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# Nursing Informatics Competencies: Assessment of Undergraduate and Graduate Nursing Students

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**Abstract:** *Today in the digital age, we are committed to prepare the future nurse for the information technology-rich workplace, and to help them reducing the “shock reality” upon arriving at the clinical setting. The study aims to promote the knowledge and examine the implications of Information Competencies Technology among undergraduate nurses and to address the current state of informatics competency guidelines and assessment tools. Due to the growing use of technology and shift to electronic health records, informatics competency is becoming a needed skill and requirement in the nursing profession. Studies show that integration of technology in the patient setting improves quality of care and patient safety. To possess competence in nursing informatics, one must possess the ability to obtain, store, retrieve, and communicate data, information, knowledge, and wisdom, which is essential to nursing practice. In order to understand whether nursing students are competent in clinical informatics, a descriptive design was adopted among purposively selected undergraduate and internship nursing students (n=70) to complete self assessment of informatics competency skills SANICS tool and demographics survey to measure student’s personal knowledge and understanding of nursing informatics. The tool was sent out to undergraduate and internship nursing graduate students. The results of this study indicate that students whom have taken an informatics course statistically report an overall higher mean competency than students whom have never taken an informatics course (p=.048). Further studies using this tool, or tools like it, can lead to evaluation of the need for informatics courses in nursing curriculum. Nurses must be educated and competent in nursing informatics in order to exhibit safe and effective nursing practice. Possessing a tool that assesses how competent an individual is in nursing informatics ultimately improves outcomes of nursing practice and increases the safety and effectiveness of patient care. In conclusion, the overarching theme of this study is the need for Information Technology to be integrated within the larger body of the nursing learning program, and its implication for educators and students.*

**Keywords:** *Educators; nursing students; nursing informatics competency*

## I. INTRODUCTION

The field of Nursing Informatics (NI) requires nurses to move beyond the standard nursing model and integrate computer science, information management, and cognitive science into the nursing process to create a field of study that will have a profound impact on healthcare delivery. The American Nurses Association’s (ANA) defines NI as: A specialty that [communicates] data, information, knowledge, and wisdom in nursing practice. NI supports consumers, patients, nurses, and other providers in their decision making in all roles and settings. This support is accomplished through the use of information structures, information processes, and information technology (2015).

NI has become an integral part of nursing science in the past decade. However, NI was essential from the very beginning of formal nursing science. Florence Nightingale recognized the potential power of NI to improve the quality of patient care. She “called for standardized clinical records that could be analyzed to assess and improve care processes and patient outcomes” (Ozolt & Saba, 2008, p. 199). Nightingale’s early recognition of the important role of NI would be fully realized with the passage of the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 (HealthIT, 2015) and the publication of the Technology Informatics Guiding Education Reform (TIGER) Initiative (2009). Informatics competencies are essential for nursing practice, and are critical to providing safe and effective patient care.

As a profession that depends on the use of technology, the need for appropriate collegiate and continuing education programs in nursing with a focus on informatics competency is crucial to the development and maintenance of effective practice.

The purpose of this study is to address the current state of informatics competency tools. This study also provides insight into the implications of developing tools that not only assess and identify the areas of informatics competencies that need further education, but also discusses the amount of education needed in the identified areas.

The practice of nursing is based on the collection, storage, retrieval and use of data, information, and knowledge. Nurses must be competent in these areas in order to provide safe and effective patient care. Often times, technologies are used in practice to help with the management of information and clinical decision making. The development, implementation, and use of technology is integral to the practice of nursing.

#### A. *Use of Technology*

The use of many types of technologies in healthcare, and specifically in nursing, has become a key component to providing patient care. As an integral element to health care, technology used within the nursing profession varies widely, and requires numerous skills for the utilization of specific technologies. Technology used daily by nursing personnel may include, but is not limited to, IV pumps, blood pressure machines, ventilators, naso/oropharyngeal suction devices, wound vacs, bladder scanners, ultrasound machines, glucose monitoring kits, barcode scanners, and computerized provider order entry systems (CPOE) and the EHR. Bedside monitors also assist nurses in the process of data collection, with input into the EHR.

