What can virtual patient simulation offer mental health nursing education?

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Accessible summary

- Simulation has become a valuable educational tool with a variety of devices available for use.
- Examples of simulation scenarios developed especially for use with psychiatric and mental health nursing students are scarce.
- A simulation technique with considerable potential for the teaching and learning of essential mental health nursing skills is the narrative virtual patient.
- Wider use of virtual patient tools would help establish if it is a viable educational device.

Abstract

This paper discusses the use of simulation in nursing education and training, including potential benefits and barriers associated with its use. In particular, it addresses the hitherto scant application of diverse simulation devices and dedicated simulation scenarios in psychiatric and mental health nursing. It goes on to describe a low-cost, narrative-based virtual patient simulation technique which has the potential for wide application within health and social care education. An example of the implementation of this technology in a web-based pilot course for acute mental health nurses is given. This particular virtual patient technique is a simulation type ideally suited to promoting essential mental health nursing skills such as critical thinking, communication and decision making. Furthermore, it is argued that it is particularly amenable to e-learning and blended learning environments, as well as being an apt tool where multilingual simulations are required. The continued development, implementation and evaluation of narrative virtual patient simulations across a variety of health and social care programmes would help ascertain their success as an educational tool.

Introduction

The use of a wide variety of simulation techniques is a growing phenomenon within nursing education and training. It has, however, been noted that there is a comparative lack of reported examples of simulation implementation within mental health nursing (Nehring & Lashley 2004). A review conducted by Brown (2008) concluded that there are ample opportunities for expanding the implementation of simulation in psychiatric and mental health nursing and called for educators and researchers to share their experiences of the use of simulation technologies within this branch of nursing to promote and expand further use. This paper looks at the specific possibilities offered by virtual patient (VP) technology, which can be defined as technology that enables and supports interactive computerized clinical simulations. It has been noted that there is a shortage of VP simulation scenarios constructed for use within
online and blended learning environments.

In an effort to encourage wider development and implementation of VP and other simulation within mental health nursing education and training, this paper briefly discusses rationales for and benefits and barriers associated with its general use. It then goes on to look at the application of various simulation techniques within psychiatric and mental health nursing. In particular, the potential uses of VP technology within this branch of nursing are considered by giving an example of the application of a specific narrative-based VP simulation technique a pilot online course for European mental health nurses. The prospective role VP simulation tools can have in fostering essential skills among psychiatric and mental health nurses will be discussed, particularly within the context of multilingual online and blended learning environments.

The use of simulation in nursing education and training

In the broad context of medical and healthcare education, simulation is regarded as a technique, device or activity that aims to authentically recreate, imitate or amplify characteristics, processes and experiences of the real world for the purposes of teaching, acquiring and assessing knowledge, skills and attitudes. Simulation types include: paper and pencil or video-based case studies and vignettes (Johannsson & Wertenberger 1996, Chau et al. 2001); anatomical models and part task trainers (Nehring & Lashley 2009); games (White & Davis 1987, Royse & Newton 2007) and computer-based systems (Giddens 2007); role play with simulated or standardized patients (SPs) and environments (Shawler 2008, Zavertnik et al. 2010); and integrated or full-scale simulators such as human patient simulators (HPSs) (Nehring et al. 2001, Nehring & Lashley 2004). Each approach is usually associated with the teaching and learning of a specific skill type that maximizes its potential as an educational tool (Nagle et al. 2009). During a simulation exercise, students must suspend disbelief to take on the given role of a healthcare professional. They have responsibility for the assessment, care and/or treatment of the ‘patient’, as they would in the real world (Campbell & Daley 2009).

The application of some simulation devices has been traced as far back as the 19th century (Nehring & Lashley 2009). Modern simulation types were, however, introduced relatively recently, following ground-breaking training for resuscitation and anaesthesia practitioners in the 1960s. Since then, ongoing technological developments, pedagogical advances and significant changes in healthcare services have all contributed to the now increasingly common use of simulation techniques for the imparting of clinical knowledge and skills (McCallum 2007, Murray et al. 2008, Nehring & Lashley 2009). A combination of staffing shortages, fewer clinical placements, higher patient acuity, shorter length of patient stay and an increase in patient-to-staff ratios have all resulted in students’ limited exposure to patients in the clinical environment (Tanner 2002, 2006, Seropian et al. 2004).

