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Simulated Learning in the Clinical Education of Novice Physiotherapy Students

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Abstract

Clinical simulation is well established in nursing and medical education. It provides an effective learning opportunity for students to develop confidence to apply their skills in the clinical setting. Using simulation in physiotherapy education is less well established. The aim of the pilot study reported on in this article was to determine if a simulated clinical experience for physiotherapy students could: 1) increase student confidence before commencing a traditional clinical placement; and 2) replace part of the traditional clinical placement without compromising the student's ability to attain competency. The study consisted of replacing the first week of a five-week physiotherapy clinical placement with a simulated learning experience using standardised patients. Other structured learning activities such as peer learning, feedback sessions and opportunities for self-reflection were incorporated into the simulation week. Confidence to undertake clinical placement was measured at the beginning and end of the week and compared with a control group who undertook a five week traditional clinical placement. Assessment of student competence using the Assessment of Physiotherapy Practice, a standardised valid competency assessment tool, was compared between the two groups. Results indicated that the simulated learning experience significantly increased students' confidence to apply their professional and clinical skills. One week of clinical simulation did not compromise students' ability to achieve competency at the completion of their five-week placement. The power of the associated learning activities during the simulation week was evident from the students' feedback. This study highlights the benefits of incorporating simulated learning experiences and well-structured learning activities as part of all clinical experiences.

Key Words: clinical simulation; competence; confidence; physiotherapy; standardised patients

Introduction

To achieve the goal of graduating high quality health professionals, well-supported and mentored clinical experiences are essential. Students undertake clinical placements to develop the competencies needed for both professional practice and accreditation. Over recent years, difficulties have arisen in ensuring 'safe' clinical experiences that provide rich learning opportunities for entry level physiotherapy students. The main contributor to this is the large increase in the number of physiotherapy students requiring clinical placements as more universities offer programs in physiotherapy in Australia (National Health Workforce Taskforce 2008). Relative reduction in physiotherapy staffing levels within some health areas has translated into fewer student placements offered. Both education and health providers are increasingly encouraged to seek alternative methods of delivering clinical experiences that increase clinical education capacity whilst not compromising students' opportunities to achieve entry level competency in all aspects of patient care (Voelker 2009).

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To maximise the student's learning in the clinical setting, students ideally should develop some level of confidence and skill prior to commencement (Parry and Brown 2009, Jones and Sheppard 2011). Lack of confidence, which leads to a desire to avoid shame by avoiding challenges inherent in clinical settings, has been shown to be one of the biggest obstacles to successful learning in clinical settings (McCallum 2007). The challenge is how to build confidence to undertake clinical experiences prior to placement. Simulated patient care scenarios relevant to an actual patient population within a specific clinical environment have been shown to help students learn skills, gain experience, and develop confidence and competencies in a planned and prescribed manner (Bokken *et al.* 2008, Kneebone and Nestel 2005). Standardised patients, played by trained actors, allow structured delivery of patient scenarios to which students apply their clinical skills, rather than relying on the opportunistic learning in the clinical setting (Nestel *et al.*, 2011). Using standardised patients provides a bridging for students between theory and real-life patient care and also the opportunity to provide 'safe' training in specialised or sensitive areas of practice before the students are placed in a real-life situation. Critical thinking and active learning are promoted by simulated clinical experiences and enable students to build confidence in a supportive environment (Gordon *et al*. 2001). Therefore, simulation could be considered as a means to prepare students to maximise learning during a clinical placement. The question of whether a simulated learning experience is powerful enough to reduce the time required in the 'real' clinical environment to achieve competency could also be considered. The aims of this study were: 1) to evaluate physiotherapy students' responses to a one-week clinical simulation in acute or rehabilitation settings prior to a four-week clinical placement and; 2) to compare the clinical competencies of students who completed a one-week clinical simulation plus four week clinical placement in either acute or rehabilitation settings, with competencies of students who completed a five-week clinical placement in these areas of practice without a simulation experience.

Method

Design

The study used a mixed methods approach (Creswell and Plano Clark 2010), using quantitative and qualitative methodology to explore the participant's experience.

