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Are Nursing Faculty Ready to Integrate Genomic Content into Curricula?

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Abstract

Genomics is an emerging field with newly developed expectations for all healthcare professionals. Nursing faculty are critical to preparing the future nursing workforce in genomics but faculty knowledge, receptivity and interest in learning more about this subject was an unknown. The authors discuss the process used to assess nursing faculty's readiness to change as a way to substantiate the need for faculty training.

Genomics is an emerging field with newly developed expectations for all healthcare professionals. Genomics refers to advances in understanding the biological manifestations of all genes in the human genome interacting together, with the environment, personal, psychosocial, and cultural factors (1). Results from these advances provide the foundational knowledge of health at the level of the gene and have begun to necessitate changes in nursing education (2). Nurses serve as translators of this complex information to individuals and their families, thus nursing faculty are beginning to question about what exactly students need to be taught. Available to assist faculty in this process are genetic/genomic educational competency standards that identify the foundation for education of all nurses (3). This competency document helped inform the work of the American Association Colleges of Nursing's (AACN) Essentials of Baccalaureate Education for Professional Nursing Practice (4) and The Essentials of Master's Education in Nursing (5) resulting in the expectation that all faculty include genetic/genomic information in the curriculum.

As nurses working at the National Institutes of Health (NIH), we had an opportunity to create a training program as part of our nursing competency implementation plans to inform and support nursing faculty to meet this expectation. Baseline information was needed about faculty knowledge, receptivity and interest in attending a focused genomics education program to determine the need and create justification for funding support for such an educational intervention.

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Background

A key component of behavior change and diffusion frameworks is the inclusion and support of respected members or “opinion leaders” of an organization (6, 7), in this case nursing faculty champions. Using opinion leaders to accelerate adoption of new knowledge or practices accelerates change (6). To determine whether there would be interest and receptiveness for a nursing faculty champion program to train opinion leaders so that the integration of genetic and genomic curriculum content into entry level nursing education could be accelerated, we assessed nursing faculty’s readiness to change in December 2008. We had been invited to provide genomic educational sessions at nursing meetings in which faculty would be in attendance. We decided to reach out to attendees and ask questions of participating faculty in separate sessions offered at the American Association of Colleges of Nursing (AACN) Baccalaureate Meeting (2 sessions); and a Sigma Theta Tau Regional Meeting (one session). Content included in each of the 2 hour sessions was aimed at disseminating information about relevancy of genomics for nursing practice, methods to integrate genomic information into nursing curricula, and resources available.

Questions were formatted for use inside the educational content provided via PowerPoint presentation and with answers that could be selected by using an electronic voting keypad. We reviewed existing instruments assessing faculty competency in genetics and genomics and readiness of change (8, 9). Nineteen multiple choice questions were developed based on constructs of the transtheoretical model and stages of change (10,11). Of the 19 questions, 2 assessed demographics and 3 evaluated genetic/genomic knowledge (Table 1). Expert review of the proposed questions was provided by 10 genetic nursing leaders. These questions were formatted on a PowerPoint slide, inserted just prior to specific content addressing the subject queried, and then content was presented following display of the group results.

The Transtheoretical Model and Stages of Change

The Transtheoretical Model was used to provide the theoretical core constructs for the questions describes influencing factors of stages of change, decisional balance, self-efficacy, and the process of change (10). The core constructs describe the change process as occurring over time, with individuals proceeding through 5 stages. The *Precontemplation* stage is when faculty express no intention of changing. For example, faculty may not be motivated to change; not see the value of changing; or feel it’s too much effort to change. Some faculty may, however, be in the *Contemplation* stage. For example, they may recognize the problem, are seriously thinking about changing, but have not yet taken action. Others may be preparing for action associated with the *Preparation* stage. Those faculty may have already created an action plan and are thinking about moving change forward within the next thirty days. Other faculty may already have recognized the problem and have made curriculum changes reflecting the *Action* stage, but have enacted consistent behavior change for less than 6 months. The *Action* stage requires commitment of time and energy. The fifth stage of change, *Maintenance*, is where the participant maintains their new behavior for 6 months or more.

