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Title

Does Simulation Enhance Nurses' Ability to Assess Deteriorating Patients?

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Research Highlights

- The use of simulation is one method of developing the nurse's knowledge and skills of effectively identifying a deteriorating patient.
- Registered nurses reported an increase in knowledge, improved assessment skills and decision making.
- The simulated environment enhanced the learning.
- The registered nurses perceived that knowledge and skills were transferred from simulation to clinical practice when recognising the deteriorating patient.
- The continuing education of the registered nurse is vital with the increasing acuity of patients on wards, to ensure that these nurses have the appropriate skills and knowledge.

Abstract

Recognising and responding to patient deterioration has been identified as a key skill in nursing care to ensure that care is escalated for prompt, efficient management of the potentially critically ill patient. Simulation is one teaching strategy that has been established in nurse education as a method for enhancing skills.

The objective was to explore the experiences of registered nurses to ascertain whether they perceived that simulation enhanced their skills in recognising the deteriorating patient.

An exploratory qualitative design was used. Data were collected from registered nurses using semi-structured interviews following a professional development course where scenario-based simulation had been used to assess the patient. Eight registered nurses were interviewed for this study. Semi-structured interviews were conducted face to face. Verbatim transcripts were analysed using thematic analysis to identify major themes.

Four themes were identified: knowledge, improved assessment skills in caring for the acutely ill patient, the learning environment and decision making. The use of simulation as a strategy was perceived by nurses to improve their own ability in identifying deteriorating patients. The participants described how their knowledge was transferred to clinical practice, with the overall perception that this led to improved patient care.

Key words; registered nurses, high fidelity simulation, recognition of deteriorating patients, post-registration training.

Introduction

The challenges associated with early recognition and response to deteriorating patients have been acknowledged extensively (Cooper 2013; Rattray et al., 2011; Devita et al., 2010). It has been identified that deteriorating patients often have changes in their physiological indictors prior to deterioration. The introduction of early warning tools, such as National Early Warning Score (Royal College of Physicians, 2015), has provided a means to alert the nurse to altered physiolology. If a systemic assessement, interpretation of the observations and subsequent appropriate action is achieved in a timely way, this potentially can impact significantly on patient outcomes (DeVita et al., 2010).

Registered nurses are faced with increasing workload, demands of the job, and the acuity of the patient on the ward (Cooper et al., 2011). It has been acknowledged that there are concerns about whether registered nurses have the knowledge and skills to be able to detect and respond to the acutely unwell patient (Devita et al.,2010; Askew et al., 2012; Waddie et al., 2106). However, it has to be recognised that there could be unacceptable consequences arising from of a lack of knowledge and skills in identifying the deteroriating patient. It is imperative to consider the efficient and effective delivery of education necessary for the registered nurse to provide safe care of the deteriorating patient (Jansson et al., 2013; Kelly et al., 2014).

Simulation is a teaching method that has been used to improve clinical skills with good evidence that it also increases confidence along with decision making skills (Stirling, Smith & Hogg, 2012; Wolf et al., 2011). For some years simulation has been used in undergraduate nursing programmes with positive results (Alinier et al., 2006; Cant and Cooper 2010). The use of high fidelity manikins provides a non-threatening and safe

environment allowing the nurse to engage in an activity that reflects clinical practice, but without causing harm to the patient (Gaba 2007). The evidence also shows that the debrief and feedback is a crucial part in the development of knowledge and it gives the opportunity for the nurse to reflect on practice (Abelsson and Bisholt 2017).

There is a plethora of literature that supports simulation has a positive benefit for patient safety (Cannon-Diehl 2009; Disher 2014; Copper et al., 2013). Most of the evidence within the context of nursing has been specific to the development of the undergraduate nurse; there is limited literature regarding the ongoing effectiveness of simulation to develop knowledge acquisition for the registered nurse and the impact this has on clinical practice (Jansson et al., 2013; Hauber et al. , 2010 ; Stirling et al., 2012). While some of the principles of using simulation in the education of pre-registration students is applicable to the post-registration setting, it is inappropriate to assume the same processes will be effective in improving skills and changing practice for the registered nurse. The literature has identified that the effectiveness of simulation-based learning for post-registration nurses is still largely unknown (Alinier and Platt 2013), and furthermore there is limited empirical evidence to support the overall effect simulation has on clinical practice, with regard to the transfer of knowledge and skills clinical practice (Murray et al., 2008).

