Designing simulation learning experiences to reduce technological burden on nursing academics: a discussion paper

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KEY WORDS

simulation, nursing, satisfaction, medium fidelity, engaged

ABSTRACT

Objective
The literature reports nursing academics avoid manikin-based simulation because they feel intimidated by the technology. With that in mind we sought to design a manikin-based simulation learning experience for nursing students, with low technological burden for those nursing academics expected to work with the technology.

Setting
A multi-campus Australian regional university school of nursing.

Subjects
Nursing academics with little or no experience in manikin-based simulation.

Primary argument
Nursing academics are encouraged to use manikins in their clinical teaching but little has been done to address their fears and concerns around the technology. We argue that taking simple steps to decrease the technological burden will help to encourage nursing academics uptake of manikin-based simulations, as a favoured pedagogy in clinical teaching.

Conclusion
The technological burden around manikin-based simulation was reduced by: (1) choosing medium level fidelity simulations, (2) designing simulations where students operate the equipment, (3) preparing participants for the SLE with a pre-brief video and instruction handouts, (4) offering academics roles as observers, and (5) providing on-site technological support. Nursing academics were encouraged by the process and more inclined to engage with manikin simulations. Designing simulations that address nursing academics' fears and concerns around simulation technology encourages simulation uptake.

INTRODUCTION

Professional bodies and advisors involved in nursing education are placing greater emphasis on incorporating simulation based learning experiences (SLE) throughout nursing curricula (International Nursing Association for Clinical Simulation and Learning [INACSL] 2015; Rudd et al 2010; Benner et al 2009). In Australia and elsewhere, patient safety and limited opportunities for nursing students to have clinical experiences contributes to this demand (Bogossian 2016; Nestel et al 2014; Harder 2010; Rudd et al 2010). As most Australian universities have already invested in manikins for use in simulation, this places added pressure on nursing academics to use the manikins available rather than leave them 'laying idle' (Rudd et al 2010, p3). This may cause stress for those who are unfamiliar and intimidated by the associated pedagogy and technology because internationally, nursing research literature has reported nursing academics do not engage with manikin simulation equipment because they feel incompetent with simulation pedagogy and lack understanding of the manikins' technology (Hollema 2015; Rudd 2013; Blazeck 2011). In particular, nursing academics report they are fearful students will not engage or be satisfied with SLE when technological mishaps occur and they do not feel confident in their capabilities to troubleshoot or solve technological problems (Simes et al 2015; Blazeck 2011). Harder et al (2013) confirmed student satisfaction with manikin simulation learning is significantly impacted when simulation teaching staff lack technological expertise, and are not adequately prepared or supported.

Attempts to address these concerns have been reported. Coleman et al (2011) enlisted skilled SLE champions as support persons and found American nursing academics were more inclined to embrace high fidelity manikins with this support in place. Similarly, in North America, Anderson et al (2012) reported professional development in simulation to be effective when skilled simulation facilitators offer less skilled colleagues active learning with debriefing and feedback. Earlier, King et al (2008) also investigated ways of supporting American nursing academics with simulation. This team recommended one way to overcome barriers around computer manikin-based SLE is to provide increased technological support in the simulation laboratory. This strategy meant nursing staff could spend time focusing on facilitating the SLE, rather than becoming concerned with the technological aspects of the SLE. In the United Kingdom, Berragan (2011) found when nursing teachers were introduced to SLE, using lower fidelity equipment, the technological responsibility and the technological problems they were likely to encounter were reduced. More recently, in Australia, evaluations of a national professional development program, NHET-Sim, found employing simulation experts to facilitate workshops focussing on the equipment, the technology and the pedagogy, improved uptake, integration and quality of simulation into health curricula (Nestel and Bearman 2014). Thus, there is evidence that nursing academics are more likely to engage with manikin -based simulation when their fears and concerns are addressed and support is available.

DISCUSSION

After learning that nursing academics in our own multi-campus university were uncomfortable with the use of manikins for simulation, our research team secured a grant to design and evaluate a SLE aimed at addressing their concerns by providing pedagogical and technological support. Ethical approval for the study was obtained from the university ethics committee. Each member of the research team had undertaken NHET-Sim training and were experienced in scenario writing and other facets of simulation pedagogy. The literature was further perused for guidance on how to design the SLE. The required SLE design components, considerate of the student perspective and recommended by Australian and American simulation training and education institutes, were included such as; students' level of knowledge, needs assessment, setting learning objectives, creating scenarios to meet learning objectives, and debrief (Edlington et al 2014; Howard

et al 2013). However, consideration was also given as to how to help nursing academics become more comfortable in manikin SLE. We did this in our study by: (1) choosing medium level fidelity simulations, (2) designing simulations where students operate the equipment, (3) preparing participants for the SLE with a pre-brief video and instruction handouts, (4) offering academics roles as observers, and (5) providing initial on-site technological support.

