



Simulated learning activities as part replacement of clinical placements in osteopathy: A case study



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ABSTRACT

Simulation has played an important role in health professional education for over 50 years but is relatively new to osteopathy. Simulation provides an opportunity to control some of the variables in clinical education such as adequate patient numbers and case mix exposure and provide a meaningful contribution to the students' clinical education. Simulation learning (SL) is a process where the learner practices a procedure or routine in a simulated learning environment. SL has recently been investigated as a valid part replacement of traditional clinical placements in physiotherapy. This case study endeavours to provide osteopathy educators with a framework to develop, implement and evaluate simulated learning in osteopathic education.

This case study outlines simulated learning activities that part replaced clinical placements in osteopathy education and provides an overview of costs and resources required. Student feedback obtained throughout the project suggests structured simulated learning activities may build critical practice skills and be used as an acceptable clinical learning tool.

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Introduction

Simulated learning has played a role in health professional education for over 50 years and recently as a part replacement of traditional clinical placements [1]. Simulation is a technique “to replace or amplify real experiences with guided experiences that evoke or replicate substantial aspects of the real world in a fully interactive manner” ([2], p. i2). Simulation provides an opportunity to control some of the variables in clinical education and provide a meaningful contribution to the students' clinical education [3]. Simulation learning (SL) is the process where the learner practices a procedure or routine in a simulated learning environments (SLE). SLE's can utilise mannequins or simulated patients (SPs) in environments of varying fidelity and complexity. Simulated patients are well people trained to portray unhealthy or ill patients and to interact with and provide feedback to learners and educators.

Simulated learning (SL) is commonly utilised in health professional education but relatively new in osteopathy. Simulated learning has been reported by students' and supervisors' as

educationally, professionally and clinically relevant [4]. In addition, SL has been found to increase student engagement, psychomotor and clinical reasoning skills, self-confidence, self-efficacy, ability to manage unfamiliar situations, and satisfaction with learning [5].

Studying osteopathy includes a mixture of traditional classroom-based teaching and clinical placement activities where students are able to apply the skills, knowledge and attributes developed in the classroom to a real world setting. Osteopathy students usually commence their clinical placement learning activities in second or third year through being an observer in patient consultations. Students then progress to leading the consultation in their senior years by treating patients under the supervision of registered practitioners [6].

Hours spent in the clinical environment forms a substantial portion of most health profession students' course requirements. Competition for clinical placements, costs of clinical education [7], increasing student numbers in health professions programs, and the desire to implement interprofessional education and practice, have all required teaching institutions to conceptualise innovative ways of delivering meaningful clinical education for their students. Simulated learning may provide an avenue to address some of these issues.

This case study describes the implementation of simulation as

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part of the clinical education of students in the osteopathy program at Victoria University (Melbourne, Australia). The rationale, development, implementation and evaluation of this approach will be described as an example of how simulated learning can be embedded in osteopathy clinical education. The framework used to design junior student simulated clinical placement activities is proposed as a starting point for discussions within the osteopathy education community regarding the use of simulation in conjunction with, or as part replacement of clinical placements. Part replacement of clinical placements with simulated learning has been successfully implemented in physiotherapy education without adverse effects on the student's clinical assessment performance [1,8].

A simulated learning case study

The osteopathy program at Victoria University (VU, Melbourne, Australia) is a five-year Bachelor-Masters model, with a new 4.5 year program format being implemented in 2016. In both programs the number of clinical placement hours increase as student's progress through their course. In their third year osteopathy students observe the senior students and are required to undertake 40 h of clinical placements each semester. Fourth year students complete 75 h and fifth year students complete 120 h of clinical placement per semester.

In 2014, VU significantly increased the first year intake in osteopathy and enrolled 140 students (approximately double the previous year). The larger cohorts have continued with a drastic increase in student numbers from 300 students in 2014 to over 500 students in 2017. The increase in osteopathy student numbers is also occurring at other universities in Australia. These increasing cohorts have placed significant pressures on the delivery of clinical placements at VU and academic staff have been forced to consider alternatives to traditional clinical placements to ensure students continue to receive high quality clinical education.

