

Knowledge Development and Classification Systems in Nursing

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I. Introduction

Since the turn of the century, nursing has known that the profession needed knowledge to guide nursing practice. From that time, nursing scholars have continuously redefined the meaning of nursing and health by expanding nursing knowledge and conceptual models, which in turn leads to better nursing practice. Nursing sought professional status by conducting empirical research to establish a scientific knowledge base. However, because of nursing's broad scope, complexity, and lack of a clearly defined goal, the development of nursing as a profession as well as identifying a nursing theory to guide nursing practice is neither clear nor completely understood at this time.

A discipline is defined as a way of knowing and is described by its phenomena of interest: its rules of inquiry (how new knowledge is discovered), and

its history. Development of knowledge in nursing has been based on different philosophies and perspectives over the decades. As new philosophical, theoretical, and methodological trends occurred in nursing, it became obvious that the discipline was moving in new directions. Historical changes in economic, societal, political, cultural, and ethical circumstances have also provided an important contextual background for understanding the impact of those changes on nursing. These major changes continue to influence nursing today.

An overview of nursing's historical movement toward professionalism is important in order to understand the way nursing has conducted and continues to conduct its search for a body of knowledge in nursing. The first part of this article describes the evolution of nursing science as a discipline. Knowledge development in nursing differed according to the dominant

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philosophies and perspectives of each period. The later part of this article discusses the development of nursing classification systems and how the clarity, succinctness, and applicability of nursing classification systems contribute to the expansion of nursing's scientific knowledge for use in nursing practice, theory, and research. How classification systems are applied in nursing practice and how they provide a framework for nursing practice are also addressed. Reviewing the history of nursing research and examining one of the current research movements in nursing may enable one to predict the direction of future nursing research.

II. Background

1. Evolution of Nursing Knowledge

At the turn of the century, nursing began to move away from being a vocation and towards being a profession (Alligood, 1994a, 1994b; Johnson, 1974; Meleis, 1991; Rogers, 1961). At its initial establishment, nursing focused on practice and teaching students to do nursing. Nevertheless, the idea that nurses needed knowledge to guide and to improve nursing practice was noted in this period. The first national gathering of nurses at the World's Fair in Chicago in 1893 and the publication of the first edition of the American Journal of Nursing (AJN) in October 1900 were among nursing's first moves to attain professional status (Alligood, 1997; Kalish & Kalish, 1995).

With the boom of the industrial age, hospital training schools flourished in the

US, and the curriculum era of the 1920's and 1930's followed (Kalish & Kalish, 1995). In the 1920's to 1930's, efforts to identify the nature of the knowledge needed to guide nursing practice was evidenced by the standardization of curricula. The emphasis on what nurses needed to know in order to practice nursing led to the expansion of curricula from merely medical knowledge to include social sciences and nursing procedures (Alligood, 1997). In this era, as science gained popularity, the first baccalaureate nursing program was started. Nursing curricula emphasized science and research. The move of nursing into higher education was a major shift for the nursing profession as the search for a substantive body of knowledge led to the research era (Alligood, 1997).

In the 1940's and 1950's, research became the driving force in the development of nursing. Nursing scholars believed that research alone would generate the body of knowledge (Alligood, 1997). Starting in 1955, the US federal government began providing financial support for the graduate education of nurses through various research projects and grants. Many of these funded nurses sought doctoral education and studied behavioral sciences such as sociology, psychology, and education until well into the 1980's. Through curriculum grants, the development of doctoral programs in nursing was facilitated and nursing theory and science were catalyzed (Schlotfeldt, 1992).

With the emergence of the scientific era in the 1960's, nurse researchers criticized

nursing practice as nursing scholars recognized the need to define nursing practice to develop nursing theory. Several nurse leaders, including Abdellah, Orlando, Weidenbach, Hall, Henderson, and Levine, developed and published their theories for the purpose of enhancing nursing practice. These theories evolved from the nursing scholars' personal, professional, and educational experiences and reflected their perception of "ideal" nursing practice. The work of nurse theorists focused on defining the nurse's role and nursing actions to assist clients. However, after the 1960's several nurse theorists expanded the earlier models in different directions. Despite the expansion, the knowledge generated from these theories was still unable to guide nursing practice.

