Review Article

Various Aspects of Nursing as A Science and Its Impact on Nursing

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Abstract

This paper explores the various aspects of nursing as a science and its impact on nursing since its conception. A review of three major peer reviewed articles[1-3] was completed and defined nursing as a science founded on empiric knowledge or scientific knowledge and expanded by nursing theory through the four ways of knowing or epistemology in nursing, nursing conceptual frameworks through nursing theorists, and evidence-based practice (EBP) models for care Chinn and Kramer[4] to support nursing practice through educational program development. Key concepts included: interactive training programs, team resuscitation programs, minimum length of time and work hours for new nurse orientation programs, a formalized new graduate nurse program to increase transition scores for new graduate nurse programs. Nursing as a science truly became known and recognized in the 1950's and expanded in the 1990's through the introduction of EBP Chinn and Kramer.[4] Through use of empiric knowledge, scientific research, application of nursing theory, and nurses training program development nursing as a profession can advance and meet future challenges of a changing and challenging healthcare system.[1-14]

Keywords: Nursing science, Empiric knowledge, Ways of knowing, Florence nightingale, New graduate nurse, Orientation, Transition programs, Emergency training, Interactive training

Introduction

In order to know Nursing as a Science we should first look at the beginning of Nursing with Florence Nightingale. Florence Nightingale was born in May of 1820 in Florence, Italy. Despite her parents' objections and bucking convention, in 1844, Nightingale enrolled as a nursing student at the Lutheran Hospital of Pastor Fliedner in Kaiserswerth, Germany Chinn and Kramer,[4] McDonald.[1] In 1853 the Crimean War broke out and eventually there was a request for nurses and Nightingale took a core group of 34 nurses by 1854 to the Crimea to staff hospitals for ill and injured soldiers due to poor staffing and substandard care of their soldiers noted by the army. She was known during the Crimean War at the British base Hospital to have improved unsanitary conditions thereby developing prevention for wound infections and reducing the death count (i.e., death from cholera, typhoid) by two-thirds.[4,1] She wrote her findings and thus began worldwide health care reform. In 1860 she established and developed St. Thomas' Hospital and The Nightingale Training School for Nurses.[4,1] Nightingale wrote about the importance of sanitary conditions towards prevention of infection and became the pioneer of modern nursing developing the first standards in military and civilian hospitals for care and the first standards in nursing educational programs.[4,12]

Emergence of Nursing as a Science

According to[4] the emergence of nursing as a science did not develop until the 1950's in the United States (U.S.) and grew strength

and momentum in the 1960's. Here we developed the concept of nursing knowledge being predominantly scientific. Our early beginnings with Nightingale were very influential by documenting her improvements in sanitary conditions specifically and outcomes (i.e., reduction in infection rates of illnesses) she initiated health care evidence to support practice through scientific endeavors.[4,1] Due to wartime efforts in the 20th century, women were encouraged to provide care to the sick and injured. The U.S. government developed programs to educate nurses who agreed to provide service to the war efforts[10,12] as cited in Chinn and Kramer.[4] Due to a greater demand of nurses more highly technically trained, programs for higher learning and educators began to develop collegiate programs into graduate nursing programs by the end of World War II.[4]

In 1950, *Nursing Research* the first research journal was established for nurses. Professional articles appeared with research methodologies and conceptual frameworks or nursing theory and began to shape nursing as a science.[4] The focus moved towards empiric knowledge as the foundation of nursing.