Background

Nursing is a profession that requires the registered nurse to be competent at a required professional level (Nursing and Midwifery Council, 2015). The essential knowledge and often the complexity of the skills require the registered nurses to be proactive in their development to be effective practitioners. As a learning strategy, simulation allows for active participation where there is construction of knowledge which is relevant to the individuals.

Simulation promotes creative thinking and allows the nurse to problem solve and to develop competence in a safe environment (Garrett et al., 2010; Nagle et al. , 2009). Educational theorists such as Knowles (1970) and Kolb (1984) identified that adult learners are interested in problem-centred approaches where learning is derived from constructivism. They support the notion that learning takes place for students who play an active role in learning. Simulation has been identified as an important method of learning and one that can provide a bridge in the transference of knowledge to practice (Hauber et al., 2010; Wolf 2011; Alinier and Platt 2013).

Critical thinking and decision making skills are a crucial element of the registered nurse's role; simulation actively encourages and develops these vital skills in a safe environment (Disher et al., 2014; Kelly et al., 2014; Jansson et al., 2013). Constructive feedback plays an important role in the development of the nurse's learning (Kegler, Dale, and McCarthy 2012). Although Day (2007) views that there is a place for simulation but it is unlikely to promote faster skills acquisition and could hinder the actual process of learning if it takes the nurse away from the patient and the experienced mentor. There is a relationship between knowledge acquisition and performing skills, (Liaw et al., 2011) although mastering a skill may not mean that nurses are effective at decision making (Elfrink et al., 2010: Hauber et al., 2010). It is the act of effective decision making that is key when escalating the treatment of a deteroriating patient and the need for the nurse to be empowered with the knowledge and skills (Liaw 2016). Endacott et al., (2012) noted that decision making was a complex process and for simulation to have an influence on the timely management of the deteriorating patient there needs to be a high level of clinical skill and knowledge.

Simulation can be a particularly effective method in enhancing the registered nurse's process of decision making as it can be practised in a safe environment. A safe learning environment is viewed as a postive factor in the retention of knowledge (Cant and Copper 2009; Garrett et al., 2010). Furthermore, Merchant (2012) noted an improvement in team working and communication skills

The positive benefits of simulation as an educational tool allow nurses to interact and they can immerse themselves in a clinical scenario without causing harm to the patient. Skills can be practised repeatedly and nurses can learn from their mistakes (Brown 2008; Tiffen et al 2009). Furthermore, the simulated environment allows nurses to reflect on their skills and knowledge and this in itself promotes learning and is viewed as a positive aspect of simulation, the debrief playing a vital role in learning (Abelsson and Bisholt 2017).

Simulation has been reported to have a positive effect on nurses' confidence in their knowledge and skills which leads to improved management of the acutely ill patient (Ozekcin et al., 2015; Stirling et al., 2012). Skills are learnt more quickly in simulation than in a traditional classroom setting, where simulation promotes knowledge with the development of clinical skills (Cooper et al., 2011; Garrett et al., 2010). Simulation has been shown to have benefits over other teaching methods in some settings but the realisation of these benefits largely depends on the context (Cant and Cooper, 2010). These benefits have not been consistently demonstrated and there is limited evidence to support whether there are any differences between a more traditional method of teaching and simulation (Zulkosky, 2012). Scherer et al., (2007) found there to be no difference in knowledge and confidence for a group of nurses taught by simulation compared to those taught by case studies.

In summary, simulation has had many positive benefits. The evidence suggests that the simulation environment actively encourages learning, decision making skills, confidence and assessment skills (Kaddoura 2010; Disher et al., 2014). Simulation provides the nurse with a safe environment to practise, where feedback is given and there is time to reflect. Despite our knowledge of the benefits of simulation, there is limited evidence of the benefits for the post-registration practitioners who do have knowledge and skills, but need the exposure to practise undertaking an assessment of the patient to enhance effective decision making regarding the deteriorating patient. The transfer of knowledge and skills to performance in practice has been acknowledged as an area for further research, particularly with regard to whether the knowledge gained in simulation is used in clinical practice and hence results in safer patient care (Disher et al., 2014; Hallenbeck, 2012). The skills involved in identifying a deteriorating patient are essential to ensure safe and efficient management of patients.