During the 1960's, a series of three conferences brought nurses together to exchange ideas and evaluate the results of their doctoral programs in other fields. These conferences are noteworthy because this was the first time in the history of nursing that nurses tried to identify the nature of the body of knowledge that is unique to nursing (Alligood, 1997). To develop a specialized body of knowledge in nursing, the nurse researchers should ideally be prepared in the discipline of nursing. Therefore, in this era a distinction was made between nursing knowledge and borrowed knowledge (Johnson, 1968). Nurses also became aware that theories developed in other disciplines were insufficient to describe nursing, and concluded that nursing needed to develop its own theories.

The theorists began publishing their nursing frameworks. The works by Johnson (1980), King (1971), Levine (1967), Newman (1972), Orem (1971), Rogers (1970), and Roy (1970) were evidence of the new emphasis on nursing theory. Dickoff and James' (1968) position paper presented a four-level typology of theory development that is useful for describing research and theory for a practice discipline. They introduced the idea that significant nursing theory must be situation producing; in other words, nursing must develop theories that prescribe nursing actions for predictable client outcomes.

During the era of the 1960's and 1970's, graduate curricula were proposed for master's-level preparation and standardized by the National League for Nursing (NLN). By the end of the 1970's, most accredited master's educational programs in nursing included courses in nursing research, clinical specialty advanced practice, advanced physiology, and leadership. Many also included a course in nursing theory in the core curriculum (Alligood, 1997). Dickoff and Wiedenbach (1968) stimulated research by describing how theory is developed for a practice discipline. Although their approach to theory development was debated, it sparked a growing commitment by nurses to develop their own models and theories.

By the 1970's numerous studies were published on the development of nursing theory and nursing science. The shift of emphasis from research to theory at the national level was noted with the nurse educator conferences at Chicago in 1977

and New York in 1978. Although the Chicago conference did not have a theoretical theme, Sr. Callista Roy's workshop on how to use her conceptual framework as a guide for nursing practice was so popular that a second conference was planned with nursing as its theory theme. The New York conference was the first time in history that nursing theorists were all brought together on the same stage. That second conference underscored a growing awareness that theoretical knowledge to guide nursing practice was needed (Alligood, 1997). Other factors in the shift toward theory were the publication of Carper (1978)'s pattern of knowing for nursing. Carper identified four types of nursing knowledge and clarified their context. Her work is significant in nursing history for distinguishing empirical knowledge from ethical, personal, and aesthetic knowledge.

During the 1970's, however, the report by the Joint Commission on Nursing Theory and Nursing Education noted the absence of nursing theory and research in practice which hindered the development of nursing (Physiological). In 1977, the Journal of Nursing Research (vol.26, no. 3) published reviews of the progress of nursing research in the past decades. It pointed out the lack of conceptual or theoretical direction or connection in the research (Alligood, 1997). Batey (1977) also comprehensively reviewed the first 25 years of published nursing research and identified lack of conceptualization as the greatest limitation of the projects.

From the 1980's to 1990's nursing theory development achieved phenomenal

growth, and has been noted to be the cornerstone of the development of the nursing discipline (Meleis, 1983). Proliferation of nursing literature, with new nursing journals, national and international nursing conferences, and the opening of new nursing doctoral programs are evidence of the growth in this era. During this decade, Fawcett (1984, 1989) made a significant contribution to our understanding of the nature of nursing knowledge. She developed a metaparadigm explanation of the interconnectedness of the various theoretical works in nursing, and proposed a structure of nursing knowledge according to Kuhn's philosophy of science (1970). This began to clarify different levels of abstraction in nursing theoretical works. Based on a survey of curricular commonalties in baccalaureate schools of nursing, nursing scholars identified four common constructs (manhuman, health, societyenvironment, and nursing). While these concepts specified four phenomena of central importance to nursing, these concepts are central to other health care disciplines as well.

In conclusion, nursing's efforts to search for a specific nursing knowledge has been conspicuous throughout this century and each of this era was necessary for the growth and development of nursing profession. The question what is the nature of nursing knowledge which is needed to lead nursing practice was a driving force for nursing profession. The proper use of nursing theory for nursing practice will facilitate continuous professional nursing development.

