan, 2011). Despite the desire for pharmacy programs to prepare students for practice, there is limited understanding about pharmacy students' experience of their transition to practice (Stupans, 2012), and the pharmacy literature offers little on the effect of simulation on graduates' transition to practice. This study supports previous nursing and pharmacy findings using a number of simulation strategies (Chunta & Edwards, 2013; Edwards et al., 2015; Olejniczak, Schmidt, & Brown, 2010; Rickles et al., 2009) that resulted in students developing greater confidence and enhanced preparation for transition to

practice thus bridging the gap to practice, albeit as this manuscript will later describe, with important limitations.

Scicluna, Grimm, Jones, Pilotto, and McNeil (2014) found that greater integration of patient contact across undergraduate curriculums can improve students' self-perceptions of capability in clinical skills and preparedness for practice. By acknowledging potential experience differences between real and simulated patients, this study found that standardised patient methods are an effective method to prepare students for transition to practice. This is supported by Laack et al. (2010), who found that even brief exposure to patient simulation strategies (the reported intervention also included longitudinal case studies and problem-based learning) is effective preparation for medical students transition to residency. While standardised patient teaching methods are simulations only, this study supports the existing literature finding that standardised patients are useful for embedding patient exposure into the pharmacy curriculum to improve graduates' transition to practice. Further, the use of standardised patients can complement other clinical opportunities, such as clinical placement and extracurricular pharmacy work.

8.6.2 Adjusting to reality. The realities of the clinical practice encountered by graduates and the associated limitations experienced in the workplace can make best-practice solutions taught during their undergraduate education difficult to apply. While this study found that standardised patients assisted graduates to translate theory to practice, this study also found that the benefit of standardised patient interactions is limited by the use of scenarios with insufficient contextual realism to develop accurate role understanding. This finding complements those of Mak, March, Clark, and Gilbert (2013) and Eden, Schafheutle, and Hassell (2009), who also identified that a source of graduate dissatisfaction was the mismatch between graduate expectations and

experiences upon transition to practice. We, the authors of this current study suggest two possible solutions to limit simulation's contribution to this conflict. Like Mak, March et al. (2013) suggested, it may be productive to alter the intern training program to match graduate expectations. A possibly more pragmatic response is to ensure standardised patient experiences in the students' undergraduate education have an appropriate mix of scenarios that demonstrate best practice responses and introduce the practical real-world limitations of pharmacy practice. This may reduce the transition shock described by graduates and reported in studies by Perrone and Vickers (2003) and Stupans (2012). In doing so, the forecasting of actual professional conditions and the avoidance of unmet expectations of involvement in patient care may reduce professional dissatisfaction and negative effects on the retention of pharmacists.

8.6.3 Making the most of standardised patient interactions. Acknowledging the limitations of standardised patients in terms of being 'nearly authentic', exposure to standardised patients is a suitable supplement to real practice experience, providing greater graduate confidence and preparation during transition to their intern year. As supported by other authors (Eden et al., 2009; Issenberg, McGaghie, Petrusa, Gordon, & Scalese, 2005; Seybert et al., 2008), this study found that the antecedent conditions that contribute to successful implementation of simulation include integrating quality multisource feedback during the experience (in this case, multisource feedback from student peers, standardised patient and a pharmacist tutor), providing opportunities to practice, integrating simulation sessions into the overall curriculum, and providing cases embedded in authentic workplace contexts.

The benefits of simulation on graduates' transition to practice will be maximised when simulation is delivered in a way that acknowledges best practice, and enables students to develop skills to appropriately respond to these real-life demands (such as

time pressures, complex situations and managing patient preferences), while practising strategies that promote effective patient care. Simulation scenarios must be constructed in a way that enables an introduction to and attainment of skills associated with best practice, while managing the often-conflicting pressures associated with clinical practice. Two limitations of this study are the small interview population and the singular perspective of graduates. While considering the perspective of community members and pharmacy employers would provide a richer insight into the effect of standardised patient teaching methods on graduates' transition to practice, this study does provide new understanding of the benefits and limitations of standardised patient teaching methods and takes an important step in exploring the graduates' lived experience.

8.6.4 Conclusion

This study examined the impact of learning through standardised patients on transition to practice. The findings from this research add to existing evidence in pharmacy education that standardised patient teaching strategies can have positive effects on pharmacy graduates' transition to practice. The major mechanism contributing to this is providing opportunities to apply the knowledge and skills learnt at university to the practice environment, albeit under ideal situations, and near-authentic practice conditions combined with a quality feedback cycle. This exposure allowed the translation of theory to the practice context; however, the best-practice skills taught and the realities of clinical practice frequently collided, creating conflict for graduates. Other mechanisms—such as pharmacy practice experience (clinical placement and extracurricular pharmacy work)—were important in gaining a more realistic understanding of real practice. This suggests that standardised patients can be effective in smoothing the transition to practice when appropriately combined with other

curricular and extracurricular experiences. This manuscript reports that employing standardised patients is an effective method to prepare students for their transition to practice as part of a broader educational strategy.

—End of Manuscript—

8.7 Chapter Summary

In this chapter, the researcher has reported on the effect of standardised patients on pharmacy graduates' transition to practice. This chapter developed two important themes: 'prepared for practice' and 'adjusting to reality'. This chapter found that graduates experienced increased ease and confidence in conducting a patient intervention during their transition to practice; however, there was a conflict between the 'near-authentic' practice scenario and real practice, which resulted in a mismatch between expectations and the realised experience. Standardised patient teaching strategies can have positive effects on pharmacy graduates' transition, even under ideal near-authentic practice situations. However, to maximise the value of standardised patient teaching on transition to practice, students should be exposed to scenarios that introduce the often-conflicting pressures associated with real clinical practice. In chapter 9, the researcher provides a discussion based on the findings of the four findings chapters (Chapters 5, 6, 7 and 8), situated in the contemporary literature.

Chapter 9: Discussion

9.1 Introduction

The purpose of the chapter is to respond to the Case in the context of the contemporary literature. The chapter begins with a brief summary of the Case in its frame of reference. It then provides a tabulated summary of the key findings from Chapters 5 to 8. The major findings are then discussed in relation to the contemporary literature. A summary based on the major conclusions drawn from the finding of this research and the contemporary literature is then provided using an approach consistent with some grounded theory methodologists – theoretical coding.

Theoretical coding was originally described by Glaser in 1978 (Birks and Mills, 2015, Hernandez, 2009). In grounded theory, this process is traditionally applied to later stages of grounded theory analyses. The overall aim of theoretical coding is to develop relationships between substantive codes to develop 'an abstract explanation of the findings of [the] research" (Birks and Mills, 2015 p.119).

The method of theoretical coding described above applies an extent theory to the findings of the research – and in doing so, contextualises the findings in either the broader literature or a selected theory without imposing an existing framework on the analysis. This approach overlays the existing evidence or theoretical frameworks on the findings, positioning the finding of the research within the context of what is already known. The findings are therefore able to 'speak for themselves' rather than be shaped by an existing theory. Theoretical coding as a final stage of analysis 'makes sense' of the story produced as a result of the process of research. Chapter nine will use this approach to integrate the findings of this study with existing theory and evidence.

9.2 Study Questions

At the beginning of this research, four research questions were proposed:

1. Are there student characteristics that influence strong or weak performance in communication or process ability, and can standardised patient teaching methods mitigate the effects of these characteristics?
2. Do teaching strategies integrating standardised patient teaching methods increase perceptions of confidence and reduce perceptions of difficulty in managing OTC prescribing or prescription medicine counselling interventions for pharmacy undergraduate students?
3. Are teaching strategies integrating standardised patient teaching methods effective in developing foundational communication and process skills in undergraduate pharmacy students?
4. Does the use of standardised patient teaching methods in an undergraduate curriculum affect early-career pharmacists' transition into practice?

Discussion of study question four was contained in the manuscript in Chapter 8. This study outcome will not be discussed in detail in this chapter again. However, the most important learnings from that chapter intersect with the findings from the preceding chapters (Chapters 5, 6 and 7) and will subsequently be briefly revisited in this discussion chapter.

9.3 Summary of the Case and its Context

The Case was set within a four-year undergraduate pharmacy program in a regional Australian university that prepares undergraduate students for entry to the pharmacy profession. A new clinical module designed to teach OTC prescribing and prescription medicine counselling was developed using standardised patients as the major teaching intervention, supported by small-group learning and traditional didactic methods, such as lectures, to deliver the foundational theoretical content. The researcher examined two sub-cases within the Case. In sub-case one, community volunteers were

used as standardised patients to teach OTC prescribing and communication skills to 59 third-year (penultimate-year) undergraduate pharmacy students. Sub-case two was developed with a similar structure and used peers as standardised patients to teach OTC prescribing, communication and prescription medicine counselling skills to 74 fourth-year (final-year) undergraduate pharmacy students.

In both sub-cases, theory and practice through exposure to standardised patients were delivered over a six-week period to students. During this time, each student undertook at least five patient interventions and observed a minimum of 15 peer interactions with standardised patients. The exposure to the standardised patient occurred in a small-group learning environment comprising three to four students and a registered pharmacist in the role of tutor. The role of the patient was played by a community volunteer in sub-case one and student peer in sub-case two. Detailed descriptions of the rotations for each sub-case are presented in Chapter 4, Figures 4.1 and 4.2. The effect of this learning strategy on knowledge and skill acquisition and on graduates' transition to practice was the focus of this study.

9.4 Summary of Key Study Findings

Ten key findings are identified in Table 9.1, organised by research question and cross-referenced to chapter. This chapter is similarly organised by research question. This chapter begins with a discussion of the demographic predictors of student performance in standardised patient teaching interventions. Second, the effect of exposure to standardised patient teaching methods on students' self-reported levels of confidence and difficulty in undertaking an intervention is discussed. Third, the researcher presents a discussion on the effect of standardised patient teaching methods on knowledge and skill acquisition. Fourth, the most salient findings of the effect of standardised patient teaching methods on graduate transition, as previously discussed in

detail in Chapter 8 is recapped. The findings in Table 9.1 are drawn on to respond to the case for using standardised patients in undergraduate pharmacy education.

Table 9.1

Tabulated Summary of the Ten Key Study Findings

Finding	Study question	Chapter	Summary of findings
1	1	5	**International status:** International status was a predictor of poorer initial student performance, yet FLOTE was not, which suggests that the cause of the performance differential was more complex than language alone.
2	1	5	**Work experience:** Extracurricular pharmacy work experience was an initial predictor of success, with the benefit to performance lasting between two and four sessions. The volume of work hours did not matter, nor did exposure to non-pharmacy extracurricular work. There was no performance difference between students who were and were not exposed to extracurricular pharmacy work by the final simulation session.
3	1	5	**Gender:** Males and females demonstrated similar initial performance, although females performed significantly better in communication by the last session.
4	2	6	**Confidence and difficulty:** As expected, the final-year students (sub-case two) were initially more confident and found conducting a patient intervention less difficult than did the penultimate-year students (sub-case one). There was no difference between the two groups in terms of confidence and difficulty after exposure to five sessions of standardised patients, despite the different relative points in the pharmacy program. The confidence gained as a result of exposure to standardised patients endured into their transition to practice.
5	3	7 and 8	**Efficacy:** The standardised patient teaching method is an effective and efficient method for translating theory to practice. Further investigation with an appropriately validated data collection tools is required to confirm this finding.
6	3	7	**Performance:** Standardised patients produced improvements in students' communication, process and total scores between sessions one and five. The magnitude of improvement was greater for the less experienced penultimate-year (sub-case one) students. Further investigation with an appropriately validated data collection tools is required to confirm this finding.
7	3	7	**Volume of exposure needed:** Four standardised patient sessions was sufficient to maximise benefit in this Case.
8	3 and 4	7 and 8	**Preparation for practice:** Simulation was effective in preparing students for practicum and transition to practice. Standardised patient teaching methods may provide an

			opportunity to advance students' preparation for more complex scenarios that replicate the true clinical environment. This may also serve as a mechanism to realise the full potential of organised clinical placement.
9	4	8	**Standardised patients part of transition to practice puzzle:** Standardised patients did help students deal with uncertainty or new situations during their transition; however, other supports (such as preceptor pharmacists, other qualified pharmacists and pharmacy assistants) were more important.
10	4	8	**Highly authentic context required to realise maximum benefit:** The near-authentic nature of the simulation had important limitations in preparing graduates for the realities of practice.

9.5 Literature Search Strategy

A separate search strategy was conducted for each of the discussion areas. Key search terms were developed by first identifying relevant MeSH search terms and key words from relevant publications. Scopus was then searched using combinations of the search terms. Tables 9.2 to 9.8 in Appendix 9-1 record the search terms and approximate return count for each of the subject areas. A hand search using an ancestry approach was also undertaken to identify other relevant manuscripts.

