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Exploring the Experiences of Nursing Students in Clinical Simulation: A Qualitative Study

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Abstract: The effective training of student nurses is recognized as an essential aspect of health care training, to ensure the health and well-being of patients. A teaching method recently introduced in nursing education is the use of simulation. A descriptive phenomenological approach was followed. The College of Nursing- Jeddah was included in the study. A convenient sampling method was used including five nursing students. Data collection included in-depth interviews and analysis followed the Gorgi's steps. Results showed three themes emerged from the data: strengthening clinical practice discovery in practice, fostering independence; Allowed to make mistakes, promoting multidisciplinary team work, Peer support, integrating theory with practice; assertive learner learning without fear, building self-confidence; ease in critical thinking; challenges timing of simulation, non-life like patients, sources of stress. Conclusion even though simulation in nursing education improves skills such as critical thinking and clinical reasoning towards improved patient care, there are still challenges that face both the students and nurse educators.

Key words: Nursing education · Simulation in nursing · Simulation experiences

INTRODUCTION

The effective training of student nurses is recognized as an essential aspect of health care training, to ensure the health and well-being of patients [1]. A teaching method recently introduced in nursing education is the use of simulation. "Simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion" [2]. The use of simulation in nursing education in both undergraduate and postgraduate programs has been growing so rapidly [3, 4]. Simulation is rapidly becoming an essential strategy in nursing education for teaching the principles of patient care in a controlled and safe environment [5].

Simulation has demonstrated to be effective in improving student cognitive skills and critical thinking [6, 7]. A key element of simulation training in developing critical thinking skills and cognitive capacity, are through the range of approaches that can be used, including physical props such as mannequins and visualization of scenarios using computer technology [8]. This offers a range of information sources that can reinforce the learning experience. This application of vicarious learning experiences is recognized as beneficial across a range of learning settings relevant to health care and more broadly. Indeed, the use of this carried approach to information sharing and skills development is recognized within the profession specific [9] as well as national and global directives [10]. These specify the importance of developing strong learning approaches using techniques that meet a range of learning styles across students. Simulation is recognized to offer these broad learning opportunities [10].

Furthermore, Chakravarthy *et al.* [11] highlighted that simulation has resulted in significant improvement in medical students' knowledge, management skills, confidence and satisfaction. This covers a range of benefits; the basic requirements to meet training and development needs, flexibility and cost effectiveness and effective training practice [8]. Consequently, simulation training is a recommended strategy for safe clinical practice, because the real patient setting is hindered by

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changes in resources, such as shorter length of patient stay, higher patient acuity, nursing staff shortages and a greater concern and emphasis on the prevention of medical errors [12].

The use of a qualitative approach can be considered essential when exploring the efficacy of a simulation approach to training of nurses. This is due to the person-centered nature of learning, which is known to differ from person to person [13]. Applying a qualitative approach to research allows for exploration of the individual experience of a behaviour or activity, such as simulation learning. This can assist in understanding how and why an activity may be effective [14]. Incorporating an understanding of the effectiveness of training to the individual is considered necessary in the development of effective training that is likely to have an impact on working practices.

The emotional experience of the learner is noted in the current literature as being a factor that contributes to the impact on any learning scenario on the student or trainee [10]. This would suggest that the emotional experience of the training exercise is as valued as exploration of the content being delivered. In this case this would suggest a value in a qualitative approach to this work that explores the experience of the trainees as they undertake simulated learning activities, which can be considered in light of learning outcomes either in isolation or in comparison to other learning approaches. Additionally a qualitative approach can be less intrusive than might be the case in observed or experimental approaches. This may also be a valuable consideration in assessing the value of learning approaches through research.

MATERIALS AND METHODS

Study Design: A descriptive phenomenological approach using the Husserl's school of thought was used. In addition, the researchers assumed a relativist ontological position, claiming the world to be consisting of multiple individual realities influenced by circumstances [15] and epistemologically, the researchers were constructivist in nature.

Study Area/Setting: The study was conducted at College of Nursing – Jeddah, King Saud Bin Abdulaziz University of Health Science, which offers a four-year baccalaureate degree. On an average students are exposed to simulation for a cumulative total of two years within the various clinical courses completed within the programme. Level 7 students are exposed to at least two semesters of simulation whilst level 8 students are exposed to at least 3 semesters of simulation. The various courses are often engaged in high fidelity simulation.