In order to deliver sustainable clinical education in low resource environment and address some of these pressures, academics from the program obtained an internal university grant of AUD\$20,000 to develop, implement and evaluate simulated learning (SL) activities as part replacement of the traditional observer and 'hands-on' clinical placement hours described previously. Research from physiotherapy [1,8] demonstrated that physiotherapy students undertaking 25% of their clinical placement as SL were as clinically competent at the end of the study as the students undertaking traditional clinical placements. Due to the paucity of published research on the use of simulation in osteopathy education, our project utilised methods from these two research projects from physiotherapy [1,8]. The benefits of simulated learning have been researched in physiotherapy education and are outlined above. How these benefits translate to osteopathy clinical education is yet to be established.

The simulated learning project

Ethics approval for the project was obtained from the Victoria University Human Research Ethics Committee (HRE16-011).

Case scenario creation

The project team identified the key learning outcomes in subjects undertaken by third year students in semester 1 2016. From these key outcomes three clinical scenarios were created. Scenario 1 was the most basic, with the second being more challenging and the third being most complex. All three scenarios were aligned with the graduate outcomes of year 3 of the bachelor degree and

expected improvement of a participant's communication and clinical reasoning skills as they progressed through semester 1. Each scenario took 5 h to write and an experienced case writer (sessional staff member) was paid approximately AUD\$300 per scenario. The scenario details can be found in Table 2. Case 2 (Diane) has been provided in appendix 1 as an example of the back end documentation for the SL activity.

Recruitment

Student participant recruitment

Students enrolled in the third year of the osteopathy program were offered the opportunity to volunteer to participate in the SL project, and were able to withdraw at any time. All participants were informed if they believed they had been disadvantaged by replacing clinic shifts with simulated learning, they would be able to undertake additional clinical shifts after the project ended. No participants utilised this option. Students who did not participate completed their clinical placement hours as normal.

Recruitment: simulated patient recruitment

Professional actors were recruited from a specialist simulation acting agency. Each scenario involved one simulated patient undertaking 2 h of home preparation and 2 h of work at the VU campus which included preparation (e.g. organisation of make-up, props such as crutches), training for the scenario with an experienced SP trainer (TD) and filming for the scenario. The total cost for each SP per scenario was AUD\$360.

Recruitment: osteopath participant recruitment

Experienced osteopaths were recruited from the pool of osteopathy clinical educators working at VU to play the role of the osteopath. Osteopaths were given a detailed overview of the project and their role in the scenario. Osteopaths were given a snapshot of the case but were not privy to any case details until they were revealed by the simulated patient in the simulated consultation. Osteopaths were paid the usual clinical supervisor rate (~AUD\$60 per hour) for their time at a cost of approximately AUD\$150 per filmed case scenario.

Filming

All simulated consultations were filmed using two video cameras purchased through the project grant. One of the researchers (BV) was responsible for all the video recording, while another acted as the director giving instructions to the osteopath, simulated patient and assisting with scene changes (TD). Case histories and management were filmed at a typical clinical desk set up. Examination was filmed in a simulated clinical room with an electric plinth, linen, examination equipment and a light box. All parts of the simulated consultation were filmed in the usual sequence of a consultation – history, examination and management. An additional element was the inclusion of the recording of both the osteopath and patient reflections of each of these components. These were recorded so the students undertaking the SL would hear the osteopath and patient perspective of the clinical scenario – something that is not common in traditional clinical placements.

Each scenario took approximately 2 h to film and 4 h to edit. Project team staffing costs for filming, directing and editing are estimated to be approximately AUD\$500 per scenario.

Learning management system (LMS)

All student participants in the project (n = 10) were added to a secure, closed online learning management system created or this

Table 1

Summary of project activities in semester 1 2016.

Group	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Activity 6
Students participating in simulated learning activity project	Week 1 or 3 Clinical Placement (5 h)	Week 4 Simulated Learning activity 1 (3–5 h)	Week 5 or 6 Clinical Placement (5 h)	Week 8 Simulated Learning activity 2 (3–5 h)	Week 9 or 10 Clinical placement (5 h)	Week 12 Simulated Learning activity 3 (3–5 h)
Students not participating in project	Week 1 or 2 Clinical Placement (5 h)	Week 3 or 4 Clinical Placement (5 h)	Week 5 or 6 Clinical Placement (5 h)	Week 7 or 8 Clinical Placement (5 h)	Week 9 or 10 Clinical Placement (5 h)	Week 11 or 12 Clinical Placement (5 h)

Table 2

Summary of simulated learning activity year 3 cases.