Choosing medium level fidelity

The degree of fidelity was carefully considered. Fidelity is defined as the extent to which the simulation experience approaches realism and is determined by a number of factors such as environment, simulation equipment and learner engagement (Meakim et al 2013). High fidelity experiences are most desired because they are extremely realistic and provide a high level of interactivity and realism for the learner. One example is the computerized patient simulators or manikin. These manikins are operated with computer software and when manipulated by a human operator are capable of simulating bodily functions such as coughing, crying, bleeding and cardiac rhythms (Meakim et al 2013). Thus, when working with these computerised manikins, nursing academics must be familiar with the technology to enable effective operation and provide participants realistic experiences. Medium fidelity experiences also rely on computer-based systems and human-like manikins, and are capable of some level of realism for participants, but the operating systems and the computerised components are not as sophisticated (Meakim et al 2013). SimPads are an example of a medium level fidelity device. Erlam (2014) suggested SimPadTM are easier to use because the technology resembles smartphones and tablets, and is familiar technology to most people.

Students operate the equipment

The technological burden was further reduced for the nursing academics because the student nurses participating in the SLE were given roles that required them to control the SimPadTM technology. In a study of New Zealand undergraduate nurses participating in manikin simulation for the first time Erlam (2014) designed SLE by relying upon traits of the contemporary millennial learner. Millennial learners make up the majority of numbers in higher education classrooms and they are known to be technologically savvy, unaverred by technological troubleshooting and able to multitask whilst also taking command of technological equipment (Prensky 2013). Prensky (2013) further explained millennial learners learn best by doing, all the while looking for immediate gratification from, and feedback on, their performances. Erlam described nursing students “flocking in droves” to the manikin SLE featuring technology, not dissimilar to their smart phones, and “requesting more” (Erlam 2014, p13). Thus, with this in mind and in addition to findings from the literature review, we designed a medium fidelity SLE using full-size, life-like manikins connected to a Laerdal SimPadTM.

Pre-brief instructional handouts and video

To further reduce the technological burden for academics and students, instructional handouts explaining the scenarios and the equipment, were created and made available online before the SLE, using the university online teaching platform, Moodle. Laminated copies of the handouts were also placed at the bedsides, in the simulation ward, for use during the SLE. The scenarios created for the SLE were designed to be completed by groups of 4-5 nursing students. Each scenario comprised five roles (SimPadTM device operator, nurse, physician, observer and patient’s voice for the manikin) and focused on assessing nursing students’ capabilities in pain assessment, communication, hand washing, medication administration, recognition of deteriorating patients and basic life support. The length of time given to complete the scenario enabled nursing students to experience the scenario from multiple perspectives as they rotated through the roles. This also gave the students time to become familiar with the equipment. Thus, nursing academics’ responsibilities around the technology was minimal.

To further reduce technological concerns and support the nursing academics' understanding of the pedagogy, a 20-minute, real-to-time video was developed to inform the pre-brief stage for both the student cohort and the participating nursing academics. The video portrayed three volunteer nursing students participating in a medium fidelity manikin SLE for the first time. Prior to making the video the students attended a pre-brief session and were orientated to the environment, the equipment and the manikin. The video showed the students utilising the laminated instructional handouts and demonstrating how to operate the equipment, as they completed one scenario. The video captured the nursing students troubleshooting and resolving technological incidents. These incidents were indicative of the typical challenges the students might encounter with the manikin and the hand-held device. The incidents were resolved when the students referred to the laminated instruction guide or followed the prompts on the hand-held devices. This video did not require editing, attesting to the usefulness of the laminated handouts and the pre-brief students had attended. The video was circulated to the participating student cohort and all nursing academics in the school, two weeks prior to the scheduled SLE, in an effort to address any fears or concerns about the equipment or the activity.