9.6 Main Discussion

Experiential learning has a long tradition in medical (Maudsley & Strivens, 2000; Spencer, 2003; Yardley, Teunissen, & Dornan, 2012), nursing (Lisko & O'Dell, 2010; Poore, Cullen, & Schaar, 2014; Spence Laschinger, 1990) and (more recently) pharmacy education (Danielson et al., 2014; Jackson, 2015; Page & Hamilton, 2015). Experiential learning takes many forms, including clinical placement, simulation experiences and other authentic hands-on tasks. Experiential learning is an important learning strategy because it immerses students in an environment that encourages the development of problem-solving skills, critical thinking and interpersonal development (Seybert et al., 2008), and it is efficient learning method when the lessons are relevant to real life (Clark, Threeton, & Ewing, 2010). Experiential learning is a recognised and

required element of the curriculum for Australian pharmacy programs (Australian Pharmacy Council Ltd, 2012).

The link between adult learning, experiential learning and simulation is well established in the literature (Clapper, 2010; Tofil, Benner, Worthington, Zinkan, & Lee White, 2010). The design of the educational intervention described in this study was originally influenced by the prominent educationalist David Kolb. Kolb's experiential learning cycle model (see Figure 9.1) is compatible with an andragogic approach to learning and teaching, and was a useful starting point from which to begin this journey to understand the effect of standardised patients on pharmacy students and graduates. Kolb (1984) described the term 'experiential learning' as learning through discovery and experience. Kolb's cycle assumes that the learner has experiences that aid the learning of new material, is motivated, and is engaged in the learning experience. Kolb's experiential learning cycle begins with a concrete event, followed by reflection on the experience by oneself and others.

In this case, the concrete event was the interaction with the standardised patient or the observation of the patient intervention by peers. This was followed by purposeful feedback from multiple sources, which allowed self-reflection on performance. The learning environment in this study provided multiple 'near-authentic' simulated patient (case) presentations for students to practice and receive feedback. Students were then able to form abstract concepts as a result of interpretation of events. In doing so, students drew understanding, comparisons and relationships between what they did or observed, and what they already know. Through reflection, students modified practice and maximised the learning potential as a result of reflecting on their experience of doing and observing others doing. Students were then able to consider how they would use their reflections and translate into practice that which they had learnt.

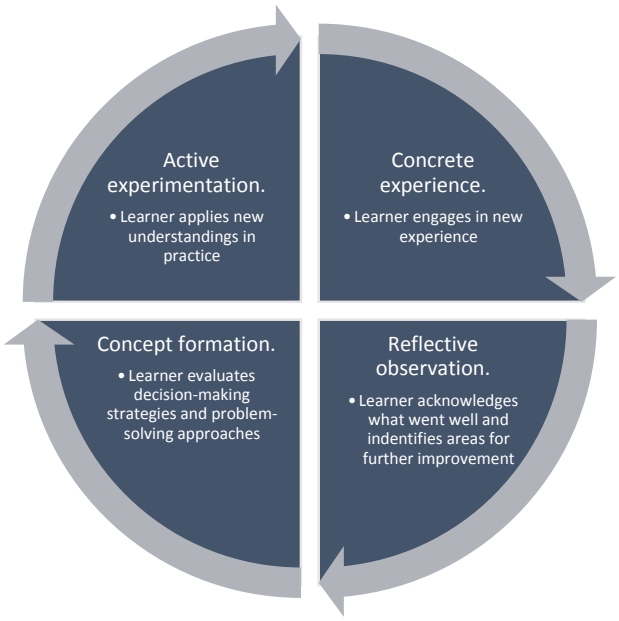

Figure 9.1. Kolb's learning cycle, adapted from Schultz, McEwen, and Griffiths (2016).

Simulation, in its various forms, is an established element of many undergraduate health curriculums. Simulation and the use of standardised patients was first described in the medical literature by Barrows and Abrahamson in 1964. Since then, it has become an integral part of many entry-level nursing, medical and (to a lesser extent) pharmacy programs, as simulation is recognised as:

- a valid and reliable means of teaching and assessing (Plaksin et al., 2016)
- assisting in the authentic development of professional skills, such as communication (Bosse et al., 2012)
- acting to supplement increasingly limited placement opportunities
- generating benefits to patient safety
- improving graduate readiness upon transition to practice (Bradley, 2006; Decker et al., 2008).

Standardised patient teaching interventions are considered cost effective, although they remain costly to properly implement (Beck, 2000; Bosse, Nickel, Huwendiek, Schultz, & Nikendei, 2015; Rickles et al., 2009). Therefore, it is important to understand the parameters that affect student success when engaged with simulation, as well as the likely outcomes and benefits to ensure maximum value is extracted from this teaching intervention.

Simulation and standardised patients are known to be an acceptable teaching method for both students and faculty staff (Chen et al., 2015; Gallimore et al., 2008; Grice et al., 2013; Monaghan, Turner, Vanderbush, & Grady, 2000; Sibbald, 2001; Smithson et al., 2015; Yuksel, 2011). The 10 findings of this study (Table 9.1) suggest that standardised patients are an effective and acceptable teaching method to teach OTC and prescription medicine counselling interventions as part of a broader educational design within the planned curriculum. Findings one to seven of this study showed that:

- students' ability to undertake the technical aspects of the intervention improved significantly
- demographic predictors of student success in undertaking a patient intervention at the commencement of standardised patient experiences (international status and exposure to extracurricular pharmacy experience) could be mitigated
- students were more confident and reported reduced perceptions of difficulty in undertaking a patient intervention.

Findings eight to ten of this study also showed enduring benefits of standardised patient teaching methods, as evidenced by an easing of graduates' transition to practice. These findings will be discussed in the context of the contemporary literature in the following sections.

9.6.1 Study question one: Student demographics as predictors of success in patient intervention. There were two predictors of student performance in the first session of standardised patient simulation—international status and extracurricular pharmacy work experience—and one in the final (fifth) session—gender. With respect to **international status**, this study found that international status did influence performance, yet FLOTE did not. The literature offers no advice on the effect of simulation or standardised patient teaching methods on international student performance; however, there are some reports on the relative academic performance of international students in Australian pharmacy programs and other courses. Davey, Grant, and Anoopkumar-Dukie (2013) found that domestic students slightly outperformed their international counterparts in the first half of an Australian pharmacy program; however, the performance difference narrowed in the second half of the program. This is congruent with this study, in which international students initially performed at a significantly lower level, but very quickly closed the performance gap to achieve parity with their domestic peers. The findings of this study contrast those by Liddell and Koritsas (2004), who found that students who preferred using a language other than English performed worse in final-year assessments in an Australian medical course, when compared with those preferring English. Similarly, they found that international students performed worse than did domestic and Australian residency students.

Like Davey et al. (2013) and other studies from the nursing (Pardue & Haas, 2003; Zheng, Everett, Glew, & Salamonson, 2014) and medical literature (Malau-Aduli, 2011), this study proposes that initial performance differences are affected by factors other than English language proficiency alone. It is likely that a complex mix of causes contributes to the performance differentials observed in this study, including language, the requirement to adjust to different academic expectations, a new social and cultural

context, and a different physical environment. The effect of international status was short lived in this Case. Standardised patients may be useful to more rapidly contextualise practice from a social and cultural perspective for international students, thereby reducing any performance differences and better preparing students for subsequent clinical placement and future transition to practice.

Extracurricular pharmacy experience was the second predictor of student performance during the standardised patient encounters. This study found that students who engaged in paid or unpaid extracurricular pharmacy work performed significantly better for the first two to four sessions and, in both sub-cases, the benefit of paid extracurricular pharmacy work was not apparent by the final session. The researcher also found that the number of hours worked by a student in paid or unpaid extracurricular pharmacy work did not influence performance—it was only important that they were engaged in pharmacy-related employment. Benefits to student performance were not seen in students who engaged in employment unrelated to pharmacy practice (such as part-time employment in a non–pharmacy related workplace). The literature is conflicted about the effect of extracurricular pharmacy work on students' academic performance. Valdez, Namdar, and Valuck (2013) found that extracurricular pharmacy work experience was a predictor of knowledge retention in a pharmacy course. This was supported by Ho, Chan, Fan-Havard, Thompson, and Hess (2014), who found that a moderate amount of part-time employment (less than 15 hours per week) was beneficial to academic success when compared to no employment, but an excessive amount of part-time employment may have a negative effect on academic performance. In contrast, Mar et al. (2010) found that previous pharmacy work experience did not affect the academic or clinical performance of pharmacy students, while Greene, Nuzum, and Boyce (2010) found that previous pharmacy work

experience was not a predictor of students' grades in a Top 200 Drugs course, except where students had little or no pre-pharmacy work experience.

Like the methodological design of these studies, the findings related to the effect of extracurricular pharmacy work on academic performance were inconsistent. This study found that previous pharmacy work experience was an initial indicator of significantly better performance in an OTC or prescription medicine counselling interventions; however, the performance differential between students who did and did not undertake extracurricular pharmacy work progressively declined and eventually disappeared with sequential exposure to standardised patient teaching sessions. Specifically, within two to four exposures to standardised patients, students who had no extracurricular pharmacy work experience performed at a statistically similar level to those who had recently or continued to participate in part-time work in a pharmacy. The implications of this are interesting. The use of standardised patients may 'level the playing field' with respect to any disadvantage a group of students experiences due to non-participation in extracurricular pharmacy work. In geographical contexts where extracurricular pharmacy work opportunities are limited, this may serve to mitigate differences in student performance based on extracurricular pharmacy work-related opportunities. The finding that four sessions of standardised patients are sufficient to mitigate this effect, as well as the finding in Chapter 7 that there was no significant improvement in student performance after four sessions with standardised patients, may also provide a useful indication of the number of sessions required to extract the maximum learning benefit.

The researcher also found **gender** to be a predictor of performance after five sessions with standardised patients—specifically, females generally performed better. The pharmacy, nursing and medical literature offers very limited observation on the

effect of gender on performance during a standardised patient scenario. One study by Wiskin, Allan, and Skelton (2004) did not find that female students performed significantly better when dealing with 'female issues' during simulation. More broadly on the effect of gender on performance, one paper in the available literature reported the comparative differences between male and female performance during communication-based assessments in an Australian pharmacy program. This study by Davey et al. (2013) concluded that female students outperformed male students throughout the program (Davey et al., 2013). The medical and nursing literature draws a similar conclusion on the performance differences between genders. Haist, Witzke, Quinlivan, Murphy-Spencer, and Wilson (2003); Wiskin et al. (2004); and Cuddy, Swygert, Swanson, and Jobe (2011) found that female students achieved numerically higher scores on assessment (such as examinations) than did males in medical courses. Similarly, Colbert-Getz, Fleishman, Jung, and Shilkofski (2013) found that female medical students achieved higher assessment scores than did male medical students when they were experiencing high levels of anxiety during high-stakes clinical assessments. The reason for the disparity in performance is less clear. Huang, Huang, Yang, Lin, and Chen (2015) and Yazbeck-Karam, Aoun Bahous, Faour, Khairallah, and Asmar (2014) found that the gender of the standardised patients is an important factor during communication skills assessment, with female standardised patients effectively reducing potential gender effects. This researchers conclusion is consistent with Cuddy et al. (2011)—that differences in gender-related performance may result from differences in socialisation between the genders, with the effect that female students develop stronger interpersonal and communication skills than do male students, and this effect may be somewhat mitigated by appropriate selection of standardised patient gender.

These findings suggest that standardised patients can reduce the performance differences between (i) international and domestic students and (ii) students who do and do not engage in extracurricular pharmacy work. In a national higher education context characterised by increasing international and domestic student numbers (Knott, 2015; Minister for Education and Training, the Hon Christopher Pyne MP, 2015) and pharmacy schools' inability to expand extracurricular work experience opportunities for students, standardised patients may be consciously used to mitigate the potential negative influences caused by student origin and unavailable extracurricular pharmacy work participation on initial and early performance. The performance difference between genders was not mitigated, but this seems consistent with other studies' findings regarding the relative performance between male and female students.

Chapter 5 identified three student demographic parameters that influence performance in communication or process ability. It demonstrated the ability of standardised patients to positively augment the performance influence of international status and extracurricular pharmacy work, yet not gender. These findings are largely consistent with the current literature.

9.6.2 Study question two: Effect of exposure to standardised patients on students' self-reported perceptions of confidence and difficulty. The researcher found that the standardised patient teaching method focused on in this Case was effective in improving students' self-reported levels of confidence, and reducing students' perceptions of difficulty in undertaking a patient intervention—specifically, an OTC or prescription medicine counselling intervention. There were improvements in both sub-cases; however, the magnitude of positive change in confidence and difficulty (increase in confidence and decrease in difficulty after sequential exposure to standardised patient teaching sessions) was much greater for students in sub-case one. Contributing to this

was the much lower initial levels of confidence and higher initial levels of difficulty reported by the penultimate-year group students in sub-case one. The positive effect of standardised patients on students' perceptions of confidence and difficulty detected in this study is consistent with current pharmacy and nursing literature. In a study examining an inter-professional educational experience for nurse practitioners and pharmacy students, Koo et al. (2014) found that standardised patient intervention increased student confidence. James et al. (2001) found that standardised patients (termed 'simulated patients' in the study) were effective in improving pharmacy students' confidence and reducing perceptions of difficulty in conducting a patient consultation. Seybert et al. (2008) found that HPS was effective in improving students' perceptions of self-confidence in resolving patient treatment problems. Chen et al. (2015) found that teaching strategies using standardised patients significantly improved students' counselling confidence. Vyas et al. (2014) found that student confidence in using medical records and drug information resources was higher among students exposed to standardised patients. Davies et al. (2015) reported that students' confidence in talking to patients and physicians and making evidence-based recommendations improved after exposure to standardised patients.