2. Classification and Nursing Knowledge

1) Development of nursing classification system

The increasing complexity inherent in nursing practice, the volume of information managed by nurses, and the efforts to define and describe nursing as a profession stimulated the development of classification and standardization of nursing nomenclature (Delaney et al., 1997). Several developments outside of nursing have also stimulated the development of nursing classification systems. First, the federal government, insurance companies, and the medical community have been collecting standardized health information for a number of years for the purposes of reimbursement and effectiveness research (McCloskey, 1996). Second, the Institute of Medicine (IOM) has strongly encouraged participation of nurses and inclusion of nursing data in developing a nationwide computer-based patient record (CPR) for the effective and efficient management of patients or patients' data (IOM, 1991). Finally, the guideline development movement of the Agency for Health Care Policy and Research (AHCPR) has also identified the need for the development of classification systems and standardized languages for the enhancement of cooperation among health care professionals (McCloskey, 1996).

Many classification schemes have been developed in the past several decades to describe health-related practice. The major systems for medical classification are the International Classification of Diseases (ICD and ICD-CM) (World Health Organization, 1978; Practice Management Information

Corporation, 1989), The Current Procedural Terminology (CPT) (American Medical Association, 1986), The Diagnostic and Statistical Manual of Mental Disorders (DSMD) (American Psychiatric Association, 1980), and the Systematized Nomenclature of Medicine (SNOMED) (Cote et al, 1993). However, none of these classifications represent nursing practice (Zielstorff, 1992). Therefore, the contribution of nurses to patients' health have not been recognized, and the work of nurses has been hidden in narrative nurses' notes.

In 1986, the ANA urged the uniform classification of four areas of nursing practice: assessment, diagnosis, intervention, and outcome (ANA, 1986, p.3). In 1989, they followed with this strong advice, Nursing must be able to name itself and to describe what it does in order to function effectively in a world where computerized information is used to establish everything from diagnosis-related groups (DRGs) to cardiac output. Until nurses can name what they do and assign a computer code to that name, we may be neither reimbursed nor recognized as a profession with unique skills and knowledge (ANA, 1989, p. 3).

The first classification system in nursing, the North American Nursing Diagnosis Association (NANDA) was began in 1973. Recently, a number of classification systems have been developed to describe nursing practice more precisely. These classification systems in nursing include the following: Nursing Interventions Classification (NIC) (McCloskey & Bulechek, 1996); Nursing Outcomes Classification (NOC) (Johnson & Maas, 1997); Omaha system

(Martin, 1989); Verran's Taxonomy of Ambulatory Care (Verran, 1986); Saba's Classification System for Home Health Care (Saba, 1992); Grobe's Nursing Intervention Lexicon Taxonomy (Grobe, 1993); Ozbolt's Patient Care Data Set (PCDS) (E-mail Listserv); and Arnold's Taxonomy of Transitional Follow-up Care (Arnold, 1991).

The classifications and taxonomies in nursing vary significantly in their developmental stages, target patient populations, and their degree of applicability. However, none that include all components of nursing process exists (Bowles & Naylor, 1996; Henry, Holzemer, Reilly, Campbell, 1994; Henry, & Mead, 1997; Lang, Galliher, & Hirsch, 1989; McCloskey & Bulechek, 1996). Currently, six taxonomies have been recognized by ANA: NANDA, NIC, NOC, the Omaha system, Home Health Care System, and Ozbolt's Patient Care Data Set (PCDS). Only NANDA, NIC, and NOC are comprehensive classifications across specialty and practice settings.

4. Nursing classification systems' contribution to knowledge development

The classification systems provide methods to name, describe, and organize the contents of disciplines. Kritek (1984) states that Classification is the systematic arrangement of entities or categories according to their relevant features or properties. It assumes recognition of similarities as a basis of grouping or clustering and assigning entities into categories (p. 77).