Participants

Participants were 32 (16 male, 16 female) students enrolled in a two-year Graduate Entry Masters physiotherapy course of a large Australian university, undertaking their first clinical placement in either acute or rehabilitation, in a public or private hospital setting. The seven tutors supervising the simulation and six clinical educators who subsequently supervised the students from the simulation group at the hospitals provided feedback through focus groups and semi-structured interviews.

Protocol

Prior to the allocation of students to groups, clinical educators at 10 external sites agreed to take part by either taking students after the one-week simulation, i.e. Simulated Clinical Group (SCG), or by acting as the control site, i.e. Control Group (CG). Thirty-two students due to undertake their first clinical placement were allocated to a clinical site via the University's electronic system for student placement allocation: 16 students to the SCG, 16 students to the CG. The SCG attended one week of a clinical simulation in either acute or rehabilitation followed by four weeks of clinical placement in the same clinical area. The CG attended five weeks of clinical placement in either acute or rehabilitation. The study was approved by the University of Sydney Ethics Committee and all participants provided informed consent.

Procedure

Simulated Clinical Group (SCG)

The SCG attended the one-week simulated learning experience within the University of Sydney School of Nursing simulation clinic. The environment authentically replicated an acute hospital ward setting and a rehabilitation gymnasium space. Actors were employed to play the role of the standardised patients with various medical conditions commonly seen in either the acute setting (e.g. post cardiac surgery, acute exacerbation of chronic obstructive pulmonary disease), or rehabilitation setting (e.g. stroke, Parkinson's disease). The standardised patients were based on real patients and actors were matched as closely as possible to the age and physical characteristics of the patient. Scripts were developed by physiotherapists, expert in clinical practice in cardiorespiratory or neurological physiotherapy at the University of Sydney, and actor training sessions were supervised by these physiotherapists. Full sets of medical records were developed for each of the standardised patients. During the week in the simulated learning environment, students were tutored by expert clinicians at a ratio of one clinician to four students. Students initially worked in groups of four and by the end of the week were assessing and treating standardised patients independently. An example of the week timetable is detailed in Table 1 (all Tables appear in Appendix 1).

At the completion of the simulation, the SCG then commenced their 'traditional' clinical placement for four weeks as allocated via the University's electronic placement allocation system, in a setting aligned to their simulated learning environment (i.e. to an acute setting if they had been in an acute simulated learning environment, and to a rehab setting if they had been in a rehab simulated learning environment).

Control Group (CG)

The Control Group undertook the 'traditional' clinical placement in either an acute setting or a rehabilitation setting for the standard five weeks of the placement.

Outcome measures

Quantitative

1. Confidence Questionnaire

A questionnaire (Table 2) was developed for this project to gauge the perceived preparedness and confidence of students for their clinical placement and was based on the Australian Physiotherapy Council Competency Standards (Australian Physiotherapy Council 2006). All students were asked to rate on a four-point Likert scale their level of confidence on 16 items relating to professional/generic and clinical skills. All students completed this questionnaire on the first day of either their simulated or traditional placement. The SCG repeated the questionnaire at the completion of the simulation week. The SCG questionnaire was administered by an independent member of the academic staff and the CG questionnaire was administered by the clinical educator conducting the five-week traditional placement. All questionnaires were anonymous.

2. Assessment of Physiotherapy Practice (APP) tool

The Assessment of Physiotherapy Practice (APP) is an assessment tool based on the competency standards required for entry level practice by the Australian Physiotherapy Council (Dalton, Davidson, and Keating 2011, Dalton, Davidson, and Keating 2012). The APP has been shown to be a valid measure of student competency (Dalton, Davidson, and Keating 2011) with good inter-rater reliability (Dalton, Davidson, and Keating 2012). The tool assesses seven domains of practice covering professional/generic and clinical skills. The professional/generic skills include professional behaviour, communication, ethical practice and team work. Clinical skills include assessment, clinical reasoning, and treatment planning, implementation and evaluation. The students are graded on 20 items (Table 3) against performance indicators for each item. The grades range from 0-4 where 0 = 'infrequently/rarely demonstrates performance indicators' and 4 = 'demonstrates most performance indicators to an excellent standard' in relation to an entry level physiotherapist. If an item is not

assessed then an N/A is allocated to that item. The overall score is calculated by summing the scores and converting to a percentage. The APP was completed by the clinical educator for students in both groups at (i) the beginning of the third week of placement at the time of the mid-unit formative assessment and (ii) the end of the 5-week placement for the end-unit summative assessment. These are the usual times for assessment during all clinical placements.