Offering observer roles

In the days prior to the SLE taking place, nursing academics, inexperienced in SLE, were invited to participate in the SLE as passive onlookers and asked to report their observations of the SLE to the research team. Four nursing academics accepted. These nursing academics participated in a special workshop style pre-brief, facilitated by the research team members and designed to introduce the pedagogy and address the nursing academics' concerns around equipment technology. During this pre-brief, the nursing academics engaged with the manikin and the SimPadTM as they rotated through the scripted roles in the SLE scenarios. This pre-brief mimicked the pre-brief offered to the volunteer nursing students, with slightly more information around simulation pedagogy.

Initial on-site technological support

On the day of the SLE, the four nursing academics were asked to present to the simulation laboratories one hour before the nursing students arrived, for another pre-brief. During this repeat pre-brief the nursing academics were again invited to interact with the manikin, the SimPadTM device, and the SLE scenarios to address any final concerns or questions arising from the initial pre-brief. When the nursing academics indicated they were satisfied and comfortable to proceed, they were orientated to their roles as passive onlookers.

Nursing academics' first impressions

The research team invited the nursing academics to share their observations of the SLE. Informal conversations took place between the two SLE facilitators and the participating nursing academics to discover their first impressions, experiences and perceptions of the SLE. The nursing academics each verbalised they would be interested in adopting the medium fidelity manikin SLE in their teaching. They reported the introduction to medium fidelity manikin SLE in this way was beneficial. In particular, the support provided by the more experienced simulation facilitators alleviated their fears as they did not feel burdened by the simulation pedagogy or technology. Their observations of nursing students' engagement with the SLE, and also the nursing students' ability to troubleshoot minor problems independently, was a motivating experience for these nursing academics. They found the video especially helpful because it introduced them to the pedagogy in advance of the actual experience, giving them time to reflect and prepare for the actual experience. Thus, the nursing academics who participated in the SLE were encouraged and enthusiastic about engaging with medium fidelity manikin SLE because of all the steps that prepared them for the experience. This anecdotal feedback was later used to plan the focus groups that were conducted in other phases of the project (O'Neill et al 2016; Simes et al 2015).

Looking to the future

The nursing academics' reflections, and the previously reported high student satisfaction with this SLE (Curtis et al 2016), suggest that reducing the technological burden and providing support resulted in a positive experience for both students and nursing academics. The SLE was designed to address academics' fears around technology from the onset. Resources were provided for their preparation and on the day they were freely able to engage with or observe the SLE as recommended by others (Anderson et al 2012; Coleman et al 2011; King et al 2008).

The choice of a medium fidelity simulation also helped to decrease technological burden. Berragan (2011) had suggested using lower fidelity SLE may reduce nurse teachers' technological capabilities required for successful simulation experiences and this was the case in this project. With medium fidelity manikin SLE, like the one used in this study, nursing academics facilitating the simulations are relieved of the burden of high technological expertise associated with computerised manikins. The burden on nursing academics is further relieved when students are given control of the equipment and in this SLE students managed minor troubleshooting of the equipment easily perhaps because it is not unfamiliar to them (Curtis et al 2016; Erlam 2014). Harder et al (2013) cautioned faculty must feel supported and undergo adequate preparation. Without such preparation, including technological support, they may not offer students worthwhile and effective learning experiences. In the SLE presented here, nursing academics received support, with the technology and the pedagogy, prior to and during their initial experiences with medium fidelity manikin SLE.

Subsequent to this study and based on the student evaluations there has been increased interest in using medium fidelity manikin SLE's amongst this university's nursing academics. A new curriculum has been designed featuring high and medium fidelity manikin based SLE's in most clinical courses (CQ University 2015). At this university, the scenarios are banked in a central digital repository to further support the usage of SLE. The digital repository also contains simulation information and resources to encourage and support uptake (O'Neill et al 2016).

CONCLUSION

Nursing academics wanting to prepare and provide engaging and worthwhile manikin SLE for undergraduate nursing students, with a focus on delivering quality teaching, benefit when the technological burden is lessened. This type of support is needed as more and more pressure is put on them to embrace simulation and, in particular, manikin based SLE as a favoured pedagogy for teaching clinical skills in nursing.

RECOMMENDATIONS

Since some nursing academics feel burdened by the technology around manikin-based simulations we recommend steps, like the ones taken in this study, are followed to help alleviate their fears and concerns. We also recommend that there be further research into alternative ways to reduce technological burden when designing manikin based SLE. This would serve to ascertain ongoing increased uptake and nursing academics' impressions of implementing this kind of manikin simulation learning experience. Finally we recommend longitudinal studies to further explain students' learning and academics evaluations of utilising SLE where technological burden has been greatly reduced for the nursing academics.

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