



Home care simulation for student nurses: Medication management in the home



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SUMMARY

Background: Preparing students to provide medication management in home care (HC) settings is challenging. Simulation methodology for teaching of complex skills has been successful in other clinical areas.

Objectives: This study tested a HC simulation model of education and examined student scores on tests of confidence and knowledge in managing medications and pre filling patient medication boxes in a HC setting.

Design/settings/participants: This quasi-experimental study of pre-licensure nursing students (N = 60) enrolled in a Baccalaureate program was conducted at a private university in the Northeastern United States.

Methods: Bandura's self efficacy instrument was modified to measure confidence in students' knowledge of and skills in pre-filling medication boxes in patient homes. Participants were randomly assigned to control (n = 30) or experimental groups (n = 30) where both groups received traditional classroom teaching about medication management, and the experimental group also received simulation education. Both groups completed a pre test prior to the medication module. At the end of the module, both groups completed a post test measuring confidence, as well as a multiple choice (MC) test measuring knowledge of medication management skills in HC settings.

Results: Paired T tests revealed a significant increase in perceived self confidence from pre (mean score = 4.6) to post simulation (mean score = 8.6) (p < .01). Knowledge test results demonstrated a statistically significant difference overall between groups (p = .02).

Conclusions: Students have limited access to medication management in HC settings during clinical rotations. This study supports the need for home care focused simulations, especially given errors detected during the simulation experience. Students improved their pre to post test confidence scores and reported the activity was "valuable", "made them think", and provided a safe arena for them to learn.

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Introduction

The purpose of this study was to determine if student participation in a home care (HC) simulation resulted in statistically significant higher scores on two tests measuring knowledge of and skills in medication management, compared to students who did not participate in the simulation. The tests measured perceived self confidence via Likert scale, and knowledge via multiple choice (MC) questions. Another purpose was to evaluate students' ability to demonstrate proper medication administration during a simulated HC visit as measured by a checklist of skills. There are few studies whose investigators compared medication management using traditional versus simulation methods of learning. The value of this study is that it includes students in the same nursing curriculum (presumably with similar

classroom and clinical experiences) exposed to two different teaching pedagogies.

Background

HC services came into existence in the United States (U.S.) in the 1880s and include care within their own homes for people with acute, long term, and terminal illnesses, permanent disabilities, or those in need of rehabilitation (National Association for Home Care and Hospice [NAHC, 2010]). Approximately 8.6 million people currently receive HC services in the US (John A. Hartford Foundation, 2011), and it is anticipated that the numbers will rise with the aging of the US population. Rising health care costs in the US and globally support the need for well educated health care professionals, especially for assisting with medication management.

The majority of HC recipients in the US are over age 65 and have Medicare as the primary payer for these services (NAHC, 2010). Under Medicare guidelines HC nurses engage in skilled teaching/training to patients or caregivers about treatment regimens while in the home (Center for Medicare and Medicaid Services [CMS], 2011, p. 2). This often includes teaching about medication regimens, as medication errors have been found to exist in HC settings (Mager and Madigan,

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2010). Sometimes nurses initiate the use of a medication box, also called a MCA, or multi compartment compliance aid (Nunney et al., 2011) to dispense medications so patients can take pills out of the pre filled box, rather than struggle with a myriad of bottles. One type of MCA frequently used has individual spaces for the seven days of the week, and four times a day (morning/noon/evening/bedtime). These 4 × 7 boxes can be helpful when numerous medications are ordered at various times of the day and the patient is having difficulty managing the regimen. Some older adults have found MCAs to be convenient, easy to use and helpful in maintaining independence (Nunney et al., 2011). The role of the nurse is to teach the patient/caregiver how to accurately pre fill one week's worth of medications into the box and to take medications at proper times of day while omitting the need for individual pill bottles.

In spite of the frequency with which HC nurses manage medications, often student nurses do not have this opportunity during HC clinical experiences. Reasons may include patient or nurse preference (they prefer the nurse manage medications); liability issues and the possibility for errors; and limitations in the ability to bill Medicare when a student, not a licensed person conducts the HC visit. By not having an opportunity to practice these skills, students may graduate without the necessary expertise in this area unless other methods are employed to prepare them. For this reason, a HC simulation was developed to teach students how to accurately pre fill a MCA using critical thinking skills and to manage unexpected medication management issues that arise.

