The Professional Association's Perspective on Nursing Informatics and Competencies in the US

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Abstract. The American Nurses Association (ANA) recognized nursing informatics as a nursing specialty in 1992, developed the first scope and standards of nursing informatics practice in the mid-1990s, and remains the custodian and steward of each document revision. Over the past two decades, the definition of nursing informatics, scope of practice statement, and framework of the standards of practice have evolved to now include a collection of competencies for the informatics nurse and informatics nurse specialist. The American Nurses Credentialing Center (ANCC), an ANA subsidiary, created and maintains a nursing informatics certification program that offers a board certification credential to qualified applicants, including international nurse colleagues. Such a certification program is intended to assess and publicly recognize competence of the informatics nurse.

Keywords. Nursing informatics, scope of practice, standards of practice, competence, certification

1. Introduction

The American Nurses Association (ANA), the professional organization representing the interests of the 3.6 million nurses in the U.S., provided leadership in development of the specialty practice of nursing informatics by engaging nursing leaders from academia, practice, and research in thoughtful dialogue about the future of health care and how best to assure nursing's contribution could be identified, evaluated, and improved. Because this perspective demanded the knowledge and expertise of those nurses interested in the acquisition, codification, analysis, transformation, and dissemination of data, information, knowledge, and wisdom, ANA supported the development and formal recognition of the nursing specialty practice of nursing informatics in 1992.

2. History of the Nursing Informatics Scope and Standards Documents

ANA convened a workgroup to develop the 1994 *Scope of Practice for Nursing Informatics* that included a definition identifying that "Nursing informatics is the specialty that integrates nursing science, computer science, and information science in identifying, collecting, processing, and managing data and information to support nursing practice, administration, education, research, and the expansion of nursing

knowledge. It supports the practice of all nursing specialties, in all sites and settings of care, whether at the basic or advanced level." [1] Further detailing of the answers to the "who", "what", "when", "where", "how", and "why" questions addressed in specialty nursing scope of practice statements, confirmed the informatics nurse attended to the development and evaluation of applications, tools, processes, and structures that assist nurses in managing data associated with patient care or the infrastructure supporting nursing practice. Nursing informatics practice included adapting or customizing existing technology to meet nursing requirements. Interprofessional collaboration with other healthcare and informatics professionals was expected in the development of informatics products and standards.

The informatics nurse was expected to hold a bachelor's degree in nursing and have additional knowledge and experience in the field of informatics. Eighteen delineated competencies, such as systems analysis, systems design, use of applications software, and employment of computer programming tools and utilities in the accomplishment of nursing informatics work, were included. The informatics nurse specialist's preparation included a masters' degree in nursing with graduate-level courses in the field of informatics. Seven competencies were identified for this advanced level, including developing and teaching theory and practice of nursing informatics, consultation practice in the field of nursing informatics, and development of strategies, policies, and procedures for introducing, evaluating, and modifying information technology applied to nursing practice. [1]

The following year, ANA published the product of another workgroup, *Standards of Practice for Nursing Informatics*, to further describe nursing informatics practice with a detailed framework of standards and accompanying measurement criteria.[2] Six standards of practice reflected the implementation of the nursing process of assessment, diagnosis, identification of outcomes, planning, implementation, and evaluation in nursing informatics practice. In addition, eight standards of professional performance addressed characteristics of how nursing informatics was to be conducted, including quality of nursing informatics practice, performance appraisal, education, collegiality, ethics, collaboration, research, and resource utilization. This resource also included five domain standards for the informatics nurse addressing the information system life cycle, principles and theory, information technology, communication, and databases. [2] Each standard statement had associated measurement criteria that could be used as part of a personal performance appraisal and could also inform development of a position description.

ANA convened a new expert panel in 2000 to review and revise the first nursing informatics scope and standards documents, resulting in a 2001 combined document, *Scope and Standards of Informatics Practice*. The revised definition of nursing informatics reflected evolution of the specialty: "Nursing informatics is a specialty that integrates nursing science, computer science, and information science to manage and communicate data, information, and knowledge in nursing practice. Nursing informatics facilitates the integration of data, information, and knowledge to support 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."[3] Note the attention to management and communication of data, information, and knowledge in nursing practice that moves beyond the original identification, collection, processing, and management activities. Changes in focus addressed integration of data, information, and knowledge into

decision-making processes that now were completed by patients, nurses, and other providers.

The 2001 scope of practice content more than doubled the content recorded in 1994, included a new figure and discussion addressing the transformation of data to information to knowledge, and introduced ethics content. The section about the diverse roles of the informatics nurse and informatics nurse specialist identified the new roles of entrepreneurs and executive level positions in provider and vendor organizations. The description of the published Delphi study research of Staggers, Gassert, and Curran identifying computer skills, information literacy skills, and overall informatics competencies of the beginning nurse, experienced nurse, and informatics nurse was another key addition.[4] However, these competencies were not detailed in the standards component of this scope and standards edition.

