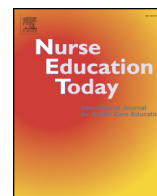




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Review

Learn the game but don't play it: Nurses' perspectives on learning and applying statistics in practice

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SUMMARY

Background: An integrative review regarding undergraduate level statistics pedagogy for nurses revealed a paucity of research to inform curricula development and delivery.**Objective:** The aim of the study was to explore alumni nurses' perspectives about statistics education and its application to practice.**Design:** A mixed-method approach was used whereby a quantitative approach was used to complement and develop the qualitative aspect. Setting: This study was conducted in Toronto, Ontario, Canada.**Participants:** Participants were nursing alumni who graduated from four types of nursing degree programs (BScN) in two Ontario universities between the years 2005–2009.**Methods:** Data were collected via surveys (n = 232) followed by interviews (n = 36).**Results:** Participants reported that they did not fear statistics and that they thought their math skills were very good or excellent. They felt that statistics courses were important to their nursing practice but they were not required to use statistics. Qualitative findings emerged in the two major themes: 1) nurses value statistics and 2) nurses do not feel comfortable using statistics.**Conclusions:** Nurses recognize the inherent value of statistics to improve their professional image and interprofessional communication; yet they feel denied of full participation in application to their practice. Our findings have major implications for changes in pedagogy and practice.

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Introduction

In 2005, the Baccalaureate Degree in Nursing (BScN) became the entry-to-practice requirement for a Registered Nurse (RN) in the Province of Ontario (College Nurses of Ontario [CNO], 2009a). As a science degree, the BScN academic requirement incorporated an undergraduate level statistics course. The Canadian Nurses Association (CNA, 2002) emphasized research theory, methods, inclusive of statistical analyses, and practice applications (p. 20) as foundational curricula in RN educational programs. However, an integrative review regarding undergraduate level statistics pedagogy for nurses revealed a paucity of research to inform statistics curricula

development and delivery (Epstein et al., 2011). The current study addressed this gap with a mixed-method descriptive design that explored alumni nurses' perspectives about statistics education and its application to practice.

Background

The integrative literature review conducted by the researchers prior to this study revealed the following weaknesses in the validity of previous works: a lack of conceptualization, inadequate study designs, and poorly designed sampling methods. Notable omissions in research topics were: 1) student and faculty characteristics, 2) curriculum content and course delivery methods 3) nurses' statistical competencies and 4) outcomes related to the application of statistical knowledge in evidenced-based clinical practice (Epstein et al., 2011). Therefore, our team determined that a mixed method exploration of alumni experiences and perspectives regarding their statistics education and its application to practice was appropriate to initiate our research program.

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Research Questions

1. What are the attributes of alumni and their experience in statistics courses in baccalaureate nursing programs?
2. To what extent do recent nursing graduates feel competent and confident in utilizing statistics at the entry-to-practice level?
3. What are the perceptions of alumni about the importance and relevance of statistics in their clinical practice?

Methods

Design

This mixed-method study included a questionnaire and follow-up interviews. The study met the purposes of complementarity and development (Greene et al., 1989). Complementarity allowed the “enhancement, illustration, and clarification of results” (p. 259) of quantitative surveys via qualitative interviews. The researchers created quantitative survey questions (see tables) capturing key attributes of undergraduate level nursing students and faculty as identified in the literature review (Epstein et al., 2011). The results of the quantitative findings then informed the development of the qualitative interview questions and probes; as development “seeks to use the results from one method to help develop or inform the other method” (p. 259). The qualitative interview questions captured information of breadth and depth of the alumni experiences.

Measures

Quantitative Instrument

The quantitative instrument comprised 30 multiple-choice questions in an online survey including 10 demographic questions, 13 questions related to experiences in the statistics course, five with the relevance of statistics to their practice, and two with self-perceptions in competence in math and statistics. There were also five open-ended questions.

Qualitative Instrument

The interview questions were:

1. What were your experiences of your statistics education in your undergraduate program?
2. What are your experiences using statistics in your practice?

Ethics Approval and Data Collection

Quantitative

Research ethics board approval was obtained from three respective academic institutions (two universities, one college whose nursing program is affiliated with one of the universities). Eligibility criteria included RNs who graduated from nursing degree programs (BScN) (e.g., Collaborative, Post-Diploma RN, Internationally Educated Nurses (IEN), Second Degree Entry [SDE]) in either of two Ontario universities between the years 2005–2009. Those who provided a forwarding email address to their respective university alumni relations offices were contacted during the survey period between November 2009 and February 2010 (N = 2000), and were provided with a link to the electronic survey as well as information about the nature of the study. Two-hundred and thirty two participants completed the electronic survey for an 11.6% response rate.

Qualitative

Forty-nine individuals who participated in the survey consented to a telephone interview to explore their experiences of their statistics education in clinical practice but only 36 participants shared their experiences.

A research assistant (nursing student) contacted (via e-mail and/or phone call) the participants and scheduled the interviews, at a time and day convenient to the participant.

Data Analysis

Quantitative

The researchers compared descriptive statistics for the overall sample (n = 232) and the target population (N = 2000) in order to get a sense of sample representativeness and generalizability of any findings, and investigated participant descriptions of their experiences in the classroom and their perceptions of relevance and competence in statistics.

Qualitative

The qualitative analysis followed an iterative inductive analysis process in which data from the survey guided questions for the interviews (Miles and Huberman, 1994). Transcripts were coded using a qualitative thematic analysis approach to identify cross-cutting emergent themes related to the main research questions, across interviews. Two of the researchers analyzed responses from the open-ended questions of the survey and triangulated the themes with the interview findings. Researchers also transcribed the qualitative data from alumni interviews verbatim and coded transcripts into themes.

The transcripts from the qualitative interviews were analyzed using deductive analyses guided by Miles and Huberman (1994) study. The four main gaps in research topics as elucidated by the literature review: 1) student and faculty characteristics, 2) curriculum content 3) course delivery methods and 4) outcomes related to the application of statistical knowledge in evidenced-based clinical practice (Epstein et al., 2011) provided the provisional list of codes (Miles and Huberman, 1994). We assigned data that did not match the provisional codes to the category ‘miscellaneous’. The researchers kept a codebook including a summary list of the overarching themes, the sub-themes, codes and their corresponding definitions. Two research assistants compared the codes after they analyzed all transcripts independently.

Findings

Participants' Demographic Attributes

The nurses in this sample graduated between 2005 and 2009; and therefore are younger than nurses in the general population of Ontario (CNO member statistics, 2009b) (Table 1). The survey participants also have a higher proportion of males than the population of Ontario nurses. Our participants' employment is distributed fairly similarly across the sectors as compared to the Ontario population. However, age and gender distribution differences limit representativeness to the 2009 population.

Table 2 reveals a fairly even distribution of alumni participants from Post-Diploma Degree Registered Nurse programs, and from college/university collaborative programs, while a small proportion (3.9%) came from second degree entry nursing programs. Most possessed between one and three years of experience (39.7%), however, a substantial number of participants had between four and seven years (24.1%), and 30.6% had more than 10 years of experience. The vast majority of participants worked in ‘direct care’ positions, followed by ‘education’, case management, management, and research, and 16.4% reported ‘other’ as their current position in nursing.

Perceptions of Competence and Confidence with Statistics

The quantitative findings challenged two beliefs about nurses and statistics. The first belief was that nurses generally reported anxiety

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