Method

Aim

The aim of the study was to explore the experience of registered nurses who had undertaken a continuing professional development course using simulated practice as an educational strategy to recognise the deteriorating patient.

Setting

A continuing professional development course was offered to registered nurses to develop knowledge and skills in acute and high dependency nursing. This was an existing course which had been in use for over five years, consisting of a simulation component. It was offered to nurses who worked in an acute care setting. One specific aim of the module was to

develop the nurse's skills in identifying the deteriorating patient; this was achieved through classroom teaching, online learning and simulation. The course consisted of five study days which were divided between classroom teaching and simulation. The classroom teaching of three hours consisted of a mixture of lectures and seminars. The lectures and seminar included respiratory, cardiovascular, neurological and liver/pancreas pathophysiology. Within these subject areas common causes for patient deterioration were discussed. The self-directed online learning included workbooks and relevant reading which gave the student the opportunity to formatively build on and consolidate knowledge gained in the classroom or the simulation suite. The classroom session occurred prior to the simulation sessions: for example, cardiac pathophysiogy and haemodynamic instabilty was addressed in the classroom followed by the simulated scenarios related to cardiovascular compromise in the simulation suite.

The simulation sessions involved 2.5 hours per week for 4 weeks giving a total of ten hours of simulation. The classroom and simulation sessions were taught by members of the nursing faculty, including the researcher, with experience in acute and critical care. Simulation offered the opportunity to bring theoretical knowledge and practical aspects together. The aim in the simulation session was for nurses to develop their skills in the ABCDE assessment and escalation of care of a deteriorating patient (supplementary table 1). The ABCDE is a systematic approach based on airway, breathing, circulation, disability and exposure to assess and treat the acutely ill patient (Resuscitation Council, 2015). High fidelity manikins allowed nurses to interact as they would in a real situation, with visual interpretation of respiratory rate, oxygen saturation, electrocardiogram and non-invasive blood pressure. In addition, there was an opportunity to develop knowledge and practice in auscultation, basic interpretation of an electrocardiogram (ECG) and relevant blood results to gain a wider comprehension of clinical deterioration.

Scenarios had been previously developed by the course facilitors, who had a background in acute care nursing and were experienced in simulated practice. The scenarios had been designed to achieve the learning objectives of the course which included the development of knowledge and skills for the nursing management (including assessment, communication and escalation) of the deteriorating patient. The scenarios represented patients with complex conditions who were likely to deteriorate, such as those with respiratory failure, hypovolaemia, septicaemia and cardiac arrhythmias. The scenarios were assessed for face validity within the nursing faculty by lecturers with acute and critical care backgrounds for their suitability, design characteristics and learning outcomes. The scenarios had been used in preceeding courses, however on the commencement of each course the scenarios were reviewed by the course facilitators to ensure ongoing relevance and currency to practice.

On the commencement of the first simulated session, nurses received an introduction to the manikin to familiarise them with the technology and the learning environment. The nurse would work independently or in pairs to complete the assessment and escalation plan. This would involve the nurse performing the ABCDE assessement, interpreting the clinical observations and implementing of treatment strategies. Appropriate patient information, such as fluid charts, clinical observation charts, nursing records, 12 lead ECG recording and laboratory blood test results were made available. Different scenarios were used during simulation to allow maximum exposure to varying clinical situations and promoted knowledge for not only those part-taking in the sceanrio but for the peers (Table 1).

Table 1 - Example of a scenario

Scenario 1

Presenting Problem

A 48 year old gentleman was an emergency admission 3 days ago with acute abdominal pain and heamatemesis. He underwent a laparotomy for perforated duodenal ulcer 2 days ago. He has had an uncomplicated recovery.

Past Medical History

Angina for the last 4 years

High cholesterol

Hypertension

Weight 98kg.

Current condition of the patient

Your patient has had an uncomplicated recovery following his emergency admission. His observations have been stable.