Sampling and Sample Realization: A convenient sampling method was followed and included 5 nursing students from level 7 and 8 until data saturation was reached.

Data Collection and Analysis: Data was collected using in-depth interviews, which were audio recorded. All interviews were transcribed verbatim. Data collection and analysis in this study occurred simultaneously so that the search for themes and concepts begins from the moment the first interview was completed following Giorgi's steps of data analysis [16].

Trustworthiness: Trustworthiness was ensured using the criteria of credibility, transferability, dependability and confirmability. Credibility was ensured by member checking. Transferability in this study was achieved by providing a rich and thorough description of study processes. Dependability was achieved by giving a detailed methodological description to allow for the replication of the study. Confirmability was achieved by an independent audit by a qualitative expert within the college context [17].

Ethical Considerations: The research proposal was submitted to the Research Unit at the College of Nursing – Jeddah for ethics approval. All the participants were informed about the nature of the study. All participants signed an informed consent document prior to data collection. Ethical principles such as confidentiality and anonymity were ensured by not connecting any participant's details to the interviews.

RESULTS

The average age of participants was 23 years. Students from levels 7 and 8 (Third and fourth year) were included.

The following table summarizes the themes and subthemes that emerged:

Table 1: Summary of the results themes and subthemes

Themes	Subthemes
Strengthening Clinical Practice	Discovery in practice
	Fostering independence
	Allowed to make mistakes
	Promoting multidisciplinary team work
	Peer support
	Integrating theory with practice
Assertive learning	Learning without fear/
	Building self confidence
	Ease in critical thinking
Challenges	Timing of simulation
	Non-life like patients
	Sources of stress

Strengthening Clinical Practice

Subtheme 1.1.Discovery in Practice: The study participants expressed that the simulation sessions provided an opportunity for them to discover new things in practice. In addition, having the opportunity to learn new things enables students to better their performance:

> "*I managed to learn new things and my performance gets better*.

Subtheme 1.2.Fostering Independence: Participants expressed that the simulation sessions regardless of the course fostered a sense of independence. During clinical placements students are either accompanied by a primary nurse of a patient, or a teaching assistant within the programme. However, within simulation sessions students work independently of any support person which allows for confidence building and understanding in decision making:

> *"To be independent during the simulation because the Teaching Assistants are not participating so we are independent I think it raise our confidence, we can totally understand what is really happening"*.

Subtheme 1.3.Allowed to Make Mistakes: Participants added that simulation sessions allowed them the opportunity to make mistakes before handling real patients in hospital. In addition, making mistakes on models prevents mistakes on real patients as students remember possible mistakes made and prevent repeating them:

> *"I mean we are dealing with the model as it's a real patient, when we make mistakes on it we will never forget this mistake…. So when we go to the real patients we do remember that mistake that we made at the simulation"*.

Feedback provided to students after the simulation session during the debriefing period allows students to reflect on the positive and negative during the session. Students are able to learn from any mistakes and improve in skills the next time:

> "*At the end of the day, when we have a feedback from teaching assistant and course instructor, we can prevent these errors next simulation sessions*".

Subtheme 1.4. Promoting Multidisciplinary Team Work: Study participants highlighted that simulation session promotes working within a multidisciplinary context by allowing them an opportunity to interact within a team context. Working with colleagues, who portray the various roles of members of the multidisciplinary team allows students to understand the diversity of roles. This allows for an understanding of how to communicate with the various role players and cooperation within a team effort:

> *"Regarding the group work, it helps me how to deal with the other personnel in the hospital. For example, when we had a simulation, there is a physician, there is a nurse; there is other staff so we can understand how it goes, how we can communicate with them"*.
>
> *"When we are dealing with like two nurses… doing something in the simulation… how we can cooperate together to give perfect care to the patient"*.

Further to this, one participant added that simulation session also equips them with the skill to know when it is appropriate to interact with staff during real life situations that are stressful:

"*Okay ... when we had a simulation about code…we saw there is bad communication between physician and the nurse and they are all stressed …. But when I saw it in a real ER I saw how the nurse was really stressed and how the physician was really stressed and how the nurse deal with this situation and that time if I didn't have that simulation I would ask her a lot of questions but because I know that she is really stressed, I just, I didn't ask her until she finished and then I start to ask her situation*".

