Evidence Based Practice Project

Elizabeth Kinnucan, Bethany Perry and Jessica Way

Auburn University at Montgomery

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Since the completion of the Human Genome Project in 2003, genetics and genomics have shifted cancer research towards more specialized care. Understanding how genetics and genomics affect cancer prevention, screening, diagnosis and treatment is becoming increasingly necessary to provide optimal patient care since they play a part in the etiology of all cancers (Santos et al., 2013). The integration of genomics into routine health care falls predominately upon nurses who comprise the largest contingent of health care providers. Therefore, it is essential that nurses have a firm knowledge of how this information fits into the clinical setting (Calzone et al., 2012). Cancer has a number of etiologies. Approximately 5-10% of cancers are caused by a gene mutation which is passed through the egg or sperm and present in every cell in the child’s body. Other forms of cancer are caused by acquired factors, such as pollutions or excessive sun exposure, leading to a possible alteration of the deoxyribonucleic acid (DNA) in a specific area of the body. This form of mutation is more common and descends to every offspring of the initially altered cell.

**Patient or Situation Focused Question**

This team will use the evidence-based process (EBP) to find the facts that will help integrate genetic and genomic information into the clinical setting so that patient education and care are improved. The focus for the query comes from a case study about an oncology nurse who was recently diagnosed with melanoma. She recognizes that she possesses a lack of information on genetics and genomics in relation to the prevention and treatment of cancer. She would like to develop a program for oncology nurses related to how genetics and genomics can be integrated into cancer care. The purpose and goal of the query is to increase the oncology nurse’s knowledge of genetics and genomics and its relation to cancer care. To guide a search for information, a focused question was developed. The focus question is what educational program can oncology nurses be provided to effectively implement knowledge of genetics and genomics and how it will be utilized in the diagnosis, treatment and prevention of cancer to improve client outcomes?

**Targeted Resources/Search**

When deciding which resources to include in the query, the team determined relative search terms by using the PPAARE acronym developed by Howlett, Rogo, and Shelton (2014) (see Table 1). Databases explored included PubMed, CINAHL, Cochrane and Google Scholar. The team searched these databases for information by using search terms including educational programs, oncology nurses, cancer prevention, cancer diagnosis, cancer treatment, genetics, genomics, qualitative research, and quantitative research. From a total of almost a hundred results, the team read abstracts and reflected on the focus question to establish the relevancy of the articles to the query. After determining pertinence, the team read the full articles and discussed applicability of the resources.

Table 1

*PPAARE table to determine focus of study*

| Problem: | Lack of genetics/genomics knowledge |
| --- | --- |
| Patient/Demographic: | Oncology nurses |
| Action: | Implementation of genetics/genomics cancer education program for oncology nurses |
| Alternative: | None |
| Result: | Improved patient outcomes, higher prevention and success rates, early diagnosis and treatment rates |
| Evidence: | Highest available |

The problem was identified as a lack of knowledge related to genetics and genomics. Oncology nurses are the targeted demographic in this study; however, oncology patients will be the ultimate beneficiaries of such educational programs. The action of the team will be determining and implementing an educational program specifically designed to teach oncology nurses the roles genetics and genomics have in cancer etiology, risk assessment and recognition. The anticipated results based on the highest available evidence include better prevention, earlier diagnosis and more successful treatment rates leading to improved overall patient outcomes. No alternative to the action was identified by the team.

**Relevant Evidence**

Oncology nurses lack education about the role genetic and genomic technologies play in cancer, thus being unable to interpret and integrate these advances that will promote health promotion, symptom management, and disease prevention (Lea & Calzone, 2010). The synopsis of research found evidence that indicates the use of genetic and genomic technology is becoming more prevalent in health care. Providing nurses with education and training in genetics and genomics is essential to offering optimum care to individuals and families. The results of the research show this knowledge is imperative to creating a culture of evidence-based practice in the nursing setting. It is crucial for practicing nurses to continue their education and increase their knowledge in the subject of genetics and genomics regarding cancer care. Early implementation of this education, preferably integrated into nursing school curricula, readily affords nurses the opportunity to utilize this knowledge immediately at the point of patient contact. Oncology nurses must understand the basics of genetics and genomics in regards to carcinogenesis and be able to translate this information to their patients. In searching for evidence for the best programs available, research found an obvious lack of knowledge not only on behalf of the students, but faculty as well. This lack of knowledge also affected their capacity to effectively teach and implement genetic programs (see Table 2).

