Assessment of Understanding of Foundational Genomic Concepts Among RN-to-BSN Nursing Students

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The advancement of genetic science and technology has transformed health care (Daack-Hirsch et al., 2013). Genomics is now being integrated across the health care continuum at the point of care in areas such as risk assessment, prevention, screening, diagnosis, treatment, prognosis, and personalized medicine (Calzone, et.al., 2012; Calzone & Jenkins, 2012; Clark, Adamian, & Taylor, 2013). All health care providers need to integrate genetics and genomics into their practice in order to provide holistic care to patients. Nurses are the largest health care profession, with 2.9 million registered nurses (RNs) active in 2012 (Health Resources and Services Administration [HRSA], 2013) and a projection of 3.5 million in 2025 (U.S. Department of Health and Human Services, HRSA, National Center for Health Workforce Analysis, 2014). Nurses practice in all health care settings, and continue to be rated as the most honest and ethical professionals (Riffkin, 2014). Nurses need to be at the forefront of integration of genomics into clinical practice. However, despite educational initiatives, nurses have limited knowledge and have shown minimal integration of genetics-genomics competencies into nursing practice.

The development of the Essential Nursing Competencies in Genetics/Genomics in 2006, which were updated with outcome indicators in 2008 (Consensus Panel on Genetic/Genomic Nursing Competencies, 2009), provided nursing with a framework for identifying the educational needs of nurses. The American Association of Colleges of Nursing (AACN) used these competencies to support their recommendation for the inclusion of genetics and genomics into nursing curriculum (AACN, 2008; Jenkins & Calzone, 2012). Educational programs and curricula guidelines have been developed to assist in the integration of genetics and genomics into baccalaureate nursing curricula (Calzone, et al., 2013a; Calzone & Jenkins, 2012; Jenkins & Calzone, 2014) Genetics has been included in undergraduate curriculum via both stand-alone genetics courses, and integration across the curriculum. Many studies have addressed genetic and genomic knowledge gaps, integration of competencies into practice, and educational needs of nursing students, practicing nurses, and nurse educators (Calzone, et al., 2012; Calzone, et al., 2013b; Calzone, et al., 2014; Coleman, et al., 2014; Scanlon & Fibson, 1995). Recent research has included the use of nursing’s first concept inventory (The Genomic Nursing Concept Inventory (GNCI ©) to evaluate meaningful learning of genetic concepts, as well as common misconceptions (McCabe, Ward, & Ricciardi, 2016; Ward, French, et al., 2016; Ward, Haberman, & Barbosa-Leiker, 2014; Ward, Purath, & Barbosa-Leiker, 2016). Ausubel's Assimilation Theory suggests meaningful learning is a better approach to understanding difficult concepts, as opposed to rote learning (Ausubel, et al., 1978). Meaningful learning occurs when new knowledge is anchored with pre-existing knowledge in a person’s cognitive structure. The majority of studies identified that nurses with a higher level of education, and nurses who had taken a genetics course since licensure had increased knowledge and increased integration of genetic competencies into practice. However, many of these studies did not include RN to BSN students. Scant research is available to assess the genetics knowledge of the practicing RN enrolled in a BSN completion program. The educational barriers include nursing faculty with a weak understanding of foundational genetics and a lack of practicing nurses’ knowledge (Jenkins & Calzone, 2014; Read & Ward, 2016). Research has indicated some progress in the acquisition of genetic-genomic knowledge by nurses, but much work still needs to occur.

The Genomic Nursing Concept Inventory (GNCI©) was developed to evaluate nurses’ and nursing students’ understanding of foundational genetic-genomic concepts, or genetic-genomic literacy (Ward, Haberman, & Barbosa-Leiker, 2014). The purpose of this descriptive research was to identify the current genetic-genomic knowledge and misconceptions of RN to BSN students as measured by the Genomic Nursing Concept Inventory (GNCI©) (Ward, Haberman, & Barbosa-Leiker, 2014). The participants were registered nurses enrolled in or recently graduated from an online RN to BSN completion program in a large, urban university in the Mid-Atlantic region of the United States. A cross-sectional design was used.
and provided access to students at varied levels of progression within the program, in various stages of development (Houser, 2015). This design allowed the researcher to analyze differences among participants across the continuum of their program, compare these differences against the GNCI© score, and provide more generalizable results. The differences evaluated included age, sex, educational program at attainment of licensure, and past genetic education.

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Abstract Summary: This poster will report the outcomes of a research study that assessed the understanding of genomic concepts by RN to BSN students. Common misconceptions will also be reported. This information will help to inform genomic nursing curriculum.

Content Outline:
I. Introduction
   A. Importance of Genetic/Genomic Knowledge to nursing practice
   B. Background of Genetic/Genomic educational initiatives

II. Body
A. Main Point #1 Current educational knowledge

1. Supporting point #1 Review of the literature
   a) Research addressing genetic/genomic knowledge
   b) Research addressing integration of genetic/genomic knowledge into practice.

2. Supporting point #2 Use of GNCI©
   a) Ausubel’s theory
   b) Concept inventories

B. Main Point #2 Research study using GNCI© with RN-BSN students

1. Supporting point #1 Research plan
   a) Participants
   b) Results

III. Conclusion

A. Implications for nursing curriculum
B. Implications for future nursing research

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01/01–06/04 Nurse Coordinator, Cancer Risk Evaluation Program Pennsylvania Oncology Hematology Associates 2016 - Present ISONG (International Society of Nurses in Genetics) Education Committee and ISONG Ethics Committee 05/2010 - Present Virtual Administrator, Oncology Nursing Society, Cancer Genetics SIG 2015 - 2016 ISONG Communication Committee 01/2014 – 10/14 Member of ANCC’s Content Expert Panel for the Genetics Nursing specialty 2012 - 12/2015 Associate Editor, Oncology Nursing Forum, Genetics and Genomics Column (Term 2012-2015) 2012 - 2014 Cancer SIG Coordinator, International Society of Nurses in Genetics 09/2009 - 08/2011 Team Leader for the development of Oncology Nursing Society (ONS) Cancer Genetics Web course 05/2008 - 05/2010 Coordinator of Cancer Genetics SIG, ONS

Author Summary: Lisa Aiello is an Assistant Clinical Professor at Drexel University. She is pursuing her doctoral degree at Villanova University. Her research focuses on the genetic/genomic educational needs of nursing students. She will be presenting her dissertation research study and results, as well as the implications to nursing curriculum.