

IMPROVING CLINICAL PRACTICE THROUGH SIMULATION: A CASE STUDY OF STUDENTS OF THE DEPARTMENT OF NURSING SCIENCE, UNIVERSITY OF CALABAR

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ABSTRACT

Acquisition of knowledge and skills by nursing students before real-life practice is a familiar nursing education challenge. The use of clinical simulation in nursing education provides many opportunities for students to learn and apply theoretical principles of nursing care in a safe environment. The purpose of this study was to evaluate nursing students' perceptions of clinical simulation as a teaching/learning method to increase self-efficacy during clinical practice in a nursing undergraduate program. A survey design was used for the study. A sample of 45 students completed the survey, indicating their confidence in various skills necessary for patient examination, both before and after the simulation experience. Results indicated that students experienced a significant increase in overall self-efficacy ($p < .01$), confidence in assessing vital signs ($p < .01$), clinical judgment ($p < .01$), communication ability ($p < .001$), and in providing patient education ($p < .001$). It was concluded that clinical simulation is a safe and effective method for nursing students to experience and practice patient examination using clinical scenarios to overcome challenging circumstances.

KEYWORDS: Clinical Practice, Perception, Simulation, Nursing students

INTRODUCTION

Nursing is a hands-on profession that requires competent cost effective care delivery practitioners who have the ability to explore and utilize knowledge to satisfy and meet the health-care needs of the society. Nurse education determines the type of professional development each category of nurses receives to meet continuous societal changes. Nursing education programs are therefore challenged with increased demands to produce graduates who will be capable of providing safe patient care. To achieve this, nursing education programs are constantly reviewed and accredited to develop curricula, employ qualified faculty, and select learning experiences for students in an effort to help students progress in their development, with experiences designed to encourage them. As Porter-O'Grady (2001) states, such programs are to make the students to first think like nurses, then care like nurses, act like nurses, and finally, be nurses. One such ways to achieve this aim is the introduction of simulation teaching method. A three year arrears of students performance is always evaluated for accreditation (official approval of the program by National Universities Commission (NUC) and Nursing & Midwifery Council of Nigeria (N&MCN). The accreditation boards (National

Universities Commission and The Nursing and Midwifery Council of Nigeria) provide appointed panel members a bench mark to use in evaluation of institutions for the training of nurses. Among the evaluation requirements is the inventory of the instructional materials, teacher/learners ratio, infrastructural facilities and teachers' qualifications. To avoid disqualification during such accreditation exercises the needed materials are provided based on needs assessment by faculty and the department and recommendation from previous accreditation exercise. Among instructional materials recommended and provided are mannequins for students' skill acquisition. It is also important to note that high nursing student admission demands an improved method of teaching (Scott et al, 2014). Curricular and program outcomes of clinical simulation in this organization has not been evaluated within the context of improving nursing students education. The purpose of this study thus was to evaluate the perceptions of nursing students on clinical simulation as a teaching strategy.

Statement of Problem

Nurse education is an important part of professional development. Jack (2013) asserts that teaching and learning strategies determine students' achievement.

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One major problem in nursing education as identified by Hall (2015) is the lack of clinical experiences available to students to enable them apply theory to practice. This lack is reported to impact on students negatively as they may be deficient in the hands-on experience with live patients they need in order to become competent and clinically successful nurses (Aurilio & O'Dell, 2010; Wagner, Bear, & Sander, 2009). Students' inability to transfer theory to practice may increase hospital cost when they eventually graduate from school and become practitioners as a result of poor quality care delivery. Evaluation reports of our students during clinical assessments indicate a serious lack of clinical competence, poor transfer of theory to practice knowledge and poor clinical judgment. This situation is made worse with the high shortage of nursing manpower that should help students to learn through observations and teaching. Secondly, the traditional hospital-based clinical instruction is observed not to always provide the same type of patients discussed in the classroom (Hall, 2015). Thirdly, improved health care systems and information technology have reduced the length of hospital stay for patients thus preventing students to have sufficient time to understudy a particular disease condition and care with real life patients. High cost of nursing education rationally demands high quality training that meets the needs of the nursing care service consumers. An interaction with the students revealed clinical field as stressful due to lack of competence and confidence, a situation reported by Gaba (2004) in Hall, (2015)'s studies. The need to provide students with a synthesis learning experience in which nurses have the opportunity to utilize previous knowledge and experiences as they assess, intervene, and evaluate the care of a rapidly deteriorating patient condition especially where the nurse is likely to be the only qualified health personnel calls for teaching/learning strategy that empowers the nurse to be competent and assertive in her decision making ability. It is also important to note that Nursing professional competences are built based on opportunities that allow students to develop positive attitudes towards effective and efficient performance. Preparation of students for National Council Licensure (Final Qualifying Examination for nurses) and competent practice by N&MCN informed the departmental members to adopt teaching /learning techniques that will adequately equip students to demonstrate competency in assessment, critical thinking, communication, teamwork, skill performance, and documentation during such examinations and thereafter as professional nurses. This study therefore was carried out to evaluate the perceptions of students on clinical simulation as a teaching strategy.