Classification theory is a descriptive empirical theory in which the characteristics of a phenomenon are structurally interrelated and can be linked according to some criterion (Fawcett & Downs, 1992). Taxonomic classification of nursing practice is worthwhile as it provides a framework for conceptualizing the various elements of nursing practice. The nursing taxonomies contribute to theory development because the systematic naming and classifying of our discipline makes possible new types of studies and demonstrate areas of needed research.

Taxonomies, or classification systems, are knowledge structures because the substantive elements of a discipline are organized into groups or classes (Blegen & Tripp-Reimer, 1997). The taxonomy contains discrete concepts of the entire domain of the discipline. Classification schemes are testable and provide a fertile area for nursing research. Only through systematic evaluation of classification schemes can the proposed theories be expanded, refined or refuted (Carpenito, 1989). Furthermore, each accumulated body of knowledge using classification systems provides the nursing profession with a way to view clinical situations and facilitates the identification of details that are relevant to nursing from the plethora of available information.

According to McCloskey and Bulechek (1992), classification helps advance the knowledge base of a discipline by providing order to the environment and improving understanding. More specifically, they listed eight reasons why a classification of nursing interventions is

needed: 1) to standardize the nomenclature of nursing treatment; 2) to expand nursing knowledge about the links between diagnoses, treatments, and outcomes; 3) to develop nursing and health care information system; 4) to teach decision-making to nursing students; 5) to determine the costs of services provided by nurses; 6) to plan resources needed in nursing practice setting; 7) to communicate the unique function of nursing; and 8) to articulate with the classification systems of other health care providers.

The classifications of diagnoses, interventions, and outcomes provide the content of nursing. They define concepts that are the building blocks of nursing science. The classifications of NANDA, NIC, and NOC are crucial to theory development because each clinical concept contained in NANDA, NIC and NOC provides the vertical shafts to build the substantive structure in the discipline of nursing (Tripp-Reimer et al., 1996).

5. Why nursing classification system is needed

Only a few investigators have compared terms from a nursing specific classification system with general health care terms for their ability to represent nursing data. Zielstorff and associates (1992) compared the terms from NANDA (NANDA, 1992) and the Omaha system (Martin & Scheet, 1992) with the terms in the Unified Medical Language System (UMLS) (Humphreys & Lindberg, 1989) Metathesaurus. They found exact matches for only 9% of the NANDA terms, 1% of the Omaha problems, and 34% of the Omaha interventions with the

UMLS.

Henry and associates (1994) tested the ability of the Systematized Nomenclature of Medicine (SNOMED) (Cote, Rothwell, Palotay, & Beckett, 1993) to represent the natural language terms used by nurses to describe patient problems in 485 encounters. They found that the NANDA nursing diagnoses in SNOMED matched 30% of the patient problems as described by nurses, however, an additional 39% of the patient problems were matched by other terms in SNOMED such as signs, symptoms, and medical diagnoses. The investigators concluded that in addition to continuing the effort towards inclusion of nursing classification systems in the existing health care vocabularies, the nursing profession must test the feasibility of using existing vocabularies to represent nursing concepts (p. 73). They demonstrated that health care vocabulary terms not specifically designed for nursing were used by nurses for the description of patient problems.

Henry and colleagues (1997) compared NIC and CPT to see which classification represents nursing better. A total of 21,366 nursing activity terms were collected through patient interviews, nurse interviews, intershift reports and patient records from 201 AIDS patients and then categorized using the NIC and CPT codes. Nursing activity terms were categorized into 80 NIC interventions across 22 classes and into 15 CPT codes. This research showed that NIC included 100% of the nursing activity terms for the AIDS patients, whereas CPT only explained 6% of nursing activities. Therefore, this finding shows evidence that NIC more

completely captures nursing activities and supports the importance of discipline-specific classification in nursing.

Griffith and colleagues' research (1993) on nine specialty groups demonstrated that CPT codes only represent 1% of nursing care, and some CPT-coded services once provided by physicians have a large nursing component or are exclusively provided by nurses. This result means that not only are many nursing interventions not included in the CPT codes, but also often physicians are reimbursed for interventions done by nursing.