The pharmacy literature delivers consistent evidence supporting the positive effect of standardised patient teaching methods on students' self-reported levels of confidence and perceptions of difficulty, across a range of professional activities and patient intervention contexts. As reported in Chapter 8, this researcher also identified that the positive effects on students' confidence and difficulty endured until the students' transition to practice. The effect of this enduring improvement in confidence and reduced sense of difficulty prepared students for the important transition to practice, thereby allowing them to be more proactive in the patient–pharmacist exchange in early

practice. Chapter 6 found that using standardised patient teaching methods can effectively build students' confidence and reduce perceptions of difficulty, both during the program and upon transition to practice during the graduates' intern year. This has broader implications when considering the overall place of standardised patient teaching methods in the broader curriculum and its intended outcomes, as will be discussed in the study conclusions and recommendations in the final chapter (Chapter 10).

9.6.3 Study question three: Effectiveness of simulation in imparting knowledge and skills. Standardised patients have been found to be an acceptable (Chen et al., 2015; Gallimore et al., 2008; Grice et al., 2013) and effective (Davies et al., 2015; Emmert & Cai, 2015; Eukel et al., 2014; Grice et al., 2013; Smithburger, Kane-Gill, Ruby, & Seybert, 2012) mechanism to develop professionally relevant skills and knowledge to students in a range of health-related courses. In conducting this study, this researcher found that standardised patients were effective in improving students' communication skills, technical knowledge and application of process when conducting an OTC or prescription medicine counselling intervention. There is strong support for the finding of this study that standardised patients improve pharmacy students' communication skills. A number of pharmacy-related studies have found that standardised patient teaching methods improve students' communication skills with patients (Chen et al., 2015; Davies et al., 2015; Nestel et al., 2007; Rickles et al., 2009) and when part of an inter-professional team (Koo et al., 2014; Marken et al., 2010; Solomon & Salfi, 2011). Indeed, the literature on standardised patient use in health-related programs commonly reports on the use of standardised patient teaching as a method to develop and assess students' inter-professional and patient communication abilities (Kimberlin, 2006; Rickles et al., 2009; Wallman, Vaudan, & Kälvemark Sporrong, 2013; Westberg, Adams, Thiede, Stratton, & Bumgardner, 2006). Standardised patient teaching methods

and communication are closely associated and strongly supported by evidence. This study adds to the evidence of the positive effect of this teaching method on the acquisition of professional communication skills.

There is increasing evidence from the pharmacy literature supporting the effectiveness of the use of standardised patients in pharmacy undergraduate programs for improvements in knowledge, skills and the application of such (Lupu et al., 2012; Smithburger et al., 2012; Vyas, Bhutada et al., 2012). One study by Vyas et al. (2014) found that standardised patients provided no significant difference to students' perceptions of preparation or capability, such as their self-assessed level of preparedness for an IPPE. However, Vyas et al. also found that a greater percentage of students exposed to simulation (including both standardised patient and high-fidelity simulations) passed a practical exam. The current study supports previous published research that knowledge acquisition and application is facilitated by standardised patient teaching methods. Indeed, the qualitative data from Chapter 7 suggest that standardised patients not only offer the opportunity to apply new knowledge in a relevant context, but also encourage student engagement with theory. While standardised patient teaching methods are found to be effective, the benefit of standardised patient teaching in comparison to other simulation techniques is less clear. For example, Smithburger et al. (2012) found that students exposed to high-fidelity simulation scored higher on knowledge-based quizzes and had higher levels of satisfaction than did standardised patient simulation methods.

Despite the limitations of the assessment tool, findings from this study suggests that standardised patient teaching methods could improve pharmacy students' communication and process skills. The improvement will be demonstrated with no more than four sessions to achieve maximum benefit. While students in both sub-cases

showed improvement when undergoing the standardised patient teaching experience, the greatest magnitude of improvement was seen in sub-case one—the less experienced student group. This suggests that the greatest beneficiaries of this learning method are the less experienced student cohort midway through their program. Further increasing the argument for the use of this teaching method, graduates reported that the benefits experienced during their undergraduate studies endured through to transition to practice. Despite the obvious conclusion that (in this Case) standardised patients are useful to prepare students for transition to practice, there may exist additional value in standardised patient teaching methods in advancing student communication and knowledge capability to prepare for exposure to more complex tasks or scenarios involving cases under more practice-relevant conditions. This idea will form part of the recommendations in the final chapter (Chapter 10). When interpreting this finding, the researcher acknowledges the strength of this finding is limited by the data collection tool used to measure student performance. While this tool was designed using relevant industry standards and validated using basic data collection tool validation techniques, further validation of the instrument or confirmation of results using another validated tool is necessary to confirm these findings.

9.6.4 Study question four: Effect of standardised patient teaching on transition to practice. In chapter 8, the researcher described the positive and enduring benefits of standardised patient teaching strategies on graduates' transition to practice, and discussed this finding in the context of the contemporary literature. While this will not be unnecessarily repeated in this chapter, the major findings of Chapter 8 are revisited to complete the four study questions and enable a response to the case for using standardised patients in pharmacy education. Chapter 8 contains two major findings on the effect of standardised patient teaching methods on pharmacy graduates' transition to

practice. The first finding was students' perceptions of increased ease and confidence during their transition to practice. The medical education literature reports that integrating patient contact in undergraduate curriculums improves students' self-perceptions of capability and preparation for practice (Laack et al., 2010; Scicluna et al., 2014). Like these previous studies, the current study found that standardised patient teaching methods gave graduates a greater sense of preparation and, in this case, facilitated a more proactive approach to the patient–pharmacist exchange in early practice. Graduates reported that this was significantly enabled by quality feedback that allowed them to 'learn by reflecting on doing'. That is, graduates reported that they incorporated the feedback received during their performance with the standardised patient into the next exposure to simulation in order to adapt their approach, and subsequently improved their competence and confidence. They reported that the feedback cycle enabled by the standardised patient teaching method maximised the learning potential and increased competence and confidence, and that the experience endured in the transition period.

The second major finding uncovered important limitations to the standardised patient teaching methods in this Case. The 'near-authentic' context of the standardised patient scenarios allowed students to apply theory to the practice context. However, while graduates developed a 'best-practice' approach to patient interventions, their strategies were not always fit for real practice, as students were not required to apply these solutions in a context reflective of the structural, practical and organisational limitations experienced in real pharmacy practice. Dieckmann et.al. (2007) argues for the need to observe simulation realism as critical to simulations success. Interestingly, Dieckmann describe 'realism' as more than just the physical reconstruction of the artefacts used in simulation. They argue the realism of the scenario or clinical case is

important for the participants to 'suspend disbelief' and warns an over reliance on the physical aspects of simulation at the expense of the social practice (defined as the 'contextual event in space and time, conducted for one or more purposes, in which people interact in a goal-oriented fashion with each other, with technical artefacts, and the environment' (Dieckmann et.al. 2007, p183-4)), will not realise the full potential of the simulation experience. Reflecting on the discussion provided by Dieckmann et.al, this researcher observed where the context and conditions of the simulation was not 'realistic' conditions, conflict resulted. This was due to a divergence between the ideal solution practised under ideal conditions in the classroom and the solutions and conditions experienced during transition to practice in graduates' intern training program. This phenomenon of role confusion is reported in other studies in the literature (Eden et al., 2009; Mak, March et al., 2013; Perrone & Vickers, 2003; Stupans, 2012).

9.7 The Case for Using Standardised Patients in Undergraduate Pharmacy Education

There is much to recommend the application of standardised patient teaching methods in Australian undergraduate pharmacy programs. In this study, the researcher investigated two forms of standardised patient teaching interventions to understand their effect on teaching undergraduate pharmacy students OTC and prescription medicine counselling in an Australian undergraduate pharmacy program. In conducting this study, the researcher found important limitations of standardised patient teaching strategies when the degree of case or context realism is insufficient to develop practice-appropriate patient care and communication strategies. The researcher also found four equally important benefits of standardised patient teaching methods:

1. improved confidence and reduced perceptions of difficulty in undertaking a patient intervention

2. facilitation of the translation of theory to practice
3. improved student performance in communication and process
4. enabling a more positive transition to practice.

This research demonstrated that standardised patient teaching strategies are an effective means of mitigating important student demographic differences of international status and exposure to extracurricular pharmacy work. It also evidences the positive effect on students' self-reported levels of confidence and difficulty when conducting a patient intervention. Of significant value is the students' continued confidence in themselves when making the important transition to practice. The findings also contribute to existing evidence that standardised patient teaching methods are effective in improving student communication and process skills. In the context of this Case, the researcher found that four exposures were sufficient to realise the full benefit. The findings also suggest there is a benefit to earlier incorporation of standardised patients into the pharmacy program of study, finding evidence that the largest performance improvement was realised in the less experienced group (sub-case one), though this later finding requires confirmation using a validated tool. Finally, the effect of standardised patient teaching methods on graduates' transition to practice, and the limitations of standardised patient teaching when the simulated case context does not reflect a realistic encounter in the practice (as experienced in this Case) is demonstrated.

9.8 Summary

In this chapter, the researcher has discussed the findings of three research questions in the context of the contemporary literature, and revisited the argument in the Chapter 8 manuscript relating to the fourth research question. The researcher has argued that standardised patients are an effective method of reducing the effect of demographic

influences on student performance, and are effective in positively augmenting student levels of confidence and difficulty in undertaking a patient intervention. It has also demonstrated some evidence of the positive effect of standardised patient teaching methods on student performance in OTC interventions and prescription medicine counselling, and reported that the benefits of standardised patient teaching methods endure through to graduates' transition to practice. However, important limitations existed in this Case. In chapter 10, the researcher provides the final recommendations of this study.

Chapter 10: Recommendations

10.1 Introduction

In this chapter, the most significant learnings of this study are drawn together in the form of the researcher's conclusions and recommendations. This chapter begins by revisiting the researcher's reflections formed at the beginning of this research journey. The quality of the research, and, importantly, the limitations of the study design are then considered. The study findings are then translated to a series of recommendations and considerations for planning and implementing the use of standardised patient teaching methods into a pharmacy curriculum. The recommendations are organised by three headings: practice and education, policy and research. This chapter concludes with a summary of the researcher's observations formed as a result of this study.

10.2 Reflections on Chapter 1

I have just reread my initial reflections contained in Chapter 1. I spoke of my experience as a novice practitioner transitioning to practice, and the preparation my undergraduate pharmacy education afforded me both before and during that transition period. I made observations on the utility of clinical placement and what my experience told me was needed to smooth others' transition to practice. Those reflections remain accurate, but now have matured to incorporate a new internal dialogue centred on fulfilling potential, realising opportunity and acknowledging the lived experience.

I reflect on two externalities and one internal realisation that are a result of this research process. The first centres around a new understanding I have about the potential influence that a well-planned educational experience can have on graduates (and, through them, on patients and communities) both before and after they transition to practice. Time, educational and human resources are finite. Professional worlds, such as the pharmacy profession, grow in complexity, necessitating the deliberate

allocation of resources to high-value outcomes. The planning of educational activities needs to consider outcomes that are broader than their immediate and short-term effects, such as student skill acquisition at the conclusion of the unit, subject or year. While acknowledging the imperative to understand the immediate effect and gain of an educational activity, consideration should equally be devoted to the medium- to long-term effect on individuals (students and graduates), the community and the profession. When educational interventions are measured by longitudinal outcomes, only the most worthy ideas should survive in our resource-constrained environment.

The second external reflection is a crystallisation of my thinking about the transformative potential of higher education and the grand role it plays in society for individuals, professions and communities. Bound to this is the influence and responsibility of high-quality research (and researchers) on realising and maximising this transformative potential. This study has been about linking the learnings from one element of a program designed to improve pharmacy student competency in undertaking a patient intervention, to the effect of this intervention on graduate outcomes. In a meaningful way, this research also contributes to the body of knowledge about the transformative potential of higher education.

The last observation is of my own transformation as an academic and researcher. At the beginning of this process, I was largely ignorant of the lens through which I viewed the world, as well as its effect on how I interpret meaning and act in response. This study set out to investigate and justify the case for the use of standardised patients in an undergraduate pharmacy program. To achieve this aim, I have undertaken a deliberate, methodical and quality research process to produce a meaningful body of work that I know will make a modest, yet meaningful, contribution to the profession and higher education sector. As I write this paragraph, the question I

ask myself is: what did I achieve from this extensive effort? I contend that this process has developed new academic 'muscles' for me as the researcher. I have been effectively mentored to cultivate a new range of skills and knowledge that I can now apply to other important problems. This three-year PhD journey has helped to crystallise the last 10 years of my academic experience, thereby increasing my potential to effectively contribute to the community I serve, as a researcher and educator. I trust that this experience will increase my contribution to higher education and the transformation of communities, societies, industries and, most importantly, people.

