Journal of Professional Nursing 35 (2019) 170–173

Contents lists available at ScienceDirect

Journal of Professional Nursing

journal homepage: www.elsevier.com/locate/jpnu

Research Prescription for Undergraduate Students: Research Mentoring in a Small Liberal Arts University

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ARTICLE INFO

Keywords:
Undergraduate research
Mentoring
Novice faculty
BSN
Research implementation

ABSTRACT

Creating and executing unique research projects for completion in four semesters is a challenge especially in a small liberal arts university in a rural Health Professions Shortage Area (HPSA) with a newly established BSN program. HPSAs are designations that indicate health care provider shortages in primary care, dental health or mental health. Undergraduate research is an emerging focus across campus with limited faculty funding. Most of our nursing faculty are in the process of developing their programs of research which required faculty of the research course to become mentors for both faculty and students. This article describes one strategy utilized in establishing an undergraduate research focus within a BSN nursing program. Working in small groups with a faculty mentor, students planned and conducted their entire research study, presenting their findings to the university community in the period of four semesters of the nursing program. Research course faculty served as mentors for less experienced faculty, involving the entire nursing program in research. Research projects were conducted in institutional and community settings to improve population health in our HPSA.

Introduction

Developing a new baccalaureate nursing program at a small liberal arts university is challenging. Establishing an undergraduate research focus within a BSN program with novice faculty in four semesters is a daunting task. However, the Department of Nursing at Texas Lutheran University (TLU), a private church affiliated liberal arts university in a rural Health Professions Shortage Area (HPSA), has accepted this challenge and is showing impressive results.

Undergraduate research is an emerging focus for many universities to assist students in developing necessary skills and competencies required in the workforce today. With support from research foundations and institutions, scientists are reshaping their courses to connect key concepts and questions with students' early and active involvement in systematic investigation and research (Kuh, 2008). With the goal of assisting students to become professional registered nurses for the 21st century workforce, TLU's nursing faculty embraced this concept of undergraduate student research early on in the implementation of the BSN program. The BSN Essential III for undergraduate nursing programs established the standard for scholarship of evidence-based practice, including the research process (American Association of Colleges of Nursing (AACN), 2008). Patients who receive care based on evidence, experience better care, less variation in costs and better outcomes (Melnyk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). As nurse educators, it is important to integrate evidence-based practice competencies into the academic and clinical setting.

Barriers to implementing clinical nursing research as well as establishing an undergraduate research program are well known. Some of these barriers have been identified such as lack of knowledge and/or negative attitudes about research, lack of communication strategies by researchers to translate outcomes to bedside clinicians, results that do not always translate to daily clinical practice, and lack of institutional support needed to conduct research (Athanasakis, 2013).

This article describes one strategy utilized in establishing an undergraduate student research focus within a BSN nursing program. Particular challenges for this university involved novice nursing faculty with limited research experience and absence of funded research programs facilitating mentoring of the undergraduate students through faculty expertise. After several open discussions with faculty, students' feedback, and a systematic review of the literature, the Department of Nursing determined that a faculty research manual was needed to fully guide faculty and students in the undergraduate research process. Lead undergraduate research course faculty undertook this endeavor during a semester course release opportunity at the university. The *R_x for Undergraduate Student Research: Faculty/Student Research Manual* was designed as a guide to assist all faculty through the process of

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https://doi.org/10.1016/j.profnurs.2018.12.007
Received 8 October 2017; Received in revised form 17 December 2018; Accepted 28 December 2018

developing, implementing and evaluating undergraduate student research in a new nursing program at a small liberal arts university. The manual is a tool for establishing a clear focus with identified outcomes, facilitating a uniform development process and product culminating in completed student research with faculty mentorship.

Mentoring has been an effective strategy in many disciplines, including nursing, to develop and enhance expertise within the profession (Krause-Parello, Sacrone, Samms, & Boyd, 2013). This undergraduate student research project employs mentorship of the faculty by the research lead instructors and mentorship of the students by the faculty. The major goals for the student research projects are: a) to provide an opportunity for professional growth through didactic and practical learning in research and evidence-based practice methodology and b) increase the capacity for nursing research and evidence-based practice within the profession through early initiation and role modeling of the rigors of the research process.

Developing a research manual that faculty and students can use to guide them through implementing undergraduate student research in nursing was a first step in standardizing the processes to achieve these goals. A second strategy involved professional development for faculty mentors to assist with student research throughout the research process with the final component involving the integration of the nursing program into the senior student university symposium for dissemination of research and collaboration among interdisciplinary professions.

Literature review

A nursing research course is found in many programs of nursing curriculum but our nursing program wanted to have the research process integrated throughout the curriculum with the end result being a completed research study. The research faculty felt that actively participating in research was the best way to learn the research process and procedures. The review of literature focused on current research on active learning and undergraduate research.

