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Summary

This study explores the impact of simulation upon learning for undergraduate nursing students. The study objectives were (a) to explore the experiences of participating in simulation education for a small group of student nurses; (b) to explore learning through simulation from the perspectives of the nursing students, the nurse educators and the nurse mentors. Conducted as a small-scale narrative case study, it tells the unique stories of a small number of undergraduate nursing students, nurse mentors and nurse educators and explores their experiences of learning through simulation. Data analysis through progressive focusing revealed that the nurse educators viewed simulation as a means of helping students to learn to be nurses, whilst, the nurse mentors suggested that simulation helped them to determine nursing potential. The students' narratives showed that they approached simulation learning in different ways resulting in a range of outcomes: those who were successfully becoming nurses, those who were struggling or working hard to become nurses and those who were not becoming nurses. Theories of professional practice learning and activity theory present an opportunity to articulate and theorise the learning inherent in simulation activities. They recognise the links between learning and the environment of work and highlight the possibilities for learning to inspire change and innovation.

Background

A systematic review of nursing simulation literature and its use of learning theory by Kaakinen and Arwood (2009) concluded that for simulation to foster student learning, there must be a fundamental shift from a teaching paradigm to a learning paradigm. They also suggested that foundational learning theory should be used to design and evaluate simulation. In a systematic review of simulation based learning in nurse education, Cant and Cooper (2010) established that 'simulation enables nurses to develop, synthesize and apply their knowledge in a replica of real experience' (p.13). They support the views of Levett-Jones and Lapkin (2012) emphasizing the role of feedback in simulation and the opportunity it affords students to learn.

Simulation has become an established pedagogy for clinical nursing skills (Berragan, 2011, 2013), offering students the opportunity to learn fundamental nursing skills in a safe environment, which closely represents reality (Linder and Pulsipher, 2008). Jeffries (2005) describes it as an active learning strategy where the learner is central to the activity, and the role of the educator is to facilitate learning and encourage students to demonstrate self-motivation and direction. Bland et al., (2011) and Robinson and Dearmon (2013) accept the active nature of learning which is offered through simulation. They highlight further opportunities presented by this approach in terms of alternative and complementary responses to the challenge of securing consistent learning opportunities in clinical practice, and the adoption of simulation as an attractive alternative strategy in many universities.

Leigh (2008) supports the use of simulation for helping students to feel more confident and competent in performing clinical work. However, self-confidence and self-efficacy are only part of the learning picture. Other aspects of learning include conceptual knowledge and skill development. According to Jeffries (2005) simulation is used to facilitate ‘connections between and among concepts and engage students in the learning process’ (p. 99). Leigh (2008) takes this further suggesting that simulation offers a safe learning environment for the translation of classroom knowledge. This notion of translating knowledge is captured by Robinson (2009) who states that the best theoretical or practical approaches to achieving learning outcomes in nursing depend upon elements such as subject matter, learning style preferences, and multiple other instructor and learner variables. It is this view of translating theory into practice, and thus enabling students to learn nursing which appears to unite authors in their descriptions of simulation. Macedonia et al., (2003) and Mills et al. (2013) defend the role of simulation, celebrating its potential for learning how to make sound decisions in unpredictable health care situations that are time-sensitive and require critical thinking and advanced skills.

In the controlled learning environment of the simulation suite (Jeffries, 2005) students are supported as they learn the skills of nursing assessment, react to

changes in their patient's health and prioritize each patient's care needs without exposing real patients to risk (Moule et al., 2006; Robinson and Dearman, 2013). In comparison to the intensity and pace of the clinical learning environment, learning through simulation takes place at a measured pace in order to meet individual learning needs (Reilly and Spratt, 2007), where activity can be halted in order to explore knowledge and understanding, where feedback can be given and tacit knowledge articulated (Eraut, 2000).