This lack of direct contact with patients means that reliance upon traditional teaching methods, where reflection in clinical practice is a major means of imparting critical thinking and decision-making skills, has become increasingly problematic (Garrett & Callear 2001, Henneman & Cunningham 2005, Tanner 2006). In an environment with an ever increasing focus on quality, safety and personal accountability across healthcare services (Campbell & Daley 2009), cost-effective and safe skills acquisition through simulation has come to be considered a valuable adjunct to traditional teaching approaches like clinical placements and internships (Campbell & Daley 2009, Berragan 2011).

The rationale for simulation and its benefits to teaching and learning

Simulation is underpinned by adult learning principles, often drawing on learners’ critical reflection on own actions and experiences (Waldner & Olson 2007, Peddle 2011). A well developed simulation tool is usually founded on a view of learning as a dynamic, active and reflexive process, where the focus is as much on the importance of professional identity construction as attainment of skills (Berragan 2011). The benefits of simulation are many. Simulation enables deliberate, standardized practices ensuring that targeted learning tasks are addressed (Ker & Bradley 2007). It also allows students to practise and repeat procedures as needed and at their own pace to gain confidence and proficiency (Ziv et al. 2003). The underlying principle of active learning encourages self-directed and self-motivated learners to make connections between and among concepts (Jeffries 2005). One of the biggest benefits of simulation, however, is that it can provide immediate feedback on performance. This is essential to successful learning as it helps learners integrate new skills and recognize the consequences of decision making (Issenbern & Scalese 2007, Nagle et al. 2009).

Simulation is also an especially valuable tool in helping to promote the knowledge and skills necessary for ethical practice (Ziv et al. 2005, Ker & Bradley 2007). It may not always be practical or safe for nursing students and inex-
experienced nurses to be involved in complex or acute clinical care situations. Through the use of simulated scenarios, students can safely make mistakes and learn the implications of failure without the burden of liability, blame or guilt (Ziv et al. 2003). Importantly too, as Campbell & Daley (2009) argue, simulation techniques are ideal for integrating theoretical knowledge and practice, encouraging critical reflection and decision making. Nursing accreditation bodies such as the Nursing and Midwifery Council in the UK currently recommend that simulation become fully integrated into undergraduate nursing curricula to help facilitate this link between theory and practice (Nursing and Midwifery Council 2007).

Barriers to the use of simulation

The widening application of simulation to clinical nursing skills training is an indication that simulation as an educational tool is starting to overcome some of its early hindrances, such as a lack of guidance on how to incorporate simulation into educational programmes (see, e.g. Roberts et al. 1992). Some barriers remain however, including a lack of a more comprehensive theoretical framework to support and guide the use of simulation in nursing, as well as a lingering lack of conclusive empirical evidence on its impact (Waldner & Olson 2007, Schiavenato 2009). It is also acknowledged that some simulation tools are expensive and time-consuming to develop, implement and/or maintain and that this prohibits wider use (Conradi et al. 2007, Nehring & Lashley 2009). In addition, not all students are comfortable with the active learning principles underpinning simulation and may prefer more traditional teaching methods (Royse & Newton 2007, Peddle 2011).

Further, it has been argued that there is an overall poor understanding of the purposes and potential directions of simulation, in addition to lacking expressions of expected goals and outcomes of its use (Schiavenato 2009). Brown (2008) notes, however, that the provision of new examples of the use and effectiveness of simulation will go a long way towards overcoming some of these obstacles. This is especially pertinent within mental health nursing education and training, as this is a branch of nursing that has traditionally lacked dedicated simulation scenarios and technologies.

Use of simulation in mental health nursing

The noted dearth of examples of the use of simulation in education and training targeted at psychiatric and mental health nursing is surprising, considering that some elements of psychiatric nursing are particularly suited to simulation activities (Brown 2008). Simulation has been used to foster many competencies fundamental to contemporary mental health nursing, including skills essential for reflective and integrative practice relevant to complex crisis management, de-escalation capabilities and the therapeutic use of self (Edward et al. 2007, Brown 2008).