As individuals proceed through these stages, they reflect on the pros and cons of changing, trying to achieve a decisional balance. Included in this reflection is an evaluation of their own self-efficacy or confidence to change their behavior. This model has mostly been used to assess the process of change in persons trying to change addictive and health behaviors such as smoking, alcohol abuse, and preventive medicine interventions (9). The Transtheoretical model provided us with a foundation from which to consider factors influencing change in the academic environment and to identify focus points for influencing the process and rate of change.

Opinion Leaders

Change takes time and is not always a quick process. Diffusion of new knowledge or new behaviors is multifaceted and can be influenced. Using opinion leaders to accelerate adoption of evidence-based practices decreases the length of time associated with change adoption (6). Ten techniques have been used to identify opinion leaders and many randomized controlled trials have demonstrated their effectiveness (11). However, opinion leaders are not necessarily the earliest or early adopters of new knowledge or behaviors, rather their behavior signals whether a new idea is likely to be readily adopted by the community (7). When opinion leaders are identified, they can be used as change agents and assigned specifically to create efficient “learning communities” (6).

Methods

Regulatory Review/Approval

This study was reviewed and approved by the National Institutes of Health Office of Human Subjects Research. The study was determined to be Code of Federal Regulations (45 CFR 46) exempt because the information collected in the survey was recorded so that individual respondents could not be identified (indirectly or directly through identifiers), participants could choose not to answer any question without penalty, and there were no other risks to the participants.

Responses to questions were collected using the electronic voting methodology Turning Point, that provides real time question responses. Individual survey questions were posed prior to the content that complemented the topic presented in the session. Respondents needed to press their response on the key pad to each question posed and the software assembled group responses for immediate viewing. The presenter and participants then viewed aggregate anonymous responses immediately.

Study Population

Genomic nursing education presentations were delivered to 3 groups of nurses in December 2008. Group 1, nursing faculty attending an AACN Baccalaureate Meeting December 5, 2008, in Texas, Session 1 (n=57); Group 2, repeat of the Group 1 content (session 2) for nursing faculty attending the same AACN meeting (n=56); Group 3, nurses attending (mixed group-55% nursing faculty/educators, 33% practicing nurses, and 12% in other roles) a Sigma Theta Tau International (STTI) Regional Meeting in New York December 7, 2008 (n=54). The total sample for all 3 sessions was 167.

Statistical Analysis

Data collected from the 3 groups was collapsed into one excel dataset to analyze the question responses. Results were tabulated and analyzed using descriptive statistical techniques. The per question response rate varied and ranged from a high of 69 individuals not answering the question about intent to adopt curriculum changes to as few as 6 individuals not responding to a question about rating their personal genetic/genomic knowledge base.

Results

Study Population

The majority of session attendees (82%) had masters or doctoral degrees. Most rated their personal genetic/genomic knowledge as low (46%) or very low (25%). The majority of workshop attendees (81%) had heard that genetics and genomics was incorporated into the

2008 revised Baccalaureate Essentials from AACN which is used to establish the criteria by which the Commission on Collegiate Nursing Education (CCNE) accredits many schools of nursing.

Decision/Adoption

Table 2 provides summaries of the survey findings. Most attendees felt positive (44%) or extremely positive (almost 29%) about the Baccalaureate Essentials including genetics/genomics in nurse preparation. Although 71% rated their own personal genetics/genomics knowledge as low or very low, 83% agreed that preparing nurses to use genetic/genomic information was an important role for nurse educators. Seventy four percent strongly disagreed or disagreed with the statement “there are no changes I can make in nursing curriculum/courses to make room for genetics/genomics”. Most were motivated to learn more about genetics/genomics by advances in healthcare (69%) with 64% also reporting motivation by the academic environment. Furthermore, 85% of respondents agreed or strongly agreed that now was the time to start teaching genetics and genomics. In addition, less than 3% indicated that there were no changes that they could make in their nursing curriculum or courses to make room for genetics and genomics.