Qualitative

Two focus group interviews were conducted at the conclusion of the simulation week with the SCG, one with students undergoing acute simulation and the other with students in the rehabilitation simulation. Two different academics who were not physiotherapists and had not participated in the simulation week conducted the interviews. One topic guide was prepared for the two interviewers running the different focus groups, in order to promote some consistency in data elicited. Topics covered in the focus groups at the end of the simulation week are outlined in Table 4. A further focus group was conducted with the SCG students together at the conclusion of the five-week block. This focus group was conducted by another academic who was not involved in the simulation week or first SGC focus group. Individual phone interviews were held at the end of the five-week block with the clinical educators who had the students for the four weeks after the simulation.

The student focus groups ran for 45 minutes and 37 minutes. The focus groups were digitally recorded, with student consent, for later transcription and analysis. The digital files were professionally transcribed by an external transcription service. Because no student names were used during the interview, no names were attributed to individuals in the transcript, although it is clear from the layout that successive students' comments in response to a question appear as a new paragraph, allowing the author to excerpt illustrative quotes from a range of students. This paper focuses on the student focus group data collected at the end of the simulation week; other data from students and clinical educators will be presented in a later paper.

Data Analysis

Quantitative

Data was analysed using SPSS software. Within the SCG, preparedness and confidence for clinical placement was compared from beginning of simulation week one to end of simulation week one using independent group t-tests for all outcomes. The SCG and CG were compared for competence by comparing APP scores at week three and week five using independent group t-tests. A p value of $p<0.05$ was considered significant.

Qualitative

Qualitative analysis commenced with the identification of quotes relating to the focus group questions. Exemplar quotes for each of the focus group questions are recorded in Table 4. Categorical analysis (Patton 2002) was then conducted on the focus group transcripts as the answers to the questions did not reflect the totality of the data. Coding was undertaken manually on the focus group transcript, independently by the first two authors on this paper. They then met to agree on codes, returned to transcripts to finalise coding, and worked separately to cluster codes into overarching data categories. These were then compared and discussed, and consensus reached on the final set of categories to be used for refining data analysis.

Results

32 students were recruited (16 males; 16 females) (16 in SCG and 16 in CG), and 28 completed the study (13 in SCG and 15 in CG). Drop outs in the SCG were due to illness (2 students) and misadventure (1 student). In the CG drop out was due to illness (1 student).

Quantitative

The response rate to the questionnaire was 100%. Results are summarised in Tables 5-7. The results of the confidence questionnaire demonstrated that there was no difference in confidence of the SCG vs. CG on day one of the five-week placement. In the SCG overall confidence to commence clinical placement significantly increased after the one-week simulated learning experience. The SCG was significantly more confident prior to starting their first day of the traditional placement vs. the control group. Comparison of the clinical competencies at the third week mid-unit assessment using the APP showed no difference in the performance of the clinical skills of the SCG compared with the CG. Comparison at the end-of-unit assessment also found no difference in clinical skills. Comparison of the professional competencies showed a significant difference between the SCG and CG at both mid- and end-unit, with the CG scoring overall higher mean results. Results are summarised in Tables 8 and 9.

Qualitative

Responses to the focus group questions were recorded and transcribed. The questions and examples of answers provided by the focus group participants are provided in Table 4. Six overarching categories arose from the iterative data analysis outlined above. These were authenticity of learning experience, confidence, integration of theory into practice, self-directed learning, peer learning and scaffolding of student learning. This last category contained several sub-categories, which, in combination, allowed for positive learning experiences for the students. We present these categories below with quotes which exemplify the range of student responses. Quotes were chosen for their representativeness, clarity and powerful illustration of the category. Glossing has been used to ensure the quotes are understood by the reader not aware of the context.

