



## CHALLENGES OF NURSING INFORMATICS –A CRITICAL REVIEW

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### ABSTRACT

The healthcare delivery environment is dramatically changing and nursing has found itself in the midst of these revolutionary changes. Health care providers are expected to be able to provide safe, competent care in a highly technical and digital environment. Today's nursing requires nurses to be constantly aware of new developments, new medications, and new technologies among others. With the influx of patients into the medical system, it is more essential than ever that nurses keep up. A major theme in this new healthcare arena is the use of information systems and technologies to improve the quality and safety of patient care. Expanded roles and technology are being incorporated into the domain of nursing informatics. The effects of these roles are visible across all sectors of nursing. This paper explores the field of nursing informatics and presents the relevance to contemporary nursing.

**KEYWORDS:**-Healthcare, Informatics, Computer Application, Nursing.

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### INTRODUCTION

#### Nursing Informatics [History]

Historically, nurses who worked in nursing informatics were considered “pioneers” who frequently got into the informatics practice because they were good practitioners, were involved in IT projects as project team

members or educators, or were just curious and technically competent. This is focused on using informatics tools, principles, theories and practices to enable nurses to make healthcare safer, more effective, efficient, patient-centered, timely and equitable. This goal can only be achieved if such technologies are integrated transparently into nursing practice and education. Recognizing the demands of an increasingly electronic healthcare environment, nursing education must be redesigned to keep up with the rapidly changing technology environment. Nurses are expected to provide safe, competent, and compassionate care in an increasingly technical and digital environment. A major theme in this new healthcare environment is the use of information systems and technologies to improve the quality and safety of patient care. Nurses are directly engaged with information systems and technologies as the foundation for evidence-based practice, clinical-decision support tools, and the electronic health record (EHR) [1]. Unfortunately, not all nurses are fully prepared to use these tools to support patient care. The nursing informatics Competencies Collaborative sought to evaluate the current preparedness of the nursing workforce and propose a set of minimum informatics competencies that all nurses need to practice in today's digital era. Nurses certified in Nursing Informatics are: skilled in the analysis, design, and implementation of information systems that support. Nursing in a variety of healthcare settings function as translators between nurse clinicians and information technology personnel. And insure that information systems capture critical nursing information [2]. These specialized nurses add value to an organization by increasing the accuracy and completeness of nursing documentation improving the nurse's workflow and eliminating redundant documentation automating the collection and reuse of nursing data and facilitating the



analysis of clinical data, including Joint Commission indicators, Core Measures, federal or state mandated data and facility specific data[3]. While Nursing Informatics is a highly specialized field, there are foundational informatics competencies that all practicing nurses and graduating nursing students should possess to meet the standards of providing safe, quality, and competent care. The Technology Informatics Guiding Education Reform Informatics Competency Collaborative was formed to develop the informatics recommendations for all practicing nurses and graduating nursing students. Following an extensive review of the literature and survey of nursing informatics education, research, and practice groups, the nursing informatics competencies model consists of three parts, detailed in this document: 1) Basic Computer Competencies 2) Information Literacy 3) Information Management. In addition to the substantial investment in capital, technology and resources, the success of delivering an electronic healthcare platform will require an investment in people to build an informatics-aware healthcare workforce[4]. This has accelerated the need to ensure that healthcare providers obtain competencies needed to work with electronic records, including basic computer skills, information literacy, and an understanding of informatics and information management capabilities. To be realized, the profession must master a minimum set of informatics competencies that allow nurses to use EHRs to deliver safer, more efficient, effective, timely and patient-centered care. This education will determine how well evidence and informatics is integrated into day-to-day practice[5].

### Basic Computer Competencies :

A “digital native” has grown up with digital technology such as computers, the Internet, mobile phones, and MP3. There are a substantial number of digital immigrants in the nursing workforce who have not mastered basic computer competencies. Many digital natives have gaps in their basic computer competency skill set[6]. Concepts of Information and Communication Technology (ICT) 2. Using the Computer and Managing Files 3. Word Processing 4. Spreadsheets 5. Using Databases 6. Presentation 7. Web Browsing and Communication. [7,8].

### INFORMATION LITERACY

1. Determine the nature and extent of the information needed.
2. Access needed information effectively and efficiently.
3. Evaluate information and its sources critically and incorporates selected information into his or her knowledge base and value system.
4. Individually or as a member of a group, use information effectively to accomplish a specific purpose.
5. Evaluate outcomes of the use of information [9].

### Information management:

It is the underlying principle upon which TICC Clinical Information Management Competencies are built. Information management is a process consisting of

- 1) Collecting data.
- 2) Processing the data.
- 3) Presenting and communicating the processed data as information or knowledge. Information is managed by nurses in a variety of ways, but more and more the preferred or required method is through information systems. We define an information system as being composed of human and computer elements that work interdependently to process data into information. The most relevant, important, and fundamental information management competencies for nurses are those that relate to the electronic health record system (EHRs) [10]. Using an EHRs will be the way nurses manage clinical information for the foreseeable future. However, nursing responsibilities are not changing in the shift to increased use of EHRs. For example, nurses are still required to exercise due care in protecting patient privacy. But the manner in which these responsibilities to patients and communities are upheld may be different. Therefore, all practicing nurses and graduating nursing students are therefore strongly encouraged to learn, demonstrate, and use information management competencies to carry out their fundamental clinical responsibilities in an increasingly safe manner. Nursing is both a system and science. A system brings a order or method and is a coordinated arrangement of elements or organism[11,12].