These are all very positive views of simulation and the contribution that it can make when included in an undergraduate nursing curriculum. It is evident that a number of researchers acknowledge that simulation offers potential as a learning pedagogy. However, Brown and Chronister (2009) and McCaughey and Traynor (2010) advise caution warning that simply including simulation within a curriculum is not sufficient to guarantee learning. Analysis of the simulation literature suggests that there is a dearth of empirical research focusing upon the efficacy of simulation. Critics of simulation emphasize the potential for simulation learning to be 'intimidating' and even 'fearsome' for some learners (Lasater, 2007; Lundberg, 2008), thus inhibiting their ability to learn in this environment. Questions have been raised about the transferability of simulation learning to practice (Haigh, 2007; Murray et al., 2008; Gordon et al., 2013). Prion (2008) highlights the difficulty in obtaining evidence of learning having taken place during simulation, given that such evidence would require the demonstration or observation of change in a learner's behaviour.

Methods

This was a small-scale narrative case study which focused upon participants who were engaged in simulation activities in order to learn, facilitate or support learning of fundamental nursing skills. The participants were full time first year undergraduate students (n=9) undertaking the RN BSc (Hons) Adult Nursing programme, nurse educators (n=3) who facilitated simulation sessions and registered nurse mentors (n=4) who supported students in practice.

Students were given the opportunity to take part in small group, lecturer facilitated simulation sessions at the University. These sessions were timetabled for two hours on eight occasions introducing the students to a variety of clinical nursing skills at the beginning of their adult nursing programme. Each session would require the students to interact with each other and plan and deliver fundamental nursing care using case studies to provide context and background to their patient (in this case SimMan or a member of academic staff). Opportunities for informal drop in sessions were also provided to enable students to rehearse their skills. The simulated learning environment was also used as a means to assess students' learning outcomes through OSCE. The formative OSCE took place prior to commencement of their first adult nursing practice placement. The summative OSCE took place at the end of year one, just before the first summative assessment in the practice placement setting.

Ethical approval for the study was sought and granted from the Research Ethics Committees of the University and the Foundation Hospital Trust where the students were placed.

Collecting data

Semi-structured interviews conducted by the researcher took place at the end of the academic year (after formative and summative OSCEs and during the second practice placement) at the convenience of each participant and were arranged by telephone and via e-mail. Examples of questions and prompts used are illustrated in Figure 1. The interviews were tape recorded and transcribed verbatim. In addition to reflective notes made by the researcher following each interview, the students gave permission for the researcher to watch video recordings of their simulation experiences and OSCEs, and to read extracts of their reflective accounts written about simulation experiences. Whilst the main focus of data collection was the interviews, supplementary information from the students' reflective diaries and the video-recordings helped to inform the study (Figure 2). This so called 'triangulation' of different methods of data collection (Denzin and Lincoln, 2005; Flick, 2009) provided additional perspectives of simulation experiences.

Analysing the data

Transcription of each interview recording followed by reading and re-reading of the transcripts allowed the tracing of emerging narrative themes between each participant group (students, mentors and educators), and over the whole set of interviews for all participants. In order to reduce and make sense of the data and move towards generation of issues, themes and patterns, progressive focusing (Parlett and Hamilton, 1972) was employed. This involved three stages – making initial sense of the data, reducing data to issues, themes or areas for further exploration, and explanation. Validation of analysis was sought and achieved with the assistance of a number of the participants, experienced colleagues and the researcher's supervisory team (Figure 3). As well as providing a strategy to ensure accurate representations of the participants views and experiences, this also went some way to addressing aspirations to give equal voice to all of the participants and create a sense of balance between the researcher and the participants in the process of the research.

Results

The Nurse Mentors

The nurse mentors viewed simulation as a means of recognizing nursing potential and identifying students who were becoming good nurses. Their perceptions and views of simulation emphasized the benefits of simulation for the safe supervised practise of nursing skills in preparation for the challenges of caring for patients in different environments (Robinson and Dearman, 2013). One mentor saw the potential of simulation to identify good nurses.

Simulation helps ... Students who are confident think about what the observations really mean ... they look at the patient and if it is a 90 year old lady who has had a number of strokes, they understand that blood pressure measurement is important and that we need to use the obs [observations] to make sure that the medication is working.

(nurse mentor – 21, 4.)

Similarly, another recognised the benefits of simulation promoting confident nursing performances for good students (Leigh, 2008) and offering supportive learning opportunities for weaker students:

They learn to talk to the patient, to gain their trust, to try to calm them a bit if they are unsettled and that's really important. Good students can do that. The weaker students have more problems often getting into a tricky situation because they haven't been able to take a step back and work out the best for that patient. Simulation can help with that and scenarios where students have to consider specific patient concerns are useful. (nurse mentor – 52, 6.)