Ozbolt and Graves (1993) succinctly described the importance of nursing classification systems and their link to nursing information management: As nurses become able to retrieve and analyze data from clinical practice, they will gain the power to demonstrate both that nursing makes a difference and how nursing makes a difference, and to learn from aggregated experience how to make that difference better, more reliable, and cost effective (p. 411). McCarty (1989) urged that Nursing must have the statistics to demonstrate its impact on patient outcomes if nursing care elements are to be included in payment plans developed by the federal government and private insurers (p. 10).

6. Applications to nursing practice

Although the ability to classify nursing practice holds many potential benefits for nursing, there is concern about inconsistent approaches and duplication associated with the development of multiple classification

schemes (Delaney & Moorhead, 1995). The ANA Steering Committee on Databases to Support Clinical Nursing Practice hopes that nursing practice classification systems will emerge as a unified nursing language system (UNLS) that identifies nursing data elements and links those elements across nursing and health care vocabularies (ANA, 1993, p. 10). Just as the unified medical language system (UMLS) seeks to address the lack of uniformity in medical terminology, the development of a unified nursing language system holds great promise for binding the multiple lexicons used in nursing. Lang (1989) said that limiting the development of classification systems by adopting a single taxonomy could severely limit developments in nursing science. Therefore, ongoing development and testing of classifications to classify nursing practice should be encouraged and supported as nursing expands its body of knowledge (Kirby, 1996).

The classifications should be evaluated to determine the general value of nursing classification and the extent to which the original goals and purpose of classification are achieved. (Bowles & Naylor, 1996). Use of classifications in clinical practice should not be rigid but updated whenever it is needed (McCloskey & Bulechek, 1996; Ozbolt, 1997). As the classification systems are endorsed by ANA and tested in various practice settings, their research findings will continue to provide information leading to the development of an unified nursing language system that accurately describes the practice of nursing.

The ANA Steering Committee on

Databases to Support Clinical Practice is charged with identifying coding systems which they believe support the development of the UNLS. For recognition by the Committee, a system must meet criteria for clinical usefulness, reliability and validity, and have processes for revisions and extension (McCormick & Zielstorff, 1995). A unified classification system that is useful across all health care settings and for different types of health care providers would be ideal in the current and evolving integrated health care system where continuity of care is an important component. As patients progress through the integrated health care system, a classification system useful for all health care providers would provide a valuable communication tool (Bowles, 1997). A unified nursing language system will make it possible to include nursing care elements in local, regional, and national health care data sets used for research, clinical, education, policy, and administrative purposes.

Without computerized documentation, system information retrieval is time consuming and tedious. Computerized patient records will assist in outcomes research by improving the efficiency of data collection, retrieval of data on nursing diagnoses, interventions, and outcomes, and can provide impetus to effectiveness research. Current RN substitution with unlicensed assistants is being done to reduce costs without adequate information on its impact on quality and safety of patient care. If we identify the interventions that nurses perform for specific patients, then we can make better decisions about

substitution with lesser prepared personnel. Effective use of nursing resources results in an increase in the RN's productivity by improving use of the skills of the RN, while providing appropriate documentation of nursing's contribution to the outcomes of care (Kelly, Huber, Johnson, McCloskey, & Maas, 1994).

III. Results

While efforts to define nursing as a discipline have been made for over three decades, the discipline of nursing has been criticized for the absence of unique body of knowledge due to its broad scope, complexity, and lack of a clearly defined goal. The use of nursing theories distinguishes nursing from other health professions and represents nursing's unique contribution to the health care system.

Nursing's world views have been presented in many conceptual frameworks (Johnson, 1980; King, 1971; Newman, 1982; Orem, 1971, Rogers, 1970; Roy, 1970). These conceptual frameworks, despite their contribution to nursing's identity as a professional discipline, have been criticized for their difficulty in application to nursing practice. Because complicated nursing theories which are not applicable to practice have diverted attention away from the nursing model and toward the medical model as the base of practice. This results in rejection of knowledge of the nursing discipline as nurses strive to become junior doctors instead of senior nurses (Meleis, 1993), and theory and practice become isolated

from one another (Lenz, Suppe, Gift, Pugh, & Milligan, 1995). Now nursing has moved to the point of abandoning the conceptual frameworks (Blegen & Tripp-Reimer, 1997).

