Integrating Genetics and Genomics into Nursing Curricula

You Can Do It Too!

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KEYWORDS

• Nursing education • Genetics • Genomics • Case study • Undergraduate curriculum

KEY POINTS

- Rapid advances in knowledge and technology related to genomics cross health care disciplines and touch almost every aspect of patient care—assessment, screening, diagnosis, and treatment.
- Nurses are key to bridging the gap between genomic discoveries and the human experience of illness.
- There is a critical need for genetics and genomics in nursing education.
- Strategies and recourses exist to enable nursing faculty to successfully integrate genetics and genomics into curricula.

INTRODUCTION

Three billion base pairs code for an entire human genome and hold the key to regulating biologic processes that are fundamental to our lives, and slight variations across the genome are responsible for our differences. Health care professionals can no longer categorize disorders and characteristics as either genetic or nongenetic.

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Rather, they must consider what the genetic and genomic contributions are to susceptibility and predisposition to illness as well as responses to pharmacologic and nonpharmacologic therapies when caring for patients.

The Human Genome Project has accelerated discovery, expanded understanding of how genomes work, invigorated a wave of new technology resulting in the ability to sequence a single human genome for just thousands of dollars (the cost continues to drop), and revolutionized health care.[1] This ever-evolving knowledge and technology related to genomics is unique in that it crosses health care disciplines and touches almost every aspect of patient care—assessment, screening, diagnosis, and treatment. The ability to sequence a genome holds the promise that health care can be personalized based on a unique genome sequence and treatments tailored on a profound understanding of how their unique genetic characteristics interacts with their physical environment—leading to more-effective treatments and preventative care.[1,2]

Health care professionals, including nurses, are faced with a gap in the ability to use the rapidly expanding technology and knowledge related to genomics in practice.[3,4] Yet, nurses are key to bridging the gap between genomic discoveries and the human experience of illness because nurses care for patients, families, and communities with an intimate knowledge of their perspectives. Nurses are skilled communicators; are knowledgeable about the biologic, social, and psychological implications of illness; and have the public's trust.[5] Unfortunately, many practicing nurses do not have educational training in genetics. Recent studies show that nurses have low genetic literacy.[6–10] Furthermore, nursing faculty are not prepared to teach genetics/genomics in their curricula, thus perpetuating the problem.[6,11,12] To that end, professional groups have endorsed the need for genetics and genomics in nursing education.[13–17] Two seminal examples of professional endorsement in the United States include the *Essentials of Baccalaureate Nursing Education for Professional Nursing Practice*[13] and *Essentials of Genetic and Genomic Nursing: Competencies, Curricula Guidelines, and Outcome Indicators*.[14] Central to these documents is the understanding that nurses are crucial to the provision of health care that incorporates genetic and genomic information.[7,18]

Several articles have been published on how to go about planning for and integrating genetics and genomic content into nursing programs.[18–20] Likewise, several faculty resources and strategies to prepare faculty to integrate genomics into education programs exist.[21–24] There is, however, little documentation and evaluation of the process of integrating genetics and genomics into programs. The purpose of this article is to present a case study documenting the experience of five schools/colleges of nursing as they work to integrate genetics and genomics into their curricula.

OVERVIEW

The Genomic Nursing Education in the Heartland Initiative was developed to provide consultation to nursing education programs to support their integration of genetics and genomics into the nursing curriculum. This consultation provided practical assistance to faculty teaching in undergraduate programs as they prepared for accreditation or reaccreditation by the Commission on Collegiate Nursing Education. The consultant was a nurse academician who is a content expert in clinical genetics. Description of the five colleges/universities that completed the consultation is provided in **Table 1**. Deans or department heads from each nursing program identified a faculty member to serve as a site coordinator and change agent. In preparation for the consultation site visit, faculty completed a self-study; details of the self-study are presented in **Table 2**.