For the nurse mentors, simulation helped good students to flourish and develop confidence in their abilities to provide resourceful, safe and effective nursing care. For weaker students it highlighted areas of concern, the need for further support and engagement with the adult nursing programme. From their perspective, simulation enabled students to explore difficult situations and recognise their own responses to the suffering of others. In their view, it also provided a supportive and safe learning environment in which students could rehearse their skills in preparation for caring for patients.

The Nurse Educators

The nurse educators saw simulation as a means of helping students to learn to be nurses (Jeffries, 2005). They emphasized the importance of clinical practice for students and the complementary nature of simulation learning. Nurse educators also highlighted the need for students to use their simulation learning efficiently and effectively for the patients that they nursed in a hospital ward or in their homes. They wanted the students to put their learning in to practice:

Say for example a student nurse who is measuring a BP [blood pressure]. Whilst they are doing that they should also be assessing the patient looking at mood, pain, mobility, skin

condition, oxygenation, respiratory function ... it is a really great way to develop and learn before you get into practice and have to deal with the real thing. (nurse educator – 49, 29.)

Another educator developed this further highlighting the possibilities afforded to prepare for the challenges of bearing witness to human events:

We can give them a scenario about a patient dying and ask them to start thinking about what they might do and how they might feel. ... they start to share their feelings, their fears ... to think about how it feels for the relatives, about how they will approach the patient. It is important to give them that opportunity, to explore it. Simulation is a safe place to do that before they experience it in practice.

(nurse educator – 47, 28.)

For the educators, the recognition of the differences between the best practice environment of simulation and the real and often complex world of the patient was important and offered evidence of the formation of a nursing identity (Scholes, 2008). Students demonstrating such recognition and self-awareness were deemed by the nurse educators and the mentors to be good nurses.

Throughout their narratives, the nurse educators and nurse mentors described student nurses' experiences and outcomes of simulation learning in relation to three key areas (a) successfully becoming nurses:

I think the students that have passed their OSCEs are people that have worked for it, have been practising in simulation sessions and on the ward for it and have a much more mature outlook. They are the ones who try to interpret and use all of the information that they have about the patient and make the links between theory and practice. (nurse mentor – 20, 31.)

(b) struggling or working hard to become nurses:

I also think that for those who aren't successful, sometimes it [simulation] just highlights why they're not doing so well, in a way that sometimes they say, 'I'm not very good at that' and it gives them the opportunity to go away to practise, even though some of them find it really hard. (nurse educator – 37, 27)

and (c) not becoming nurses:

For some of them, they might not pass the first year and their goal of becoming a nurse. It may be a good way of showing them that this is not the career for them.

(nurse educator – 37, 27.)

These three categories were adopted to present some order and distinction to the student nurses' narratives.

The Nursing students

(a) Successfully becoming nurses

Students who were successfully becoming nurses found simulation and OSCE helpful. They recognised the benefits of simulation for the safe supervised practise of nursing skills (Moule et al., 2006). Similar to the views of nurse mentors and educators, they saw learning through simulation as enhancing their confidence and nursing identity (Leigh, 2008).

I do think if we hadn't done simulation and the OSCE, I wouldn't know it as well as I do now. I think I feel a bit more confident and I know I'm competent and I have no reason not to do that right. I think I feel like a nurse. I do feel more responsible as well. I suppose you do get that sense of becoming a professional, you're leading that way so you act in that manner. (student nurse - 3, 23.)

(b) Struggling or working hard to become nurses

Students who were struggling or working hard to become nurses found that simulation and OSCE helped them to look more closely at their nursing

performance. This group of students identified that learning through simulation enabled them to develop competence and confidence (Mills et al., 2013). It had also helped them to recognise areas of concern and ultimately, encouraged them to work hard to strengthen their skills and identities as nurses.

It [simulation] makes you think how to do things properly ... I did struggle at first, and it did worry me because everyone else seemed to get on well in simulation sessions. Not having a nursing background before I started, I now feel that I have got to where I should be at the end of Year 1. That's quite nice really it gives you a confidence boost. I am starting to feel like a nurse, which is a really big step and makes me feel proud of what I have achieved so far. (student nurse - 11, 11.)