You are the nurse looking after the patient on a day shift. He calls you over as he does not feel well.

The following documents are available to support your assessment of the patient:

- Vital signs chart
- Fluid balance chart
- Blood results
- Drug prescription chart
- 12 Lead ECG

The aim of the scenario (Table 1) was for the nurse to perform an ABCDE assessment and from this identify that the patient was in atrial fibrillation. The nurse would recognise the need to treat this arrythmia and would suggest strategies for management of the patient. Information would then be communicated and escalated using the Situation, Background, Assessment and Recommendation tool.

The simulated ABCDE assessment, interpretation of clinical findings and development of a plan took approximately 15 to 20 minutes. This was followed by 20 to 25 minutes of feedback and reflection during a debrief period. The debrief post-simulation took place between the nurse, her peers, and the facilitator, and was designed to allow the nurse to explore areas that were assessed well and areas for further development (Table 2). The debrief occurred immediately following completion of the simulation exercise.

Table 2 – The Debrief Process

1. The nurse undertaking the simulated scenario reflected on what they felt they did well and areas for development.
2. The facilitator posed questions to draw out further discussion of clinical considerations and made corrections where necessary.
3. Peers identified strengths and areas of uncertainty and how they thought the assessment could be improved for the nurse.
4. The nurse and peers identified further areas for learning.
5. The facilitator summarised the main points arising from simulation and areas for further reading and learning.

On completion of the five study days the participants undertook - an Objective Structured Clinical Exmination, a summative assessment. This involved undertaking a ABCDE

assessement on one of the high fidelity manikins, identify areas of concern and develop an escalation plan

All simulation sessions took place in the simulation suite at a London University.

Methodology

A qualitative approach was taken to ascertain the participants' perceptions of their ability to assess the deteriorating patient following simulated practice. This was achieved through use of semi-structured interviews. In-depth exploration of the participant's views was fundamental to establishing the role simulation had in the identification of the deteriorating patient. It was also used to discover the participants' perceptions of whether simulation had enhanced their clinical reality and how this had an impact on their practice.

Sampling

All participants undertaking the professional development course were invited to participate. There were no other inclusion or exclusion criteria and all course members could volunteer. A total of twelve nurses from a potential twenty agreed to take part in the research. Two participants piloted the questions and a further two declined to participate. A total of eight nurses were interviewed. All eight nurses worked in acute medical or surgical areas or High Dependency Units.

Data Collection Method

Semi-structured individual interviews were used to gather information. Originally ten questions were developed but, based on the pilot study results, two additional questions were added to gain data on the length of the time the nurse had been registered and whether they had used simulation before. Twelve questions were used to explore the perceptions of the participants on complex matters (Table 3). All eight interviews were conducted by the researcher at the School of Health Science; they were audio-taped and lasted approximately 45 minutes.

Table 3-Interview Schedule/Questions

1. How long have you been a qualified nurse?
2. What strategy do you use when prioritising a patient's needs in your clinical area?
3. Have you used simulation before this course? If yes, what?
4. What were your expectations of simulation?
5. What skills from simulation do you think you have transferred to your practice?
6. How do you think simulation has helped you assess a patient?
7. How realistic do you think simulation is?
8. What aspect of simulation was most beneficial? Examples.
9. What aspect of simulation was less beneficial? Examples.
10. How has simulation helped you to link the theory to practice?
11. What other skills besides the clinical skills do you think you have gained by simulation?
12. Tell me if you think that simulation has enhanced your skills in identifying the deteriorating patient?

Implementation of the research

The interviews were held approximately six weeks following the completion of the professional development course. This time allowed the nurses the opportunity to utilise the knowledge and skills that they may have gained through simulation in their clinical practice and to consider the influence that the learning experience had on their practice.

Data Analysis

Thematic analysis was done using the framework developed by Miles and Huberman (1994). This framework used a process which included data reduction, data display and conclusion drawing/verification, which lead to the identification of themes**.** Interviews were transcribed verbatim and then analysed. The transcribed interviews were returned to the participants to verify if this was a true reflection.