Specific examples of skills needed in mental health nursing that have been fostered through the use of simulation devices include critical thinking skills (Johannsson & Wertenberger 1996, Weis & Guyton-Simmons 1998, Chau et al. 2001, Rush et al. 2008), communication skills (Donovan et al. 2003, Zavertnik et al. 2010), decision-making skills (Lowdermilk & Fishel 1991, Wong et al. 1992, Garrett & Callear 2001), self-efficacy (Madorin & Iwasiw 1999, McConville & Lane 2006), confidence (Jeffries 2005, Tiffen et al. 2009) and cultural competency (Rutledge et al. 2004, 2008). Considering these applications, simulation has the potential to be a valuable tool for competency training and rehearsal for current mental health nurses, as well as being a useful means of recruiting more students into this branch of nursing (Edward et al. 2007). Ultimately, the incorporation of simulation in psychiatric nursing education could help ‘dispel the common misperception of the [mental health nursing] specialty as oversimplified and lacking standards or objectivity’ (Brown 2008, p. 640).

Brown (2008) argues that the simulation techniques best suited to learn and practise core mental health care competencies are HPSs, simulated or standardized patients and virtual scenario tools, including VPs. Often however, scenarios are not developed for dedicated use with mental health nurses or nursing students. Reported use of HPSs is scarce among mental health nurses and likely linked to the fact that many simulation scenarios are originally developed for the training of competencies related to physiological assessments and interventions (Nehring & Lashley 2004, Medley & Horne 2005). Indeed, there are no standardized psychiatric nursing scenarios developed for use with HPSs (Brown 2008). Despite this lack of standardized HPS scenarios, the technology has been used by mental health nurses to practise care management and therapeutic communication skills (Sleep & Thompson 2008, Hallmark & Folds 2009), although it is noted that HPSs are unable to simulate the non-verbal communication essential to mental health nursing (Brown 2008).

Traditionally therefore, SPs have been the simulation type most often used to teach mental health nurses more comprehensive communication skills (see, e.g. Festa et al. 2000), alongside various assessment and diagnostic skills (Shawler 2008, Meakim 2009). Role playing with SPs continues to be widely used within mental health nursing (Nehring & Lashley 2009), despite some criticism for their lack of diversity (Parsons et al. 2008b). Standardized patient scenarios have extended into the virtual world by being used
Virtual patients

In the context of the online or distance learning environment, VPs are ideal simulation tools. A VP is an interactive computer-based simulation of a real-life clinical case scenario, where learners take on the role of a healthcare professional and make judgements and clinical decisions regarding the assessment, diagnoses, treatment and therapeutic care of the VP in the same way they would with a real-life patient based on continual information given during the simulation scenario (Ellaway et al. 2006).

Essentially therefore, VP simulations are case-based educational computer games where the user progresses through a range of steps in one or more pre-programmed pathways by applying clinical knowledge and critical thinking skills to make care and treatment decisions (Conradi et al. 2007). The use of games as well as computer-assisted instruction in nursing education is not new (Nehring & Lashley 2009, Peddle 2011), but examples pertaining to mental health nursing are again lacking. Royse & Newton (2007) note that in addition to encouraging active learning and critical thinking, games have been found to increase retention of knowledge, promote problem-based learning, and enhance student motivation and enthusiasm for learning. A review by Blakely et al. (2009) found that games are equally as effective for student learning as traditional didactic teaching methods.

In general, widespread use of VPs has been negatively impacted by their traditional image as technically complex, time-consuming and costly to develop (Conradi et al. 2007). The introduction of simpler, low-cost development methods is, however, contributing to VPs becoming increasingly prolific teaching tools. There are currently a number of differing approaches to VP design and development (Round et al. 2007, Posel et al. 2009), with a vast array of possible case structures and multimedia applications. Fundamentally however, it is the scenario to be simulated that is at the centre of this teaching and learning tool, and an educationally effective simulation scenario must be designed with specific learning needs and teaching objectives in mind (Beaubien & Baker 2004, Nehring & Lashley 2009).