## Table 2

## *Relevance of Evidence*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Evidence Citation (APA)** | **Level of**  **Evidence** | **Research Design** | **Purpose/Question(s)/Hypothesis** | **Population/Sample**  **/Inclusion and exclusion criteria described** | **Data Collection**  **Method(s)** | **Data Analysis**  **Method(s)** | **Findings and Conclusions** |
| Lea, D.H., Jenkins, J., & Monsen, R.B. (1999). Incorporating genetics into nursing practice. *Nurse Educator, (24)*5, 4-5.  Retrieved from EBSCOhost | lowest | Qualitative | To assess the amount and nature of genetic information in nursing licensing and certification examinations, which is one way to ensure the quality of patient care with respect to genetics and nursing practice. | nurses | Survey | Coding, figures | There is a need to strengthen nursing knowledge in genetics and recognition of the relevance of genetics to nursing practice. Nurses need to participate actively in integrating knowledge of genetic conditions, testing, and therapeutics into their practice as healthcare incorporates advances in these areas. The inclusion of genetics into competency examinations is critical today. |
| Kirk, M., Calzone, K., Arimori, N., & Tonkin, E. (2011). Genetics-genomics competencies and nursing regulations. *Journal of Nursing Scholarship, 43*(2), 107-116. doi: 10.1111/j.1547-5069.2011.01388.x | Lowest | Qualitative | What is the interaction between the integration of genetics-genomics into nursing curricula and regulatory standards? | Nursing education programs | surveys | Interpretive techniques, survey analysis | Strong leadership from the genetics-genomics community, and the interest and participation of nursing professionals at all levels play a vital role in integration of genetics-genomics education into nursing curricula. |
| Edwards, Q.T., Maradiegue, A., Seibert, D., Macri, C., & Sitzer, L. (2006). Faculty members’ perceptions of medical genetics and its integration into nurse practitioner curricula. *Journal of Nursing Education, 45*(3), 124-130. Retrieved from EBSCOhost | lowest | Qualitative | To assess faculty members’ perceived knowledge of medical genetics concepts and conditions, the importance of integrating this content into NP curricula and how this was being done. | Nurse Practitioner faculty | survey | Survey analysis, tables, figures | 87% of participants rated their perceived knowledge of medical genetics as low to moderate.  10% reported that their institutions offered a genetics course as part of the NP curricula.  95% of participants felt that genetics knowledge is important in NP education.  The majority of those surveyed had no formal training in basic genetics concepts and specific disorders. |

**Evidence Appraisal**

A critical step in the EBP process is appraisal of evidence for support of the focused question. A qualitative study conducted by Kirk, Calzone, Arimori, and Tonkin (2011) was appraised using questions from Howlett, Rogo, and Shelton (2014). After appraising the trustworthiness of the study (see Table 3.1), the team found the study to be strong evidence for the focused question, although it did have its limitations. The limitations were found in the areas of data collection and data analysis. It was not evident why the authors used the qualitative method for their study or how they ensured credibility and objectivity. There is no evidence that the data was transcribed verbatim. The authors noted that the theory was divided into headings and subheadings, but it was not evident how they were constructed. The conclusion was that this study supported our search for genetic-genomic educational programs for oncology nurses.

A second qualitative study by Edwards, Maradiegue, Seibert, Macri, and Sitzer (2005) focused on faculty members’ perception of their knowledge of genetics and integrating this knowledge into nurse practitioner curricula. There was much strength found in the study along with some limitations (see Table 3.2). It was unclear how the study was funded and no rationale was given for using a qualitative study. The study was conducted using a multiple choice survey that was taken voluntarily by nurse practitioner educators. It was not evident what steps were taken to ensure credibility, dependability and objectivity during the data analysis. The conclusion was that the majority of faculty considered genetics/genomics education important, but had no formal training of basic genetics themselves and only 10% of the educators surveyed offered a genetics course for nurse practitioners. This study supported the team’s focused question in that there is a lack of programs focusing on genetics and reaffirmed the need for genetics and genomics education for nurses.