Authenticity of the learning experience

Students felt that both the learning environment and the standardised patients closely represented their perception of the real clinical environment:

> [If] we'd have walked in and not known they were in a simulated setting I think we wouldn't have been able to tell [they were not real patients].
>
> I think some of us were asking afterwards […] on the first day, like does that person actually have that? Like a real patient, 'cause they were that good.
>
> [the best part of the SLE was] the reality of it. The setting is really good and the patients. You step into that ward and you feel like you're in it, you're right there so it's been good. It's not like 'oh they're an actor', you step in there and you really feel for the person, you really think and you've got to act how you would in a real situation as well.

Confidence

Students frequently reported that they felt more confident to commence clinical placement than they did prior to the simulated learning experience. This was achieved through the opportunity to practice skills on standardised patient and from time tutors spent providing constructive feedback on student performance:

> I think the biggest thing this week has literally been confidence, because they said 'you're doing really well, we're not expecting you to know everything'. They're saying 'it's good, you're fine', and I think that's the really big difference.

Integration of theory with practice

Students felt much more confident to apply the skills learned in the classroom in the clinical setting after the simulated learning experience:

> And so this week has really helped bring together my knowledge of the theory side of things and how to put it into practice in a day-to-day situation, all the practical side of things and how it works in a hospital setting, rather than me going there feeling like an idiot when I guess it doesn't go the way it probably should, 'cause we don't get taught that at uni.
>
> I don't think I've learned that much more theory, all the stuff we've already learned in class, but I feel like I know heaps more because […] you know how to apply it.

Self-directed learning

Time for self-directed learning was structured in to the simulation week. This included specific activities such as video self-analysis of performance as well as independent time to review academic material to assist with the interactions with the standardised patients:

> [Video review of performance] was like a self-review, and I thought they were good to see how you handled yourself with patients, 'cause it's hard to know what you are actually like doing it.

Peer learning

Peer learning came through in the students' focus group interviews as one of the most powerful learning opportunities provided by the simulated leaning environment. These included structured activities such as a peer assessment of performance as well as incidental learning from peer interactions:

> […] the peer support is really good as well and you can talk to them about what you're going to do and what you think you found hard, and you've always got one of these people to tell you, 'yeah you're doing well, and that was really good to see'.
>
> I think also when you were made to do a peer review of someone else, I think that was really helpful against seeing another person do something and thinking to yourself, 'yeah that's a really good idea'. So learning from your peers as well.

Scaffolding of learning

A large category to emerge from the focus groups was the benefits of learning activities students participated in throughout the simulation week. From this there emerged sub-categories that highlighted the students' positive learning experiences.

1. Procedural practice

In the academic setting students have limited opportunities to practice the skills required to conduct a complete patient assessment and treatment as would happen in the clinic. Breaking down tasks to practice specific aspects and practice of specific skills is often the focus of practical classes and assessments. The simulated environment and standardised patients allowed students the opportunity to practice their patient interaction skills as a whole, including skills such as communication and time management:

> at uni we don't get taught how to [...] look at their social history and put it together in like 20 minutes. It took us like an hour on the first day and now we're down to like half an hour, so that shows it's been heaps better.

2. Timing

The simulated environment allowed controlled introduction of students to practice with the standardised patients. The amount of time allocated to each session with the standardised patients

could be tailored to the students' levels of experience. Grouping students encouraged peer learning and support in the early part of the week:

> […] the timing was really good. There's four of you to start the week, go down to two of you doing it together, and I thought it was good how one day was focussed on assessment, on treatment with the four of you so you started to bring all that knowledge back into your head and then you do it and it builds you up. [...] there was enough time and I really liked the way they paced it.

3. Feedback

Feedback sessions were scheduled in at the conclusion of each of the sessions with the students and standardised patients. Feedback was provided by the tutors, standardised patient actors and students. Students regularly commented on the benefits of this feedback for their performance and confidence:

> I think the feedback sessions we had after were really good for our confidence. Like a lot of the time we went in, discussed what we want to do as a group and then we went in and implemented as a group, but all of us had no idea at the time. You still have a lot of doubt whether what you're doing is actually right, and is what a professional would do for that patient. So I really found the feedback sessions after were the real kicker and a boost for our confidence.