Discussion

The Transtheoretical Model core constructs guided the assessment of faculty readiness for change related to genetics/genomics content integration into nursing curriculum. Only 1.2% of respondents identified that they were in the *precontemplation* stage with no intent to adopt any curriculum/course changes that included genetics/genomics. Thirty-five percent of faculty were in the *contemplation stage* and planning to adopt curriculum changes within the next 6 months. Almost 4% had plans to make changes within the next 30 days so were in the *preparation* stage. Some faculty were already in the *action stage* with 9% already reporting curriculum changes that included genetics/genomics for less than 6 months and almost 10% in *maintenance* stage with curriculum changes that included genetics/genomics for greater than 6 months. The majority of attendee respondents are still in the *precontemplation* or *contemplation* stage but 41% of attendees did not respond to this question. We recommend additional research to support this conclusion for the general faculty population.

There was clear recognition by session attendees of the value of genetics/genomics for nursing education. In addition, more than half of respondents were in some phase of action. As such, these findings provided the evidence needed to create justification for a request for funding from the NIH for a nursing faculty opinion leader intervention aimed at training nursing faculty champions in genetics/genomics in order to accelerate the integration of genetics/genomics curriculum content into entry level nursing education.

Although positive about making these changes, attendees provided other suggestions about what they needed most to be able to include genetics/genomics in the curriculum. These included: web-based toolkit resources (27%); model curricula (26%); didactic modules (14%); and faculty mentors (5%). Currently, a web-based toolkit repository has been funded by the National Human Genome Research Institute, NIH and is available to assist nursing faculty to locate peer reviewed genetics/genomics educational materials at <http://www.G-2-C-2.org>. In addition, faculty can upload exemplar curricula and modules for others to access. More information about such resources are available in a 2011 article series being published in the Journal of Nursing Scholarship that highlight the key role of nurse educators in bridging the gap between genomic discoveries and clinical care (12).

Conclusion

So are nursing faculty ready to integrate genomic content into curricula? Those attending these sessions reported limited capacity to integrate this science into their program, but agree with its importance and feel now is the time to act. Nursing faculty are aware of the incorporation of genetics/genomics into the AACN Baccalaureate Essentials and intend to adopt curriculum/course changes to include genomic content in nursing curriculum. Many intend to adopt curriculum/course changes within the next 6 months and would value resources that could assist them in this endeavor.

The profession of nursing has an important leadership role in assuring that the nurses of today and for the future are prepared to be proactive in translating the benefits of genomic research to assure improved patient care. A prepared nursing workforce is essential for the translation of genomic discoveries to improve health outcomes. The academic environment is critical to preparing the future nursing workforce in genetics/genomics. Based on this baseline information about faculty knowledge, receptivity and interest, funding was obtained to launch a Faculty Champion training and support initiative for 2009 to 2010. Such efforts provide opportunities for faculty to collaborate with each other, to learn about resources together, and to recognize that they are not alone in their goals to integrate genomic content into curricula.

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Table 1

Transtheoretical Model and Stages of Change Domains Linked to Associated Survey Questions

Domain Construct	Survey Questions
Demographics	What is your Highest Educational Preparation?
	What is your Primary Professional Role?
Knowledge	Do the Baccalaureate Essentials Recommend that Genetics/Genomics be Included in Nurse Preparation?
	How Would You Rate Your Personal Genetics/Genomics Knowledge?
	Family Health History Assessment With Genetics/Genomics Content (i.e., pedigree, 3 generations, age at diagnosis) Has Little Value For Patient Care.
Precontemplation/Contemplation	How Do You Feel About The Baccalaureate Essentials Including Genetics/Genomics In Nurse Preparation?
	Preparing Nurses to Use Genetics/Genomics is an Important Role of Nurse Educators.
	The Academic Environment (i.e., Dean; curriculum committee; accreditation standards) is Motivating Me to Learn More about Genetics/Genomics.
	Teaching Nurses Genetics/Genomics Is Important To Keep Nurses As A Central Partner In Patient/Family Care.
	Genetics/Genomics Healthcare Advances (i.e., value to patient care; clinical setting demand) are Motivating Me to Learn More about Genetics/Genomics.
	The Promise Of Genetics/Genomics For Healthcare Has Been Exaggerated.
	It Is Time To Start Teaching The Next Generation Of Nurses About Genetics/Genomics.
	There Are No Changes I Can Make In Nursing Curriculum/Courses To Make Room For Genetics/Genomics.
Preparation/Action/Maintenance	How Likely Are You To Ever Include Genetics/Genomics In The Nursing Courses You Teach?
	Identify Your Intention To Adopt Any Curriculum/Course Changes That Include Genetics/Genomics?
	Genomics Is Unlikely To Become Relevant For Nursing Practice In The Next 12 Months .
	Genomics Is Unlikely To Become Relevant For Nursing Practice In The Next 5 Years .
Action/Maintenance	What Do You Need Most To Include Genetics/Genomics In The Courses You Are Teaching?
	Which Curriculum Concept Do You Feel is the Most Important Priority To Include In Nurse Preparation?