(c) Not becoming nurses

In contrast, for two students simulation and OSCE raised some important concerns and established that they were not progressing successfully towards becoming a nurse. For these students, simulation highlighted deficits in their knowledge and understanding of fundamental nursing skills (Robinson, 2009). It established that they were unable to consider what their nursing actions in a given situation might be. Reliance on previous experience and the weight of other responsibilities challenged their commitment and engagement with the adult nursing programme.

I did things the way I have always done them and I didn't learn what I should have learned. I don't know enough about why we do it and how it all links together. (student nurse – 18, 3.)

Anyway, I did the blood pressure and it didn't go too well. I thought I knew it ok. I couldn't hear it properly and I couldn't get the cuff to go round the arm and I had the stethoscope in the wrong way I knew what they were going to say.

(student nurse - 20, 26.)

Discussion

For all of the participants in this study, success appeared to be dependent upon development and learning in four key areas: nursing performance, communicating and relating information to the patient's specific situation, interpreting information, and nursing identity. Benner and Sutphen's (2007) work focusing upon performance, contextualisation, interpretation and formation offers a model where interpretation, understanding and relationship are key to engaging students and helping them to learn to be nurses. Their pedagogical model offers a framework through which the participants' narratives can be further explored and an understanding sought regarding the impact of simulation upon learning for student nurses.

Activity theory (Engeström, 2001) emphasizes change rather than stability, with its focus on the dynamics of learning rather than the learner as a participant in an established system. The principles of activity theory and expansive learning (Engeström, 2001) offer a framework through which the learning environment can be explored and opportunities highlighted. Rather than focusing upon vertical learning processes, aimed at elevating students upward to higher levels of competence, horizontal or sideways learning and development described by Engeström (2001) as 'expansive learning', might offer a complementary perspective (Berragan 2013).

Simulation and expansive learning for the formation of nursing identity

There are many issues pertinent to the development of nursing identity, such as the role of the nurse mentor and nurse educator, the notion of practice, the role of employment and the need to acquire practical and theoretical knowledge. Simulation may have a part to play here, offering an environment where, as one student nurse eloquently stated:

Simulation and OSCEs do determine whether we are competent to perform the most fundamental nursing skills and, when we have practised, rehearsed and passed, provide us

with the confidence to undertake these tasks in the clinical arena and to feel more able to call ourselves nurses.

(student nurse - R6, 8.)

This initial development of professional identity was seen to be important for all participants, offering valuable opportunities to enable students to begin to recognise the complexities of nursing (Scholes, 2008). Some nurse educators and nurse mentors suggested that it was important that the development and formation of a nursing identity took place in a setting which offered support, encouragement and feedback in order to help the students to gain confidence (Levett-Jones and Lapkin, 2012). They proposed the simulation suite as a suitable setting.

The student nurses began to develop a way of conducting themselves formed from new understandings, new skills and judgments and new perceptions (Benner and Sutphen, 2007). As they began to engage with their learning and participate in simulation sessions, they became attuned to nursing situations and, rather than performing tasks, following step by step instructions, and acting like nurses, they recognised that they were beginning to respond, behave and feel like nurses. The students were demonstrating an expansive approach to learning and engaging in what Engeström (2001) calls horizontal or sideways learning and development (Berragan 2013).

Simulation and expansive learning for the interpretation and contextualisation of patient care

All of the nurse educators emphasized the importance for students to learn to establish the context of care. They highlighted the situated nature of knowledge (Lave and Wenger, 1991) and the need for students to begin to perceive which aspects of their professional knowledge and skill were relevant to their patient's changing situation. Benner and Sutphen (2007) call this 'practical reasoning' or reasoning about a patient in a particular situation. They explain that recognizing the importance of context will enable nurses to be responsive to a particular situation and learn to find their limits. A student narrative offered a good example of this:

I have found that simulation has helped me quite a lot. Making sense of things, helping to work it out when you are less pushed for time and you know that it is ok to ask questions. Then you can begin to get the confidence about what a high BP really means in the scenario for the 87-year-old lady who has kidney problems. You make the links and understand why keeping her blood pressure at a certain level is so important and what the medications may do to alter that. It's like a jigsaw really and when the pieces fall into place ... (student nurse - 15, 25.)