To facilitate thematic identification, a categorisation system was used to allow for the coding of the data. The transcripts were read and scrutinised several times by the researcher to ensure that all the data were considered. The sentences were coded numerically and key themes were highlighted. Line-by-line coding was done for ease of identifying information and emerging themes. Coded transcripts allowed for a deeper level of scrutiny, allowing the extrapolation of systematic patterns or themes which go beyond those in data reduction. On further examination of each transcript there were similar themes that emerged from the data collected.

Finally the eight interviews were compared with each other for emerging themes; from this information the themes that were similar were grouped together and hence final themes emerged. The identification of themes led to commonalities, while acknowledging variation in the responses from the individual participants. Additionally, the results of the analysis of each participant's interview were reviewed by an academic peer to optimise the reliability and validity of the data.

Ethical Issues

All participants gave informed consent prior to partaking in the study. Ethical approval was granted by the School of Health Sciences Research Ethics Committee (No.11-12/08).

Results and Discussion

Eight registered nurses volunteered to participate in the study including six females and two males. All participants were working in the adult nursing field, specifically working in an acute care setting. The eight nurses interviewed had been registered from three to twenty three years, with a median (interquartile range) of 10 (6 – 15) years, although it was not clarified if they had been in clinical practice for the entire time they had been registered.

Six of the eight participants had taken part in some form of simulation before. However, out of these six only one participant had used high fidelity manikins. Four out of the eight participants used the ABCDE framework prior to simulation, including the participant with the least amount of clinical experience (two years). Of interest, the participants that had been nurses for over 15 years believed their assessment of a patient was driven by pattern recognition from previous experience rather than using the ABCDE framework. Post simulation, seven out of the eight participants identified the ABCDE as a framework that they would use in practice. All interviewees perceived that simulation had enhanced their current skills in identifying a deteriorating patient; they felt that the combination of knowledge and practice with the high fidelity manikin gave them improved confidence and ability to assess the deteriorating patient. Participants agreed that the action of actively participating in their learning helped to cement this knowledge for practice. Seven of the eight participants felt that the realism was good but also identified ways in which this

could be improved. The least beneficial aspect to simulation for three participants was concern about being watched by their peers.

There were four main themes that emerged from the data these participants provided; increased knowledge, improved assessment skills of the acutely ill patient, decision making, and learning in a safe environment.

Knowledge

All participants reported that the simulation had improved their knowledge and they perceived they could transfer both knowledge and skills to the practice environment. While the current study was not designed to quantify that improvement, it suggested the effectiveness of this teaching method in bridging the gap between theory and learning:

"I think the two go together, knowledge and the practise and that's what I think is good about simulation; it's a bridge between the two, you are putting the knowledge into action". Participant N

Bridging the theory to practice has been previously identified as strength of simulation (Garrett et al., 2010; Hauber et al., 2010; Wolf et al., 2011). Knowledge was paramount to the participants, the manikins allowed for the deterioration of a patient in the simulation, where the participants had to apply knowledge quickly and with justification. The participants perceived that this way of learning bridged the theory to practice gap. Participation in the scenarios was one of the key factors in improving the nurses' ability to learn and hence increasing knowledge:

"I feel confident that when assessing a deteriorating patient now I will be able to use the knowledge and practice of what I have learnt in simulation". Participant M

Improved assessment of acutely ill patients

The participants perceived that they had improved their skills in identifying an acutely ill patient and this was paramount in answering the research question. The participants believed that practicing the ABCDE assessment in simulation gave them a framework to systematically identify a deteriorating patient:

"You can think back to what you have learnt when you did simulation and it acts as a trigger when you are faced with that or a similar situation". Participant S

The participants highlighted that they valued the ABCDE assessment practice and on reflection this was partly due to the scenarios used in the simulation being realistic. The realism of simulation has been acknowledged as an important factor in the retention of information and the transfer of knowledge to practice (Alinier, Hunt, Gordon & Harwood, 2006; Cooper et al., 2011). Schön (1983) emphasises the professional importance of being able to think on your feet and applying previous experiences. The improved assessment skills of the nurse were a result of a combination of repetitive practise, knowledge and reflection:

"Practising the ABCDE assessment in simulation really helped me on the ward. To begin with I went through the assessment on patients that were not acutely ill, and then I had to do it on a patient who was deteriorating I felt that I knew what I was doing". Participant R

The participants all felt that simulation had enhanced their ability in practice to assess and take appropriate action with an acutely ill patient.