Review of Literature

It is a well-known fact that simulation is viewed as a valuable method for teaching nursing students in economically developed countries where complex critical-thinking skills are necessary in preparing competent practitioners. In a systematic review of the role of simulation-based learning in nursing education, six of twelve studies demonstrated increases in "knowledge, critical thinking, ability, satisfaction, or confidence compared with a control group (7–11%)" (Cant and Cooper, 2010, p. 3). Similarly, Zulkosky (2010) compared teaching strategies using an active teaching approach in comparison to lecture-classroom format and found student satisfaction and self-confidence increased with the use of simulation. However Brannon et al. (2008) found an increase in cognitive skill performance (scores on exams) when simulation was used but the effect on student's self-confidence was unclear. Garrett et al. (2011) conducted a review of a three year simulation project comparing it to a national survey in Canada (Garrett et al., 2007) and concluded that team-based learning coupled with the use of High-Fidelity Simulation (HFS) created more synergy for students to experience "teamwork, critical thinking, prioritization and increased awareness of interdisciplinary team members" (p. 675). In another multi-site study, Johnson and colleagues (2012) demonstrated enhanced clinical judgment in the care of a geriatric patient when both simulation and role modeling were incorporated. Starkweather and Kardong-Edgren (2008) describe the importance of non-linear teaching to technology savvy students who are accustomed to gaming, multi-modal learning, and internet surfing and how simulation can improve engagement and learning for this cohort.

While many simulations focus on acute care settings, home and community health are also beginning to benefit from the use of simulation pedagogy. For example, Lange et al. (2011) outlined an educational model for community-based geriatric education that successfully used simulation to teach best practices in care of older adults to over 100 health care personnel in long term and home care settings. Yeager and Gotwals (2010) incorporated HFS into community health curriculum focused on care of an older adult. Findings suggested decreased student anxiety and increased knowledge about providing HC visits post simulation. Smith and Barry (2012) described the use of simulation as an approach to preparing nursing students for care of the elderly in the home, and found positive outcomes in student satisfaction and self-confidence

when comparing traditional (control) and simulation (experimental) groups. Unsworth et al. (2011) described the use of simulation to improve HC standards in the United Kingdom. The researchers developed scenarios for practicing nurses to enhance diagnosis and management of deteriorating conditions for patients at home and found increased confidence after simulation education and debriefing. Similarly, Richards et al. (2010) described the role of simulation in increasing the confidence of public health nursing students preparing to do home visits. Using a researcher created self-efficacy tool they examined students' overall knowledge about and confidence in their ability to gain entrance for a home visit, assess the client, identify priorities for care, summarize the visit, use their nursing bag and exit the home. Outcomes included decrease in student anxiety and faculty ability to assess student readiness to conduct a home visit. Finally, Eaton et al. (2011) used a qualitative approach to explore end-of-life simulation in home health and hospice practicum settings. They found three themes: *experiential learning, affirmative outcomes, and family as client* and concluded that students' experiences were perceived as valuable and useful.

The unique approach to teaching medication administration in HC to pre-licensure nursing students uses simulation pedagogy to enhance hands on skills and critical thinking necessary to manage the complex medication regimens of HC patients. Previous researchers have demonstrated enhanced self-efficacy, decreased anxiety, and improved clinical performance of skills after role-modeling, practicing, and debriefing scenarios using simulation for complex instances. Given significant numbers of medication errors, increasing polypharmacy, and need for careful patient education, this study focused on medication management and the pre filling of a MCA during a HC visit.

Research Questions

1. Do students who participate in a simulation demonstrate higher scores on perceived self confidence in their ability to pre fill medication boxes in a HC setting than students who do not?
2. Do students who participate in a simulation demonstrate higher scores on a multiple choice (MC) test on knowledge of medication administration in a HC setting than students who do not?
3. Do students who participate in a simulation demonstrate ability to perform medication administration in a HC setting as evaluated by checklist during the simulation?

Methods

Sample and Setting

Permission to conduct the study was granted by the Institutional Review Board of a small private institution in the Northeastern US. Baccalaureate level pre-licensure nursing students in year three of four willing to sign informed consent to participate, and enrolled in a skills course were the target population (N=60). Course faculty members conducted the simulation sessions in the school's skills laboratory.

Design

A convenience sample of students (N=60) participated in this quasi experimental study. Prior to presentation of oral medication content in class or laboratory, participants completed a pre test to measure perceived self confidence in their knowledge of and skills in oral medication administration in a HC setting. Participants were then randomly assigned to two groups; the control group (n=30) had no simulation experience but was provided normal classroom instruction on HC medication management issues including use of power points, didactic lecture, readings, and demonstration/return demonstration of pre filling a MCA in the laboratory.

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