

An Innovative Approach to Complex Client Simulation in Community Health

Innovative Client Simulation

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Abstract— Though there are community health simulations available, these scenarios can be cost prohibitive and lack a sophisticated level of complexity. Further, students using these existing scenarios have all of the work of developing learning objectives and key events check lists done for them. These limitations and a desire to foster critical reasoning in students prompted faculty to develop an activity in which students created a complex client simulation. Cost effective, sophisticated, complex community health scenarios were developed and student clinical reasoning in a safe environment was fostered. Ninety-five percent (19/20) of the students found the activity a valuable learning experience.

Keywords—Complex, Simulation, Community Health

I. INTRODUCTION

There is much in the literature on the use of simulation to improve students' critical thinking, clinical skills and student confidence.¹ Though a level of complexity can be achieved with high fidelity simulation for an individual client at the bedside, the setting is usually acute or intensive care for these types of simulations with a focus, particularly at undergraduate level, on safety.² Schools can purchase prefabricated client simulations that are medical-surgical based, that cover cultural diversity, are varied ages, and are inclusive of a multitude of nursing practice skills.³ These simulations also include physicians' orders, client background and summaries and key event observer evaluation check lists that can be copied and distributed to students.

There are now some community health scenarios available but they can be very costly to purchase. The available scenarios contain learning and practice opportunities of physical assessment and communication skills. Students using all of these existing simulations have the work of developing learning objectives and key events check lists done for them. ⁴ Community health faculty regularly needed to collaborate to 'tailor' the existing simulations to meet the needs of specific course objectives and program outcomes. It was in so doing that they realized the value of having their students also

participate in the developmental process of creating as well as executing a simulation. Critical reasoning occurs when students learn how to collaborate, talk about, and reflect on what they are reading or doing, to make meaning independently and together. ⁵ Thus faculty developed an innovative teaching method whereby a community health simulation would be created as well as executed by senior level community health nursing students using a learning paradigm instead of the more traditional teaching paradigm involving the existing prefabricated simulation scenarios.

The faculty involved with developing this teaching method had many years of simulation experience and had received training via the Peter M. Winter Institute for Simulation Education and Research (WISER). WISER, of the University of Pittsburgh Medical Center and its affiliates, is a world class multidisciplinary training and research facility with a mission to conduct research and training programs utilizing simulation based education to provide a safer environment for patients.⁶

II. LITERATURE REVIEW

Simulation has been proven valuable for undergraduate nurses in the development of skills proficiency, critical thinking and the building of student self confidence. ⁷ Cant and Cooper found that simulation had some advantage over other teaching methods, depending on the context, topic and method.⁸ These simulation scenarios tend to focus on physical assessment and technical skills. However, as the trend is now for student nurses to practice outside of the more traditional acute care settings, a wider range of community health concepts should be developed for simulation. ⁹ Cant and Cooper also reports that simulation can be a valid teaching and learning strategy whereby knowledge, critical thinking, student satisfaction or confidence can be achieved. Yet validity and reliability of simulation activities can vary due to differences in design and assessment methods.

Rourke, Schmidt and Garga concluded that theory-based research could bring coherence and external validity to simulation after finding that that 45% of faculty made no use of theory in simulation; 45% made minimal use; and only 10%

made adequate use. 10 Kaakinen and Arwood concluded that most nursing faculty approach simulation from a teaching paradigm and that for simulation to foster student learning there must be a fundamental shift to a learning paradigm.¹¹ They advocated learning theory to design and evaluate simulation. They also suggested that more research be done to investigate the efficacy of such simulation activity designs in the improvement of student learning.

Senior level community health faculty wanted to use theory based research to both guide and provide external validity to simulation activities for their students and chose to adhere to a learning theory approach in order to increase senior level nursing students' critical thinking in the simulation setting as well as begin to investigate the efficacy of such an approach with their students. In addition, constructivism is a learning theory that attempts to explain how learners learn by constructing understanding for themselves.¹² This theory helps the student gain confidence, as well as reliable knowledge through experience. The student acquires new knowledge through testing and interacting with a particular environment. This theory enhances a student's logical and conceptual growth. Community health faculty felt that a constructivist learning theory approach to simulation would yield the best results in facilitating critical thinking in senior level nursing students. It was thought that the best way to do this was to have students *create* as well as execute the simulations. In this way students would apply existing knowledge and real-world experiences in the clinical setting to simulation. They would also learn to hypothesize and then test their theories in the simulation lab, and ultimately draw conclusions from their findings. The innovative teaching method developed by faculty that is presented in this paper strove to teach simulation from a learning paradigm in order to enhance critical thinking amongst students.