Learning in a safe environment

All eight participants interviewed enjoyed learning in a simulated environment. The learning environment allowed time to prioritise what skills they might need to develop and most importantly the opportunity to make mistakes, and feel supported in this process. Simulation offered the participants the ability to repeat skills; this has previously been noted as not always practical in the clinical situation (Gaba, 2007; Issenburg, McGaghie, & Petrusa, 2005; Jeffries, 2008). Cannon-Diehl (2009) places great emphasis on learning without causing harm to the patient:

"In the ward you are just expected to get on with things, there is very little time to learn and practise anything; simulation was good as you were learning, but in a stress-free environment". Participant T

The simulated environment offered a non-threatening learning environment for nurses to develop away from the clinical setting with its daily pressures (Murray et al., 2008). Furthermore, learning in a safe environment was considered positive in retention of their knowledge:

"Simulation relates to what you do naturally in practice but it helps to link the theory to practice and you do it in a safe environment". Participant R

Participants felt simulation was an active way of learning even if they were observing others performing the scenarios. The simulated scenarios were developed to reflect clinical practice and this has been previously recognised as paramount to the success of the learning experience (Stirling et al., 2012):

"You have the chance to learn in an environment where you can also evaluate and reflect; you don't get this in practice". Participant Q

All participants valued the opportunity to practise their assessment skills, however, while they valued the peer support, some participants found this awkward. The challenge of practising in front of peers has been identified by others (Garrett et al., 2010). This may be explained by the fact that several of the nurses were more senior and felt that they should know what to do in the simulated scenarios:

"Talking to a dummy is a strange thing to do, I didn't feel comfortable, it didn't seem real to me." Participant N

Learning in a safe environment is a key benefit in developing knowledge and practice. The participants in this study positively acknowledged that the learning environment played a major role in the development of knowledge, skills and decisions that they made. In relation to the research question the learning environment contributed to their perceived ability to assess a deteriorating patient as the environment provided a safe place to practise.

Decision making

Participants believed that simulation had improved their knowledge and provided them with a framework (the ABCDE) to accurately assess patients, interpret findings, and take appropriate action. The participants became more confident and discerning about their decisions:

"It helped me to speed up my management of the patient, I felt more confident in the decisions that I made". Participant M

Making decisions is a multi-faceted process that involves knowledge, confidence, and critical thinking (Guhde, 2010). It was difficult to isolate decision making from knowledge, skills, and confidence as it is a combination of all these factors that leads to an improvement in decision making. One of the major findings from this study was that participants demonstrated a clear understanding of how quickly a patient could deteriorate. Furthermore, by making concise decisions and interventions the outcome of the patient's condition may be changed:

"It has certainly improved my decision making skills, knowledge and confidence. The decisions you make you can act on them faster and with more confidence and certainty". Participant M

Although decision making was an important theme in this study, it should be noted that the participants were all registered nurses and were not unfamiliar with making decisions about patient care and management. However, simulation allowed them time to focus on how they made decisions.

Implications for Education, Practice and Research

The emerging themes in this evaluation support the position that simulation is an effective method of teaching practicing register nurses. Further participants believed that what they had learnt in simulation had a positive effect on their performance in clinical practice. Nurse education needs to be responsive by using innovative methods that are tested to facilitate the learning of nurses (Jansson et al., 2013). Simulation for these registered nurses had an advantage over other teaching methods as the context and subject material was relevant to their everyday practice.

The continuing education of registered nurses is paramount in providing a safe practice of care for patients. As Cooper et al. (2011) noted, there is an increase in the number of patients who are more acutely ill in the ward environment so registered nurses need to have the knowledge and expertise to manage these patients.

The literature has identified a gap (Reilly & Spratt, 2007) in the transfer of knowledge to practice. It is important that as educationalists we know the outcome of learning in the simulated environment and how this knowledge is used in practice. It would be valuable to consider collaboration with hospital nurses to develop simulation scenarios. This would be an effective method not only in maintaining realistic scenarios but also to address the effectiveness of simulation.