10.3 Quality and Rigour

Assurance of quality of this study was embedded in the research process from conception. Various mechanisms to monitor the quality and rigour of the study in the context of the methods and methodology were used and discussed in Chapter 3. Table 10.1 briefly describes how each of the major mechanisms to enhance and ensure research rigour were deployed. The first is the fulfilment of university processes throughout the duration of this study. These processes are designed to provide ethical safeguards and maintain the chain of evidence, while ensuring that the study size, scope, design and implementation is worthy of the award of Doctor of Philosophy. The second is the deliberate separation of methods and methodology in the thesis. This process forced the researcher to establish a philosophical underpinning for the research that informed not only the interpretation of the data, but also the meaning of 'truth' itself. The acknowledgment of the researcher's philosophical stance as a researcher radically changed his interpretation of data from this study, as well as his conceptualisation of others' research findings in relation to his own. Understanding the importance of philosophy in a PhD and understanding how both a conscious or unconscious philosophical stance affects the researcher's interpretation and response to many issues

may be the single most important personal outcome of this study, as it has significantly affected the researcher's thinking in relation to his everyday work and life. In addition to this, appropriate selection of a methodology (case study) and philosophical stance (pragmatism and post-positivism) has meant the use of the most appropriate methods to investigate the research question.

The third, trustworthiness of analysis (rigour), was achieved by reasonably conventional, yet proven, means. Data collection, storage, organisation and analysis were undertaken in a deliberate and transparent manner. Both qualitative and quantitative data benefited from audit trails, peer checking and constant defence of the conclusions to the study supervisors and the researcher himself. Quantitative data rigour used measures of reliability and validity to confirm the meaning of the numbers. The qualitative analysis used audit trails, team checking and peer analysis. Complementing this, the chosen philosophical underpinning (pragmatism) enabled the selection of research methods that were fit for the purpose, and enabled triangulation of data from multiple and complementary data sources. The final assurance of quality was the appropriate selection of experienced research supervisors who were familiar with the context and methods, and the external review of the research proposal at the early concept stage and when reporting the findings. This final application of quality external critique gave its own rigour.

Table 10.1

Mechanisms Used to Enhance and Ensure Research Rigour

Category	Action undertaken by researcher
Process	• Engagement with and enactment of university quality research processes, such as external review of study design and responsible compliance with ethics • Maintenance of chain of evidence via quality data management processes • Development of a data management plan
Design	• Extensive use of contemporary and relevant historical literature to inform research design • Separation of methodology and methods to acknowledge influence of the philosophical underpinning and achieve appropriate methodological design • Purposeful selection of Case (and sub-cases) • Bias or subjectivity reduced via standardisation of data collection tool, such as prescriptive standardised grading criteria and interview guides, and standardisation of processes to collect data • Data secured according to data management plan • Collection of complementary data from a variety of sources using a variety of methods • Use of appropriate sample size and purposeful selection of statistical tests to assure significance of quantitative results • Use of appropriate methods, such as peer analysis and team checking, to assure significance of qualitative results • Triangulating results (from multiple sources of data) to confirm validity of conclusions and findings • Recognition of limitations of case study design and its transferability to other contexts
Analysis	• Analysis facilitated by an in-depth understanding of the Case • Triangulation of findings using convergent lines of enquiry • Peer analysis and team checking • Admission of influence of researcher's beliefs on interpretation of data and results • Extensive use of contemporary and relevant historical literature to inform assessment of quality of results
External reference	• Appropriate recruitment of experienced supervision team • Study design independently externally reviewed • Study findings assessed by external review panels during pre-completion seminar

10.4 Limitations

There are a number of important limitations which must be considered when interpreting the findings and conclusions of this study. There are four broad areas that

have been considered during the identification of the limitations of this study, methodology, sample and study context, methods and results and introduction of study bias.

10.4.1 Methodology.

The case study design is by itself no means a limitation; however, by virtue of its approach, the potential for generalising findings must be considered. Unlike typical quantitative methods, where populations are chosen based on their representative nature and statistical conclusions drawn about the relationship between the study findings and larger populations (thereby arguing for the broader application or generalisability of findings), the Case in this study was chosen to understand a particular phenomenon—the effect of standardised patients on pharmacy students and graduates. Admittedly, the respondent sample used in this case would not normally be broad enough to enable a quantitative-style generalisation to larger or similar populations. While this is the case, the theoretical concepts generated by case study research—the resultant analytic generalisations—can have application beyond the original case study setting (Yin, 2014). Both Creswell (2013) and Flyvbjerg (2011) argued that there is established rationale for selecting the case so that it is purposeful and non-random. In purposeful case selection, a hypothesis can be generated and tested, and the findings can be more broadly applied. While acknowledging the inherent differences between quantitative notions of generalisability and the purposeful examination of a confined and defined case, the deliberate design of this study does establish a logic that can be applied to other situations, and can be justified as an equally valid method of exploring such a phenomenon.

10.4.2 Sample and study context.

The sample population used for the primary data collection was confined to two independent groups of students in two consecutive year levels of a regional Australian undergraduate pharmacy program. While the selection of target population was convenient and suitable given the methodological design of the study (case study), the approach can limit the application of findings to broader contexts as the sample population and context may not be representative of a larger population. While the selected population sample, participation within the sample and study design were complementary, and the learnings from the case study has value in that they are generalizable more broadly, the limitations of the approach (case study which looks at a particular phenomenon, population and case context) and the inherent application limitations of the resultant findings and conclusions broader than the case should be acknowledged.

10.4.3 Methods and results – Quantitative data collection.

The research design, study timeline and mixed methods approach was fit for purpose to investigate the research questions. The confidence (PS-PoC) and difficulty (PS-PoD) Likert questionnaires were developed with reference to one described by James, Nastasic, Davies, and Horne (2001) with additional questions that related to identified elements in the Competency Standards for Pharmacists in Australia (Pharmaceutical Society of Australia, 2003) and the Standards for the Provision of Pharmacy Medicines and Pharmacist Only Medicines in Community Pharmacy (Pharmaceutical Society of Australia, 2006) to respond to the Australian context. The initial tool was developed with reverse questions to validate responses and reversed scales to identify corrupt entries. Face validity of the tools were tested using two experienced researchers and two practicing clinical pharmacists. The tool was then piloted in a small group of volunteers who were not in the target population. Following

the pilot of the tool, adjustments were made to the wording to improve clarity and resubmitted to the original four reviewers to determine face validity again. After data was collected, internal consistency of the questions was assessed using Cronbach's *alpha*. Content validity was not tested and broader use in other studies is required to establish construct validity. The absence of greater validation of these two tools is a small but important limitation of this study.

When used as individual data sets, the confidence (PS-PoC) and difficulty (PS-PoD) Likert questionnaires have limited value and weight to draw isolated and independent conclusions. Indeed, it may be questioned why the constructs of confidence and difficulty are actually important from a strictly research perspective. Acknowledging this, the researcher determines conclusions made on a single one of these data sets would probably be sufficiently weak so as to deter their use independently and thus if used in this way would represent a limitation. This study has used a number of data sources to develop a more detailed and multi-faceted observation of the case. It has used the confidence and difficulty measures to add to and reinforce the case for the use of simulation in undergraduate pharmacy education. So while the independent use of these measures may be discouraged, their concomitant use with other sources of evidence works to improve the understanding of the case overall.

The prescriptive standardised assessment criteria was initially developed as a student performance measurement tool in the conduct of OTC prescribing interventions and prescription medicine counselling and to guide pharmacist tutor feedback. The primary design of the tool was undertaken by the researcher and based on the Standards for the Provision of Pharmacy Medicines and Pharmacist Only Medicines in Community Pharmacy (Pharmaceutical Society of Australia, 2006) and discussions with pharmacist academics and community pharmacists. The original purpose of the

prescriptive standardised assessment data collection tool was to assess student performance and guide pharmacist tutor feedback. It was then adapted for use as a data collection tool for this study.

Like the confidence (PS-PoC) and difficulty (PS-PoD) Likert questionnaires, the prescriptive standardised assessment criteria underwent face validity prior to use in the target population. While this tool proved adequate to measure student performance during class activities and guided and improved pharmacist tutor feedback, the tool would have benefited from the inclusion of other validated performance measurement tools, more extensive development and validation. This represents the largest limitation of this study. The weakness of the prescriptive standardised assessment data collection tool is somewhat mitigated by the study design (using multiple methods to build a picture of the phenomenon) and the use of case study, in that this approach seeks to understand a particular phenomenon in a well-defined context. Nonetheless, the limitations of this particular tool and the resultant effect on the conclusions must be understood when interpreting the findings of this study.

10.4.4 Methods and results – Qualitative data collection.

A sample of nine graduate pharmacists, with a range of clinical and professional areas and experience was achieved. While interviews were conducted until saturation of themes occurred and the number and duration of interviews would be considered adequate, a larger number of interviews would increase the robustness of the findings of Chapter 8.

The second qualitative limitation of this study was measuring the effect of learning through standardised patients on transition to practice. While this study considered an important perspective (that of the graduate), it did not consider other perspectives, such as those of community members or industry employers. While doing

so would provide a richer insight to the effect of standardised patient teaching methods on the transition to practice for graduate pharmacists, this study does take an important first step by exploring the graduates' lived experience.

10.4.5 Study bias.

Data was collected primarily by the researcher with the exception of those student assessments using the prescriptive standardised assessment data collection tool. As a result of the assessments being conducted during normally scheduled classes, trained pharmacist tutors collected approximately 70% of the data. The researcher, who was also the participant's educator, conducted all interviews. While efforts were made to reduce moderator acceptance bias and bias of the researcher in the interpretation of the findings, the potential for some bias to occur must be acknowledged.

10.5 Recommendations

The researcher's recommendations are based on the major study findings, which have been broken into three sections: practice and education, policy and research. Each recommendation is supported by the findings described in Chapters 8 and 9, and will be aligned with Table 9.1 in Chapter 9. Table 10.2 summarises the recommendations of this study.

Table 10.2

Study Recommendations

	Finding	Recommendation
Practice and education	4 6 7	**Recommendation 1:** The timing or sequencing of standardised patient experiences in the curriculum should be considered as part of the planning for simulation.
	5	**Recommendation 2:** Feedback should be a conspicuous part of standardised patient teaching experiences to maximise reflexive learning opportunities.
	8 9 10	**Recommendation 3:** The realism of standardised patient experiences should gradually increase to include the realistic limitations encountered in actual practice contexts.
Policy	5	**Recommendation 4:** Simulation (including standardised patients) should be a prominent feature in professional accreditation standards to maximise simulation opportunities and clinical placement potential.
Research		**Recommendation 5:** More well-designed and resourced research into the benefits of standardised patients on graduates' transition to practice and the costs associated with this teaching method should be undertaken.

10.5.1 Practice and education. The use of standardised patients can benefit undergraduate pharmacy students in four main areas:

1. improved confidence and reduced perceptions of difficulty in undertaking a patient intervention
2. facilitated translation of theory to practice
3. improved performance in communication and process (acknowledging the limitations of the data collection tool used in this study)
4. positive effect on experience upon transition to practice.

Recommendation 1: Planning for timing or sequencing of standardised patient experiences should be influenced by the natural curriculum milestones and learning outcomes. Deliberate sequencing of standardised patient simulation experiences offers course teams the opportunity to not only assist student learning, but also maximise the benefits of the limited planned curricular placement opportunities.

Better student preparation for clinical placement has the potential to increase the learning potential of planned clinical placements, thereby possibly facilitating student engagement with more complex and realistic patient presentations. The effect of this is to prepare them for transition to their next placement, and ultimately transition to the workplace. The critical question then becomes when standardised patients should be programmed into the curriculum—what is the optimal timing?

As part of this chapter, a brief literature scan was conducted to ascertain the prevalence of investigations into timing of simulation experiences (the search relating to timing and standardised patients was broadened to include other forms of simulation due to the very limited availability of standardised patient–specific literature). A number of manuscripts were reviewed to understand planning considerations and the implications of sequencing simulation in a curriculum; however, the majority of the reviewed studies simply reported when simulation teaching events occurred. These studies provided no insight to the rationale for the sequencing of a simulation experience in a curriculum timeline, and were similarly silent on the implications or planning considerations of the timing or sequencing of simulation experiences in a program of study.