One example of a VP simulation that is particularly amenable to the teaching and rehearsal of mental health care scenarios, and which is reasonably cheap and quick to produce, is the narrative-based VP type described by Conradi et al. (2007) and further developed by Round et al. (2009). Narrative VPs are constructed around a narrative clinical case scenario. They have a branching case structure, which means that there are several alternative pathway options through the case. This is in contrast to VPs with a linear case structure where there is only one possible way through. The branching model is particularly useful for learning critical decision-making skills, as the path of the case changes dependent on inputted student decisions (Cook & Triola 2009). Case-based instruction also aids the formation of critical thinking and decision-making skills by increasing the visibility of clinical reasoning processes (Thomas et al. 2001). The central focus of the narrative VP development process is thus on the authoring of an authentic clinical case scenario, centred around a realistic narrative and the creation of a large but limited amount of possible decision pathways through the case. These include the ideal pathway containing the essential stages of the case as well as alternative paths through the scenario.

Narrative feedback at each step along the pathway links each potential care decision to another. This means that those playing the scenario base each care decision on the narrative feedback received at each step. If at any stage an adverse choice is made, the scenario either ends or allows a reconsidered choice based on the feedback given. A narrative case structure is fundamental to learning as it contextualizes the learner’s role within the scenario by giving a framework for the consequences of the decisions the learner makes throughout (Ellaway et al. 2008). A narrative structure also brings an emotional dimension to the given educational task, which is important to encourage communication and interactive skills (Bearman & Cesnik 2001, Bearman et al. 2001). In addition, a narrative framework can foster cultural sensitivity, empathy, self-esteem, critical thinking and ethical insight (Giddens 2007).
An example of virtual patient application in mental health nursing

The narrative VP type described above is arguably particularly suited to teaching realistic decision making in addition to being ideally suited to online teaching and learning environments (Conradi et al. 2007) and for cross-cultural and multilingual purposes (see, e.g. eViP 2011a). It was thus deemed an ideal simulation type to incorporate into a multilingual pilot e-course where the overall aim was to encourage critically aware, non-coercive practice among mental health nurses caring for acutely distressed and disrupted service users (ePsychNurse.Net 2010). A total of 13 nurses completed the pilot.

Examples of the interface of one of the virtual mental health patients developed for the course can be seen in Figs 1 and 2. The case features a scenario where students take on the role of the mental health nurse and are presented with a variety of choices of action to resolve a potentially adverse situation involving a distressed service user, by making ethically sound and therapeutically appropriate care decisions. Figure 1 shows the introduction to the narrative scenario with the choices of potential first actions. Figure 2 is an example of a possible subsequent step in the branching scenario with associated narrative feedback and further actions presented. The pilot e-course, hosted in Moodle (2011), featured two such scenarios developed for two separate course units, each focused on a specific aspect of patient care relevant to the units’ respective desired learning outcomes.

This narrative VP type is particularly suited for use in multilingual and cross-cultural learning contexts. As noted, this is because any existing VP scenario can be easily repurposed to accommodate new languages, cultural or educational settings, professions or disciplines (Ellaway et al. 2008, eVIP 2011b). The VP scenarios described here were developed for use by a cross section of European nurses simply by translating the original English scenario texts into four other languages. However, to help ensure their cross-cultural applicability, both scenarios were carefully
constructed to avoid reference to any culturally bound care practices. Non-coercive practices considered ethical and therapeutic across Europe were encouraged instead.

The development process for this scenario was based on Huang’s (2005) framework for educational multimedia tool production and featured the aforementioned VP authoring model described by Conradi et al. (2007) and refined by Round et al. (2009) to produce branching VPs that are programmed and accessed via the OpenLabyrinth platform (OpenLabyrinth 2007). The development process and the VP implementation within the e-course will be described in more detail elsewhere (V. Guise, unpubl).

There has hitherto been scant evidence to support the use of VP techniques in healthcare education (Conradi et al. 2007), a problem they share with simulation tools in general (Murray et al. 2008, Harder 2010). There are indications, however, that students consider online problem-based learning VP scenarios more educational than paper-based problem-based learning cases (Poulton et al. 2009). In addition, data suggest that VPs match the educational outputs of SPs. A randomized trial found that VPs were equally as effective as SPs for the teaching of clinical skills and knowledge (Triola et al. 2006).

