

Sim-Man



Not Your Grandma's Nursing Education

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Nursing schools have been using simulation as part of their curriculum since the 1950s, although it wasn't until recently that research has sought to evaluate the efficacy of human patient simulators in nursing education. Human patient simulators have improved over time. Used primarily in schools of anesthesia in the 1960s, they have progressed from a torso apparatus with separate computerized software, to high-fidelity human patient simulators that have software maintained within the mannequin.

Created in the 1960s, "Sim One" was the first computer-controlled patient simulator. Sim One was controlled by a hybrid digital and analogue computer. Only one Sim One was created and was not distributed due to the cost as well as the fact that there was already a

well-known apprenticeship training model used in the 1960s (Cooper & Taqueti, 2004). Other models with different applications developed over time, including the Harvey cardiology mannequin and the Comprehensive Anesthesia Simulation Environment (CASE) model. SimMan® was not developed until the mid-1990s and was much more cost effective than other high fidelity human patient simulators, and it altered the market for this type of learning. Once the simulators became affordable to nursing education, it was time to convince educators of their effectiveness in the classroom. According to Peteani (2004), using human patient simulators to practice clinical skills provides students with a safe environment which fosters autonomy, independence, and the development of analytical skills.

Studying SIM

A limited part of my nursing education was spent in the simulation classroom learning how to listen to heart tones, auscultate breath sounds, and think through actual case scenarios. Human patient simulators were, I believe, a somewhat daunting task for the nursing faculty at my school, as most of the clinical faculty are limited-term lecturers and work full-time jobs outside the academic setting. The professors I had were initially unreceptive to this new technology mainly due to lack of education on the mannequin. After reviewing current research and student evaluations, I think they were more apt to invest the time necessary to learn how to operate the human patient simulators. When I was a student, this new technique was in the process of being introduced, and not mandated. Given how beneficial I found the experience, I would have enjoyed



more opportunities with this type of learning.

As part of my capstone course for my Bachelor's degree, we were required to collaborate with a member of the nursing faculty on a project that would influence change in the

nursing program. The project was an attempt to have student input be a driving force behind the future of the nursing program. The faculty member I was assigned to was teaching the first hospital-based clinical to associate degree nursing students.

I was able to observe the students throughout the semester and to determine what type of project would best meet their learning needs. We decided to develop a simulated clinical setting with the use of SimMan to foster development of clinical skills and to boost confidence among novice nursing students. We hoped that working in a simulated setting would allow students to be exposed to patient care without fear of hurting the patients. The high fidelity simulators are able to respond to student interventions and then provide the consequences of their decisions. The teaching plan included opportunities for students to make mistakes and learn from their experience.

Working with a faculty member was also a rewarding experience for me as I learned to communicate effectively and to draw on her expertise in nursing education. We met several times to develop the case studies we felt would pro-

mote the best possible learning for our students' level of experience. Our different perspectives as student and teacher helped us expand the knowledge base we had to pull from. We wrote three unique case studies complete with lab results, medication lists, critical thinking exercises, and nursing diagnoses. We frequently used the course description to guide us in creating case studies pertinent to the students' learning needs. Throughout the case study creation process, we continually evaluated whether we would be able to create a realistic simulation with SimMan.

Once the case studies were written, I gathered the information and created a functional CD-ROM that we distributed to the students prior to and during the case scenarios. The CD-ROM contained all the information the students needed to be prepared for the simulation exercises. This format also made it possible for the

students to return to the information after the simulation and review for added learning.

After the case studies were created, my preceptor and I met in the simulation classroom to practice programming SimMan prior to the day we met with the students. We worked through the scenarios several times to make sure that we had the settings correct and SimMan functioning as closely to the case studies as possible. Meeting prior to the clinical day was critical to the success of our simulation experience. We discovered it was necessary to have two faculty present during the simulation experience, one to program SimMan throughout the case scenarios and one to assist the students working through the lab and medication data.

The SIM is sick

The first case study included a patient with atrial fibrillation who was experiencing a deep vein

thrombosis. SimMan was programmed with an irregular heart beat, shortness of breath, extreme pain in his lower extremity, and corresponding audio. There were IV pumps with the correct fluids and the students could work through math problems to calculate the correct rate for their patient. The students started by completing an initial head-to-toe assessment, checking IV fluids and vital signs. Once the students completed their primary assessment, they collaborated to determine what their course

of action should include. They were given choices, such as calling a physician, giving pain medication, administering oxygen, etc, and then asked to give the rationale for their decision. If the decision was to call the physician, they were then given instructions to follow. Once the first group finished their case study, the human patient simulator would be programmed to say something like, "I feel better now," and the groups would switch places. A second group spent the first half of the clinical

looking up labs and medications, and were asked to explain what implications the medications had or what they might expect because of certain lab results. They were able to apply this information while caring for the patient. Students were encouraged to ask questions throughout the exercise to gain the most experience from their simulation clinical.

The second case study was a patient who had recently had hip replacement surgery and was having trouble breathing. SimMan was programmed to have tachypnea, shortness of breath, chest pain, and agitation. Again, the first group of students would work through the scenario at the simulator while the other group would look up medications and lab results. Once the students completed their assessment, they were asked to use critical thinking skills to determine

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what the best course of action to take. They were also asked to think of possible diagnoses for this patient. Once they talked with the physician, they were asked to start Heparin and they had to figure out the correct dosage before starting the medication. They were asked to determine what labs would be required while the patient was on Heparin and what the goal of the Heparin therapy would be. Again, students were encouraged to ask questions throughout the simulation.

The final case study was a patient who was in respiratory distress. The students were split into groups as before and were asked to work through the case study individually without input from their fellow classmates. This way, the students felt as though they were one-on-one with a patient. Once they completed their initial assessment they were allowed to leave the room

and collaborate with their fellow nurses, as a nurse might do working in the hospital. Before they left the room, they were expected to make some judgments about what they should immediately do for the patient. They were encouraged to think about the ABC's (airway, breathing, circulation) and implement nursing interventions accordingly. They were asked to give their rationale for each implementation. The groups then switched and worked through the other half of the case study.

At the end of the case studies, the students were asked to create an entire nursing care plan for each patient. They were asked to consider physical and psychosocial needs of the clients in the case studies. After developing their care plans, the groups discussed their different diagnoses and then worked together to prioritize them. Discussion followed as to why certain nursing diagnoses took precedence over others.

SIM Learning: Don't Be Afraid to Touch

The goal of clinical simulation was for students to gain confidence and learn in a highly adaptable, safe environment. We asked the students to fill out surveys at the end of the simulation experience to evaluate the effectiveness of substituting a hospital clinical for a simulation setting. The feedback from the students was

positive. They felt they gained valuable experience from the SimMan session and requested more opportunities to learn in a safe setting. They especially liked being able to listen to breath sounds and heart tones on a simulator to try to distinguish the difference before actually hearing them on a patient.

Overall, this experience was very enlightening. I learned a great deal about human patient simulators and their effectiveness in the educational setting. I gained valuable experience in planning and implementing a teaching project within a clinical setting. I believe human patient simulators will be used more readily in the future of nursing education as an important tool in the learning process. Rhodes and Curran agree that human patient simulators can help aid in the dilemma of inadequate clinical experiences and facilitate improving skills, decreasing fear, and promoting safe nursing care. The nursing school I attended now strongly encourages clinical instructors to use SimMan in the clinical setting. As more opportunities for education using SimMan are available to the faculty, the use of this technology will be mandated. The goal of the assignment was to influence change in our nursing program. SimMan is changing the future of nursing education and preparing nurses for real-life experiences. ©

references

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