4. Reflection

Self-reflection activities were structured into the simulation week. Adequate time was allowed for students to reflect on their performance which they found beneficial to their learning:

> You've got no pressure, like you could do everything in your own time; you're never feeling rushed and desperate so it meant you could really formulate your ideas. If you wanted to look into something you really have time to go and look into something.

5. Teaching experience - not an assessment experience

In the academic environment students may only have their skills closely observed under examination conditions. Students appreciated the opportunities provided in the simulation week to have their performance observed and critiqued by the university tutors without formal evaluation:

> […] whereas here it's not about marks, it's just like okay you did really well, you should have done this, but that's fine. It's really different.

Students also identified activities that they felt that would enhance their learning experience during the simulation week. These included observation time and role modelling through tutors performing assessment and treatment sessions with the standardised patients:

> […] because [treating patients is] something we've never seen, so we don't actually know what to aspire to, we don't have a role model. And even if we couldn't see it happen in person [tutors] could have it video recorded, like we would all watch a video of the way someone would […] one of our tutors would treat them that we could watch as like a reference or we all watch at the beginning to say this is what you're aiming for.

Discussion

The mixed methods approach used in this study allowed triangulation of the data sources and enriched interpretation of the findings. The key findings of the study were that the simulated clinical experience can replace part of a traditional clinical placement without impeding the students' ability to achieve competency and that the experience enhances the students' confidence to commence clinical practice. This was achieved by providing a well-supported clinical experience, authentic to the clinical setting, where the students could safely integrate theory into practice. The learning environment

provided allowed for the incorporation of powerful learning activities such as peer learning, structured introduction to practice, feedback sessions and self-reflection that further enhanced the experience for the students in the SCG.

The APP data demonstrates that there is no difference in the student's ability to achieve competence at the level expected at the end of a five-week placement when one week of a clinical placement is replaced by a simulated clinical experience. This finding has been previously demonstrated by (Watson *et al.* 2012). In their study, the APP was used to assess physiotherapy students' performance after one week in a simulated learning environment and three-week traditional clinical placement. Students' skills were assessed by observing their performance with a new patient and also with a previously seen patient. The APP is designed to assess the students' overall performance across a clinical placement, so allowing the assessment of not only students' performance with the patient but also taking into account their ability in activities such as teamwork and commitment to learning. In contrast to the Watson study, this study assessed the students' overall performance at mid-unit and end of placement. This process replicates the usual competency assessment process and utilises the APP in the way it was designed to be implemented (Dalton, Davidson, and Keating 2011).

In this study there was a significant difference in the mean score of the APP for the professional skills between the SCG and CG, with the mean score of the CG being greater. Both groups, however, achieved a mean score which was within the range required to be deemed competent. While the difference was statistically significant, we consider that the mean difference of two points in score between the SCG and CG did not represent an important difference in professional skill attainment as two points out of a potential 24 points for professional skills is only an eight percent difference. The two point mean difference may have been due to the small sample size which was influenced by students at one of the control sites being scored particularly highly on this domain.

Data from the confidence questionnaire showed that a one-week simulated clinical experience undertaken prior to the students commencing placement in the clinical setting increased student confidence. This increase was demonstrated in both their generic professional and clinical skills. Focus group responses from the SCG students further supported this finding. Similar findings relating to confidence and preparedness in nursing students were demonstrated by Bambini, Washburn, and Perkins (2009) and Bokken *et al.* (2009).

The student participants in this study were undertaking their first clinical placement. Many felt unsure of how to transfer the knowledge and skills they were taught in the academic environment into the clinical setting at the beginning of their first week. Students transitioning from the academic to clinical environment may experience 'reality shock' (Kleehammer, Hart, and Keck 1990). Uncertainty around how to transfer their knowledge to actual patient care may cause students to feel insecure about their ability (Yoo and Yoo 2003). Undertaking a simulated experience prior to the first traditional clinical experience gives students the opportunity to start to implement the skills learnt in their academic units of study in a safe, supported environment and provides a bridge between the classroom and clinic. The significant increase in the confidence of the SCG demonstrated in the confidence questionnaire after a week of simulation showed the students felt better prepared to apply their clinical skills in a clinical setting.