III. REDESIGNING SIMULATIONS FOR COMMUNITY HEALTH

The faculty role was to provide the problem solving tools and framework for the activities to meet the learning needs of the student and course objectives, and to provide feedback throughout the process to the student groups. This was done by examining the existing Laerdal materials and creating a 'student guide and worksheet' document which the students used to create their simulations. In addition to this guide, students were also given a 'doctors order' and 'key events check list' to complete for their scenario. The students were given two weeks to complete this assignment and submit their scenario to faculty for review and possible revision prior to execution of their scenario in the lab. The simulation experience provided a collaborative learning environment that transformed the students from being the passive recipient of information to become active participants in the entire learning process. It was also thought that this activity would provide students with a way of fostering critical thought by having students think through the process of creating the simulation and learning objectives for a complex client themselves using the guidelines set forth by the faculty.

Our community health faculty designed the framework (guidelines and student work sheets) for three complex client simulations. Students were encouraged to be creative in the development of their scenario and given a guide created by faculty to help them compile relevant information on their clients, create physician orders and key event evaluation check lists. The guide was created using the existing Laerdal materials, which were extrapolated upon to include common medications, home care issues and complex clients seen in the home health setting.¹³ Students were encouraged to use not only what they'd learned in the classroom or their textbook, but also what they had experienced first-hand in the clinical setting with their assigned home health nurses. The simulations were intentionally done toward the end of their community health clinical rotation so that students had witnessed or participated in dialogue with actual clients with the ailments, in some cases the medications, and in all cases at least one of the 'issues' (culture, health literacy, compliance and/or safety concern) to be played out in each of the scenarios. They would also be required to research the topics, medications and issues in order to present the scenario fully to their peers. All students participating in this activity were senior level nursing students. They had been taught throughout the program from sophomore level onwards exactly what quality and safety measures and knowledge, skills and attitudes were expected from the professional nurse.¹⁴ Students were referred back to these guidelines by faculty and they were included in the development of each scenario.

Senior level students (BSN, year four) were placed in three groups of six or seven and given one of these complex clients on which to create a scenario within the framework developed by the faculty. One of the students took on the role of the client and the others either as family/caregivers, other health care professionals (e.g., dietician, therapist, physician), two home health RNs and/or researcher/typist/production. Communication and collaboration between health care professionals has been shown to improve in clinical practice if interprofessional training and exploration occurs in the simulation environment.¹⁴ This was the rationale for encouraging students to incorporate these roles into their assigned scenarios. Although students were not directed to include technical competencies, the skills and experiences they had encountered during home care visits with their assigned home health or hospice nurses and faculty were written into the scenarios by the students as they pertained to their assignment. For example, the simulation for a client on Coumadin included a venipuncture to be drawn for relevant laboratory results, and the scenario for the renal client incorporated a peripherally inserted central line infusion and dressing change. A draining foot wound was included by students for the client with Type 2 Diabetes scenario they were assigned to write. This demonstrated that students were able to build upon existing knowledge and clinical experience and that this activity lead to meaningful, active learning and participation on the part of the students.

IV. IMPLEMENTATION OF COMMUNITY HEALTH SIMULATIONS

Each student group came to the simulation experience prepared to present their scenarios. All participated in the creation of their assigned scenario and at least 5 of each group actively participated in the scenario. Each scenario was creatively executed in the set-up of the simulated home environment. All post-conference debriefings were conducted by faculty using a 'Structured and Supported Debriefing' tool adapted from O'Donnell, Rodgers, Lee, Edelson, Haag, Hamilton, Hoadley, McCullough and Meeks, with time allotted for gathering, analyzing and summarizing of student comments via the "G.A.S. Debriefing Model" (G- gather, A- analyze, S- summarize).¹⁵ This tool was provided to faculty for implementation via a conference held at the University of Pittsburgh's Peter M. Winter Institute for Simulation Education and Research.

V. EVALUATION OF COMMUNITY HEALTH SIMULATIONS

Faculty invited students to voluntarily take a brief survey at the conclusion of the learning activity in order to evaluate their satisfaction level and overall perceptions regarding the effectiveness of this activity in meeting their educational needs. The survey was developed by the faculty and validated for use by the nursing department's Outcome Committee in order to assess the use of simulation in the overall program. All of the students chose to complete the survey. An overwhelming majority of the students were satisfied with the activity as a valuable learning experience and rated its purpose and the activity's organization highly. Realism, impetus to participate, importance in providing safety in home care and appropriateness in meeting the course objectives also received a 'strongly agree' or 'agree' on the survey's 5-point Likert scale with the majority of students ranking these items at a 'strongly agree.'