Role of Theory and Evidence-Based Practice in Nursing Science

According to Chinn and Kramer,[7] empiric theory is defined as "a creative and rigorous structuring of ideas that project a tentative, purposeful, and systematic view of phenomena". Chinn & Kramer's[7,8] definition of empiric theory refers to the factual evidence that is the foundation of the four ways of knowing (i.e., emancipatory-self-awareness/reflection of factors affecting a condition, ethical-moral component, personal-awareness of self and others, aesthetic-art, and empirics-science) in nursing and the most important to support an evidence-based practice (EBP). EBP first started to develop in nursing literature in the 1990's.[4] Scientific evidence and competence is strengthened through use of formal expressions of empiric knowledge by incorporating nursing theories to describe a specific phenomenon.[7] Examples of articles supporting use of empiric knowledge and theory while supporting nursing as a science through an EBP to support practice changes are as follows: Merriel[2] completed a review of randomized controlled trials (RCTs) and other studies examining emergency training protocols as it relates to practice and improved outcomes (i.e., survival to hospital discharge, mortality rate, and guideline adherence). The best effect was achieved by an *interactive* emergency training program for in-hospital-based health care providers and improved patient outcomes, clinical care or organizational practices or both, and identified multiple new effective training components.

At the point of care the bedside nurse performed a review of the literature for an interactive neonatal resuscitation program (NRP) to incorporate into clinical practice. The updated 2015 NRP guidelines (the gold standard) published by the American Acade-my of Pediatrics and American Heart Association[5] report neonatal resuscitation is best through a multidisciplinary team-based model for care. Also 2015 NRP guidelines recommend to collect outcomes data on line from specialty registries to support clinical practice with best evidence to then provide antenatal counseling, team briefing, and equipment check with first parent interaction. For example: You may need to respond to a 24-25 gestational week infant delivery and would like information on chances of survival (mortality rate) and morbidity when making decisions with the family. Do we resuscitate, provide comfort measures, or no care at all. This infant may have a low rate of survival with moderate to high morbidity. The parents may still choose to treat in this scenario, but now you have explored and offered all the treatment options and using the latest evidence possibly recommended to offer no care, given expected poor outcomes.

The 2015 NRP guidelines certification is then required to maintain competence in neonatal resuscitation through classroom and demonstration by health care providers every two years for best practice. The NRP training program is applicable for a student nurse to the expert nurse, and advanced practice nurse incorporating Benner[6] novice to expert nursing theory for advancing nursing practice. It is important to keep evaluating our emergency care procedures for ways to improve outcomes (i.e., infant mortality rates, decrease length of stay, and patient/family satisfaction) through an evidence-based practice. Rush[3] reviewed through a mixed methods study and discussed the important factors required to recruit and retain new graduate nurses through elements in a new graduate nurse orientation or transition program. An online survey (The Casey Fink Graduate Nurse Experience Survey) was completed by 2010 new graduate nurses (n=1008) who were working in acute care. Findings included:

1. A formal transition program experienced higher transition scores

2. New graduate nurse orientation length minimum (4 weeks) and average number of 49 work hours during a two-week period were strong predictors of a higher transition rate

Given findings in Rush[3] any new graduate nurse program would be a minimum of 4 weeks in length and training work hours would be a minimum of 49 hours every two weeks but would recommend a full time 40-hour work week for an orientation program. The greater the immersion, each nurse had a greater understanding of the professional nurse role. Other attributes were occasional break out educational sessions and a mentoring program (by expert nurses) during the transition phase to a professional nurse role.

During this new graduate nurse orientation program (the novice) would be the ideal time to review techniques for surgical antisepsis and any other time the 2% Chlorhexidine scrub would be

used in this facility (i.e., central line insertion and care). I might also include its history and inception as explained above to reinforce the importance of the practice change through an evidence-based practice (EBP). Other considerations would be to incorporate aspects of Benner's[6] novice to expert theory such as "caring is central to the essence of nursing; its sets up what matters, thus enabling connection and concern, and it creates the possibility for mutual helpfulness".[4] The themes or patterns that characterize the essence of caring are those reflected in the actions, thoughts, values, and priorities of the practicing nurse.[4] Benner's belief is the "know how" to incorporate nursing knowledge through evidence and experience into practice which are two essential ingredients in nursing practice.