	Patient	Main condition	Concurrent condition	Considerations	Alignment with Learning Outcomes/Course Aims
Case One	30 year old single male Plumber H:185cm W:75kg Basketballer and regular gym goer	Upper cervical pain/ headache Cervical Artery Dissection		Risk factors Referral y/n/why Protocols	Communication skills History taking skills Diagnosis/prognosis Assessment skills (including systems for example neurological and or cardiovascular assessment as per VU cervical artery dissection clinical protocol) Nociceptive/inflammatory pain Professional codes and conduct
Case Two	60 year old divorced female Service cashier H:155cm W:80kg 2 adult children	Chronic carpal tunnel syndrome		Chronic pain Yellow flags (psychosocial risk factors)	Communication skills History taking skills Diagnosis/prognosis Assessment skills Posture Peripheral joint injury Common orthopaedic complaint Chronic pain
Case Three	40 year old female Office stationary sales rep H:165cm W: 80kg Recently commenced boot camp 2 sons: 10, 7 years old	Gastro-oesophageal reflux disorder (GORD)	Ruptured Achilles tendon at boot camp (already diagnosed being treated, GORD is a new symptom)	Referral y/n/why Stress Red/medical flags	Communication skills History taking skills/red/medical flags Diagnosis/prognosis (medical and msk) Assessment skills (medical and msk) Gait/posture Peripheral joint injury Common orthopaedic complaint Nociceptive/inflammatory pain

SL study. The LMS, which is part of a university wide licence purchased by VU, enabled secure online access to activities accessible only to the student participants, researchers and the facilitator, and provided a structured environment for hosting the activities. A schedule (Table 1) informed participants of their semester learning timetable and listed clinical placement hours (50% of hours for the subject, 3 × 5 h shifts) and simulated learning activity hours (50% of hours for the subject, 3 × 3–5 h learning activities). All clinical case scenarios, prompts, multimedia and facilitation were hosted in the LMS. Members of the project team (TD & MD) created the templates and populated the LMS with the case scenario text, videos and quizzes.

The simulated learning activity

Each simulated learning activity included:

- Pre-task information page and instructions;
- 3–6 learning outcomes;
- A series of pages titled sequentially in accordance with the various components of the consultation (e.g. case history, examination, management). Each included instructions for students, then short videos of the case scenario with the simulated patient and an experienced osteopath, showing the process of clinical history taking, communication & clinical reasoning, examination and management;

- Short quizzes on the information raised in each component; and,
- A final 'bring it all together' discussion and short videos of the practitioner and patient reflecting on the history, examination and management.

The SL activities had online support from a facilitator (acting in lieu of a clinical supervisor) and peers in the decision-making around the patient. In the first scenario students received feedback from the facilitator on their responses via online live video tutorial in online classroom. The second scenario utilised the discussion forum feature of the LMS where students were required to post responses to a number of case prompts before they could view other student's responses to the same prompt. The second scenario case was finalised with a video recording from the facilitator. The third scenario had limited support so students were required to make decisions relating to the patient independently. The students were required to respond to a series of embedded prompts and videos, and completed a set of quiz questions within a time limit. Feedback to the student was provided via the quiz grading. Table 2 provides a snapshot of the three case scenarios chosen for the third year participants. Each scenario took three to 5 h for the students to complete including participation in feedback sessions.

Feedback to the student

Debriefing is a critical element of simulated learning which

occurs after the simulation. Debriefing is led by a facilitator via a structured discussion to facilitate students in assessing their decisions, actions and thought processes about the scenario [9]. A trained and experienced osteopathy educator was the activity facilitator and responsible for facilitating discussions and providing the feedback. Students received detailed feedback from the facilitator (MD) as a group on the first two activities via the online classroom and individual written feedback on the final activity to enable them to reflect on the simulated consultation. The total facilitator costs of marking submissions and providing written and live feedback was approximately AUD\$360 (6 h) per scenario.