Purpose of the study

The purpose of this study was to evaluate the perceptions of nursing students on clinical simulation as a teaching strategy in an undergraduate nursing program at University of Calabar, Nigeria.

Research questions

- How do nursing students perceive the value of using clinical simulation in their learning?

- Do nursing students perceive that they are able to transfer knowledge from the simulation scenario to the clinical setting?

Review of related Literature

Simulation features strongly within the undergraduate nursing curriculum for many Universities. It provides a variety of opportunities for students as they develop their clinical nursing skills. The nursing literature highlights the potential of this approach and the positive opportunities afforded to students in terms of developing competence and confidence. Clinical learning using simulation is becoming an increasingly important instructional instrument in nursing education (Liaw, Chan, Ho, Mordiffi, Ang, 2015). This method of learning offers the potential for creating real nursing activities for developing nursing competency in clinical practice since instructional strategies utilized in both didactic and clinical components of nursing education courses are highly influential in determining critical thinking and reflection (Hawkins, Todd, & Manz, 2008) on clinical decision making ability as well as in developing the psychomotor skill performance of new graduates. The concept of simulation is identified as a novel and effective teaching method (Dunnington, 2014), that provides students learning environment made to resemble clinical practice as closely as possible; that emphasis application and integration of knowledge, skills, critical thinking (Porter-O'Grady, 2001; Smith, Gray, Raymond, Catling-Paull & Homer, 2012). It affords the learners' opportunity to reflect on what is being taught in situations that are not threatening to patient safety (Daly, 2001; Rauen, 2004; Duffy, 2013; Burns, & Grove, 2009). It also enables the learner to obtain knowledge and competence that reflects current nursing practice (American Nurses Association, 2010; Duffy, 2013). Quinn (2001) asserts that learning in adults is most effective when the environment is made to provide opportunity for active participation, interaction and immediate feedback. Nurse education is purposeful and directional to assist learners demonstrate conceptualized judgment based on their own experiential learning based on information presented in a meaningful way to anchor new ideas (Corrin, 2009).

Simulation as a Teaching Method

Simulation is an essential educational strategy that facilitates learning among nursing students. Tagliareni (2014) opined that simulation method of teaching/learning uses a team of experts to develop curriculum models directed toward readiness for practice outcomes, innovative orientation programs with evidence-based software applications, and teacher-ready strategies to create interactive learning experiences within the practice context. Clinical scenarios are thus created to provide learning experiences based on real patient cases, maintaining the realistic details of the disease and injury processes necessary to give the relevant learning points of each case (Campbell, 2015). Clinical simulation scenarios as presented by Dunnington (2013), Risjord, 2010) provide a means to promote active construction of knowledge and prepare students for events that occur occasionally as well as let students practice and acquire the expected skills in a safe environment. This method of learning has

been shown to be very effective for all categories of learner as mistakes made can be accepted without fear of compromising the safety of an actual patient (Childs & Seeples, 2006). Donovan and Forster (2015) report that effective communication and teamwork skills can easily be gained with practice simulation. Simulation in the area of medicine and nursing has become an important part of the education of students and practicing healthcare providers. To ensure that nurses meet the demand of the society and current information advancement, many institutions recommend the use of simulation in healthcare training. The Institute of Medicine's report on nursing work environments recommends simulation as a method to support nurses in the ongoing acquisition of knowledge and skills (Page, 2004). A Robert Wood Johnson Initiative report; in the *Future of Nursing* sees simulation as a strategy that supports inter-professional education (National Research Council, 2011). The Carnegie Foundation for the Advancement of Teaching report; *Educating Nurses*, highlights simulation as an effective strategy for the education of nursing students (Benner, Sutphen, Leonard, & Day, 2010).

