Title:
Nursing Faculty Knowledge Regarding Genetics, Genomics, and Pharmacogenomics
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Session Title:
Rising Stars of Research and Scholarship Invited Student Posters

Slot:
RS PST1: Sunday, 17 November 2019: 11:45 AM-12:15 PM

Applicable Category:
Academic, Researchers

Keywords:
Genomic Nursing Concept Inventory (GNCI), Nursing Faculty Knowledge and Pharmacogenomics

References:


**Abstract Summary:**

This presentation provides an interval report on a study measuring nursing faculty knowledge of genetics, genomics, and pharmacogenomics in the Midwest USA. Results of this study are compared against other studies conducted in the USA and Malaysia.
Content Outline:

COMMENTS: The reviewers are blinded to the study site using the acronym “XXU.” The authors plan to create tables of results in our poster presentation. We provided the results in narrative form in our abstract.

1. Background/Significance
   1. Nurses are the most abundant HCP worldwide
   2. Genetic/genomic competence is needed by nurses
   3. Faculty must be able to teach this content
   4. Genetic/genomic concepts are foundational to pharmacogenomics
   5. Knowledge of pharmacogenomics is important because genomic profiling informs drug therapy selection
   6. Information is increasing exponentially. The number of pharmacogenomic biomarkers used in drug labeling nearly doubled from about 150 in 2015 (Cheek, Bashore, & Brazeau, 2015) to 283 in 2018 (Food & Drug Administration).

2. Purpose
   1. To measure nursing faculty knowledge of genetics, genomics, and pharmacogenomics. An interval report is provided.

3. Methods
   1. Cross-sectional, descriptive survey study design
   2. Purposive sample of nursing faculty recruited at faculty meetings
   3. Single site, public university in the Midwest USA
   4. Printed survey instruments were completed face-to-face with a proctor
   5. Genomic Nursing Concept Inventory (GNCI)
      1. 31 multiple choice items
         1. 4 domains include genomic basics, mutations, inheritance, genomic health care
         2. Well-validated in BSN students
         3. Also, previously used to measure faculty knowledge
   6. Survey on Pharmacogenomics
      1. Developed incrementally in Malaysia using sound design
      2. Written in English
3. Previously used to measure knowledge and attitudes about pharmacogenomics
4. Has not yet undergone additional assessment of reliability and validity

4. Results

1. Demographics of study population
2. Results on GNCI for XXU faculty compared against results reported by Read and Ward (2016)
3. Results on Survey on Pharmacogenomics for XXU faculty compared against results reported by Bannur et al. (2014)
4. All percentages in this section were rounded to the nearest whole number

5. Discussion/Conclusion

1. GNCI scores for XXU lower than Read and Ward (2016)
   1. Results showed a similar trend
   2. XXU faculty were proctored
   3. Read and Ward’s participants were not proctored
2. Survey on Pharmacogenomics score on knowledge items for XXU varied as compared to Bannur et al.’s participant scores
   1. No consistent trend in results seen
   2. XXU faculty were proctored
   3. Bannur et al.’s participants were not proctored

6. Clinical Relevance

1. Faculty knowledge of genetic, genomic, and pharmacogenomic is crucial to developing a nursing workforce adequately prepared to provide care in this genomic era.
2. Genetic/genomic information should be provided in stand-alone courses and threaded throughout the nursing curriculum.
3. Faculty must be ready to meet this need.

Topic Selection:

Rising Stars of Research and Scholarship Invited Student Posters (25201)

Abstract Text:

Background/Significance: Nurses comprise the largest portion of professional health care providers worldwide (Calzone et al. 2018; World Health Organization, 2016). Competence in basic genetic/genomic concepts is a requirement for all nurses (American Association of Colleges of Nursing, 2008; American Nurses Association & International Society of Nurses in Genetics, 2016; Greco, Tinley, &
Seibert, 2011; Read & Ward, 2016). Accordingly, nursing faculty must be knowledgeable about these concepts to successfully transmit this information to students (Bashore, Daniels, Borchers, Howington, & Cheek, 2018; Read & Ward, 2016). Genetic/genomic concepts are foundational to pharmacogenomics. Nurses and faculty need to be knowledgeable about pharmacogenomics because patient genetic–genomic profiles impact selection of drug therapy in clinical practice (Cheek, Bashore, & Brazeau, 2015). The number of pharmacogenomic biomarkers used in drug labeling nearly doubled from about 150 in 2015 (Cheek et al., 2015) to 283 in 2018 (Food & Drug Administration, 2018).

**Purpose:** The purpose of this study was to measure nursing faculty knowledge of genetics, genomics, and pharmacogenomics. An interval report is provided.