Student evaluation of the simulated learning activities

Students had the opportunity to evaluate each scenario with items grouped into three main areas: a) the case; b) the student's perception of the scenario assisting them in meeting the learning outcomes; and, c) the learning activities. Table 3 provides an overview of the student's feedback across these areas of interest. Fig. 1 outlines student feedback for each of the three cases. In summary, the student feedback was very positive with all students indicating they learnt from the SL activities. The most frequently reported challenge was related to downloading the large file videos (took a very long time to download).

Discussion

This case study provides an overview of the implementation of a simulated learning activity as part replacement for clinical placement hours in the third year of an Australian osteopathy program. Students completed a range of activities to enhance their clinical learning, and were facilitated by an experienced osteopathy clinical educator. Overall students found the experience to be positive and their feedback stated that it was a reasonable part replacement for their clinical learning at year 3 level.

There are a number of positives associated with the implementation of SL in the clinical learning environment. All students are exposed to the same case scenario and task with tailored learning outcomes. This enables a consistent clinical placement experience for all students and ensures that student can see a range of complaints. Educators are able to create typical and novel cases of a difficulty appropriate to the year level and ensure student exposure to cases with red flags or contraindications for consideration. Simulation can therefore be used as a 'bottom up' tool to embed a culture of safety oriented health care by ensuring students are exposed to this case mix ([2]; p. i6).

The use of SL scenarios may encourage development of clinical reasoning skills through the students' self-reflection, and reflection via facilitator and peer feedback [1]. Students received tailored

Table 3

Year 3 Student ratings of the online activities and scenario supporting them to meet the learning outcomes.

Area evaluated	Key impacts	Evaluation data to support this impact
The cases	Students reported a high level of satisfaction with the cases The filming of the scenarios can be improved	Fig. 1 demonstrates year 3 student evaluation of each of the three cases The student evaluation showed nearly half of the responses had a rating of strongly disagree, disagree or undecided. Focus group data also shows student frustration with some of the filming. Of the total data available the students either strongly agreed or agreed 85% of the time the learning outcomes were met. 11% of the responses from students relating to learning outcomes were a rating of 'Neutral or undecided'. Student feedback showed 90% agreement or strong agreement of the students being more comfortable after this simulated patient online activities.
The student's perception of the scenario assisting them in meeting the learning outcomes	Year 3 students mostly strongly agreed or agreed the learning outcomes were met through the online activities Students were occasionally unsure if the learning outcome was met after completing the activities	
The learning activities	After completing the online activities students are more confident in their management of the type of patient they saw in the case	

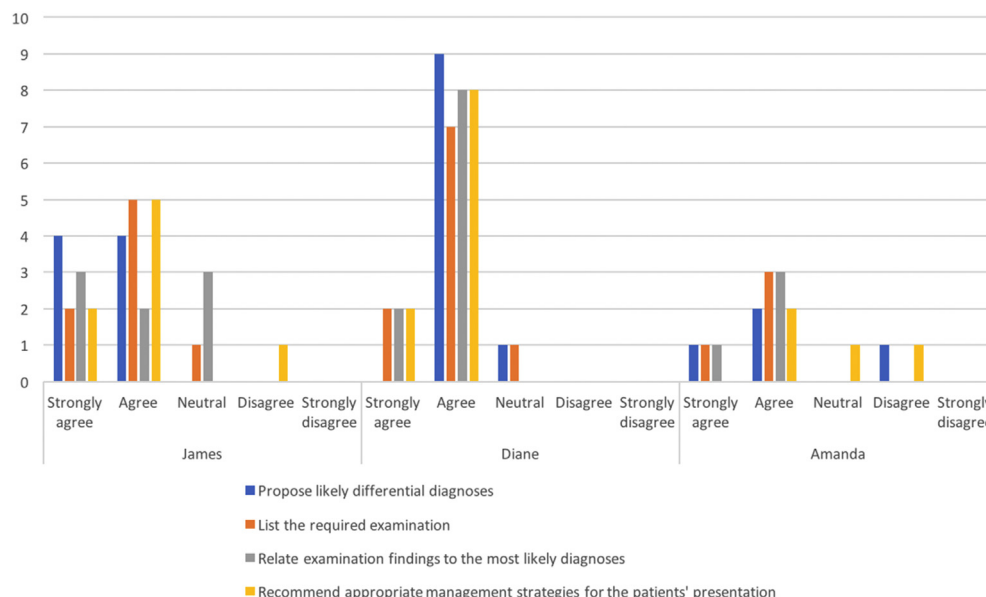


Fig. 1. Student feedback and evaluation of the simulated learning cases.

feedback after scenario 1 and 2 based on review of their written submissions by the facilitator which was focused on their reasoning skills and knowledge which may not be available in the traditional clinical education environment. SL scenarios in this case study also enabled easy and consistent assessment of the student skills via a series of short online quizzes, which are set to automatically mark and provide instant feedback to the learner.