The data category relating to the authenticity of the simulation learning experience demonstrates that the SCG students benefitted from the opportunity to practice their clinical skills in a setting more realistic than the classroom. The simulation setting reduced the fear of the consequences of making a mistake with a real patient. Reducing the stress that a novice may experience when dealing with real patients for the first time may enhance the learning experience and help him or her gain confidence (Eraut 2004). The benefits of the interaction with the standardised patients were recognised by students. The involvement of trained medical actors in simulation increases realism, emphasises the link with clinical reality and provides an authentic and powerful learning experience (Kneebone and Nestel 2005).

Student focus group comments indicated the power of learning activities incorporated into the simulated learning environment such as structured peer learning and self-directed activities. Also

evident in the data were the beneficial aspects of the scaffolding of learning achieved. The scaffolding of learning was subcategorised into the positive learning experiences of procedural practice, effective timing and the graduated introduction to patient treatments, structured feedback sessions, self-reflection activities and the teaching experience. The simulated clinical week was structured to allow sufficient time for practice early in the placement. Students found that this structure, which may be difficult to achieve in a busy clinical setting, enhanced their learning experience and therefore confidence. Clinical scenarios were written and portrayed to suit the educational purpose. A scenario can, for example, be tailored to the level expected of the student, commencing with simple cases and progressing to more complex cases later in the course. It can be challenging in the clinical setting to find patients that match the skill level of the student, especially early in clinical placements (McGraw and O'Connor 1999). Similarly, scenarios can be scripted to focus on specific skills or specific conditions. Additional benefits of simulated clinical experiences from an organisational perspective include the ease of timetabling, repetition of the scenario to enhance the learning outcomes and equity for student learning, thereby enhancing efficiency.

The controlled environment of the simulated learning experience allowed for the implementation of learning strategies that may be difficult to undertake in a busy clinical environment. If the learning activities included in the one-week simulation could be achieved in the traditional clinical environment, this may replicate the 'safe' setting achieved by the simulated learning environment and result in the same increase in student confidence. Physiotherapy clinical educators in the clinical setting usually have a full patient load to manage as well as student supervision. Many perceive that this limits their capacity to provide an experience that effectively includes the valuable learning activities provided in the simulated learning environment to the same extent. On discussion with clinical educators it appears the perception is that patient contact is considered the most important aspect of a student's learning on clinical placement and so other learning activities as described in the simulation week are not included in the timetabling. Many clinical educators feel they only have the capacity to accommodate single students and so do not have the opportunity to include peer learning activities as part of the learning on placement. Education for clinical educators about the benefits of these other learning activities for students and how these may be incorporated into their placements should be provided by education providers. This may improve the quality of the learning experience in all student placements.

There were a number of limitations of the study. As this was a pilot study it used a small sample size; however, results from this study are encouraging and a larger trial with greater sample size should be considered for future research. The participants' data was totally de-identified and therefore individual paired comparisons of before and after confidence scores could not be made. This may have reduced the statistical strength of the study.

The length of the clinical experience that is required for students to attain competence is not clear. Five-week placements are generally accepted as the standard length of time required by physiotherapy programs across Australia with most universities conforming to a five-week clinical pattern across the year. The length of time required to achieve entry level competency needs to be further investigated (Morris, Crosbie *et al.* 2002). SCG and CG students were able to achieve competency levels at the end of the five-week placement with no significant difference between the groups. Comparison with students taking a four-week placement could determine if four weeks would have been sufficient time to achieve competence. Shorter placements would allow more placement blocks in a year, thus easing placement demands.

Conclusion

This pilot study demonstrates that a simulated learning experience increases physiotherapy students' confidence to undertake clinical placement. Replacing the first week of a five-week clinical placement with the simulated learning experience does not affect a student's ability to achieve competence as measured on a standardised assessment tool at mid and end of placement. The learning activities and teaching strategies used in the simulated environment enhance the student's learning

experience. Further research investigating how such experiences can enhance the student experience on traditional clinical placements is warranted.