More research into the use of simulation and its effect on the transfer of knowledge to practice is required to identify the specific characteristics of simulation, including the skills or clinical contexts that are effective. While this study looked at the perceived benefits for nurses working in acute care setting, simulation could be beneficial in other areas of nursing practice.

Strengths and Limitations

The perceptions of the registered nurse were explored in depth to determine whether they perceived simulation had enhanced their skills in identifying the deteriorating patient. Participants were drawn from a range of different acute care settings. Importantly, simulation was not considered in isolation as the time period of approximately six weeks from simulated practice to interview allowed the nurse to return to clinical areas and experience patient situations where there was a need to assess the patient using the ABCDE framework.

The study cohort possibly consisted of volunteers who had an interest in the research topic and, therefore, are not a true representation of the entire course population. The researcher was known to the participants and this could have prompted participants to answer questions consistent with their perceptions of social desirability. The small sample size could possibly be a limiting factor however there was sufficient guidance for replication of this work. Furthermore, it may have been beneficial to have had more than one reviewer undertaking thematic coding to determine the level of interrater reliability. It has to be acknowledged that it is not possible to determine the exact contribution of simulation, as distinct from other teaching methods used on the course, to nurses' learning.

Conclusion

This exploratory qualitative study focused on the perceptions of the registered nurse with regard to how simulation enhanced their ability to assess the deteriorating patient. The participants perceived that simulation had contributed to their ability to assess the deteriorating patient in clinical practice which has implications for the on-going education of the registered nurse and the impact this will have on improved patient care.

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Table 1 - Example of a scenario

Scenario 1

Presenting Problem

A 48 year old gentleman was an emergency admission 3 days ago with acute abdominal pain and heamatemesis. He underwent a laparotomy for perforated duodenal ulcer 2 days ago. He has had an uncomplicated recovery.

Past Medical History

Angina for the last 4 years

High cholesterol

Hypertension

Weight 98kg.

Current condition of the patient

Your patient has had an uncomplicated recovery following his emergency admission. His observations have been stable.

You are the nurse looking after the patient on a day shift. He calls you over as he does not feel well.

The following documents are available to support your assessment of the patient:

- Vital signs chart

- Fluid balance chart

- Blood results

- Drug prescription chart

- 12 Lead ECG

Table 2 – The Debrief Process

1. The nurse undertaking the simulated scenario reflected on what they felt they did well and areas for development.
2. The facilitator posed questions to draw out further discussion of clinical considerations and made corrections where necessary.
3. Peers identified strengths and areas of uncertainty and how they thought the assessment could be improved for the nurse.
4. The nurse and peers identified further areas for learning.
5. The facilitator summarised the main points arising from simulation and areas for further reading and learning.

Table 3- Interview Schedule/ Questions

1. How long have you been a qualified nurse?

2. What strategy do you use when prioritising a patient's needs in your clinical area?

3. Have you used simulation before this course? If yes, what?

4. What were your expectations of simulation?

5. What skills from simulation do you think you have transferred to your practice?

6. How do you think simulation has helped you assess a patient?

7. How realistic do you think simulation is?

8. What aspect of simulation was most beneficial? Examples.

9. What aspect of simulation was less beneficial? Examples.

10. How has simulation helped you to link the theory to practice?

11. What other skills besides the clinical skills do you think you have gained by

Supplementary Table 1

	ABCDE assessment guide
Airway	**AIRWAY PATENCY** • Talks to patient • Checks for and removes any obstruction (if appropriate) • Uses correct suction technique • Assesses need for airway protection
Breathing	**Look, listen and feel approach** • Notes any cyanosis • Symmetrical movement of the chest and depth of breath • Respiratory rate • Accessory muscles • Listen to patient's breath sounds • Chest Auscultation • Percussion • Trachea position • Establishes pulse oximetry • Requests Arterial Blood Gas (ABG) • Checks SpO_2 or ABG's before administering oxygen prescription • Assesses cough, sputum • Requests Chest X-Ray • Identifies the need for other respiratory support
Circulation	• Assesses major pulse • Assesses for signs of reduced tissue perfusion • Skin: colour, temperature