Sustainability of resources is an imperative for organisations and individuals offering health professional education programs. SL provides an avenue to implement financially sustainable clinical education. The videos and LMS set up are reusable and easily editable to change the focus in future use and therefore are a sustainable resource requiring minimal cost for amendment after development. The online platform provides a flexible method for offering clinical placements with students able to access learning at their own time and pace, and therefore does not require the provision of teaching spaces. The development of the clinical scenarios in the present case study are scalable so there are opportunities to reduce the cost but potentially achieve the same outcomes. For example, students could be trained to portray scenarios, videos could be recorded on a smartphone/tablet, and open source learning management systems could be used to house the videos and related assessments.

There are a number of limitations with the development and implementation of SL in clinical education. Initial capital costs require some fixed and ongoing investment from the teaching institution. These include purchase of recording and editing equipment, potentially a licence to online learning platform (if the institution does not already have access), costs associated with simulated patients and osteopaths for the recorded scenarios, academic staff time in developing the simulated learning scenarios, and online set up. These costs per scenario in this project were AUD\$1700 per scenario. Ongoing costs would include funding of the facilitator to run the sessions and provide feedback to the students of approximately AUD\$360 per scenario for 10 students.

Therefore utilising this method of SL in osteopathy education for students in year 3 on a yearly basis would require a significant level of organisation and financial input. However with one facilitator per 10 students in a cohort of 100 for three clinical replacement sessions in a semester would still have a lower cost (~AUD\$9600 per semester) than providing traditional clinical supervision. Traditional clinical placements at VU would require approximately 10 students to be placed across 10 placement blocks per week, for an additional 3 weeks, with one supervisor per five students (~AUD\$19200 per semester). Online SL activities would also require less ongoing administrative organisation and provision of physical clinical space requirements and adequate patient numbers. Simulated learning can integrate targeted learning opportunities for these students so they are not simply observing the senior students consultations or even having limited engagement with their clinical placement. Students can also have a supplementary clinical experience that engages them in an array of carefully planned clinical interactions that develop their clinical reasoning in a safe environment. The development of realistic and achievable clinical scenarios requires time and planning to ensure they are authentic and meet the needs of the learner at the appropriate level.

Student engagement in simulated learning via a LMS may be a barrier to engagement. This case study recruited volunteers and it is possible the participants were proactive, motivated learners. There may be learners who find it more difficult to engage in the simulated learning activities when online compared to a physical clinical placement. That said, many clinical educators will have also experienced learners who do not engage in the traditional clinical placement so this difficulty is unlikely to be unique to simulated learning.

Conclusion

Simulated learning has received little attention in the osteopathy education literature to date. The approach outlined in this case study provides a sustainable method of addressing some of the challenges associated with planning and delivering clinical education in a low resource environment. The case study identifies that simulated learning activities as a part replacement of clinical placements in osteopathy education is of value for students because they are able to engage with a patient problem without navigating challenges of traditional clinical placement (scheduled attendance requirements at a physical clinic, adequate patient numbers and case mix exposure). Student feedback suggests these simulated learning activities may build critical practice skills such as identification of key history information, clinical reasoning and critical analysis outside the traditional clinical placement. How these skills translate into direct patient care is yet to be established and will be the subject of future research. The process to develop, implement and evaluate simulated learning used in the case study provides educators with a framework by which simulated clinical learning activities can utilised.

Conflict of interest

Brett Vaughan is a member of the Editorial Board of the International Journal of Osteopathic Medicine but was not involved in review or editorial decisions regarding this manuscript.

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Ethical approval details

This project was submitted to the Victoria University Human Research Ethics Committee (VU-HREC) in November 2015 and approved in February 2016.

HRE16-011: An evaluation of using video simulated patient (SP) video resources as a replacement for clinical placement hours in osteopathy students.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.ijosm.2017.10.003>.

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