Developing and Evaluating a Pediatric Virtual Simulation for Nurse Practitioner Students in Advanced Pharmacology Courses

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Advanced Pharmacology with Pediatric Patients

Background
The role of an advanced practice nurse as prescriber involves choosing the appropriate drug considering pathophysiology, understanding the expected outcome of the drug, and assessing the patient’s social factors that may determine the choice of prescribed drugs and adherence to medication regimen. Pediatric patients pose a unique challenge to advanced practice nurses not only because children are constantly developing, but also because any treatment decision must consider the parent and the family situation (Woo, 2016). In order to address these challenges, virtual patient simulations have arisen as an innovative technology for students to practice safe prescribing for the pediatric population.

Purpose
The purpose of this study was twofold: 1) to illustrate how a simulation team developed a weight-based dosing virtual patient case that included learning activities for medication selection, dosage calculation, patient and parent education, and prescription writing, and 2) to evaluate a pilot version of this pediatric virtual simulation with nurse practitioner students.

Simulation Learning Objectives

- Identify appropriate medical treatment
- Understand therapeutic uses, effects, and risks of drug classes for pediatric patients
- Understand comorbidities that reflect pharmacogenetics clinical decision making skills
- Create prescriptions that reflect patient-centered care and clinical decision making skills

Social Context

Communication with Pediatric Patients

Communication with Guardian

Cultural Competency

Study Methodology

Participants
This pediatric virtual simulation was pilot tested asynchronously with 32 students who were enrolled in graduate-level nursing courses (MSN, DNP, FNP, CNS, CNL, etc.) across the United States during the Fall 2018 semester.

Virtual Patient Simulation
The virtual simulation incorporates learning activities that address both pharmacological and nonpharmacological patient outcomes relevant to the scenario. Pharmacological outcomes include prescribing the appropriate antibiotic (amoxicillin or penicillin) to alleviate patient's GAS pharyngitis as well as suggesting acetaminophen or an NSAID if the fever gets worse. Nonpharmacological outcomes include educating the parent on when to return to the clinic if the child's symptoms do not get better, practicing therapeutic language with the parent, and practicing therapeutic language and age-appropriate language with a pediatric child.

Measures
Students responded to a 16-item (5-point Likert-type and open-ended) online survey related to their overall experience with the virtual simulation, including the conversation with the patient and parent, the medication selection activity, the patient education activity, the weight-based dosing tutorial, the prescription-writing activity.

Procedure
The pediatric virtual simulation had a post-exam activity that included a link to the online survey instrument. In the survey instructions, students were told that their answers would be confidential and that participating or opting-out of the survey would not interfere with their patient exam assignment in any way.

Overall Results

Students felt that they understood how:
- To successfully complete the simulation (4.42 out of 5)
- Their performance would be assessed (4.30)

Some factors contributing to student satisfaction were:
- Practicing prescriptions
- The opportunity to interact with both the child and parent
- Having different options available in the medication selection activity
- The steps of the weight-based dosing tutorial

Conclusions and Recommendation for Practice

Safely prescribing for the pediatric population requires special considerations and skills. Children do not necessarily understand medical language as an adult might, and they may need help in understanding their illnesses and treatments in ways that do not frighten or disturb them. Integrating pediatric patient preferences into treatment when medically appropriate is not just patient-centered care, but can preempt the challenges of pediatric medication adherence.

Virtual patient simulations present a viable, flexible, and standardized option for practicing patient-centered prescribing for the pediatric population. This study found that nurse practitioner students find value and realism in practicing therapeutic communication and pharmacological therapy using virtual patients. Virtual patient simulations can provide nurse practitioner students with opportunities to practice medication selection, patient education, and prescription writing in a safe and controlled manner before beginning actual patient care experiences with pediatric patients.