Informatics is the scholarly study of computer science and includes “the collection, classification, storage, retrieval, and dissemination of recorded knowledge” (Campbell, 2013, p. 29). Nursing informatics (NI) encompasses the study of nursing, information, and computer science (McGonigle & Mastrain, 2012). As technology has evolved, so has the definition of NI, first expressed as the application of computer technology to all fields of nursing (Scholes & Barber, 1980). Then, it was expanded to include the management and processing of data, information, and knowledge in nursing to support patient care (Graves & Corcoran, 1989). Internet applications, communication, personal data assistants (PDAs), and laptop computers, commonplace in the 1990s, led to recognition of NI as a nursing specialty and not just a term (Zytkowski, 2003).

To emphasize NI's supportive role for patients, nurses, and other providers, the American Nurses Association (ANA) expanded its definition of NI in 2008 to include the word *wisdom* and defined NI as a specialty that combines nursing science, computer science, and information science to manage and communicate data, information, knowledge, and wisdom into nursing practice (Hart, 2008). In 2009, the International Medical Informatics Association (IMIA) fine-tuned the definition to, “... (the) science and practice integrates nursing, its information and knowledge and their management, with information and communication technologies to promote the health of people, families and communities worldwide” (Murphy, 2010, p. 204).

**APPLICATION**

Preparing student nurses for practice requires awareness of the NI role. There are two distinct but separate roles for NI in nursing: nurses who utilize informatics in patient care and NI specialists who help to develop, guide, and implement use in practice. Clinical nurses routinely use NI in practice through charting, communication, and the execution of patient care. NI specialists are highly skilled nurses who have extensive knowledge and training in NI, hold a graduate or postgraduate degree in informatics, and often seek official certification (American Nurses Credentialing Center [ANCC], 2014). NI specialists work in positions beyond the electronic health record (EHR) including administration, information technology, analysis, quality management, consulting, development, education, and in ever-emerging and yet-unthought-of areas where technology, data, and patient care do and will fuse.

The ANCC has developed an NI certification examination. Applicants must hold an active registered nurse (RN) license, a minimum education of a bachelor's degree, 2 years of practice experience as a nurse, 30 hours of continuing education in informatics, and one more of a list of specific requirements, which can be found through the ANCC website (ANCC, 2014).
The Technology Informatics Guiding Education Reform (TIGER) initiative was formed in 2004 in collaboration among key stakeholders. TIGER includes a set of basic technological components that all nurses should master in three areas: competencies, information literacy, and information management. Phase III of the TIGER initiative is underway to make tools to learn Health Information Technology (HIT), such as EHRs, computerized physician order entry (CPOE) systems, and virtual learning environments, more readily available for nurses, faculty, and nursing students (TIGER Initiative, 2014).

NI entails knowledge, evidence, and trends in bedside technologies. The practice of NI includes the use of handheld and medical devices, EHRs, computers, and any aspect of information science within the health care setting. Bedside technologies include everything from computerized intravenous pumps and point-of-care laboratory testing, to smartphone apps to improve and individualize patient care, all of which hold promise and are points of ethical and legal discussion (Schmitt, 2013). For example, mobile handheld devices have the potential to eliminate computer shortages and nurses’ station congestion, to connect provider and patient, and to personalize health care. Yet cost, Food and Drug Administration (FDA) approval, and knowledge of use remain barriers (Schmitt, 2013).

The Internet and information access continues to usher rapid changes requiring examination of old and previously unconceived legal, ethical, and moral applications of technology. The following are key areas all educators and nurses should be aware of in regard to NI.

**Health Insurance Portability and Accountability Act (HIPAA)**

Title II of the 1996 HIPAA legislation, also called the Administrative Simplification provisions, first protected patient health information (PHI) by directing the Department of Health and Human Services to set guidelines for the electronic transmission of PHI. HIPAA requires covered entities, such as hospitals and health systems, to put safeguards into place for protecting the confidentiality, integrity, and availability of PHI (U.S. Department of Health and Human Services, 2013).

**The Health Information Technology for Economic and Clinical Health Act and Meaningful Use**

The Health Information Technology for Economic and Clinical Health (HITECH) Act, part of the American Recovery and Reinvestment Act of 2009, mandates universal implementation of EHRs through financial incentives and new standards for electronic privacy, updating HIPAA. HITECH directs the goals, stages, and core requirements of meaningful use in EHR capabilities and the exchange of health information. Data input by nurses will comprise the data set from which evidence-based care is analyzed. Consistency, access, accuracy, and interfaces must be accurate. In addition to improving the quality of care, the goal of meaningful use is to promote EHRs for improvements in health care outcomes.

NI is used at the bedside, in new learning platforms, nursing education, and in the exploration of new learning technologies. Learning management systems (LMS) offer new ways to educate, engage, and track student learning. Likewise, the explosion of communication technology offers new ways to connect, learn, and educate students (Schmitt, Sims-Giddens, & Booth, 2012). Nurse educators need to implement teaching strategies to accommodate the 21st-century tech-savvy learners. One creative teaching strategy encompasses the use of Go Animate, an innovative Web 2.0 tool that allows faculty and students to simulate and animate nursing scenes through creatively staged information (Lilly & Hunt, 2013).
SYNOPSIS

The nursing profession needs to adopt and universally utilize NI competencies and a universal definition for NI (Flood, Gasiewicz, & Delpier, 2010). The growth of NI and technology requires high-level understanding and application of technology through changes in how nurses are educated.

RECOMMENDATIONS

With the evolution of technology, so the demand for high-quality evidence in both application and how nurses are educated in regard to technology grows. More evidence is needed in the following areas of NI and nursing education:

- Universal integration of NI competencies into nursing curriculum and its effect on professional practice and patient outcomes.
- Measurement of specific competencies used to evaluate NI skills among nurses and nursing students.
- Understanding and application of legislation guiding technology use in practice.
- The use and application of various forms of computer and communication technology in nursing education and impact on learning outcomes.
- Best practices for more effectively teaching NI at all levels of nursing education.

Technology will continue to be one of the largest driving forces in health care and education. EHRs will be the core hub of information for reporting on quality patient care. Competencies must be developed in NI. Nurses in every profession must be fully equipped to use these technologies and to prepare nurses to be equipped to embrace these technologies with NI now and in the future.

Murphy, J. (2010). Nursing informatics: The intersection of nursing, computer, and information sciences. Nursing Economics, 28(3), 204-207.


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