Table 3.1

*Questions to Establish Trustworthiness of a Qualitative Study*

|  |  |  |
| --- | --- | --- |
| **CONTENT** | **QUESTIONS** | **APPRAISAL\check one box** |

|  |  |  |
| --- | --- | --- |
| Author’s names, credentials, affiliations, and conflict of interest | 1. Are the authors’ credentials and educational background appropriate to conduct this type of study? *Yes* 2. Are the authors affiliated with an educational program, health institution, or practice setting? Do the authors report a conflict of interest? *No* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Funding source(s) | Does the funding source have a vested interest in a beneficial outcome of the study? *No* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Purpose | 1. Is the intent of the study clearly stated? *Yes* 2. Is the phenomenon being investigated identifiable? *Yes* 3. Is the population identifiable? *Yes* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Research questions | 1. Are the research questions in alignment with the intended purpose? *Yes* 2. Is the phenomenon under study identifiable in a broad research question? *Yes* | \_\_\_X\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Qualitative approach | 1. Is the rationale for using a qualitative approach explained? *No* 2. Is the qualitative approach in alignment with the intended purpose? (e.g., ethnography, biography, phenomenology, case study, grounded theory) *Not evident* | \_\_\_\_\_Strength  \_\_\_\_\_Limitation  \_\_\_X\_Not evident  \_\_\_\_\_Not applicable |
| Sample | 1. Was a sampling method or multiple methods used to identify participants who could inform the study? (e.g., purposive sampling, snowball or network sampling, theoretical sampling) *Yes* | \_\_\_X\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicabl3 |
|  | 1. How did the researchers attempt to gain variation within the sample? *Variation was gained by choosing leaders from various countries.* 2. Were the inclusion and exclusion criteria clearly described, and were they appropriate for the purpose study? *Yes* 3. Was the inclusion and exclusion criteria clearly described, and was it appropriate for the intended outcome? *Yes* | \_\_\_X\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Data collection protocol | 1. Were data collection methods appropriate for the intended purpose of the study (e.g., interviews, focus groups, observations, document review)? *Yes* 2. Was the protocol for conducting the study described thoroughly and in enough detail? *Yes* 3. Were data collection procedures consistently applied to the participants of the study? *Yes* 4. Did the data collector have sufficient qualifications and training? *Not evident* 5. Were data collected long enough to have saturation? *Not evident* 6. Was the protocol ethical and approved by an Institutional Review Board? *Yes* 7. What steps were taken to ensure confidentiality and anonymity of the participants? *Participants were given the option of replying anonymously.* 8. What steps were taken to ensure credibility and objectivity during data collection? *Not evident* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Sample | 1. Were the participants’ characteristics described in enough detail to understand how they contributed to the data? *Yes* 2. Were the participants’ experiences with the phenomenon varied? *Yes* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Data analysis | 1. What steps were taken to ensure that the interview or focus group data were transcribed verbatim? *Not evident* 2. How were data coded? *Not evident* 3. How were categories and themes constructed? *There were 10 themes, each with a number of subthemes* | \_\_\_\_\_Strength  \_\_\_X\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
|  | 1. How were interrelationships established and a theory constructed (e.g., grounded theory approach)? *Not evident* 2. What steps were taken to ensure credibility, dependability, and objectivity during data analysis? *Not evident* | \_\_\_\_\_Strength  \_\_\_\_\_Limitation  \_\_X\_\_Not evident  \_\_\_\_\_Not applicable |
| Findings | 1. Are the themes or theory/presented in an understandable manner? *Yes* 2. Are the findings supported by quotations from the participants to facilitate transferability? *No* 3. Are findings presented relative to the intended purpose and each research question? *Yes* | \_\_\_\_\_Strength  \_\_X\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Findings | 1. Did the researcher thoroughly explain their interpretation of the findings? *Yes* 2. Were the explanations logical? *Yes* 3. Did the researchers describe the contribution of their study to understanding the phenomenon? *Yes* 4. Did the researchers discuss how their findings are related to previous studies and theories in their own discipline and, when appropriate, other disciplines? *Yes* 5. Did the researchers thoroughly identify and discuss limitations? *Yes* 6. What are the implications for practice? *The challenges to producing a “genetically-genomically competent” nursing workforce remain significant at national and international levels.* 7. What future research recommendations are made? *Not evident* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Findings | 1. Are the conclusions in alignment with the intended purpose of the study? *Yes* 2. Do the conclusions logically follow from the findings and interpretation? *Yes* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |

Table 3.2

*Questions to Establish Trustworthiness of another Qualitative Study*

|  |  |  |
| --- | --- | --- |
| **CONTENT** | **QUESTIONS** | **APPRAISAL\check one box** |
| Author’s names, credentials, affiliations, and conflict of interest | 1. Are the authors’ credentials and educational background appropriate to conduct this type of study? *Yes* 2. Are the authors affiliated with an educational program, health institution, or practice setting? *Yes* 3. Do the authors report a conflict of interest? *No* | \_\_X \_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Funding source(s) | Does the funding source have a vested interest in a beneficial outcome of the study? *No funding source was cited.* | \_\_ \_Strength  \_\_\_\_\_Limitation  \_\_X\_\_Not evident  \_\_\_\_\_Not applicable |
| Purpose  *To assess “faculty members’ perceived knowledge of medical genetics concepts and conditions, the importance of integrating this content into NP curricula and how this was being done” (p. 124).* | 1. Is the intent of the study clearly stated? *Yes* 2. Is the phenomenon being investigated identifiable? *Yes – “perceived knowledge of medical genetics”* 3. Is the population identifiable? *Yes – Nurse Practitioners* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Research questions   1. *What are NP faculty members’ perceptions of their knowledge regarding medical genetics concepts and conditions?* 2. *What are NP faculty members’ perceptions of the importance of integrating genetics content in NP education, and the barriers to doing so?* 3. *What medical genetics concepts,, conditions, and topics are integrated into NP curriculum by faculty? What is the level of this integration?* 4. *Do NP faculty members’ have prior education or training in genetics concepts, and are they comfortable teaching this content?* | 1. Are the research questions in alignment with the intended purpose? *Yes – see questions at left* 2. Is the phenomenon under study identifiable in a broad research question? *Yes* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Qualitative approach | 1. Is the rationale for using a qualitative approach explained? *No* 2. Is the qualitative approach in alignment with the intended purpose? (e.g., ethnography, biography, phenomenology, case study, grounded theory) *Yes – case study* | \_\_\_\_\_Strength  \_\_X\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Sample | 1. Was a sampling method or multiple methods used to identify participants who could inform the study? (e.g., purposive sampling, snowball or network sampling, theoretical sampling) *Yes – Self selected sampling (volunteer)* | \_\_X\_\_Strength  \_\_ \_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicabl3 |
|  | 1. How did the researchers attempt to gain variation within the sample? *No variation – sample was volunteer* 2. Were the inclusion and exclusion criteria clearly described, and were they appropriate for the purpose study? *Criteria not clearly described, but was Nurse Practitioner faculty and this was appropriate for the purpose study* 3. Was the inclusion and exclusion criteria clearly described, and was it appropriate for the intended outcome? *Not clearly described, but was appropriate for the outcome* | \_\_\_\_\_Strength  \_\_X\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Data collection protocol | 1. Were data collection methods appropriate for the intended purpose of the study (e.g., interviews, focus groups, observations, document review)? *Yes – multiple choice survey* 2. Was the protocol for conducting the study described thoroughly and in enough detail? *Yes* 3. Were data collection procedures consistently applied to the participants of the study? *Yes* 4. Did the data collector have sufficient qualifications and training? *Yes* 5. Were data collected long enough to have saturation? *Yes – data was collected throughout an NP faculty conference* 6. Was the protocol ethical and approved by an Institutional Review Board? *Yes* 7. What steps were taken to ensure confidentiality and anonymity of the participants? *Participants were given the option of replying anonymously.* 8. What steps were taken to ensure credibility and objectivity during data collection? *Yes - The data collection and interpretation is credible.*   *Yes – the researchers made their self-disclosure transparent.* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Sample | 1. Were the participants’ characteristics described in enough detail to understand how they contributed to the data? *Yes* 2. Were the participants’ experiences with the phenomenon varied? *Yes* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Data analysis | 1. What steps were taken to ensure that the interview or focus group data were transcribed verbatim? *Multiple Choice Questions* 2. How were data coded? *Tables/figures/charts* 3. How were categories and themes constructed?   *Categorical data* | \_\_X \_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
|  | 1. How were interrelationships established and a theory constructed (e.g., grounded theory approach)? *Not stated* 2. What steps were taken to ensure credibility, dependability, and objectivity during data analysis? *Prolonged engagement and reflexivity* | \_\_\_\_\_Strength  \_\_X\_\_Limitation  \_\_ \_\_Not evident  \_\_\_\_\_Not applicable |
| Findings | 1. Are the themes or theory/presented in an understandable manner? *Yes* 2. Are the findings supported by quotations from the participants to facilitate transferability? *N/A – multiple choice questions* 3. Are findings presented relative to the intended purpose and each research question? *Yes* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Findings | 1. Did the researcher thoroughly explain their interpretation of the findings? *Yes* 2. Were the explanations logical? *Yes* 3. Did the researchers describe the contribution of their study to understanding the phenomenon?   *Yes*   1. Did the researchers discuss how their findings are related to previous studies and theories in their own discipline and, when appropriate, other disciplines? *Yes* 2. Did the researchers thoroughly identify and discuss limitations? *Yes* 3. What are the implications for practice? *Gaps still exist in faculty knowledge and the integration of medical genetics in NP curricula.* 4. What future research recommendations are made? *Further research is recommended to assess NP programs throughout the US to gain a true picture of the type, amount, and placement of genetics content in NP curricula.* | \_\_\_X\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |
| Findings | 1. Are the conclusions in alignment with the intended purpose of the study? *Yes* 2. Do the conclusions logically follow from the findings and interpretation? *Yes* | \_\_X\_\_Strength  \_\_\_\_\_Limitation  \_\_\_\_\_Not evident  \_\_\_\_\_Not applicable |