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Appendix 1

Table 1. Example of weekly timetable acute Simulation Clinical Group

Day	Simulation Activity	Standarised Patient	Other Learning Activities
1	Assessment x2 4 students/Standardised patient (SP)	Bronchiectasis Post-op Thorocotomy	Preparation tutorials Revision Tutor debrief sessions Video self reflection Peer preparation Peer assessment/feedback Discharge letters Documentation X-ray analysis ICU demonstration Mannequins
2	Treatment x2 4 students/SP	Bronchiectasis Post-op Thorocotomy	
3	Assessment & Treatment 2 students/SP	Post-op Coronary Artery Bypass Graft	
4	Assessment and treatment 1students/SP	Chronic Obstructive Pulmonary Disease	
5	Assessment & Treatment 1 student/SP	Chronic Obstructive Pulmonary Disease	

Table 2. Confidence Questionnaire

At what level do you feel able to:	1=below acceptable	2=acceptable	3=good	4=excellent
Communicate with patients				
Demonstrate appropriate professional and ethical behavior				
Utilise manual handling skills with patients				
Accept and respond to constructive feedback				
Use your problem solving skills in the clinical setting				
Utilise your capacity for independent critical thought and self directed learning				
Demonstrate ability and confidence to participate effectively in collaborative learning as a team member, while respecting individual differences				
Plan work and use your time effectively				
Demonstrate flexibility/adaptability in the workplace				
Assess patients' abilities, problems and needs				
Develop a physiotherapy intervention plan to meet defined goals				
Implement physiotherapy intervention strategies				
Set up the environment to maximise the effectiveness of their assessment and treatment of the patient				
Appropriately apply knowledge and skills to patients				

Table 3. Items assessed using the Assessment of Physiotherapy Practice tool

Item	
1	Demonstrates and understanding of patient/client rights and consent
2	Demonstrates commitment to learning
3	Demonstrates ethical, legal and culturally sensitive practice
4	Demonstrates teamwork
5	Communicates effectively and appropriately - verbal/nonverbal
6	Demonstrates clear and accurate documentation
7	Conducts an appropriate patient/client interview
8	Selects and measures relevant health indicators and outcomes
9	Performs appropriate physical assessment procedures
10	Appropriately interprets assessment findings
11	Identifies and prioritises patient's/client's problems
12	Sets realistic short- and long-term goals with the patient/client
13	Selects appropriate intervention in collaboration with the patient/client
14	Performs interventions appropriately
15	Is an effective educator
16	Monitors the effects of intervention
17	Progresses intervention appropriately
18	Undertakes discharge planning
19	Applies evidence based practice in patient care
20	Identifies adverse events/near misses and minimises risk associated with assessment and interventions

Table 4. Simulation Clinical Group (SCG) student focus group questions and sample responses

	Question	Sample responses
1	What impact (if any) did the simulation week have on your feelings of preparedness and confidence to begin clinical placement?	'[confidence to start placement is] through the roof now. It's so much more than it was coming in'. '[during feedback sessions] the tutors would come back and tell us all the things we did right, things that we could improve on. But all in all you came out feeling like you can handle [the situation]'
2	What suggestions do you have to improve the way the simulated learning program was delivered?	'you could have someone who comes in pretending to be a nurse just checking their obs or someone getting someone out of bed to go to the bathroom. Just other things going on so you're dealing with noise and other movement and restrictions of having other curtains closed'
3	How authentic did you find the standardised patients? e.g Did you feel like you were treating an actual patient?	'And all their patients, like were real authentic looking. Like the TBI patient, I did a stroke patient, his limp was […] like you couldn't tell'. '[it is] important to be able to deal with those crisis situations, like when we recognised we had a TBI patient so we

