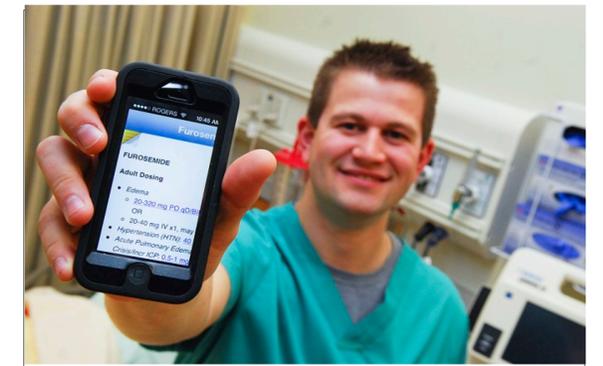




Mobile Technology Integration In Baccalaureate Nursing Education To Promote Technological Competency And Reduce Medication Errors.

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Purpose

To educate nursing faculty on effectively integrating mobile technology use into their curriculum, thereby promoting technological competency; to provide students with classroom and clinical experiences; to increase evidence-based practice and decrease medication errors by making relevant information available at the point-of-care.

Background:

- The practice environment for nurses has changed radically due to the advances in information technology and massive expansion of knowledge in health care. Promoting technological competency is a priority in nursing which can be done by integrating the use of mobile technology in the clinical setting and course work to better prepare graduate nurses for the current and future health care environment.
- The American Association of Colleges of Nursing (2005), the National League for Nursing (2008), and the Institute of Medicine (2003), which are some of the major forces in professional health care and nursing education, advocate for the incorporation of technology in nursing education (George et al., 2010).
- Technological competency is the skilled demonstration of intentional and authentic activities by nurses who practice in environments requiring technological expertise. It supports current high-tech nursing practice by validating the dependency of nursing on technologies in the management of health care (Locsin, 2005).
- Nurses are the bridge between the patient and technology. The nursing curriculum and teaching strategies needed to teach with and about technology better inform health care interventions that improve health care outcomes, especially medication error reduction (NLN, 2015).
- The IOM drew attention to the need for technology solutions that can make a difference in the ability of nurses to ensure safe, high-quality patient care, emphasizing the area of medication administration (McKesson, 2004).
- The American Association of College of Nursing (AACN) recognized that technological advances are increasing opportunities to improve the quality of, and access to, nursing education (AACN, 2002).
- Technology solutions, especially PDA technology, can make a difference in the ability of nurses to provide safe patient care in the area of medication administration, especially medication calculations, by having access to the latest healthcare information. Health care professionals require access to ever-expanding knowledge, and PDAs or other handheld computer devices can serve as valuable tools for education, information storage and retrieval, and clinical practice (George et al., 2010).
- Using PDA technology at the point of care; by a bedside, in the community, in the office, or in a patient's home can reduce errors and promote patient safety. It provides a mobile platform whereby the nursing student or nurse can download various types of software and access information quickly that supports evidence-based nursing practice (Beard et al., 2011).

Methods:

- An evidence-based pilot study using Rosswurm and Larrabee's change model was conducted at a private School of Nursing in Northern NJ.
- The stages are similar to the nursing process and are as follows: assess, link, synthesize, design, implement and evaluate, and integrate and maintain (Rosswurm and Larrabee, 1999).
- A convenience sample of twenty undergraduate junior nursing students enrolled in the medical-surgical nursing course and were given a case study with an attached medication administration record.
- Students were instructed to use the PDA with nursing software to complete the questions and calculate drug dosages in the case study. The comparison group was the same twenty students who use the PDAs. They were required to complete the same case study using textbooks and a calculator after 4 months.
- The two outcomes measured were accuracy and speed. Accuracy was determined from the 10 questions asked in the case study. Each correct answer received a score of 1, and each incorrect score was scored as 0, with a maximum score of 10. The speed was the time each student took to complete the case study, the maximum time allotted was 15 minutes.
- The groups are similar, since the same group was used for the PDA exercise and the textbook exercise to complete the case study.
- The t-test, a non-parametric test was used. The mean accuracy, mean speed, standard deviation (SD), t value, degrees of freedom (df) and level of significance (p value) were calculated.



Results:

- The mean accuracy for the PDA group was 9.90 and 9.65 for the textbook group, df was 38 and $p = 0.06$. The level of difference between the means for the two groups was not statistically significant. However, the mean accuracy was higher by 0.25 in the PDA group compared to the textbook group.
- The mean speed was 7.25 minutes for the PDA group and 12.0 minutes for the text book group, df was 38 and $p = 0.0001$.
- The level of difference between the means for the two groups was statistically significant. This shows that the group that used the PDA worked at a faster speed than the group that used the textbooks.
- The standard deviation for the two groups revealed that the participants' responses were similar to the mean. Post-evaluation survey indicated that the students found the PDAs easy to use and perceived their use as beneficial to their learning in the clinical area.

Conclusions/Implications for Practice:

- Students use the PDA in the clinical setting to access information that supports nursing practice thus reducing errors, improving care, and promoting patient safety by increasing accuracy and efficiency.
- Medication administration is a critical step, and the nursing student or nurse administering that medication must be able to perform this procedure safely. Medication administration is also performed frequently, which increases the chances for error, since it involves calculations. When medication information is available in a PDA, it can be retrieved easily at the point of care, thereby reducing the incidence of medication errors.
- This promotion of technologic competency will improve the quality of nursing practice and therefore should be included in the nursing curriculum. These outcomes are in concert with IOM's goal to provide safe medication administration at the point of care.
- The rapid influx of mobile technology into nursing practice also dictates that nurse educators train current and future nursing students to deliver new strategies of care. This provides an opportunity for nurse researchers to indulge in evidence-based research to confirm the effectiveness of these strategies in providing optimum health care (Melyn, 2012).
- This technology will eventually help the practicing nurse to spend more time on patient care and have access to the most current information. Health care employers are also expecting graduate nurses to have the latest information technology skills. Providing nursing care in a highly technological, connected work environment is the future of nursing practice. Mobile devices like the PDA can open a door of lifetime learning, as students are capable of moving from one learning environment to another (Franklin, et al, 2007).

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