The EHR, a type of electronic system, has become integral for managing all aspects of patient information. In fact, the EHR facilitates the utilization of the patient history, laboratory information, treatment plans, medications, and many other aspects of patient care (Carter, 2008).

Electronic systems directly assist nurses in organizing data and information into presentable formats, from which knowledge and wisdom can be synthesized, all pertinent toward patient care (2008). The facilitation and use of information communication via electronic systems positively affects the process of clinical decision making, thereby increasing the opportunity for more accurate, timely, and effective use of knowledge and wisdom in the nurse's decision-making process in patient care. In terms of facilitating information communication, the EHR is a comprehensive system that electronically enables the collection, storage, retrieval, and sharing of patient data and information (2008). EHRs support healthcare personnel, clinicians, and administrators with using and sharing more complete, accurate, and timely data (2008). While integrating alerts, reminders, decisional support, electronic references, and many other features, EHRs have become elemental in the provision of patient care (2008).

The proper use of technology enables the reduction in human error by providing congruency, giving the nurse multiple reference points for patient care throughout the decision making process. EHRs and CPOEs assist with effective communication between health care personnel, particularly in terms of communication between physicians and nurses. While technology is often thought of as being used at the bedside for direct patient care, clinical managers and nurse executives use administrative systems that facilitate staffing needs, as well as financial and resource management.

## II. SIGNIFICANCE OF THE STUDY

The initiative that addresses nursing informatics competency is known as Technology Informatics Guiding Education Reform (TIGER). In 2004, the TIGER initiative was formed to improve education, the delivery of care, and nursing practice through the integration of health information technology (Gugerty, Delaney & Dulong, 2012). The initiative addresses the topics of basic computer competencies, information literacy, information management, and implementation strategies (2012).

Nursing informatics competence ranges from simple clinical skills to complex application based knowledge. Competence in nursing informatics can be defined as the knowledge, behavior, and skills required for nurses to collect, store, retrieve, and process and use information (Gugerty, Delaney & Dulong, 2012). Nursing informatics is facilitated through the use of technology, and competence in this technology is required for effective nursing practice. With the integration of technology and information science into the field of nursing, there is an increased need for the existence of nursing informatics competencies; thus, nursing informatics competence is a key element to the professional nurse's body of knowledge. As technology is integrated further into the process of information communication, the need to address the coordination of safe and effective care through the transfer of information is imperative to the nursing practice (Abdrbo, 2008; Cronenwett et al, 2007). Without the existence of informatics standards and competencies, the utilization of information technology and communication would be ineffective in the health care setting, imposing risks on patient safety.

## III. AIM/OBJECTIVES OF THE STUDY

#### A. *This study is*

- 1) To report the informatics competencies of selected undergraduate and graduate Nursing Students
- 2) To examine whether informatics competencies differed between the different programmers and to suggest competency-based applications that will strengthen informatics courses and informatics-related content throughout the curricula.

#### IV. METHODOLOGY

A descriptive study to evaluate the nursing competencies through Self-Assessment of Nursing Informatics Competency Scale (SANICS), which were split into three categories that included Basic Computer Competencies, Information Literacy, and Information Management. Evaluation of nursing student's informatics competency through self-assessment of nursing competency scale tool distributed by the researcher to the nursing students and the demographics questions ask each participant which year or program they are enrolled in, already having exposure to any general computer courses.

#### V. RESULTS

From the data analysis, results conclude that students whom have taken an informatics class report a statistically higher nursing informatics competency. These respondents most likely have more self-confidence and more proficiency in informatics because of the knowledge learned in their computer courses. The "Clinical Informatics Role" and "Applied Computer Skills: Clinical Informatics" categories significantly different between those whom have taken an informatics course and those who do not, a student would better understand the use of data and health information technology to improve patient care in nursing practice. Students may understand the concept of nursing informatics, but they may not understand how to use their skills as a clinician or bedside nurse. A student may also have a high computer competency and high computer skill level, but might not possess the knowledge to apply these skills to nursing informatics unless they get a training workshop on implications of informatics in nursing practice .

#### VI. CONCLUSION

As it is recommended to develop informatics competency for all practicing nurses and graduating nursing students, including informatics class in the nursing curriculum could help students be more prepared to effectively utilize technology as a bedside nurse.

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