Simulation scenarios are presented using mannequin. Mannequins are mediated health information technology systems that provide a range of clinical decision support tool (CDS) found to be essential in transforming nursing education (Health IT, 2013). Mannequins can also be seen as health information high technology equipment made to give the students a more realistic idea of what it is like to perform tasks on human patients (O'Keefe-McCarthy, 2009). Technologically-mediated care is reported to have the ability to regulate, systematize, and order the experience of health, illness, and death (Buckley, & Gordon, 2010). The overwhelming presence of technology at the clinical bedside has the power to become the strongest reference point that nurses use to inform, direct, interpret, evaluate, and understand their nursing care. Mannequins are adjustable and controllable according to the class content or reactions to certain procedures thus allowing learners to repeat skills-based lessons as often as they need with absolutely no impact on actual patients thereby increasing students' competencies and the depth of their skills (Smith et al, 2012; Dunnington, 2013) which concluded that although simulation cannot replace real-life experience, it can act as a bridge between theory and practice.

Theoretical framework

Bandura's (1977) theory of self-efficacy, Constructivism Theory and Adult Learning Theory guided the study. The Bandura's (1977) theory of self-efficacy suggests that an instructional treatment may increase interest and motivation, increase self-efficacy, promote persistence, and lead to the achievement of cognitive competencies and skills. As students become more competent and skilled, they become more confident and more motivated to try to learn the skill better. The Constructivism Theory on the other hand employs a holistic approach to Teaching and Learning. The theory is based on observation and scientific study about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences. In clinical

simulation, the constructivist view of learning points towards application of different teaching practices that encourage students to use active techniques (experiments, real-world problem solving) to create more knowledge and then to reflect on and talk about what they are doing and how their understanding is changing. The Adult Learning theory posits that the teacher, who may very well be an expert in a field of study, works to bring out each student's relevant knowledge. This form of knowledge transfer enables students acquire knowledge and competencies in a non-threatening environment for fear of making mistakes. The framework is important because it focuses on learning as processing cognitive skills, experiential growth and pattern recognition. This framework uses learner-centered practices, constructivism, and collaboration among individuals. When the learning is experiential, it allows for more-realistic tasks, allowing the learners more hands-on experience/practice.

Significance of the study

The pride of each educational organization is to see its products perform optimally in the society in whichever care setting they are employed. This is evidenced by the employment rate demand of the graduates. The distressing rise in morbidity and mortality among hospitalized patients in most hospitals also exacerbates concerns about nursing professional competency (Vincent, & Blandfor, 2013; Kohn, Corrigan & Donaldson (2000). Nurses and other health care professionals are now constantly under increased scrutiny to provide safe and effective care (Scott, Matthews & Kirwan, 2014). This invariably requires training schools to tailor nursing education programs that will produce graduates who are capable of providing safe patient care. This study will improve learning as a post-experience logical process which evaluates the development and competence of students. The process will provide opportunities for the teachers in the department to explore and make sense, discuss what went well and identify what could be done to change what went wrong, to make it differently or to improve it next time. Information gained from this study will be added to existing knowledge as a strategy of improving students' clinical practice through simulation.

Methods

A survey of nursing students' perception was designed to evaluate the relevance and applicability of this learning strategy for students to support the needs assessment for the use of simulation as teaching/learning strategy that improves nursing education (Bastable, (2014). A total of 45 third year levels of training students were given a 5-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (5) questionnaire following their participation in the presented scenarios using a mannequin model. Face validity of the instrument was determined by the tool's author instructions through a review by three lecturers and two clinical instructors. Permission for the study was obtained from the Head of Department. Purpose of the study was explained to both faculty and students. Students who gave their consent were enrolled for the study. An evaluation of all participants' clinical performance in a simulated clinical setting was carried out using a scenario of a patient for observation

of vital signs. Based on the students' perceptions; the evaluation was on ability to observe patient's vital signs; make clinical judgment, communicate and determine the

need for patient education. This study did not seek ethical approval as it was an evaluation of an educational method.

RESULTS

Table 1: Socio-demographic data of participants

Variable	Frequency	Percentage (%)
Sex		
Males	15	33.3
Females	30	66.7
Total	45	100
Age		
20- 25	15	33.33
26- 30	20	44.44
31-40	10	22.22
Total	45	99.99= 100
Students entry mode		
Generic	30	66.7
Direct entry	15	33.3

Table 2: Showing perceptions of nursing students on simulation as a teaching/learning strategy