Table 2
Nursing Faculty Attitudes, Receptivity and Interest in Integration of Genetic/Genomic Content into Nursing Curricula (N=167)

	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)	No Answer N (%)
The promise of genetics/genomics for healthcare has been exaggerated.	4 (2.4%)	21 (12.6%)	21 (12.6%)	52 (31.1%)	55 (32.9%)	14 (8.4%)
Family health history assessment with genetics/genomics content (i.e., pedigree, 3 generations, age at diagnosis) has little value for patient care.	4 (2.4%)	11 (6.6%)	3 (1.8%)	24 (14.4%)	111 (66.5%)	11 (6.6%)
Genetic/genomic healthcare advances (i.e., value to patient care; clinical setting demand) are motivating me learn more about genetics/genomics.	59 (35.3%)	56 (33.5%)	20 (12.0%)	2 (1.2%)	4 (2.4%)	26 (15.6%)
The Academic environment (i.e., Dean; curriculum committee; accreditation standards) is motivating me to learn more about genetics/genomics.	57 (34.1%)	50 (29.9%)	23 (13.8%)	15 (9.0%)	5 (3.0%)	17 (10.2%)
Genomics is unlikely to become relevant for nursing practice in the next 12 months .	9 (5.4%)	19 (11.4%)	14 (8.4%)	46 (27.5%)	62 (37.1%)	17 (10.2%)
Genomics is unlikely to become relevant for nursing practice in the next 5 years .	7 (4.2%)	5 (3.0%)	3 (1.8%)	12 (7.2%)	114 (68.3%)	15 (9.0%)
There are no changes I can make in nursing curriculum/courses to make room for genetics/genomics.	1 (0.6%)	3 (1.8%)	6 (3.6%)	42 (25.1%)	82 (49.1%)	33 (19.8%)
Preparing nurses to use genetics/genomics is an important role of nurse educators.	67 (40.1%)	59 (35.3%)	19 (11.4%)	6 (3.4%)	0 (0%)	16 (9.6%)
It is time to start teaching the next generation of nurses about genetics/genomics.	104 (62.3%)	39 (23.3%)	3 (1.8%)	4 (2.4%)	3 (1.8%)	14 (8.4%)
Teaching nurses genetics/genomics is important to keep nurses as a central partner in patient/family care.	108 (64.7%)	30 (18.0%)	6 (3.6%)	1 (0.6%)	8 (4.8%)	14 (8.4%)
How do you feel about the AACN Baccalaureate Essentials including genetics/genomics in nurse preparation?	15 (9%)	1 (1%)	15 (9%)	14 (8.4%)	74 (44.3%)	48 (28.7%)
	No answer N (%)	No plans to adopt curriculum changes N (%)	Plans to adopt curriculum changes (<30 days) N (%)	Plan to adopt curriculum changes (next 6 months) N (%)	Already made curriculum changes (<6 months) N (%)	Already made curriculum changes (>6 months) N (%)
Intention to Adopt Any Curriculum/Course Changes to Include Genetics/Genomics	69 (41.3%)	2 (1.2%)	6 (3.6%)	59 (35.3%)	15 (9%)	16 (9.6%)