This same evaluation tool had been used in community health simulations written by faculty which used a simulation mannequin in the past and the scores were higher for the simulation written by students than any of the previous simulations. The average ranking for each item on past evaluations was rarely above 75% over the past four years. The nursing students, who volunteered to role-play the client and the rest of their team who created these simulations used the experiences they encountered with real clients while doing their medical-surgical or home health clinical rotations. They mirrored the communication styles, compliance issues, intraprofessional partnering and family dynamics they had participated in and/or witnessed in the practice arena. This made for some very lively, interesting and pertinent debriefing dialogue between the students on what worked, what didn't work, why, and what could be done better. Some examples include dialogue between students regarding nurse-client communication and advocacy for the client with diabetes who was not compliant, and identification of the signs and

symptoms of a medication overdose as exhibited by a client with Alzheimer's. Further, faculty noticed a distinct improvement in critical thought, confidence level and communication patterns amongst students as the groups learned from one another with each successive simulation. For example, in simulation one the students demonstrated faulty aseptic nursing bag technique in the home that was not repeated in simulation two or three. Further, students paid much more attention to their communication skills, roles as educators and client/family advocates than the tasks such as vital signs, venipuncture or wound care. The tasks were the things students tended to focus on when they did not write the learning objectives for the client/family in the simulation. Nursing students at senior level were very enthusiastic about the idea of bringing their own practice experiences and problem solving techniques into the simulation lab to share with their peers and stated that they enjoyed the creative aspects of the learning activity, which made it less "scary" and more "fun."

VI. LIMITATIONS

Originally, faculty wanted to use a high fidelity simulation mannequin but there wasn't enough time to have the students create the scenarios and then program them into the simulation mannequin via the Simulation Specialist. The Simulation Specialist was able to create vital signs via the monitors for the student's who role-played the client, provided changes in these vital signs based on how the student scenarios unfolded and provided all of the necessary equipment. Actual PICC dressing change, venipuncture and wound care, which could have been performed on the mannequin, had to be done on a separate plastic arm. As these scenarios were complex and the process of creating them new to both students and faculty, the faculty allowed the group who had created the scenario to simulate the scenario. Had faculty been able to program the mannequin with the depth and breadth of the student created scenarios ahead of time, the actual participants chosen could then have been selected from the group that did not actually write the scenario. This would have afforded the participants as well as the observers the opportunity to critically think and problem solve their way through the unfolding case.

VII. CONCLUSIONS

The use of constructivist learning theory to design a community health simulation activity proved to be successful in meeting the learning objectives of both the students and course. The students expressed no challenges with the assignment. Indeed the only drawback for faculty was the concern that though the exercise itself did appear to help boost student comfort level, confidence and critical reasoning in the creation of the scenario, a barrier may have been created by allowing students who created a given scenario to also execute it in the simulation in the lab. Faculty erred on the side of caution in allowing students to simulate their own scenarios, as this was the first attempt at such an innovative approach

which was unknown and untried by both faculty and students. In future, having students who were not involved in the creation of a given scenario execute it in the simulation lab should allow for students to increase their critical reasoning skills by participating in both the 'process' of simulation as well as 'product.' Further, these three scenarios written by students can now be programmed into the simulation mannequin for future use which would afford both student participant and observer the opportunity to critically think, problem solve and evaluate the unfolding cases. This simulation activity presents as more of a pilot teaching/learning activity due to its quantitative nature therefore there is a need for a more formalized 'pilot study' with inferential statistics beyond the Likert scale outcomes to be done by faculty in future. The next step would be to measure the changes in student critical thinking attributes by means of the antidotal evidence. The exercise needs to be replicated and tested to improve organization and benefit to student population and further research also needs to be done by the community health faculty to investigate the efficacy of constructivist learning theory simulation design in the improvement of student critical thinking.

If successful, more faculty-structured and student created complex simulations could be done using student created scenarios, run, improved upon and programmed into the simulation mannequin for future use, thus creating a library of community simulation scenarios specific to the course objectives and program outcomes of the nursing department that could be used by other community health faculty. Pediatric and psychiatric client scenarios in the community setting can be accomplished by using the faculty-structured, student-created approach as well. Intraprofessional scenarios can be done whereby a client is being discharged to home from an acute care setting by third year nursing students (junior level). This would be followed by fourth year students in the home care setting (senior level). Cost effective, complex community health scenarios would then be standardized and used by all faculty in the lab setting that would not only meet the need of faculty in the simulation lab, but would also encourage students to creatively analyze and synthesize relevant information in the care of their clients. It would also foster sound clinical thinking and build student confidence in taking on the role of the nurse. Also, in the future, both this learning activity and the student surveys could be designed to focus less on student satisfaction with the simulation itself and more on how student comfort, confidence levels and critical thinking enhancement in the simulation lab effect real patient care outcomes.

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