Both the university and the healthcare settings are contexts that give meaning and coherence to learning. In clinical practice the primary object of activity is the well-being of the patient. The context of this activity is a busy and demanding environment where it can be difficult for students to find time to reflect on and thus learn from an episode of patient care either during or after the event. In the simulated environment in the university setting, time can be taken to address the needs of the student and provide opportunities for deliberation and reflection upon episodes of care (Lasater, 2012). According to Jeffries (2005) and Levitt-Jones (2012) simulation can provide space for students to identify what they already know about the clinical practice setting from previous work experience or university learning, to identify what this may contribute to clinical practice and what the gap is between clinical practice and university. It is in this environment where students may begin to acquire the skills of clinical judgment and to recognise the influence of contextual factors on the development of that judgment (Benner et al., 1996; Lasater, 2007; Benner et al., 2010). In essence, simulation may offer an opportunity to support 'reflective transfer' (Schön 1995) and enable students to explore the contradictions (Engeström, 2001) between the activity systems of the university and healthcare settings and develop their skills of interpretation and contextualisation.

Simulation and expansive learning for the development of a competent nursing performance

Performance is a difficult concept to capture. It occurs in a particular situation or context, it involves understanding in action and evidence-based interpretation and requires well-formed, expert practitioners with well-honed skills of practical reasoning and clinical judgment (Benner and Sutphen 2007). There are elements of nursing performance which evade description and analysis, concealing themselves as intuitive and personal knowledge (Polyani, 1958; Moch, 1990) deeply embedded in the subconscious until it is required in a particular clinical situation (Meerabeau, 1992; Berragan, 1998).

One student noted that she enjoyed caring for patients and that simulation had helped her to begin to develop a practised and professional nursing performance. Similarly, another student highlighted the performance element of nursing in her reflective account. She described the importance of working hard to master the role of the student nurse through simulation, in preparation for live performances with patients in a clinical setting. One participant, through her unique position as nurse mentor and nurse educator, (classified as a nurse mentor for the study) believed that simulation presented a catalyst for students to prepare for the challenges of bearing witness to human events. These participants emphasized the importance of learning to recognise and interpret the complexities and nuances of nursing in order to begin to develop a professional nursing performance. For the unsuccessful students, erroneous assumptions about their performance abilities and reliance upon skills previously learned through custom and practice presented a barrier to the development of their nursing performance.

In real health care settings, learning is, in a sense, a by-product of care. The health care needs of the patient must always take priority over the educational needs of the student. Simulation, however, deliberately places the student's needs at the centre of attention and provides the opportunity to create conditions of best practice for learning (Berragan, 2011). For some participants in this study, simulation offered an 'educative environment' (Engeström, 1994) which provided opportunities to confront the emotional

climate within which clinical nursing skills were performed in the confines of a 'safe' learning environment and, to consider their professional performance.

Conclusions

Participants suggested that simulation had the potential to offer an environment in which the students could begin to practise the performance of nursing and bear witness to human events (*performance*) and acquire the skills of 'practical reasoning'. It also offered the opportunity to consider the context of care (*contextualisation*), interpret nursing information (*interpretation*) and learn to develop their identities as nurses (*formation*). Students who demonstrated development in each of these pedagogies were successfully learning to become nurses. Students who were unable to show development in each of these pedagogies were not successful and, compounded by academic challenges, withdrew from the programme. These features support the contribution of this pedagogical model towards elucidation of an effective and expansive approach to learning in nurse education. They also help to illustrate the different activity systems to which student nurses are exposed, and the expansive learning process that can occur between these systems as students learn to be nurses.

Engagement with expansive learning and professional practice learning, introduced through simulation, could enrich their nursing and, as health care and the patient population continue to change and evolve, enable students to develop an adaptive and critical understanding of nursing. These features are not just additional ways of learning nursing and developing fundamental nursing skills; they are ways of knowing nursing (Berragan, 1998). Nursing needs to act, to re-engage with the public and to secure its position at the centre of good health and social care provision. Whilst the small sample size for this study is acknowledged, the approaches discussed here may offer a starting point for further research. There is real potential for simulation to help students to understand the key features of nursing and learn to deliver skilled, integrated and compassionate care to their patients.

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