		could see that he was going to be agitated and kind of be prepared for him to like swear at us or things like that. So we didn't even know what to expect, so it's good to have that live'.
4	Are there any suggestions on ways to improve the authenticity of student and standardised patient interactions?	'Like if they have an ECG and a heart line, there'd be a screen that it was on, so that would have been good'.
5	Did the inclusion of the simulation week impact on your choice of preferences for clinical placement locations?	'I just based it on my top preference'. 'I knew that it was [a part simulation placement] […] the simulation was quite either/or for me'. 'Yeah it was the simulation, but I'm kind of glad that it was now'.
6	Do you think a week of simulation prior to clinical would be a good thing for <u>all</u> students to attend?	'Yeah'. 'Definitely'. 'If it's at all possible'.
7	Were the video review and debriefing opportunities a useful learning experience?	'I think the feedback sessions we had after were really good for our confidence. Like a lot of the time we went in, discussed what we want to do as a group and then we went in and implemented as a group, but all of us had no idea at the time. You still have a lot of doubt whether what you're doing is actually right, and is what a professional would do for that patient. So I really found the feedback sessions after were the real kicker and a boost for our confidence'. 'Really everyone was just kind of "I can't watch myself [on video]", but I mean it was good to see how you were doing from a different perspective'.
8	Overall, what were the best aspects about the simulation week?	'I think how we got to use simulated patients, so you didn't have to worry about killing the patients […] making all the decisions, like this is the place to make the mistakes, so I thought that was good'. 'They paced it really well. Whoever organised it, the timing was really good. There's four of you to start the week, go down to two of you doing it together, and I thought it was good how one day was focused on assessment, on treatment

		with the four of you so you started to bring all that knowledge back into your head, and then you do it and it builds you up. It was just […] there was enough time and I really liked the way they paced it'.
9	Overall, what were the worst aspects about the simulation week?	'It was all good'. 'I can't think of anything'. 'There was literally nothing'.

Table 5. Comparison of Simulated Clinical Group vs. Control Group confidence questionnaire pre-placement

Skills	SCG mean(SD)	CG mean(SD)	Mean Diff 95%CI	p-value
	n=16	n=16		
Professional	2.6 (0.4)	2.5 (0.6)	0.06(-0.3-0.4)	0.7
Clinical	1.7 (0.4)	1.9 (0.5)	-0.1(-0.5-0.2)	0.7

Table 6. Simulated Clinical Group (SGC) confidence questionnaire pre- and post-simulation

Skills	Pre mean(SD)	Post mean(SD)	Mean Difference (95%CI)	p-value
	n=16	n=15		
Professional	2.6(0.4)	3.2(0.4)	0.6(0.3-0.9)	0.000
Clinical	1.7(0.4)	3.0(0.5)	1.2(0.9-1.6)	0.000

Table 7. Comparison of Simulated Clinical Group (SCG) vs. Control Group (CG) confidence questionnaire pre-commencing traditional placement

Skills	SCG mean(SD)	CG mean(SD)	Mean Difference (95%CI)	p-value
	n=15	n=16		
Professional	3.2(0.4)	2.5 (0.6)	0.2(0.18-1.01)	0.007
Clinical	3.0(0.5)	1.9 (0.5)	0.2(0.71-1.48)	0.000

Table 8. Comparison of Simulated Clinical Group (SCG) vs. Control Group (CG) Assessment of Physiotherapy Practice (APP) mid-unit assessment scores

Skills	SCG mean(SD)	CG mean(CG)	Mean Difference (95%CI)	p-value
	n=14	n=15		
Professional	13.4(2.6)	16.1(2.0)	-2.22(-4.0- -0.4)	0.02
Clinical	24.1(4.2)	26.4(5.5)	-2.3(-0.6- 1.5)	0.2

Table 9. Comparison of Simulated Clinical Group (SCG) vs. Control Group (CG) Assessment of Physiotherapy Practice (APP) end-unit assessment scores

Skills	SCG mean(SD)	CG mean(CG)	Mean Difference (95%CI)	p-value
	N=14	N=15		
Professional	18.5(2.6)	20.9(2.5)	-2.4(-4.2- -0.4)	0.02
Clinical	37.1(6.4)	39.7(6.6)	-2.3(-6.0- 1.5)	0.225