Questions	Strongly agree	Agree	Somewhat agree	Disagree	Strongly disagree
Simulation is an important strategy for learning and the experience very rewarding and beneficial form of learning?	45 (100%)	-	-	-	-
Do you think the session has provided relevant learning experience?	42 (93.3%)	2 (4.4%)	1 (2.2%)	-	-
Was the content presented at an appropriate pace?	32(71.1%)	8(17.7%)	3(6.6%)	2(4.4%)	
Debriefing process is useful in preparing one in a given scenario?	41(91.1%)	4(8.9%)	-	-	-
The session helped me develop my clinical problem solving skills?	38(84.4%)	5(11.1%)	2(4.4%)	-	-
Teaching materials and resources help one prepare in advance for the session	41(91.1%)	3(6.6%)	1(2.2%)	-	-
The session helped me develop communication skills	42(93.3%)	2(4.4%)	1(2.2%)	-	-
The session increased my overall self-efficacy	42(93.3%)	2(4.4%)	1(2.2%)	-	-
Do you think you now have confidence in assessing vital signs?	42(93.3%)	2(4.4%)	1(2.2%)	-	-
You can provide patient education based on the knowledge acquired?	37(82.2)	6(13.3%)	2(4.4%)	-	-
The session has empowered you to respond to emergency?	40(88.9%)	3(6.6%)	2(4.4%)	-	-
Was the individual scenario intimidating with the instructor being in the room during the session?	-	17(37.8%)	25(55.6%)	3(6.6%)	-

Hundred percent ($n = 45$) rated the overall simulation experience excellent and 42 (93.3%) said simulation sessions provided relevant learning experiences, 41 (91.1%) reported that debriefing process was useful in preparing them in the given scenario to reduce fear and anxiety, 93.3% ($n = 42$) asserts that the session helped them develop communication skills, increase overall

self-efficacy and have confidence in assessing vital signs. Responding to an emergency for the individual scenario also rated high at 88.9% ($n = 40$). However, when the question was asked whether the instructor being in the room during the individual scenario made the experience more intimidating, the response was

37.8% ($n = 17$) for agree and 55.5% ($n = 25$) for somewhat agree while 6.7% ($n = 3$) disagree.

DISCUSSION

Simulation learning is often a case base scenario that helps student identify in the scenario the important signs and symptoms that indicate a problem, complication, or need for care, as well as the confounders that add information irrelevant to the scenario. The scenario is usually used to demonstrate the reason why real use is different from intended use and promote discussion about how equipment may be better integrated. Studies have shown that using clinical simulation before students are exposed to such conditions prepares them for clinical practice and provides opportunity for interactive learning in a risk-free environment, with immediate feedback from facilitators or lecturers (Aurilio, O'Dell, 2010, Buckley, & Gordon, 2010, Hall, 2015; Raurell-Torreda et al., 2014, Childs, Seeples, 2006).

Findings of this study indicate that simulation is useful for increasing students' skills for patient observation ($p < .01$), improving critical thinking to make clinical judgment ($p < .01$), and developing communication skills ($p < .001$). Simulation was also found to help decrease students fear and anxiety of making mistakes during client assessment thus promote greater self-confidence and self efficacy ($p < .01$) relating to patient observation. The participants reported significant ($p < .001$) clinical performance improvement recalling some experiences and using the step-by-step of procedures made of the simulation activities that showed improvement in their nursing knowledge acquisition indicating that simulation method of teaching/learning improves nursing education (Mabuda, Potgieter, & Alberts, 2008). Comments from participants revealed that simulation teaching/learning technique is relevant to practice, instructional strategies as well as fostering problem solving.

Although clinical simulation is a growing strategy to augment and complement clinical practice education, full implementation requires a broader scope than dependence on maniquin-based simulation alone (Sideras; McKenzie, Noone, Markle, Frazier & Sullivan, 2013). The challenge identified with this teaching strategy is that students cannot portray body language cues and internal anxiety in a maniquin or conduct interview (Raurell-Torreda et al, 2014). Simulation showed the possibility of paying attention to details that many times go unnoticed in the everyday of our professional lives like, only trained persons are allowed to conduct the simulation procedure. An increased enrollment in nursing program requires a larger classroom space to accommodate the number of students in each group during each session of simulation.

CONCLUSION

Simulation can provide students with opportunities to engage in hands-on application of theoretical knowledge that supports the transfer of this particular knowledge to practical skills while also improving critical thinking. As indicated in the literature and by the results, Clinical

simulation is a safe and effective instructional strategy for teaching baccalaureate nursing students to prepare themselves for effective and efficient nursing activities in real work environment. The use of patient simulators in nursing education is a relatively new instructional method especially in developing countries. The rationale for using simulation as an educational strategy thus includes the absence of risk to a live patient; the ability to provide standardization of cases; the promotion of critical-thinking, clinical decision-making, and psychomotor skills; the provision of immediate feedback, and the integration of knowledge and behavior. Through patient simulation scenarios, essential elements of patient safety can be emphasized, such as prevention of medication errors, promotion of effective communication, and the importance of teamwork. Simulations provide a promising educational tool in institutions where large groups of nurses need to be trained and accessibility to repetitive training is essential for achieving long-term retention of clinical competency.

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