Active learning

Active learning is the process of utilizing course concepts to engage students in gaining a greater depth of understanding and improved retention of content. On a continuum from least active to most active, passive activities such as listening to lecture or reading chapters in a book are least active. Engaging or participating with the material by applying concepts and skills learned to solve a problem are examples of active learning. In undergraduate nursing education, physical and intellectual skills are developed and practiced to help students gain confidence in skill performance in the clinical setting. Providing this same robust and engaging learning experience in a course on nursing research was the intended goal that led to inclusion of a research project woven throughout the four semesters of nursing school, beginning in the first semester.

Professional nursing graduates are expected to be able to use nursing research findings to provide care that is evidence-based, as well as participate in research to improve nursing practice and patient outcomes. The concepts of research are difficult to learn using passive learning strategies as the subject is complex, it may be presented in a way different from previous courses and many students are pre-disposed to view nursing research as difficult or boring (Ayoola et al., 2017). To provide the best possible active and engaging introduction to nursing research, development of a researchable problem, planning the research study and carrying it out seemed to be the optimal way for students to apply what they learned in class to a real world situation. This was exactly the teaching strategy described by Overfield and Duffy (1984) who highlighted different ways student learning might be assessed, including “learning by doing” where students work as a group with a faculty mentor to design and carry out a small scale research study (p. 190).

Further, in his widely cited work, Kuh (2008) delineated strategies to engage learners in different ways with the subjects they are studying in school including internships, faculty-mentored research projects, and service learning.

Undergraduate research

There have been several approaches to teaching research discussed in the literature. One way the evidence suggests to enhance learning in a nursing research course is with a participatory approach (Kessler & Alverson, 2014). Faculty-mentored nursing research is one active learning strategy that introduces novice nursing students to the content of a course in nursing research. Research faculty act as mentors for students to operationalize the concepts related to the research process. Active participation with faculty is an effective method for learning the research process and providing faculty an opportunity to develop a program of research (Wheeler, Hardie, Schell, & Plowfield, 2008). According to Mandleco and Schwartz (2002) participation in a research project is an effective way to introduce students to the research process and help develop the beginning skills necessary for conducting research. It can also encourage students to pursue further education while overcoming their fear of reading, utilizing, and developing research. Kessler and Alverson (2014) state that placing students in student-faculty research projects can enhance the students' knowledge of the research process. Mentoring has been a long-used method in nursing and in a group setting for research, each member can bring different experiences and levels of knowledge to solving a problem (Kessler & Alverson, 2014). Looking at millennial learners, these students prefer group work and experiential activities therefore faculty-student research mentoring is a great fit for these students. (McCurry & Martins, 2010)

Procedures/process

After teaching the first nursing cohort, it was noted that basic research concepts needed to be emphasized and integrated earlier in the curriculum. The skills and activities involved in the research process were present but not explicitly tied to the research project and therefore caused some confusion with faculty and students. Guided by the BSN Essentials and the Differentiated Essential Competencies (Texas Board of Nursing, 2011), the learning activities were identified and developed for the various courses where the research processes are aligned. The competencies from BSN Essential III that were emphasized in the process were: clinical question development, searching evidence, collaboration with clinical partners to identify problems and dissemination (AACN, 2008). The table below identifies the various research-associated student learning activities, as they are threaded throughout the four semesters of the nursing program. Experience guided the placement of the learning objectives in the modules where the content is taught and evaluated, tied to the research activities to facilitate understanding of the research concepts.

In our curriculum, the concept of evidence-based nursing process utilizing nursing research begins with Evidence-Based Nursing Practice I in the first semester. A major outcome in this three-credit course is for the student to apply critical thinking, collaboration, independent judgment, research, and decision making to selected situations and plans of care. In this course, students are taught about library searching, APA formatting, and avoiding plagiarism. As this course is occurring, the start of the research process has begun with faculty identifying possible research topics for students. This process begins with the lead faculty for the research course speaking with all members of the faculty to determine research interests and then compares this to the list of identified needs provided by the local county hospital. All of the faculty then collaborate on the most appropriate topics for students to study with help from their mentor.

The Nursing Research Course falls in the second semester of the

junior year of nursing school. In that course, students are learning the concepts in research while they are applying them to their own investigation for deeper understanding. With the help of all faculty, the research course faculty place the students into research groups of approximately six to eight students and assigns them a research topic that was previously agreed upon by faculty mentors. The small student research groups are guided by a faculty mentor in the development of a research plan, first draft of their proposal, and proposal presentation. The students are given their groups and their mentor around week two or three in the nursing research course. Mentors meet with their groups approximately every two weeks or more often if needed. Mentors have a checklist in the manual that they complete as the research process progresses. The checklist helps hold both mentors and students accountable for all aspects of the research process. During the research class, the research course faculty integrate the research project into the concepts being taught making the learned concept more valuable to the students. The biggest hurdle encountered is helping the students to focus their research question/problem to one that is researchable in the designated time frame. At the end of the research course, students put together a proposal presentation of their research student and a first draft of their proposal.