Motola, Devine, Chung, Sullivan, and Issenberg (2013) commented on the importance of an integrated approach to simulation, requiring an assessment of learning outcomes to identify those where simulation can make a meaningful contribution. A number of studies describing the implementation of simulation or standardised patients into undergraduate pharmacy, nursing or medical programs reported that simulation teaching strategies mostly occur in the upper levels of the programs. The findings of Chapter 7 suggest that standardised patient teaching methods can facilitate the acquisition of statistically similar performance levels between penultimate-year and

final-year undergraduate pharmacy students, acknowledging the limitations of the Prescriptive Standardised Assessment Criteria for Patient Intervention data collection tool. This hints at the benefits of earlier programing of standardised patients into the curriculum, and complements the notion that simulation should be well planned, be integrated into a curriculum and complement clinical placement opportunities. For curriculum teams to unpack what might represent optimal timing, they might consider the natural student or curriculum milestones. Figure 10.1 describes a general representation of what might typically be important student or program milestones in any undergraduate program (constrained to what is useful for the purpose of this discussion).

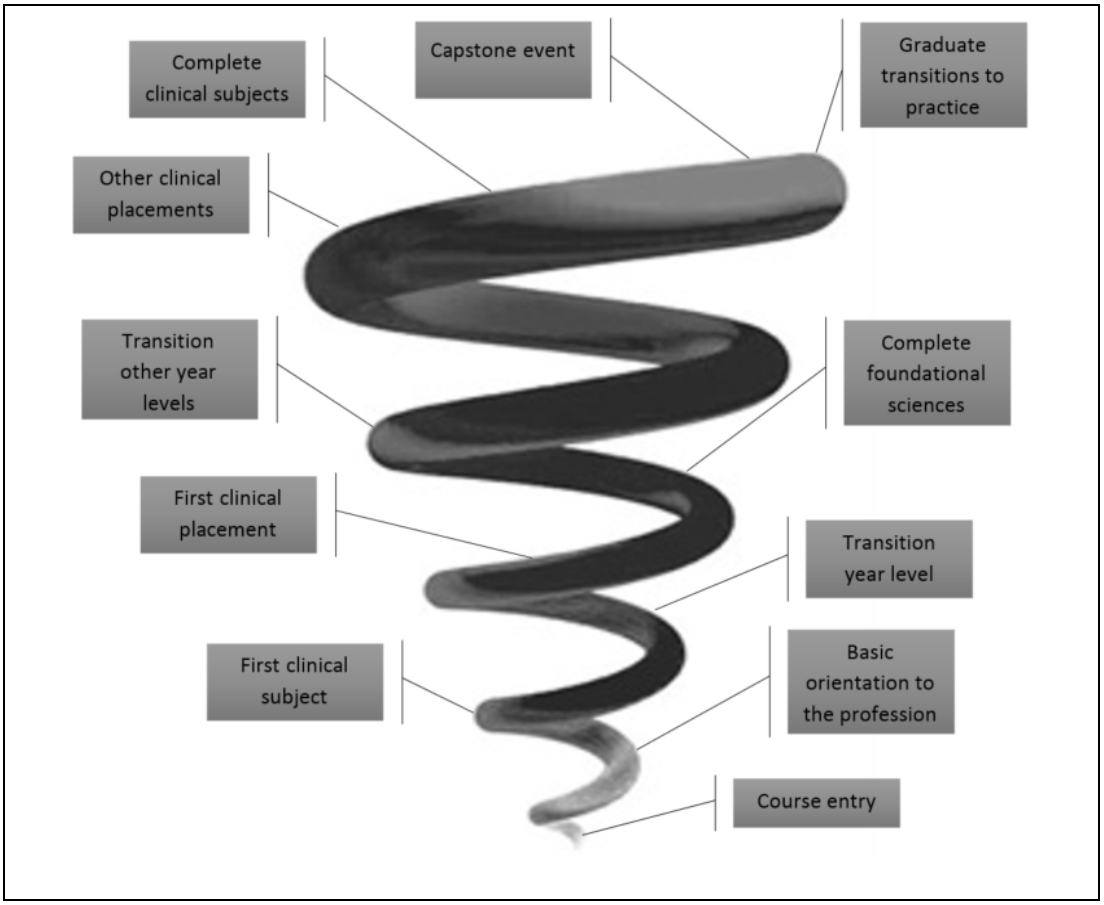

Figure 10.1. Stylised milestones in student progression through a typical pharmacy program.

When the curriculum team considers the sequencing of standardised patients in the curriculum, they should consider the natural milestones in the course. Once this has been determined, the outcomes can be further refined to ensure that the standardised patient experience aligns with and supports the desired learning outcomes of that part of the program. For example, the outcomes for the first simulation experience might be to prepare students for placement—improving communication or clinical skills in a particular area. The outcomes of a final standardised patient encounter might be to confirm that critical skills and knowledge are present, and deliver higher complexity cases in a resource-constrained environment that better reflects 'real' pharmacy practice situations. As described by Salas & Burke, to maximise the learning potential, practice in a simulated environment "must be guided by carefully crafted scenarios and diagnostic timely feedback" (Salas & Burke, 2002, p.120). As illustrated by Figure 10.2, strategic sequencing and application of standardised patient teaching methods linked with critical program milestones may improve student confidence prior to exposure to clinical placement and transition to practice, and thereby guide sequencing.

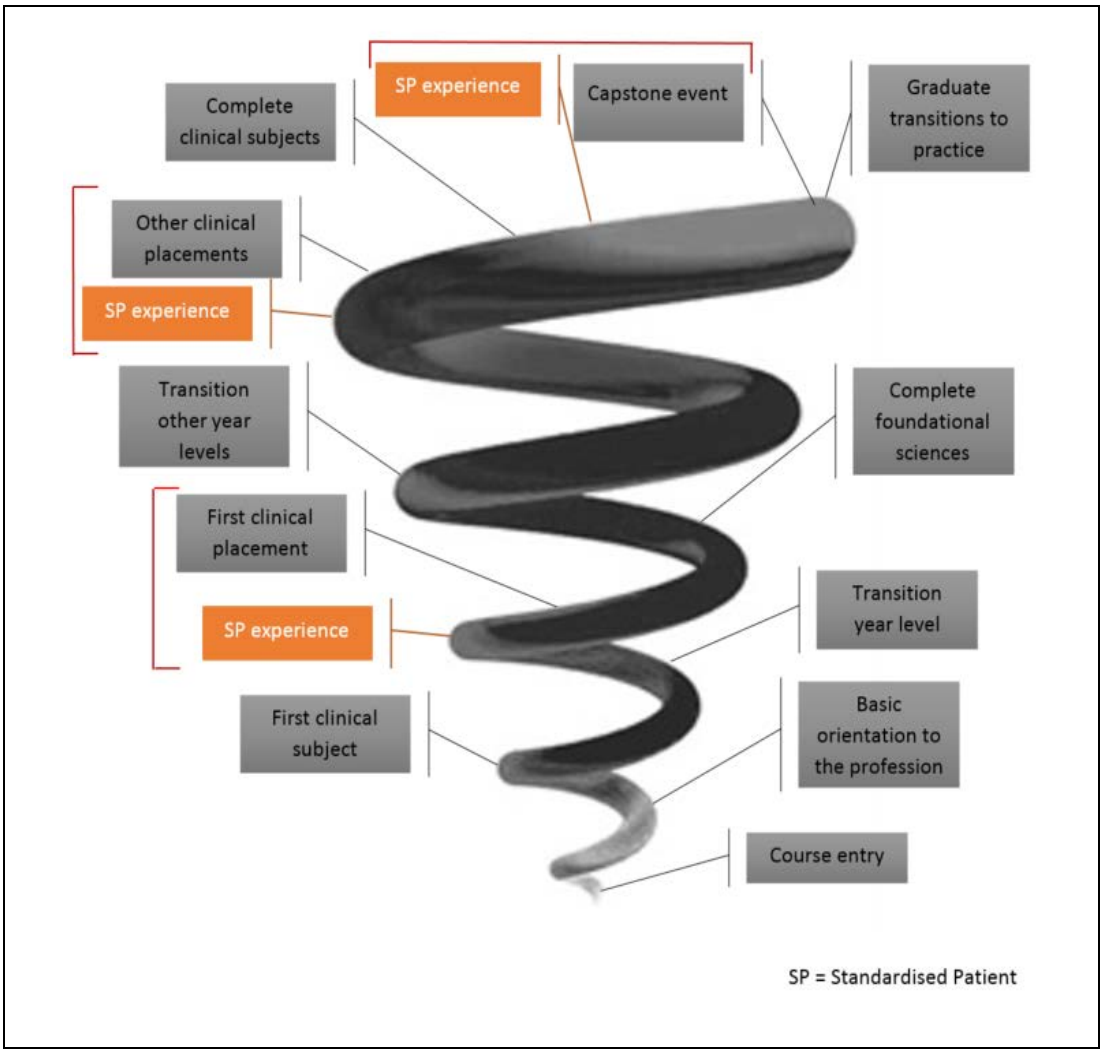

Figure 10.2. Stylised milestones in student progression through a typical pharmacy program with integrated standardised patient experiences.

Simulation is often used in Objective Structured Clinical Examinations (OSCEs) in the final year of the program to confirm students' acquisition of foundational practice skills and knowledge. As described in chapter 7, the greatest magnitude of change occurred with the less experienced, penultimate-year students, which suggests that standardised patient teaching methods can transition more junior students (from a program progression perspective) to a similar level of proficiency early in the program. This opens the possibility for simulation to be used for more than just managing more

complex cases in later years—it could also be used for cases in more complex scenarios. That is, simulation may be used earlier in the program of study so as to prepare students for more complex scenarios in more complex (or more realistic) practice contexts. In doing so, it may prepare final year students for the realities of the workplace, thereby reducing the transition shock caused by discrepancies between contrived university contexts and situations, and real practice. This conclusion is somewhat limited by the power of the Prescriptive Standardised Assessment Criteria for Patient Intervention data collection tool, though remains an important observation of this study. This finding requires further investigation to validate. This task also requires the course team to consider the level of the realism of the case (and its context) during planning. This is considered in a later recommendation (Recommendation 2).

Longitudinal training leads to longer retention of knowledge and skills in communication (van Dalen et al., 2002). Other than timing simulation with program milestones, each of those exposures to standardised patient experiences should be delivered with repetition. As reported in chapter 7, four sessions with adequate observation opportunities are sufficient to develop the necessary mastery in this Case. Achieving both sequencing and a sufficient number of exposures increases students' preparation for program-organised experiential learning (placement) experiences, as well as transition to practice.

Recommendation 2: Realism of standardised patient experiences should eventually include the realistic limitations encountered in practice contexts. Many authors have acknowledged the importance of realistic contexts and cases in the translation and application of knowledge in the workplace (Anderson, 1982; Burke et al., 2005; Chunta & Edwards, 2013, Kneebone et.al, 2006) and the role of work integrated learning in assisting students' transition to practice through their reflections

on experiences during their course (Abery, Drummond, & Bevan, 2015; McNamara et al., 2010). In chapter 8 the potential dichotomy of simulation was highlighted. The benefit to student learning and preparation for clinical placement and transition to practice is sharply contrasted by graduates' development of best-practice solutions generated in a 'near-authentic' practice scenarios, which resulted in learnings and strategies that were not always fit for practice. This highlighted an issue with contrived scenarios generating incongruence between models of pharmacy practice taught at university, and the commonly experienced models of practice experienced in the workplace.

Case realism can be viewed from two positions. The first is related to exposure to realistic case content as it would be experienced in practice. This is a common focus where teaching teams are looking to develop realistic case scenarios and can be assured with appropriate benchmarking with industry partners. The second is ensuring that the context of the case within which standardised patients are employed reflects industry norms. That is, over time, standardised patient scenarios are developed in such a way that the contextual complexity of the scenario is developed to integrate complex case matter under conditions that reflect the real work environment as closely as possible. Examples of these context elements may include time limitations, cultural or communication factors, or therapy option limitations based on drug availability or patient incompatibility.

By acknowledging the friction between the near-authentic practice scenarios and conditions experienced during simulation and real practice (as evidenced by findings in Chapter 8), standardised patients may be used as a way to maximise the level of clinical *and* practice context complexity to eventually deliver a case scenario that reflects typical complex presentations under conditions that reflect realistic practice resource

limitations. This study concludes that simulation benefits can be maximised using realistic scenarios and contextually realistic conditions, such as time constraints. Under these conditions, students may be better able to develop professional skills and coping strategies to support transition to practice.

Recommendation 3: Multisource feedback should be a conspicuous part of standardised patient experiences to maximise reflexive learning opportunities. As clinical placements across the spectrum of health disciplines in Australia are becoming increasingly scarce in comparison to the number of students in training (Hall, 2006; Kassam et al., 2013; McKenna & Wellard, 2004; Peters et al., 2013), other preparative experiences that assist students reflection on practice should be used. This study found that reflection on the standardised patient interaction was important and was strongly supported by multi-source feedback: the standardised patient, pharmacist tutor and peers. Reflection was further supported by students' observations of peer performances, where they observed a range of strategies and their effect. Students used this rich source of feedback to modify strategies in subsequent exposures. While students generally preferred volunteer simulated patients because they were considered more believable by students and peers and because they were less anxiety provoking, simulation enacted by faculty staff provided the highest quality written and verbal feedback, and added significant value to the standardised patient learning intervention.