The 2001 standards only addressed the informatics nurse specialist and included new names for the five standards of practice: identify the issue or problem, identify alternatives, choose and develop a solution, implement the solution, evaluate and adjust solutions. The actual standard of practice statements significantly differed from the earlier edition, as did the accompanying measurement criteria. The standards of professional performance carried the same titles, included new Standard IX Communication, and retained standards statements essentially congruent with the 1995 edition. The accompanying measurement criteria, not yet identified as competencies, were revised to reflect the changing nursing informatics environment.

The next revision of the document, *Nursing Informatics: Scope and Standards of Practice* (2008), bore an entirely new title in order to better align with the format of other contemporary specialty nursing scope and standards publications. [5] The definition of nursing informatics remained unchanged except for the addition of wisdom in the series "data, information, knowledge, and wisdom" and inclusion of consumers in the list of those supported by the informatics nurse in their decision-making. Rather than identify roles, the workgroup authors elected to discuss the evolving and expanding nursing informatics practice within discrete functional areas of administration, leadership, and management; analysis; compliance and integrity management; consultation; coordination, facilitation, and integration; development; educational and professional development; policy development and advocacy; and research and evaluation. Inclusion of a two-page competencies matrix addressed the competencies identified by Staggers, Gassert, and Curran [4], other authors, and the American Nurses Credentialing Center (ANCC) 2007 certification examination test content outline.

The 2008 standards of nursing informatics practice and professional performance section presented a new numbering format and revised standards names. The standards of practice names again reflected the nursing process steps of assessment, problem and issues identification, outcomes identification, planning, implementation [with associated standards addressing coordination of activities, health teaching and health promotion and education, and consultation], and evaluation. The standards of professional performance were reordered and now included education, professional practice evaluation (new name), quality of practice, collegiality, collaboration, ethics, research, resource utilization, and new standards of advocacy and leadership. Accompanying measurement criteria for each standard, not competency statements, also addressed additional measurement criteria for the informatics nurse specialist for select standards.

In 2008 ANA published a position statement about professional role competence that served to inform the thinking and decision-making of those developing future nursing scope and standards resources and other professional documents. The position statement, *Professional Role Competence*, was reaffirmed in 2014 by ANA's Board of Directors, including the following statements:

- 'An individual who demonstrates "competence" is performing successfully at an expected level.'
- 'A "competency" is an expected level of performance that integrates knowledge, skills, abilities, and judgment.'
- "Knowledge encompasses thinking; understanding of science, humanities, and professional standards of practice; and insights gained from practical experiences, personal capabilities, and leadership performance."
- "Skills include psychomotor, communication, interpersonal, and diagnostic skills."
- "Ability is the capacity to act effectively. It requires listening, integrity, knowledge of one's strengths and weaknesses, positive self-regard, emotional intelligence, and openness to feedback."
- "Judgment includes critical thinking, problem solving, ethical reasoning, and decision-making."[6]

These definitions and concepts guided development of the 2010 *Nursing: Scope and Standards of Practice, Second Edition* [7], the professional nursing resource that served as the template for future specialty nursing scope and standards documents, including the 2015 *Nursing Informatics: Scope and Standards of Practice, Second Edition*. [8]

3. Current Nursing Informatics Scope and Standards Document

Nursing Informatics: Scope and Standards of Practice, Second Edition (2015) provides a new definition of nursing informatics: "*Nursing informatics (NI)* is the specialty that integrates nursing science with multiple information and analytical sciences to identify, define, manage, and communicate data, information, knowledge, and wisdom in nursing practice. NI supports nurses, consumers, patients, the interprofessional healthcare team and other stakeholders in their decision-making in all roles and settings to achieve desired outcomes. This support is accomplished through the use of information structures, information processes, and information technologies."[8]

The workgroup authors for this edition identified the informatics nurse to be a registered nurse with an interest or experience in an informatics field, most often identified as nursing informatics. The informatics nurse specialist is a registered nurse with formal graduate-level education in informatics or a related field. [8]

This edition retains the description of nursing informatics practice categorized as a framework of functional areas. These detailed sections include discussion of administration, leadership, and management; systems analysis and design; compliance and integrity management; consultation; coordination, facilitation, and integration; development of systems, products, and resources; educational and professional development; genetics and genomics; information management/operational architecture; policy development and advocacy; quality and performance improvement; research and evaluation; and safety, security, and environmental health. A discussion of

several organization's directives, publications, research initiatives, and repositories identifying nursing informatics competencies followed.

The inclusion of a section discussing ethics in nursing informatics affirms the responsibility and accountability of the informatics nurse and informatics nurse specialist to adhere to the *Code of Ethics for Nurses with Interpretive Statements*. [9] Each of the nine provisions is cited and further enhanced with a short discussion of specific examples of its application in the specialty practice of nursing informatics. Because a new edition of the *Code of Ethics for Nurses with Interpretive Statements* was published in 2015, each informatics nurse and informatics nurse specialist is now expected to adhere to those provisions and accompanying interpretive statements. [10]

The 2015 Standards of Nursing Informatics Practice follow the architecture of earlier editions with:

Standards of Practice for Nursing Informatics:

Standard 1.   Assessment ― The informatics nurse collects comprehensive data, information, and emerging evidence pertinent to the situation.