The recent process of identifying nursing practice using classification systems suggests another promise toward knowledge development in nursing. Lang (1986) argued that the absence of a system to identify and classify nursing elements is the main reason for the gap in nursing knowledge development. The development of a classification system in nursing is essential because the classification systems have been developed from nursing practice and are well grounded in nurses' reality.

The development of classification systems in the 1970s through 1990s, such as the North American Nursing Diagnosis Association (NANDA), Nursing Interventions Classification (NIC), and Nursing Outcomes Classification (NOC), are crucial to the development of knowledge which guides nursing practice. The nursing classification systems contribute to theory development because the systematic naming and classifying of our discipline makes possible new types of studies and demonstrates areas of needed research. Tripp-Reimer and colleagues (1996) said that while the taxonomic work is a departure from previous research and conceptual efforts, it holds considerable promise for this period in nursing's evolution (p. 11).

Nursing classification systems provide the lexical elements for middle-range theory development in nursing (Tripp-

Reimer, Woodworth, McCloskey, & Bulechek, 1996). Blegen and Tripp-Reimer (1997) point out that there is now the critical mass of systematically organized knowledge elements and research tools to support an explosion of knowledge that will constitute the next phase of nursing science.

IV. Conclusions

During the last century, nursing has undergone dramatic changes in nursing practice and research. Although many factors have influenced the development of nursing as a profession, nursing's contribution to the quality of health care goes largely unrecognized by the public and, to a certain extent, by other health care professions because of nursing's inability to clearly articulate its specialized body of knowledge. Nursing theories and conceptual frameworks are often difficult to apply directly to nursing practice, and the complexity and abstractness of these theories leads to their abandonment by nurses in clinical settings.

Current nursing theories and models need more refinement in framework development. Nurses should apply theoretical concepts in their practice of patient care and continue to validate and revise these theories through research. As theories acquire continued support by nursing researchers, educators, and practitioners, the body of knowledge in nursing science expands.

The utilization of classification systems in nursing practice will be instrumental in

ushering in the next era of nursing theory development because classification theory and research demonstrate more direct implication for nursing practice. As the body of knowledge in nursing science grows, older models and theories will be replaced by newer ones that more completely explain nursing, and ultimately further contribute to professional nursing development.

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-Abstract-

주요개념 : 간호이론, 간호분류체계, 표준화된 간호언어

간호이론의 발전과 간호 분류체계

이 은 주*

간호학에서 간호업무를 이끌어갈 간호이론(지식체) 필요하다는 생각은 20세기가 되면서부터 시작되었다. 하지만 아직도 간호학은 간호학 특유의 지식체가 부족하다는 지적을 받고 있다. 주된 이유는 간호 업무가 제대로 확인되지 않았고 간호 업무를 이끌어갈 간호학 특유의 간호이론이 확실히 정립되지 않았기 때문이다. 따라서 간호가 독자적 학문으로서 인정받고 발전하기 위해서는 간호업무에 적용이 쉽고, 간호 업무에 바탕을 둔 간호이론의 개발이 필수적이다. 왜냐하면 간호 이론이 간호업무에 쉽게 적용됨으로서 간호학의 지식체가 발전할 뿐 아니라 환자 간호도 더욱 증진될 수 있기 때문이다.

이 논문에서는 간호지식의 발전 단계를 시대적 순서와 배경을 덧붙여 고찰하였고 간호학에서 간호 분류체계가 발전하게 된 동기, 그리고 간호 분류체계가 환자 간호와 간호학의 이론개발과 발전에 어떻게 활용되는가에 대해 서술하였다. 그리고 간호분류체계가 가지는 특성으로는 먼저 간호실무를 체계적으로 명명하고 분류함으로써 간호학에서 필요한 연구영역을 확인하게 하였고 간호학 고유의 지식체의 발전에 공헌하는 것 뿐 아니라 간호정보화 시스템의 개발, 다른 의료전문가들과의 효과적인 커뮤니케이션 수단 제공, 간호의 지속성을 유지, 그리고 간호의 효과성 연구에의 활용 등이 있다.

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