When sufficient individual exposures to standardised patients are delivered, the experiences are sequentially planned, and scenario realism is considered, curriculum vertical coherence can be achieved. Standardised patient teaching methods can be used to deliver complex and evolving scenarios, and eventually to present scenarios that reflect the true clinical context. A curriculum is 'vertically aligned' or 'vertically coherent' when students are prepared to function in a lesson, course or grade level by

work completed in a previous lesson, course or grade level. Learning experiences are structured, logically sequenced and evolved in such a way that students are learning the knowledge and skills that will progressively prepare them for more challenging, higher-level work. Thus, by sequentially planning standardised patient teaching methods, **vertical coherence** can be achieved in an efficient and supported way to improve students' experience and learning outcomes.

10.5.2 Policy. ***Recommendation 4: Simulation (and standardised patients) should be a prominent feature in professional accreditation standards to maximise standardised patients and clinical placement potential.*** Simulation (and standardised patients as a sub-set of simulation) feature in many health-related programs, yet are inconspicuous or completely absent in a number of professional health-related accreditation standards. The Australian Nursing and Midwifery Accreditation Council (2012, p. 13) referenced patient simulation only to ensure that simulation and workplace experience (also described as 'practicum' or 'placement') are distinguishable. Simulation activities are not included in the minimum mandated workplace experience time. The Standards for Assessment and Accreditation of Primary Medical Programs by the Australian Medical Council (2012) clearly reference the importance and need for students to attain supervised clinical experience with patients to develop clinical skills through attachments and placements; however, the standards are silent on the use of simulation to prepare students for clinical experience and transition practice.

In a similar manner, the *Accreditation Standards for Pharmacy Programs in Australia and New Zealand* (Australian Pharmacy Council Ltd, 2012) make limited reference to simulation as a learning strategy, and only distinguish between simulated experiences and placement experience (Australian Pharmacy Council Ltd, 2012, p. 14). While Standard 21 of these accreditation standards encourages the use of a variety of

teaching and learning approaches—which may include a range of learning and teaching methods, including virtual or simulated healthcare consumers (Australian Pharmacy Council Ltd, 2012, pp. 13–14)—similar to both the medical and nursing accreditation standards, the pharmacy standards fail to recognise (or at least articulate understanding of) the potential of simulation in preparing students of these pharmacy programs for placement and transition to practice.

This research provides justification for pharmacy accreditation standards to more strongly endorse the use of various means of simulation (including standardised patients) as a necessary method to teach and examine a range of professional skills and knowledge. As a result of this study, the researcher recommends that standardised patients and other simulation methods be a required element of pharmacy curricular in order to complement (not replace) existing clinical placement requirements. Further recommendations include simulation should feature as an identified standard in the *Accreditation Standards for Pharmacy Programs in Australia and New Zealand* to take advantage of this learning method.

10.5.3 Research. ***Recommendation 5: More well-designed and resourced research should be undertaken on the short- and medium-term benefits of standardised patients on graduates' transition to practice.*** There is still much that is unknown about the benefits and limitations of standardised patients and simulation more generally. The available pharmacy-related literature is generally focused on students' acceptability of simulation and standardised patients as a teaching strategy, its effects on student confidence, and changes in student performance in communication and inter-professional settings. Much of the general literature on the use of simulation in pharmacy programs in Australia and internationally simply describes the design and implementation of standardised patient teaching experiences. Less common is robust

evidence on the effect on student performance in areas other than communication skills and capacity to work as part of an inter-professional team. There is a paucity of evidence about other performance outcomes, the method's reliability as an assessment tool, and the method's enduring benefit in transition to practice. While high quality Australian and international research on simulation as a teaching strategy and its relative benefits genuinely exist, its message is diluted by other research that is limited by small sample sizes, weak methodologies or unadventurous research questions. This study exhausted the limited evidence on the measurable effects (beyond those of acceptability or improved communication capacity) of standardised patients on student knowledge and skill acquisition, and transition to pharmacy practice.

There is great opportunity for simulation and standardised patient teaching methods to play a much greater role in undergraduate teaching; however, before this can occur, greater understanding must be attained of the costs and benefits of standardised patients and simulation. There is a need for more robustly designed studies that investigate the short-, medium- and long-term educational benefits of standardised patients in the Australian and international pharmacy context. There is a pressing need to conduct more well-designed studies that evidence the short- and medium-term benefits and related costs of using standardised patients in pharmacy education, and the educational benefits of this teaching strategy.

10.6 Conclusions to the Study

This chapter commences with a reflection on the researcher's journey of completing this Doctor of Philosophy. The researcher then provides an assessment of the quality of this research and considers the study limitations. The five recommendations resulting from this study are then reported, before finally describing the contribution of new evidence this study has made to the pharmacy and standardised

patient literature. Simulation may have a number of possible purposes in a curriculum. It can help students visualise the role of the pharmacist, thereby helping role development; it may assist in developing new skills in preparation for transition to practice; and it may improve student confidence and reduce difficulty levels in engaging in patient case. Alternatively, simulation may be solely used to improve student communication, or may serve as a quality assurance means to ensure graduates are ready for practice. This study has shown that standardised patient teaching methods are a suitable means to rapidly improve preparedness for the next milestone in students' pathway through a course, and prepare students for transition to practice.

In conducting this study, the researcher has also found that the benefit of standardised patient teaching strategies on transition to practice can be limited. That is, simulation can impart foundational skills and allow some translation to other similar contexts; however, the near-authentic nature of the simulation has important limitations in preparing graduates for the realities of practice when the realism of the context is not sufficiently high. This contextually inaccurate environment may compromise the translation of learning from graduates' earlier pharmacy education to the workplace. Following on from these findings, the researcher draws conclusions on three main parameters that should be considered in order to maximise the benefits of simulation. From a practice and education perspective, course teams should:

- sequence standardised patient learning opportunities to align with important course milestones
- consider aiming for a minimum of four standardised patient experiences each time the method is used
- ensure each standardised patient experience has feedback from multiple sources, including peers, faculty staff and the standardised patient

- consider the professional context and limitations (case realism) when planning standardised patient exposures or scenarios.

This study contributes new knowledge to the existing pharmacy education knowledge base. It has described limited evidence that standardised patients can improve student communication and professional skills, such as OTC prescribing and prescription medicine counselling. Evidence to support a minimum volume of exposure in order to realise the learning benefit of standardised patients in the context of this case was also identified. The findings concluded that standardised patient teaching strategies are effective in preparing students for clinical placement. However, more importantly, the researcher found standardised patient teaching methods have an enduring benefit during graduates' transition to practice. The deeper understanding of the use of standardised patient teaching methods generated by this study will contribute to a more efficient and effective use of this teaching strategy, which will ultimately benefit students, graduates and the community they will serve.

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Appendices

Appendix 4-1: Example case scenario used to brief standardised patients.

Scenario Number ONE	
Topic –	Viral Cold Symptoms (simple cold)
Patient details	Patient 55 year old male / female.
Symptoms	2 days ago, started with a sore throat– • Woke up yesterday feeling tired and run down with a mild headache • Mild fever and some aches in the muscles today • Clear nasal discharge at beginning, now a little thicker • Irritating cough at night, but can't seem to bring anything up • No daytime cough • No blood in mucus • Some sneezing – no watery eyes or itchy nose • No pain around sinus Main problem is the aches and the runny nose Will not use a nasal spray
Other drugs / Allergies / Diseases	High cholesterol – takes 20mg simvastatin Diet controlled diabetes Menopause (if female) Nil known allergies
Medical history / medication history	Diet controlled diabetes Menopause (if female) Blood pressure normal
Diet	Outline your normal diet.
Exercise	Walks 3-4 km each morning with the dog. Some hills
Smoking / alcohol	Non-smoker. May have 1-2 glasses of wine 2-3 days a week.

Appendix 4-2: Description of Research Methods Organised by Research Question

Research question one: Are there student characteristics that influence strong or weak performance in communication or process ability, and can standardised patients mitigate the effects of these characteristics?			
Data collection tool(s)	Data collected	Collection time(s)	Analysis used
Demographics questionnaire	Student demographics: age, gender, IDO, previous work experience and type, hours worked in pharmacy-linked employment, hours worked in non–pharmacy related employment, total hours worked in any employment, FLOTE	Pre-exposure to standardised patient	Kolmogorov-Smirnov test to assess normality Descriptive statistics to describe each sub-case Graphical analysis and descriptive statistics to identify elements of demographic homogeneity and heterogeneity
Workshop and examination marking schedule	Process, communication and total scores performance using standardised process marking criteria for each sub-case	Sessions one to five of exposure to standardised patient	Difference between means test used for categorical variables (such as gender and IDO) to identify demographic characteristics that influenced performance in session one and to understand if effect persists in session three and final session (session five) Bivariate correlations test used for continuous variables (such as age and weekly hours worked in pharmacy-related work) to identify demographic characteristics that influence performance in session one and to understand if effect persists in session three and final session (session five)
Research question two: Do teaching strategies integrating standardised patient experiences increase perceptions of confidence and reduce perceptions of difficulty in managing OTC prescribing or prescription medicine counselling interventions for pharmacy undergraduate students?			
Data collection tool(s)	Data collected	Collection time(s)	Analysis used
Likert scale for confidence and difficulty			Cronbach's alpha to determine internal validity of both surveys
Likert scale measuring perceptions of confidence	Self-rated confidence score	Pre- and post-exposure to standardised patient	Z-test for two population proportions comparing both time points (A and B)

			Z-test for two population proportions comparing both sub-cases one and two at both points (A and B)
Likert scale measuring perceptions of difficulty	Self-rated difficulty score	Pre- and post-exposure to standardised patient	Z-test for two population proportions comparing both time points (A and B) Z-test for two population proportions comparing both sub-cases one and two at both points (A and B)
Semi-structured focus group	Immediate perceptions of standardised patient teaching method (sub-case one)	Sub-case one—immediately after five sessions of standardised patient teaching	Thematic analysis
Long-term follow-up semi-structured interview	Long-term perceptions of the use of standardised patients in teaching	Greater than six months after graduation—currently working pharmacist or intern pharmacist	Thematic analysis

Research question three: Are teaching strategies integrating standardised patient experiences effective in developing foundational communication and process skills in undergraduate pharmacy students?

Data collection tool(s)	Data collected	Collection time(s)	Analysis used
Workshop and examination marking schedule	Process performance using standardised process marking criteria	Sessions one to five of exposure to standardised patient	Histogram (normality)
	Change over time for each sub-case (sessions one and two, two and three, three and four, and four and five		Paired-samples t-test
	Comparison between sub-cases one and two in sessions one to five		Repeated measures ANOVA
Semi-structured focus group	Immediate perceptions of standardised patient teaching method	Sub-case one—immediately after final session of standardised patient teaching	Thematic analysis

Research question four: Does the use of standardised patients in a undergraduate curriculum affect early-career pharmacists' transition into practice?

Data collection tool(s)	Data collected	Collection time(s)	Analysis used
Long-term follow-up semi-structured interview	Long-term perceptions of the use of standardised patients in teaching	Greater than six months after graduation—currently working pharmacist or intern pharmacist	Thematic analysis

Appendix 4-3: Demographics Questionnaire

1. Student number

2. Student name

3. Gender Male Female

4. Age (at last birthday)

5. If you do work in a PHARMACY while studying, please estimate on average how many hours per week you work. If it is highly variable, please take the average of the past four weeks. (If you don't work in a pharmacy, please write NIL in the box provided.)

Number of hours working part time in a pharmacy

6. If you do work in OTHER EMPLOYMENT while studying, please estimate on average how many hour per week you work. If it is variable, please take the average of the past four weeks. (If you don't work in other employment, please write NIL in the box provided.)

Number of hours working part time in OTHER WORK

7. Please indicate the type of OTHER EMPLOYMENT

8. Did you commence your pharmacy degree immediately after completing high school? YES NO

9. If No, which of the following significant life experiences did you have between leaving high school and commencing your studies in pharmacy?

	Please provide very brief explanation (i.e., type of work)	Approximate duration
Full-time work	YES / NO	
Part-time work	YES / NO	
Family commitments	YES / NO	
Other study	YES / NO	
Travel	YES / NO	
Volunteer work	YES / NO	
Other	YES / NO	

10. Do you belong to any organised social groups, such as community, social or sports clubs that you attend on a regular basis? YES NO

11. If yes, please specify type of social group

12. How many weeks of pharmacy placement (organised by the School of Pharmacy at JCU) have you undertaken to date?

Appendix 4-4: Pre-exposure Pharmacy Student Perception of Confidence (PS-PoC) Questionnaire

The following questionnaire asks you to report your confidence **at this point in time** while dealing with patients during a consultation. Read the following questions and rate how much you agree or disagree with the statement. **You should indicate your response by circling a number between 1 and 6 on the scale**, where 1 indicates strong disagreement and 6 indicates strong agreement. A complete scale descriptor is provided below. Please answer all 12 questions.