Subtheme 1.5.Peer Support: Participants expressed that simulation sessions provided them opportunity to experience support from each other. Students that were familiar with certain skills could be used as a resource person for other students:

"*Okay…when there is like a weak student…and there's another student that she's familiar with what she's doing, I think the student who's weak can learn from that student… I think then the weak student will understand more what it means, will know what she will do next time*".

Subtheme 1.6.Integrating Theory with Practice: Participants reported that simulation sessions close the gap between theory and practice by allowing them to practice skills related to topics discussed in the classroom. Sometimes certain diagnosis are scarce in the clinical area or alternatively certain skills cannot be practiced as there is not opportunity, hence simulation allows for students to practice in sessions that covers diagnosis or skills not seen in the clinical area:

Sometimes I cannot do any procedure in the hospital… regarding to the patient or policy … there is no availability of these procedures … the simulation covers this part".

"We have a lot of cases we cannot see in the hospital and the time for certain procedures are after 5pm when we are not in the hospital, this is covered in simulation session".

Assertive Learner

Subtheme 2.1: Learning Without Fear: Participants expressed that simulation allows for them to learn without fear. Being exposed to certain situations during the simulation gives them experience to deal with similar situations in a less stressful context the next time:

Okay, um good experiences make me confirm the information that I have, bad experiences in simulation um and the time of simulation it makes me stressed but when I face this situation which is bad situation in simulation and I face it again in the real life, um the stress become less.

Subtheme 2.2: Building Self Confidence: Students expressed that during simulation practicing of skills fostered self-confidence in them. Self-confidence to carry out skills in a better manner, becoming familiar with certain situations and not just using memory to complete tasks:

"I think it's increased our quality. It makes us more qualified because we, we are practicing this, I think when we do anything it's better than, I mean when we do it by ourselves it's better than we just memorize it or you just tell it to us".

"It's getting familiar with different cases that we are studying and so and when we get, when we are familiar with it so we can deal with it, we can care for these patients in the real case.

One participant expressed that simulation allow students the opportunity to know the reasons behind ones actions. Students can rationalize why they are doing certain skills:

"*Also, we can apply our knowledge and it gives the reason. When I do something, I know why I am doing that*".

Subtheme 2.3: Ease in Critical Thinking: Some participants expressed that simulation was instrumental in assisting them to make decisions regarding patient care as critical thinking was made easier:

"Decisions related to patient's needs ... when you see the vital signs is abnormal, we can decide what we will do now, what medication we will give… if patients need oxygen or no…such kind of decisions".

"In some scenarios, there is relationship between the clinical sessions and the critical thinking. I remember one scenario where the child had tumor in the abdomen and the TA asked me to do physical examination and I remember, do not palpate the abdomen of the child with mass and I told the TA that I will not palpate the abdomen".

Challenges: Although participants expressed many benefits of the simulation sessions, they also faced many challenges which are expressed in the subthemes below:

Subtheme 3.1: Timing of Simulation: Participants expressed that the simulation sessions would be most effective immediately after a lecture as the lecture content would be fresh in their memories and they would be able to relate it the simulation. Participants also expressed that if simulation sessions are held directly after a particular lecture topic, retention in memory would be likely possible:

> "*I think if it is immediately after the lecture it will be effective because the information is still in our heads, so we, we can relate it to the simulation. And then after simulation I just, as I said they will never forget the, the patient case, so theory also, theory part that is related to simulation, they will never forget it*".

Subtheme 3.2: Non-Life like Patient: One of the challenges that student's expressed as a challenge during the simulation sessions was the inability to interact with the manikin as the manikin was not a real patient.

> *"This is a manikin. I have difficulty interacting with him, because he does not respond, he does not act, he does not cry…"*

Another challenge was that students were not able to carry out real procedures on the manikin as the manikin was not able to yield real parameters. For instance procedures such as vital signs were not possible to yield real parameters:

> "*The other thing about the values, I mean like vital signs… what will the Teaching Assistant put up…, which numbers she will put. But if we measure it by ourselves it's… I think it would be good*".