**Course of Action/Implementation/Evaluation**

The team did not find evidence for specific programs to answer the focus question of what educational program oncology nurses can be provided to effectively implement knowledge of genetics and genomics and how those programs will be utilized in the diagnosis, treatment and prevention of cancer to improve client outcomes. Therefore, the course of action for the team would be to conduct research on the programs available to further nurse education on genetics and genomics.

The team would implement this course of action by using a qualitative approach to conduct a case study of all programs available for oncology nurses for knowledge expansion of genetics and genomics related to cancer care. Ideally, over time and through in-depth data collection, a specific program would be determined for recommendation to oncology nurses, assisting them in increasing their knowledge of genetics and genomics and utilization to improve outcomes. The selected program would then be implemented on an oncology unit for a trial period. A retrospective research study could then be performed to evaluate how this newly acquired knowledge could have been used in the care of cancer patients, and how implementing this information into nursing practice can improve current and future client outcomes.

In conclusion, the team found there is a lack of knowledge regarding genetics and genomics in nursing. This lack of knowledge has been identified and research is being conducted to solve the problem. Core competencies for genetics and genomics are being identified and how they translate into nursing practice is an ongoing process (Kirk et al., 2011). The Genetics/Genomics Competency Center for Education (G2C2) is dedicated to providing education and quality resources for learners. G2C2 has developed an online course for nurses to assist in education of genetics and genomics (2013). Due to the cost, this team was unable to evaluate this program; however, it is an example of a program currently available. Continued research is recommended for the efficacy of programs as they are developed and made available to the nursing population.

References

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