The 5 levels of Benner's theory novice to expert consist of novice, advanced beginner, competent, proficient, and expert.[6] Key things to consider in novice phase to ensure successful completion by the new graduate nurse include: no experience, need basic general rules to learn tasks, rules are applied universally, rule governed behavior is limited and inflexible.[6] By the end of the new graduate nurse orientation the expectation is the nurse will have successfully completed the advanced beginner nurse phase and will display some attributes of competency. Advanced beginner nurse attributes include: demonstrates acceptable performance, has clinical experience and an array of clinical situations to draw experience from, recognize meaningful key components and learning objectives, and will know key principles based on experience to guide practice.[6] Ideally the mentoring program would facilitate the transition from novice to expert in the new graduate nurse orientation program.

Community and the Nursing Process

Community empowerment and partnerships in nursing decision making models are a vast growing focus for improving community health via intervention and research. National certifications and degrees available through universities are continuing to advance practice in the community focus. Melo[14] explore community empowerment in the nursing process to promote improved health from diagnosis to health gains using the Nursing Theoretical Model - Community Assessment, Intervention, and Empowerment Model. This has great meaning for development of public policy for continued advancement of healthy communities.

Informatics and Telehealth Advancement

Our client population complexity and specialties are so advanced that to prevent long distance travel and additional costs to client's informatics systems and telehealth are an expanding role including academic programs and national certifications to match. The call for the changing landscape for how we deliver healthcare has changed our leadership and educational needs to support nurs-

ing science, competencies and evidenced-based care in this focus. Kassam[11] complete a review of informatics competencies for nurse leaders and protocol for review while exploring the modified Delphi approach. Kleib[13] also completes a review of approaches for defining and assessing nursing informatics competencies to meet the needs of organizations in healthcare expanding their role and region in healthcare. Leadership in healthcare require knowledgeable methods to design, implement, review, and advance the care of the client using informatics tools and telehealth approaches. Kleib also calls for an international consensus utilizing these approaches for uniformity in healthcare answering the World Health Organization (WHO) call for advancing healthcare programs across the world.

Advancing Nursing Knowledge to Expand Science and Research in Leadership

The changing complexity of the client from maintenance health to chronic disease and the methods from which we manage it outpatient, inpatient, and homecare settings has vastly changed the role of our nursing leadership and the knowledge required to manage this complexity. Due to the call for expert knowledge and expanding science in research to enhance leadership roles Academic programs have developed and continue to develop Nursing Leadership degrees with matching certifications to again empower nursing through knowledge, experience, and science in leadership. Our leaders in healthcare continue to expand our knowledge in this arena to improve and make cost effective sustainable health programs that improve the outcome for the client and support job security, retention, and satisfaction for the employee. This supports the role of health competencies for continued needs to support employee knowledge and the core safety and values of a healthcare organization. Heinen[9] published a review on leadership competencies and attributes in advanced nursing practice. Heinen found 30 core competencies within four leadership domains to enhance evidence-based practice in leadership. Research in education is an area neglected due to the call for clinical practice research to improve patient outcomes so more research is recommended in this focus. Knowledge and education is a powerful tool for the change complexity of healthcare.

Conclusion

The emergence of nursing as a science in the 1950's became the most influential period in nursing with recognition of scientific knowledge or empiric knowledge as increased power.[4] The epistemology of nursing or the four patterns of knowing in nursing contributed to theory development of the nursing field from a scientific approach, furthered by the movement of the EBP in the 1990's. Clearly nursing has developed a profession founded in nursing science by creating its own body of evidence and integrating it into

nursing practice through rigorous EBP models and nursing theorists all of which shaped the past, present, and future of nursing.

Future recommendations would include the need to further explore the ways of knowing in nursing, nursing research methodologies, nursing theory, and EBP as it relates to integration of nursing knowledge, theory, and practice. New gains explored in this article in community leadership and academic leadership through advancing knowledge and science are empowering our healthcare organizations everyday to expand evidence-based practice through all levels of nursing and specialties realizing the changing complexity and dynamics of our organizations, clients, and their community needs including the advancement of telehealth programs. Developing sustainable cost-effective safe programs through advancement of nursing knowledge and science is the future and changing landscape for which we must meet the challenge and pass to our peers to form a bright sustainable future in nursing and healthcare organizations.

Conflict of Interest

The author declared no conflicts of interest.

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