Subtheme 3.3: Sources of Stress: Participants expressed that there is an increase in their anxiety and stress during the simulation session when they are told that the session will be video recorded. In addition, participants also verbalized that the they were afraid to make mistakes if they knew that the simulation sessions will be assessed:

> *"When the instructor said that the simulation will be graded, we are afraid of doing something wrong the effect our marks".*

> *"When the simulation is video recorded we are anxious during the simulation".*

DISCUSSION

This work has highlighted various factors of simulation-based training that can positively contribute to clinical practice, under three main themes.

Strengthening Clinical Practice: The findings from this study show that simulation grants a healthy environment from which individuals can grasp opportunities to apply knowledge and practical skills in risk-free scenarios, which resulted in reports upon positive improvements in clinical performance. Meyer *et al*. [18] reported that nursing students who spent time in simulation scored significantly higher on measures of performance, than compared with those who did not attend simulation. Moreover, simulation granted a greater sense of independence among nurses and required them to have a more in-depth understanding of performed tasks, which enhanced the confidence and sense of self-efficacy among most participants. In an interprofessional comparative study of nurses, midwives and doctors, high-fidelity simulation was shown to improve individuals' self-efficacy in clinical situations and also led to positive impacts on communication, team working and leadership [19].

One critical learning aspect that was reported in this study included the realization of learning from mistakes and the memorable and lasting impact this had upon them. In surgical settings, evidence has shown that simulation can reduce the frequency of errors, that may lead to improved surgical competence, in practice [20, 21]. Data on actual benefits to error reduction and improving patient safety in practice is lacking, but studies suggest that simulation can indirectly impact on patient safety through improvements in communication and team working [22, 23]. Indeed, this work highlights that simulation can increase individual awareness of the impact of team working upon patient care, of which, is essential to the delivery and co-ordination of high-quality and complex care [24]. In addition, peer-peer teaching as an adjunct to learning, forms one of the core competencies required of doctors and nurses, that is set out by professional bodies including the General Medical Council and Nursing and Midwifery Council and also promotes continuous professional development and lifelong learning [25, 26].

Building Confidence: The majority of participants in this study reported that simulation training gave them an

increased sense of self-confidence, as well as feeling more comfortable under high-pressure situations and greater ability to make clinically important decisions. Indeed, the importance of self-confidence has been reported to be essential for effective and therapeutic interactions between patients and healthcare professionals, which forms part of the healing process and can have a direct impact on the wellbeing of patients [27]. Moreover, confident health care providers are reported to be more likely to address the holistic needs of patients, which supports the practice of patient-centered care, that helps to address the patients most valued needs [27]. Although some studies report that simulation helps to improve self-confidence [28, 29] a recent systematic review evaluating the impact of simulation upon nursing students concluded that evidence for this association is limited and thus, confidence and competence may only be truly enhanced, after real clinical experiences [30]. Furthermore, research has shown that decision making can be adversely influenced when individuals are working in high-pressured and dynamic environments, which may lead to clinical errors and subsequent patient, harm [31]. Therefore, the findings of this study suggest that individuals who receive simulation training may be more effective decision makers in real-life clinical scenarios, as they may be more able to mitigate themselves from the negative influence of factors such as time-pressures and case complexity.

Challenges: The findings from this study are suggestive about mixed views about the effectiveness of the simulation environment. There were mixed views that pertain to whether simulations can represent real clinical scenarios and make students feel like they are in a real patient environment. Some students supported the sense of reality with the use of life-like simulation manikins, as well as care environments that represent real settings, the use of familiar equipment and increased levels of stress and anxiety. Indeed, the concept of simulation-based learning is designed to immerse healthcare professionals in an environment that attempts to replicate real-life situations and human responses, in order to develop knowledge, skills and attributes, while protecting patients from risk and error [32]. By replicating real-life responses, simulation can provide a host of benefits to the learner, including improving clinical competence and facilitating the development of the necessary skills and personal qualities required for clinical practice [33]. Despite the positive impacts of simulation there are a variety of limitations to simulation-based learning, which were recognized by participants in this study, such as the use of predetermined scenarios and scripts that lack dynamicity and fail to represent true clinical situations, as well as a general and intrinsic awareness of the lack of authenticity of the experience, of which, can impede the overall experiential learning process [34].

CONCLUSIONS

Even though simulation in nursing education improves skills such as critical thinking and clinical reasoning towards improved patient care, there are still challenges that face both the students and nurse educators. However despite these challenges, nurse educators should continue to incorporate simulation as an alternative teaching strategy towards developing meaningful clinical experiences for students.

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