1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Somewhat agree, 5 = Agree, 6 = Strongly agree

1	I am confident that I am able to communicate effectively with patients.	1 2 3 4 5 6
2	When working in a pharmacy, I would feel more comfortable with tasks that do not involve direct patient contact, rather than tasks that directly deal with patients.	1 2 3 4 5 6
3	I feel I have sufficient communication skills to enable the gathering of necessary information from a patient.	1 2 3 4 5 6
4	I do not feel confident in my ability to interview the patient.	1 2 3 4 5 6
5	I do not feel comfortable with my ability to discuss sensitive topics with patients.	1 2 3 4 5 6
6	I feel comfortable with the structured approach I use to gather and deliver information with patients.	1 2 3 4 5 6
7	I am confident I am able to deliver complete information to the patient in a clear and logical manner.	1 2 3 4 5 6
8	I do not feel confident in my ability to counsel a patient.	1 2 3 4 5 6
9	I feel comfortable with my ability to answer questions the patient may have during a consultation.	1 2 3 4 5 6
10	I feel confident in my ability to make an appropriate referral of a patient to a health provider other than a pharmacist.	1 2 3 4 5 6

11	I feel confident with my ability to discuss potentially sensitive topics with patients in an appropriate way.	1 2 3 4 5 6
12	I feel it is important to have a structured approach to communication with a patient.	1 2 3 4 5 6

Appendix 4-5: Post-exposure Pharmacy Student Perception of Confidence (PS-PoC) Questionnaire

The following questionnaire asks you to report your confidence **at this point in time** while dealing with patients during a consultation. Read the following questions and rate how much you agree or disagree with the statement. **You should indicate your response by circling a number between 1 and 6 on the scale**, where 1 indicates strong disagreement and 6 indicates strong agreement. A complete scale descriptor is provided below. Please answer all 12 questions.

1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Somewhat agree, 5 = Agree, 6 = Strongly agree

1	I am confident that I am able to communicate effectively with patients.	1 2 3 4 5 6
2	When working in a pharmacy, I would feel more comfortable with tasks that do not involve direct patient contact, rather than tasks that directly deal with patients.	1 2 3 4 5 6
3	I feel I have sufficient communication skills to enable the gathering of necessary information from a patient.	1 2 3 4 5 6
4	I do not feel confident in my ability to interview the patient.	1 2 3 4 5 6
5	I do not feel comfortable with my ability to discuss sensitive topics with patients.	1 2 3 4 5 6
6	I feel comfortable with the structured approach I use to gather and deliver information with patients.	1 2 3 4 5 6
7	I am confident I am able to deliver complete information to the patient in a clear and logical manner.	1 2 3 4 5 6
8	I do not feel confident in my ability to counsel a patient.	1 2 3 4 5 6
9	I feel comfortable with my ability to answer questions the patient may have during a consultation.	1 2 3 4 5 6
10	I feel confident in my ability to make an appropriate referral of a patient to a health provider other than a pharmacist.	1 2 3 4 5 6

11	I feel confident with my ability to discuss potentially sensitive topics with patients in an appropriate way.	1 2 3 4 5 6
12	I feel it is important to have a structured approach to communication with a patient.	1 2 3 4 5 6
13	I feel the incorporation of standardised patients in teaching has improved my confidence in interacting with patients professionally.	1 2 3 4 5 6

Appendix 4-6: Pre-exposure Pharmacy Student Perception of Difficulty (PS-PoD) Questionnaire

Difficulty Questionnaire

The following questionnaire asks you to report the degree of difficulty **at this point in time** you expect to experience when conducting a consultation with a patient. Read the following statements and rate how difficult or easy you would report carrying out the activity described in the statement. **You should indicate your response by circling a number between 6 and 1 on the scale**, with 6 being very difficult and 1 being very easy. A complete scale descriptor is provided below. Please answer all 11 questions.

6 = Very difficult, 5 = Difficult, 4 = Somewhat difficult, 3 = Somewhat easy, 2 = Easy, 1 = Very easy

1	I would find communicating with patients …	Difficult 6 5 4 3 2 1 Easy
2	I would find treating minor self-limiting conditions over the counter …	Difficult 6 5 4 3 2 1 Easy
3	I would find gathering clinical information about the patient …	Difficult 6 5 4 3 2 1 Easy
4	I would find delivering information about a therapy or disease to a patient …	Difficult 6 5 4 3 2 1 Easy
5	I would find referring a patient to another health professional, such as a general practitioner …	Difficult 6 5 4 3 2 1 Easy
6	I would find delivering potentially sensitive information to a patient about a disease or proposed therapy …	Difficult 6 5 4 3 2 1 Easy
7	I would find meeting the patient's information needs …	Difficult 6 5 4 3 2 1 Easy
8	I would find implementing a structured interview and counselling process during a patient consultation …	Difficult 6 5 4 3 2 1 Easy

9	I would find identifying the patient's therapeutic needs …	Difficult	6	5	4	3	2	1 Easy
10	I would find concluding or ending a patient consultation …	Difficult	6	5	4	3	2	1 Easy

Appendix 4-7: Post-exposure Pharmacy Student Perception of Difficulty (PS-PoD) Questionnaire

Difficulty Questionnaire

The following questionnaire asks you to report the degree of difficulty **at this point in time** you expect to experience when conducting a consultation with a patient. Read the following statements and rate how difficult or easy you would report carrying out the activity described in the statement. **You should indicate your response by circling a number between 6 and 1 on the scale**, with 6 being very difficult and 1 being very easy. A complete scale descriptor is provided below. Please answer all 11 questions.

6 = Very difficult, 5 = Difficult, 4 = Somewhat difficult, 3 = Somewhat easy, 2 = Easy, 1 = Very easy

1	I would find communicating with patients …	Difficult 6 5 4 3 2 1 Easy
2	I would find treating minor self-limiting conditions over the counter …	Difficult 6 5 4 3 2 1 Easy
3	I would find gathering clinical information about the patient …	Difficult 6 5 4 3 2 1 Easy
4	I would find delivering information about a therapy or disease to a patient …	Difficult 6 5 4 3 2 1 Easy
5	I would find referring a patient to another health professional, such as a general practitioner …	Difficult 6 5 4 3 2 1 Easy
6	I would find delivering potentially sensitive information to a patient about a disease or proposed therapy …	Difficult 6 5 4 3 2 1 Easy
7	I would find meeting the patient's information needs …	Difficult 6 5 4 3 2 1 Easy

8	I would find implementing a structured interview and counselling process during a patient consultation …	Difficult	6	5	4	3	2	1	Easy
9	I would find identifying the patient's therapeutic needs …	Difficult	6	5	4	3	2	1	Easy
10	I would find concluding or ending a patient consultation …	Difficult	6	5	4	3	2	1	Easy
11	As a result of the exposure to standardised patients, I expect to find conducting an over-the-counter-prescribing intervention with a real patient …	Difficult	6	5	4	3	2	1	Easy

Appendix 4-8: Prescriptive Standardised Assessment Criteria for Patient Intervention

Student name _____ Case _____
Tutor _____ Date _____

Item		Assessment				
		Yes	No	Incomplete	Weight	Score
A Information Gathering Process						
Introduction of self					25	/4
Effective use of aides/tools **WWHAM** **LINDOCARRF**						
Appropriate questioning technique Open-ended questions Closed-ended questions						
Demonstrates use of non-verbal communication						
B Problem Identification						
Identified patient problem correctly (0.5)					10	/1
Suggested therapy focused on patient problem (0.5)						
C Information delivery						
1. Introduces medicine and problem 2. Dose/special instructions 3. Side-effects 4. Non-drug advice 5. Assessment of patient's understanding 6. Allows questions	Content appropriate (essential) and accurate				25	/5
	Use of simple/complex explanations					
	Maintains control					
	Delivers critical info for scenario					
	Uses logical sequence					
D Language						
Uses important medical terms where appropriate (+/- explanation)					10	/3
Gives simple explanations of complex concepts						
Translates technical language where appropriate						
E Patient Participation						
Assesses concerns of patient					15	
Picks up on patient cue						

	Encourages patient participations in counselling					/4
	Does not interrupt patient					
F	**Organisation**					
	Logical sequence				15	/3
	Information prioritised					
	Manages time effectively					
	Total					
						/20

Mark	Description	Comment/overall impression
9–10	Higher level of skill or competence shown. Few gaps in structure or ability are evident. Student very successful in accomplishing task.	
6–8	Level of skill and competence shown that reflects expected standard for a level-three undergraduate pharmacist. Some gaps exist, but effectively accomplishes task.	
2–5	Some proficiency shown, but many gaps in information gathering/delivery, or poor communication skill demonstrated. Further remedial work needed.	
1–2	Low level of ability shown. Student considerably below standard expected. Very poor ability to gather/deliver information or communicate.	
0	No aptitude demonstrated or no attempt made.	

Appendix 4-9: Focus Group Questions

Change in Student Perception

1. The initial confidence and difficulty scores were higher than expected. After your first exposure to the standardised patients, do you think it changed your perceptions about your overall confidence and perceived difficulty in undertaking a patient intervention?
    a. (If yes) What influenced your altered perceptions?
    b. How would you respond to the following general statement: 'The students were initially overconfident in their abilities to conduct an intervention, and when faced with a standardised situation, found it much more complex'?

Exploring Boundaries in Learning

2. I consider tutorials and workshops an opportunity to explore options and try new things, and sometimes as a consequence make mistakes. One might look at it as a very safe environment to explore and 'take risks'. Did standardised patients make it harder to take those 'risks'?

Standardised Patient Influence on Learning

3. I would like you to consider the effect of standardised patients on learning:
    a. Do you think this is a time-effective way of learning?
    b. Do you think the message gets lost in the delivery method, or did it reinforce the material taught?
    c. I would like to define for you the difference between simulated and standardised patients. Do you think standardised patients would be better than a simulated patient?

Assessment and Standardised Patients

4. The standardised patients were used in assessment to a small extent. What are your feelings surrounding the use of standardised patients in a terminal (end-of-semester) OSCE?

   Standardised patient: As you have experienced, real-life people who are given a scenario, but are able to respond as they feel they would normally respond given the same situation, according to your questioning. The response may be different from student to student, depending on student response.

   Standardised patient: Using a faculty staff, peer or actor who follows a prescribed script with the aim of presenting the same scenario and responses each and every time. Less latitude is given to 'improvising' and specific key prompts are given in response to specified questioning.

   a. Do you have any concerns about the fairness of using standardised patients in teaching? For example, is standardisation an issue for you between different patients and students?

Difficulties Experienced Working with Standardised Patients

5. What difficulties did you experience working with standardised patients?
   a. reliability
   b. story telling
   c. complexity
   d. aggression
   e. leading.

‘Real-world’ Outcomes

6. Thinking back to your placements immediately after you completed the learning sessions incorporating standardised patients, can you tell me some of the unexpected consequences you encountered as a result of exposure to standardised patients?
    a. What benefits did you receive as a result of exposure to standardised patients?

Appendix 4-10: Interview Questions

Introduction

- This study aims to examine the case for using simulation in pharmacy undergraduate education.
- As part of your undergraduate pharmacy training at James Cook University, you have been exposed to various simulation techniques.
- The simulation technique of interest here is standardised patients.
- Provide definition of standardised patient:
    - Defined as the substitution of a bona fide patient encounter with live actors enacting a scenario that replicates substantial aspects of the real experience in a controlled environment. The 'standardised patient' commonly involves community volunteers or paid actors, student peers or faculty academics, or teaching and administrative staff (faculty staff) who role-play a patient-based scenario.
- Describe examples of the use of standardised patients to familiarise the interviewee with the concept.

Question Set 1: Experience

How many years of clinical experience, including your intern year, do you have?

What areas have you predominantly worked in? (hospital, community, other)

Question Set 2: Perceptions of the Use of Standardised Patients in Teaching and the Effect it had on Early Practice

Remembering back to your experience of simulation in your undergraduate degree, and your subsequent first few months after graduation in practice, do you think the exposure to simulation assisted in the transition from the learning environment to practice, or had any benefits?

Potential follow-up questions—depending on response, subsequent questions may focus on:

- confidence and difficulty
- organisation or structure of intervention
- recall and application of clinical or technical knowledge
- management of difficult or sensitive clinical issues.

Question Set 3: Perceptions of Validity and Authenticity of the Teaching Strategy in Preparing for Clinical Practice

Given your experience with simulation, do you think simulation can deliver authentic experiences that are valid (that is, relevant to clinical practice)?

Simulation is commonly used to teach and practice communication skills. The use of simulation in other health professions is more widespread. In what important topics or areas of pharmacy practice could simulation be used to better prepare you for entry into those early years of the profession?

I would like you to consider the effect of simulated patients on learning:

1. Do you think they are a time-effective way of learning?
2. Do you think the message gets lost in the delivery method, or did it reinforce the material taught?

There are a number of patient options—peers, volunteers, teaching staff and paid actors. Do you think the choice of patients would make any difference to how you engage with the learning experience?

Given your experience now, what is your sense about the use of simulation in high-stakes assessment in practice?

Question Set 4: Interview Close

Would you like to make any further comment about the use of simulation in pharmacy practice?