Science is a systematic acquisition of knowledge especially the knowledge that can be precisely measured. If we think that body systems such as cardiovascular, respiratory none of these can operate independent of the other, and often controlling or supporting changes in related systems. Nursing informatics uses both a system process and scientific data[13]. The structures and the processes and the added information technology make up the foundational pieces that support what nursing informatics is to nursing practice. If we collect data or facts that may be reported without interpretation such as blood pressure, pulse rate, temperature and so forth if there is no interpretation then data become of little value. Computer science deals with the organization of the data by collecting, storing, processing, retrieving and displaying information as well as communicating the information[14].

Using standardized nursing terminologies (SNTs) has several important –and necessary – benefits. They include better communication among nurses and other healthcare providers; increased visibility of nursing intervention and resultant patient outcomes; improved patient care; greater adherence to standards of care; and furthering the nursing research agenda by generating data about patient care in a consistent manner[15].



According to Gordon, a nursing diagnosis has three essential components: the health problem (P), the etiology (E) and the defining characteristics or signs and symptoms (S) [16].

#### Features:

1. Can identify a need and demand for itself.
2. Adheres to the overall licensure, certification, and education requirements of the profession
3. Defines competencies for the area of specialty nursing practice.
4. Has existing mechanisms for supporting, reviewing, and disseminating research to support its knowledge base and evidence-based practice.
5. Has defined educational criteria for specialty preparation or graduate degree.
6. Has a continuing education program or other mechanisms for nurses in the specialty to maintain competence.
7. Is practiced nationally or internationally.
8. Includes a substantial number of registered nurses who devote most of their professional time to the specialty.
9. Is organized and represented by a national or international specialty association or branch of a parent organization [17].

#### Opportunities in Nursing Informatics :

The opportunities in nursing informatics include all specialties in acute care, home health, ambulatory care, long-term care, outpatient settings, telehealth, software development, and redesign of work flows. These suggestions include involvement in leadership, education, and practice for nursing.

- **Leadership:** With leadership, HIMSS proposes partnership with nurse executives to lead technological changes that promote health and healthcare delivery, support the development of informatics departments, and foster the development of the Chief Nursing Informatics Officer role.

- **Education:** For education, suggestions include transformation of nursing education to include informatics competencies and behaviors at all levels of academic preparation, and promotion of continuing education of all levels of nursing, particularly in the areas of health IT and EHRs.

- **Practice:** Recommendations for nursing informatics with practice include incorporating informatics competencies into practice standards, and facilitating the collection and analysis of healthcare workforce data by collecting from existing health IT systems [18].

#### Roles of nurses in informatics:

Hersher BS had described several current and future roles for nurses in informatics [19], they include:

1. **User Liaison-** A nurse in this role is involved in the installation of a computer information system and interfaces with the system vendor, the users and management of health care institutions.

2. **Product manager -** The nurse in this role is responsible for constantly updating a current product and keeping abreast of new developments in the field. They develop applications like decision support systems, nurse staffing systems, scheduling systems, bedside and handheld terminals.

3. **Clinical systems installer-** In this role, the nurse works with the vendor who sold the computer systems to the health care institution. She/he helps train users of the system, serves as liaison between the health care institution and the vendor and works closely with the system coordinator for the health care institution.

4. **Systems analyst/programmer -** The nurse in this role works in the information systems department analyzing and maintaining the system. Other roles of nurses in informatics include chief information officer, nursing informatics consultant, network administrator, data repository specialist, nursing informatics project manager, nursing informatics educator and clinical information liaison [20]. Nurses spend a significant proportion of their time on information related activities as part of clinical decision making in order to lead, co-ordinate and support the delivery of safe, effective, person centered care. In order to provide high quality care for patients, nurses need upto- date, accurate, relevant information about the person and access to the latest evidence or best practice at the point of care delivery. Hence, research in nursing is necessary for the development of nursing practice since nursing informatics is a new specialty. It is important that research be carried out on nursing informatics.

#### Nursing Informatics Applications :

- **Practice:** knowledge of nursing information systems can be used with nursing practice such as patient documentation, monitoring devices, developing and implementing care plans and pathways, retrieval of previous records and imaging, use of telehealth, and access to current practice standards.

- **Administration:** information systems are used with communication, staff scheduling systems, cost and budget analysis, and monitoring of trends with quality and satisfaction data.



• **Education:** informatics and technology has applications in education, including simulation, electronic learning, teleconferencing, and software availability for educational presentations and programs.

• **Research:** internet capabilities and electronic databases provide rich access to obtaining, compiling, and conducting research [20].

### Applications in Hospital

1. Drug-formulary checks.
  2. Record advanced directives for patients 65 years or older.
  3. Incorporate clinical lab test results as structured data.
  4. Generate lists of patients by specific conditions.
  5. Use certified EHR technology to identify patient-specific education resources and provide to patient, if appropriate
- Medication reconciliation

- Summary of care record for each transition of care/referrals.
- Capability to submit electronic data to immunization registries/systems.
- Capability to provide electronic submission of reportable lab results to public health agencies.
- Capability to provide electronic syndromic surveillance data to public health agencies.

### CONCLUSION

Nursing informatics attempts to manage the explosion of ever increasing medical information by managing and communicating information in order to promote knowledge in nursing practice for quality care. The ultimate goal of nursing informatics is to use technology to bring critical information to the point of care to increase efficiency and make healthcare safer and more effective. However, much work is still needed to educate nurses in informatics competencies so that technology can be embraced as a tool in everyday practice.

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