**Methods:** A cross-sectional, descriptive, survey study was conducted at a public university in the Midwest USA. The purposive sample of current and former nursing faculty was recruited at nursing faculty meetings. Anticipated final sample size is 25. Former faculty were employed in school of nursing leadership positions and were current doctoral students. Printed copies of the Genomics Nursing Concepts Inventory (GNCI) and Survey on Pharmacogenomics were administered in the presence of a proctor. Demographic information was collected on a printed survey without proctoring.

The GNCI is a well-validated instrument containing 31 multiple-choice items falling within 1 of 4 domains (i.e., genomic basics, mutations, inheritance, genomic health care; Ward, Barbosa-Leiker, & French, 2018; Ward, French, Barbosa-Leiker, & Iverson, 2016; Ward, Purath, & Barbosa-Leiker, 2016). Several validation studies were conducted among BSN students. The GNCI had a Cronbach’s alpha of .77 when administered to BSN students (Ward, Haberman, & Barbosa-Leiker, 2014). Nevertheless; the GNCI was used in studies to measure nursing faculty knowledge of genetic/genomic concepts by Bashore et al. (2018); Donnelly, Nersesian, Foronda, Jones, and Belcher (2017); Read and Ward (2016).

The Survey on Pharmacogenomics was developed by Bannur, Bahaman, Salleh, and Teh (2014) at the Integrative Pharmacogenomics Institute (iPROMISE), Universiti Teknologi MARA in Malaysia. A literature review was conducted, and a draft questionnaire was created. The draft was reviewed by researchers and feedback incorporated in the second draft. The questionnaire was piloted among 10 pharmacists and physicians to identify ambiguous questions and improve the instructions. The final 38 item version of the Survey on Pharmacogenomics was written in English. The survey was deployed via email to 1500 physicians and pharmacists working in Malaysia. This survey instrument has not yet undergone additional assessment of reliability and validity.

**Results:** To date, 15 nurse faculty completed all surveys. Most participants were female (n = 87%), non-Hispanic White (67%), ranged in age from 40-49 (33%) or 50-59 (33%) years, were assistant professors (40%), held an earned doctoral degree (60%) and at least one nursing certification (60%).

The percentage of correct answers by nursing faculty on the GNCI and its four domains were calculated and compared against the results of Read and Ward (2016) who also explored nursing faculty knowledge using the GNCI. The scores were as follows: total 41% (XXU) and 48% (Read & Ward, 2016), genomics basics domain 25% (XXU) and 33% (Read & Ward, 2016), mutations domain 47% (XXU) and 54% (Read & Ward, 2016), inheritance domain 50% (XXU) and 59% (Read & Ward, 2016), genomic health care domain 55% (XXU) and 58% (Read & Ward, 2016),
The percentage of correct answers by nursing faculty on the knowledge section of the Survey on Pharmacogenomics were calculated and compared against the results of Bannur et al. (2014) who explored the knowledge of pharmacists and physicians in Malaysia. The scores of correct responses to true items were as follows: “subtle difference in a person’s genome can have a major impact on how the person responds to medications” 100% (XXU), 95% (pharmacists), 73% (physicians); “genetic variants can account for as much as 95% of the variability in drug disposition and effects” 73% (XXU), 73% (pharmacists), 49% (physicians); and “the pkg insert for warfarin includes a warning about altered metabolism in individuals who have specific gene variants” 53% (XXU), 44% (pharmacists), 71% (physicians). The scores of correct responses to false items were as follows: “genetic determinants of drugs response change over a person’s lifetime” 27% (XXU), 41% (pharmacists), 28% (physicians) and “pharmacogenomic diagnostic testing is currently available for most medications” 80% (XXU), 85% (pharmacists), 78% (physicians).

All percentages in this section were rounded to the nearest whole number.

Discussion/Conclusions: The GNCI scores at XXU were a bit lower than those reported by Read and Ward (2016) but followed a similar trend. However, the nursing faculty at XXU were proctored during survey completion; participants in Read and Ward’s study were not proctored. The results of both studies demonstrate a need for increased nursing faculty knowledge of genomic concepts. Similarly, participants in Bannur et al.’s study were not proctored during Survey on Pharmacogenomics completion but the participants at XXU were proctored. The results varied between each of the groups, without a consistent trend. The next phase of this study will include a course for faculty on genetic and genomics followed by repeat administration of the GNCl. The final phase of this study will include a course for faculty on pharmacogenomics followed by repeat administration of the Survey on Pharmacogenomics.

Clinical Relevance: Faculty knowledge of genetic, genomic, and pharmacogenomic is crucial to developing a nursing workforce adequately prepared to provide care in this genomic era. Genetic/genomic information should be provided in stand-alone courses and threaded throughout the nursing curriculum. Faculty must be ready to meet this need.