End of interview—thank you for your time.

Appendix 4-11: Second Round Interview Questions—January 2016

Introduction

- This study aims to examine the case for using simulation in pharmacy undergraduate education.
- As part of your undergraduate pharmacy training at James Cook University, you have been exposed to various simulation techniques.
- The simulation technique of interest here is standardised patients.
- Provide definition of standardised patient:
    - Defined as the substitution of a bona fide patient encounter with live actors enacting a scenario that replicates substantial aspects of the real experience in a controlled environment. The 'standardised patient' commonly involves community volunteers or paid actors, student peers or faculty academics, or teaching and administrative staff (faculty staff) who role-play a patient-based scenario.
- Describe examples of the use of standardised patients to familiarise the interviewee with the concept.

Question Set 1: Professional Identity

Critical to successful transition to practice is the development of a strong professional identity. Professional identity is influenced by the clinical practice environment, perceptions of the public and their patients, other professions' views and experience throughout the course of their professional education at university, albeit it in informal teaching experiences.

Did your experience of simulation affect the development of your own professional identity?

Question Set 2: Did it Provide You with Ability to Deal with the Ambiguity of the 'Real' Pharmacy Role?

'Transition shock' is a term used to describe the experience of moving from university to practice. There is evidence in the medical literature that supports the notion that structured work-based experiential learning involving patients promotes a smoother transition into practice, as it helps graduates better deal with the uncertainty associated with 'real practice'. This has seen the development of transition or capstone courses in a range of health disciplines.

Can you comment on any effect simulation may have had on your understanding of the pharmacists' role, and did it help you deal with uncertainty in your early practice?

Question Set 3: Interview Close

Would you like to make any further comment about the use of simulation in pharmacy practice?

End of interview—thank you for your time.

Appendix 4-12: Letters of Approval from University Ethics Committee

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Appendix 5-1: Summary of Case Population Demographics, Including Comparison between Sub-cases

Parameter	Test	Combined sub-cases	Sub-case one	Sub-case two	Note
Age—normality	Kolmogorov-Smirnov test	K-S = 0.255 P = 0.000	K-S = 0.316 P = 0.000	K-S = 0.225 P = 0.000	Failed normality test
	Skewness statistic		2.74	2.901	Asymmetrical clustering to lower age values
Age	Mann-Whitney U	*Md* = 21 years, *n* = 126	*Md* = 20 years, *n* = 54	*Md* = 22 years, *n* = 72	Statistically significant difference in age for sub-case (*p* = 0.000)
Gender	Percentage count		Females = 69.5%, males = 30.5	Females = 70.3%, males = 29.7%	
	Chi-square test (Y)	*P* = 1.000			No difference between sub-cases
IDO	Percentage count	International = 6.0% (*n* = 125)	International = 8.5% (*n* = 54) v. in sub-case two, % students of international origin in both sub-cases	International = 4.1% (*n* = 71)	
	Chi-square test (F-E)	X^2 (1, *n* = 133) = 0.487, *p* = 0.465, *phi* = −0.092.			No difference between sub-cases
FLOTE	Percentage count		Five participants (8.5%)	Zero participants (0.0%)	
	Chi-square (F-E)	X^2 (1, *n* = 133) = 4.384, *p* = 0.016, *phi* = −0.221.			Significant difference between sub-cases
Holiday pharmacy work	Percentage count	Holiday pharmacy work = 9.0%.(*n* = 133)	Holiday pharmacy work = 5.1% (*n* = 59)	Holiday pharmacy work = 12.2% (*n* = 74)	Similar
	Chi-square (Y)	X^2 (1, *n* = 133) = 1.234, *p* =			No difference between sub-cases

		0.267, *phi* = 0.123			
Weekly pharmacy work	Percentage count	37.6% (*n* = 133)	39.9% (*n* = 59)	40.5% (*n* = 74)	Similar
	Chi-square (Y)	X^2 (1, *n* = 133) = 0.367, *p* = 0.545, *phi* = 0.068			No significant difference
Hours worked in pharmacy work	Count-based analysis	*M* = 11.98 hours), *Md* = 12 (*n* = 50)	*M* = 10.7 hours, *SD* = 5.34 (*n* = 20)	*M* = 12.83 hours, *SD* = 5.09 (*n* = 30)	Similar
	Mann-Whitney U	*U* = 228, *z* = −1.44, *p* = 0.151, two-tailed, *r* = −0.2. The effect size (*r*) is small to medium	*Md* = 11 hours, *n* = 20	*Md* = 12 hours, *n* = 30	No significant difference
Other employment	Percentage count	46 (*n* = 133, 34.6%)	24 participants (40.7%)	22 participants (29.7%)	
	Chi-square (Y)	X^2 (1, *n* = 133) = 0.1.289, *p* = 0.256, *phi* = −0.114.			No significant difference
Number of hours worked in non-pharmacy work		*M* = 11.58, *Md* = 10 (*n* = 46)	*M* = 10.85 hours, *SD* = 6.48, *n* = 24	*M* = 12.36 hours, *SD* = 8, *n* = 22	Similar
	Mann-Whitney U	*U* = 238, z = −0.574, *p* = 0.566, two-tailed, *r* = −0.08. The effect size (r) is very small	*Md* = 10 hours (*n* = 24)	*Md* = 10 hours (*n* = 22)	No significant difference
Work experience combined	Percentage count	64.7 % (*N* = 133)	A total of 39 students (66.1%)	47 participants (63.5%)	
	Chi-square (Y)	X^2 (1, *n* = 133) = 0.016, *p* = 0.898, *phi* = −0.027.			No significant difference
Commenced pharmacy degree immediately after Year 12	Percentage count		34 participants (57.6%)	47 participants (63.5%)	Similar

	Chi-square (Y)	X^2 (1, n = 133) = 0.262, p = 0.608, *phi* = −0.06.			No significant difference
Full-time work prior to pharmacy degree	Percentage count		12 participants (20.3%)	19 participants (25.7%)	Similar
	Chi-square (Y)	X^2 (1, n = 133) = 0.267, p = 0.605, *phi* = 0.063			No significant difference
Part-time work prior to pharmacy degree	Percentage count		14 participants (23.7%)	10 participants (13.5%)	Similar
	Chi-square (Y)	X^2 (1, n = 133) = 1.677, p = 0.195, *phi* = −0.132			No significant difference
Full- or part-time work prior to pharmacy degree	Percentage count		18 participants (30.5%)	20 participants (27%)	Similar
	Chi-square (Y)	X^2 (1, n = 133) = 0.062, p = 0.804, *phi* = −0.038			No significant difference
Significant study prior to commencement of pharmacy degree	Percentage count		18 participants (32.7%)	23 participants (31.1%)	
	Chi-square (Pearson's)	X^2 (1, n = 129) = 0.12.408, p = 0.088, *phi* = −0.310			No significant difference
Significant travel	Percentage count		Six participants (10.9%)	Five participants (6.8%)	Similar
	Chi-square (F-E)	X^2 (1, n = 129) = 0.267, p = 0.527, *phi* = −0.074.			No significant difference
Social group	Percentage count		21 participants (39.8%)	28 participants (37.8%)	Similar

	Chi-square	X^2 (1, n = 129) = 0.000, p = 1, *phi* = −0.004			No significant difference
Significant family commitments	Percentage count		Seven participants (11.9%)	Seven participants (9.5%)	
	Chi-square (Y)	X^2 (1, n = 133) = 0.027, p = 0.869, *phi* = −0.039			

Appendix 5-2: Demographics Not Shown to have a Relationship to Performance

Demographic	Combined cases	Sub-case one	Sub-case two	Comment
Age	No	No	No	No relationship between age and performance
Gender	No	Yes	No	Influential in session five, effect lost during exam
FLOTE	No	No	No	No relationship between FLOTE status and performance
International status	Yes	Yes	No	
Holiday pharmacy work	Yes	Yes	No	
Weekly pharmacy work	Yes	Yes	No	
Any type of pharmacy work	Yes	Yes	Yes	
Number of hours worked	No	No	No	No relationship between number of hours worked and performance
Other type of extracurricular work	No	No	No	No relationship between other type of extracurricular work and performance
Hours worked in other employment	No	No	No	No relationship between hours worked in other employment and performance
Total hours worked	No	No	No	No relationship between total hours worked in any employment and performance
Commence pharmacy after Year 12	No	No	No	No relationship between commencing pharmacy after Year 12 and performance
Worked part- or full-time before commencing pharmacy degree	No	No	No	No relationship between previous work and performance
Study before commencing pharmacy course	No	No	No	No relationship between previous study and performance
Experienced significant travel	No	No	No	No relationship between previous significant travel and performance
Social group involvement	No	No	No	No relationship between social group involvement and performance
Other significant life experience	No	No	No	No relationship between other significant life experience and performance
University placement experience	Yes	-	-	

Appendix 9-1: Literature Search Strategies

Table 9.2

Timing of Simulation within a Program of Study

Search	Search term(s)	Return count
#1	“time factor” OR “time factors” OR timing	1,255,429
#2	nurs* OR medicin* OR doctor OR pharmac*	3,343,430
#3	"patient simulation" OR "patient simulations" OR "standardised patient" OR "standardised patients" OR "standardized patient" OR "standardized patients"	6,262
#4	#1 AND #2 AND #3	87
	Number of articles retained after review of title and abstract	13

Table 9.3

Search Terms and Return Count for Confidence and Difficulty

Search	Search term(s)	Return count
#1	Confidence OR Difficulty	973,360
#2	Pharmac*	1,167,192
#3	"patient simulation" OR "patient simulations" OR "standardised patient" OR "standardised patients" OR "standardized patient" OR "standardized patients"	6,271
#4	#1 AND #2 AND #3	41
	Number of articles retained after review of title and abstract	10

Table 9.4

Search Terms and Return Count Acceptability

Search	Search term(s)	Return count
#1	Pharmac*	1,167,192
#2	"patient simulation" OR "patient simulations" OR "standardised patient" OR "standardised patients" OR "standardized patient" OR "standardized patients"	6,271
#3	accepta* OR "well received" OR positive	2,512,454
#4	#1 And #2 AND #3	46
#5	Number of articles retained after review of title and abstract	8
#6		

Table 9.5

Search Terms and Return Count for Theme 3

Search	Search term(s)	Return count
#1	"International status" OR "international student"	4357
#2	Performance OR success OR progression	4,721,414
#3	Pharmac*	1,167,192
#4	"patient simulation" OR "patient simulations" OR "standardised patient" OR "standardised patients" OR "standardized patient" OR "standardized patients"	6,271
#5	#1 AND #2 AND #3 AND #4	0
#6	nurs* OR medicin* OR doctor OR pharmac*	3,334,853
#7	#1 AND #2 AND #4 AND #6	0
#8	#1 AND #2 AND #6	26
	Number of articles retained after review of title and abstract	10

Table 9.6

Search Terms and Return Count for Gender

Search	Search term(s)	Return count
#1	gender OR sex OR "male and female"	1,315,118
#2	Performance OR success OR progression	4,721,427
#3	Pharmac*	1,167,267
#4	"patient simulation" OR "patient simulations" OR "standardised patient" OR "standardised patients" OR "standardized patient" OR "standardized patients"	6,271
#5	#1 AND #2 AND #3 AND #4	4
#6	nurs* OR medicin* OR doctor OR pharmac*	3,348,365
#7	#1 AND #2 AND #4 AND #6	41
	Number of articles retained after review of title and abstract	8

Table 9.7

Search Terms and Return Count for Extracurricular Pharmacy Experience

Search	Search term(s)	Return count
#1	"paid work experience" OR "work experience" OR "extracurricular work experience" OR “Part time work”	12,064
#2	Performance OR success OR progression	4,723,245
#3	Pharmac*	1,167,598

#4	#1 AND #2 AND #3	68
	Number of articles retained after review of title and abstract	4

Table 9.8

Search Terms and Return Count for Effectiveness of Simulation

Search	Search term(s)	Return count
#1	"standardised patient" OR "standardized patients" OR "standardised patient" OR “standardised patient”	2,529
#2	effect OR effectiveness OR outcomes OR improvement OR benefit OR success	14,943,411
#3	Pharmac*	1,167,804
#4	#1 AND #2 AND #3	53
	Number of articles retained after review of title and abstract	10

Table 9.10

Search Terms and Return Count for Confidence Endures on Transition to Practice

Search	Search term(s)	Return count
#1	"standardised patient" OR "standardized patients" OR "standardised patient" OR “standardised patient”	2,530
#2	"transition to practice" OR graduat*	142,035
#3	Pharmac*	1,168,499
#4	#1 AND #2 AND #3	15
	Number of articles retained after review of title and abstract	3

Table 9.11

Search Terms and Return Count for Confidence Endures on Transition to Practice

Search	Search term(s)	Return count
#1	"standardised patient" OR "standardized patients" OR "standardised patient" OR “standardised patient”	2,530
#2	Communicat*	1,537,307
#3	Pharmac*	1,168,499
#4	#1 AND #2 AND #3	36
	Number of articles retained after review of title and abstract	15