Standard 2.   Diagnosis, Problems, and Issues Identification ― The informatics nurse analyzes assessment data to identify diagnoses, problems, issues, and opportunities for improvement.

Standard 3.   Outcomes Identification ― The informatics nurse identifies expected outcomes for a plan individualized to the healthcare consumer or the situation.

Standard 4.   Planning ― The informatics nurse develops a plan that prescribes strategies, alternatives, and recommendations to attain expected outcomes.

Standard 5.   Implementation ― The informatics nurse implements the identified plan.

Standard 5A. Coordination of Activities ― The informatics nurse coordinates planned activities.

Standard 5B. Health Teaching and Health Promotion ― The informatics nurse employs informatics solutions and strategies for education and teaching to promote health and a safe environment.

Standard 5C. Consultation ― The informatics nurse provides consultation to influence the identified plan, enhance the abilities of others, and effect change.

Standard 6.   Evaluation ― The informatics nurse evaluates progress toward attainment of outcomes.

Standards of Professional Performance for Nursing Informatics:

Standard 7.   Ethics ― The informatics nurse practices ethically.

Standard 8.   Education ― The informatics nurse attains knowledge and competence that reflect current nursing and informatics practice.

Standard 9.   Evidence-Based Practice and Research ― The informatics nurse integrates evidence and research findings into practice.

Standard 10. Quality of Practice ― The informatics nurse contributes to quality and effectiveness of nursing and informatics practice.

Standard 11. Communication ― The informatics nurse communicates effectively in a variety of formats in all areas of practice.

Standard 12. Leadership ― The informatics nurse demonstrates leadership in the professional practice setting and the profession.

Standard 13.   Collaboration — The informatics nurse collaborates with the healthcare consumer, family, and others in the conduct of nursing and informatics practice.

Standard 14.   Professional Practice Evaluation — The informatics nurse evaluates his or her own nursing practice in relation to professional practice standards and guidelines, relevant statues, rules, and regulations.

Standard 15.   Resource Utilization — The informatics nurse employs appropriate resources to plan and implement informatics and associated services that are safe, effective, and fiscally responsible.

Standard 16.   Environmental Health — The informatics nurse supports practice in a safe and healthy environment. [8]

Unlike earlier editions, each standard includes accompanying competency statements for all informatics nurses and in many instances additional competencies for the informatics nurse specialist. The competencies have been constructed to include only one verb to facilitate easier evaluation that confirms the informatics nurse or informatics nurse specialist demonstrates competence.

As part of its responsibility to update specialty nursing scope and standards resources, ANA will convene a new workgroup in 2019 to review and revise the scope and standards document to describe the scope of contemporary nursing informatics practice, standards of practice and professional performance, and requisite competencies. The expert workgroup will complete an environmental assessment of nursing informatics practice and confirm the standards and appropriate competencies to include in the next edition.

4. Nursing Informatics Certification Program

While ANA developed and then formally recognized nursing informatics as a nursing specialty with an identified scope of practice statement and standards of nursing informatics practice, its subsidiary, the American Nurses Credentialing Center (ANCC) engaged in parallel efforts to develop a nursing informatics certification program. These efforts included creation of an expert panel, test content outline, pool of test questions, and a valid and reliable examination for qualified applicants to become board certified in nursing informatics. Such certification was intended to assess and publicly recognize professional competence. The initial cohort of nursing informatics applicants sat for the first ANCC computer-based test in December 1995 and received notification of their exam status in the first quarter of 1996.

ANCC now uses regularly scheduled role delineation studies to assess the characteristics of contemporary nursing informatics practice, convenes its content expert panel of volunteer certified informatics nurses to review and revise the test content outline, recruits qualified item writers, maintains a secure repository of test items, and contracts with an external testing center to manage the security, administration, and scoring of the nursing informatics exam.

Over the past two decades, ANCC has expanded eligibility for the computer-based testing to qualified international applicants and has developed various types of review materials for purchase. Numerous review courses are now available. As of December 31, 2015, ANCC reported 1,837 nurses maintain their nursing informatics certification (http://www.nursecredentialing.org/Certification/FacultyEducators/FacultyCategory/St atistics/2015-CertificationStatistics.pdf).

5. Summary

Development of the scope and standards formalized the description of the specialty practice of nursing informatics. Concurrent efforts by nursing informatics leaders and other visionary educators continue to focus on confirming what informatics competencies are applicable and merit inclusion in undergraduate and graduate nursing education and professional development programs as connected health becomes a framework for contemporary health care. To assure safe, quality nursing practice and care, all nurses today must demonstrate understanding of the relationship and impact of data, information, knowledge, and wisdom in professional and healthcare consumer decision-making. Please examine additional chapter section B components that present nursing informatics competencies described by other entities.

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