Stevens et al. (2006) argue that VPs offer several advantages over SPs in the teaching of communication and clinical assessment skills by providing opportunity for extensive repetitive student practice with feedback in a controlled, secure and safe environment, without real-life consequence to a SP or indeed a real patient. Some studies have found that for skills with an affective dimension students prefer to practise with people face to face (Bearman & Cesnik 2001, Cook & Triola 2009). The development and implementation of more VP scenarios will allow for further research and evaluation into whether or not certain skill types are best taught via particular simulation devices; this is currently unknown (Landeen & Jeffries 2008, Schiavenato 2009).

**Discussion**

The type of narrative VP simulation described here has the potential to become a valuable teaching tool within
psychiatric and mental health nursing, a nursing specialism that has traditionally lacked both dedicated simulation technologies and scenarios. The narrative VP is a technology particularly suited to training clinical decision making, by putting the learner in charge of the decision-making process. In addition, as a simulation device where the underlying case scenarios have a narrative structure, it provides a meaningful, affective context for learning. Essential nursing skills such as cultural sensitivity, empathy, self-esteem, ethical insight, critical thinking and communication skills are thus promoted.

Narrative VP simulation is therefore a valuable means of rehearsing knowledge and skills necessary for sound practice prior to exposure to the clinical environment. This is of considerable benefit as it is not always practical, safe or ethical for nursing students or inexperienced nurses to be involved in complex care situations in the clinical setting. Virtual patients are also ideally suited to the online teaching environment, and, as both e-learning and blended learning courses become increasingly prolific, sound simulations amenable to the online environment will become increasingly crucial teaching tools. In addition, the relative ease of transference across cultural and linguistic settings means that this tool has significant cross-cultural teaching benefits.

Despite the many potential pedagogical and practical benefits of VP simulation described here, there is a continuing lack of reported research into its effectiveness as a teaching and learning tool and its impact on practice, particularly in a long-term context. Such research is thus much needed. According to Giddens (2007), an overall evaluation strategy should include broad effectiveness testing with reference to a diverse number of both educational and clinical applications and settings, investigations of which pedagogical strategies enhance and optimize learning, and additional studies of student and staff perceptions of this particular educational tool. In addition, there needs to be further exploration of whether some skill types, for example those with an affective dimension, are best taught and learnt via certain simulation devices or not.

To be able to undertake such comprehensive testing and evaluation of the uses, benefits, weaknesses and outcomes of narrative VP simulations within a range of education and training settings, more cases must be developed and implemented across a wide field of healthcare specialties, not merely within psychiatric and mental health nursing. This requires that nursing and other healthcare faculty have not only the skills and knowledge necessary to do so, but also the motivation and support to use the technology available to them. It has been acknowledged that the wider use of web-based teaching tools such as VPs first and foremost necessitates a considerable change in conventional teaching practices, a change that may be hard for faculty to make, even with the right tools in place (Giddens 2007). What is clear is that new generations of students who have grown up with technology are likely to expect such learning methods as standard practice. Nursing educators therefore need to engage with the technology in creative ways to produce the type of learning experiences students will increasingly come to anticipate. Consequently, resources need to be focused on instilling teachers, as well as students, with the knowledge and confidence to best utilize the technologies and associated pedagogies once they become available to them.

To facilitate the development and implementation of increased and better quality scenarios and tools for future VP simulations, fruitful collaboration between nursing educators and information and communications technology staff such as e-learning technologists needs to be encouraged. Meaningful cooperation among nursing faculty interested in developing and implementing these technologies will also go a long way to support development, implementation and evaluation of a variety of e-learning tools. Wide-ranging evaluation research must, however, help direct how these new teaching and learning tools are developed and applied.

**Conclusion**

Narrative VPs can offer mental health nursing educators a relatively low-cost type of simulation tool that allows for dedicated computer-based training scenarios to enhance essential nursing skills and knowledge. The applicability of this simulation type extends beyond the realm of mental health nursing education. Potential use is also envisaged within other groups of medical, health and social care professionals who come into contact with mental health service users, particularly accident and emergency staff, social workers and the police. The continued implementation and evaluation of this and similar VP technology, within a variety of health and social care courses and training programmes, will help to further establish its appropriateness and effectiveness as an educational tool.

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