In the third semester when students are taking Leadership and Management in Nursing (3 credit hours), students submit an IRB proposal within the first few weeks of the semester. Upon approval, the students, with assistance from their mentor, start data collection. At the end of the semester the students submit their final proposal or first draft of their research report, depending upon their progress. Finally, the last semester, in Evidenced-Based Practice II, students analyze their data, write a report of their study findings and present their results to the university community at a Student Academic Symposium. Publication and a wider dissemination of the groups' findings through additional presentations or manuscripts is optional and encouraged. At the completion of the BSN program, it is expected that students have participated and completed a research study or project for a better understanding of the research process and the value of research within nursing.

As faculty were going through the research process, it became evident that more guidance was needed. The research manual is a guide and resource for novice faculty on the research process and basics of statistical analysis. The research manual that was created also provides faculty with research course objectives, expectations, typical progression of student research projects, and various grading criteria for formative assessment of the project for the duration of the research study. The manual breaks up the steps of the research project by four semesters with assignments in the designated course, including a suggested timeline for faculty to follow (see Table 1).

Expected outcomes

Today's high acuity, technologically mediated care environment with financial consequences (attention to the bottom line) is driving the need for nurses at the bedside to think critically about the care they provide and systematically investigate that care to improve patient outcomes and reduce costs. Nursing research experience in nursing school (BSN) mirrors that of other disciplines such as chemistry and physics. While as nurses we feel the need to saturate the student with information and knowledge about all aspects of nursing care, the skills they learn through doing research will serve them every day of their careers. Inclusion of baccalaureate nursing students with faculty for a mentored research study can provide a deeper understanding of the research process for the student. This process can contribute to nursing knowledge and improve nursing practice. A mentored research experience can also create a readiness for employment and hopefully an increased understanding of utilizing research in practice. Collaborating within a team while managing the specifics of a research study, ideally will enable the student to be an active member of a research team upon graduation. Based on observation, faculty noted that the faculty-student mentorship fosters critical thinking and perhaps will increase student interest in research. Participation in research projects at the undergraduate level will hopefully increase the likelihood that the student will pursue graduate education. Ideally, this faculty-student mentorship will improve the relationship with the local county hospital by helping with their research needs and role modeling of evidence-based practice for our students and the hospital's nurses as shown below in the example student research. We hope that the experience has also increased visibility of the nursing program in our community and awareness that a quality BSN education preparing nurses for the future is available in our rural town. We anticipate that students who complete a research study are more desirable future employees in our surrounding hospitals.

Example student research

The local hospital was concerned about nurses not mobilizing patients and was discussed at a meeting with the research faculty. The hospital was unaware of what the issue was as they have a mobility protocol in place so a group of students used this for the start of a research study. The student group started with their literature review and proposal plan in their nursing research course. They then applied for IRB approval in their leadership course with data collection following shortly after approval. The group of students handed out a reliable and valid survey to several different units of the hospital to find out if the problem rested with the attitudes, beliefs or knowledge of the nurses. It was found that one unit had negative attitudes and beliefs regarding the protocol and there was not a lack in knowledge (Adkins et al., 2018). This has led to the hospital exploring this issue further and nurses reflecting on best practices. The faculty mentors role throughout the process was guiding the students throughout their research, providing communication between students and the hospital, assisting students with any issues they might run into. For example, the students did not receive all of their consent forms back with their surveys therefore their mentor took the opportunity to discuss the importance of consent and what needed to be done moving forward.

Other examples of topics are:

- Concussion Knowledge Among Parents of Youth in Organized Sports
- Cord Blood Banking and Donation
- Evaluating the Impact of an Educational Video on Glucose Control
- Barriers to Sepsis Guidelines Implementation
- Nurse Call Light Responsiveness
- Medication Reconciliation
- Health Literacy in older adults
- The Relationship Between an ED Based Guest Ambassador Program and Patient Satisfaction Scores

The creation of the faculty/student research manual has also streamlined the student research process for both faculty and students. All faculty have access to the manual but novice faculty are the ones who take advantage of the manual. They go to the manual to review the types of data the students are collecting and what statistical tests should be ran. They also utilize the manual to help guide the students on the various assignments that are turned in during the process because this is where they can find the grading rubrics for each of those assignments.

Conclusion

The integration of faculty mentorship with undergraduate nursing student research aligns well with the University's belief in the importance of research experience at the baccalaureate level. The students reap the benefits of seeing a project from start to finish and develop an appreciation of how the research process they learned in the sciences applies to the practice of nursing. The skills they learn from conducting research from their very first semester carry over to their capstone

Table 1
The research process timeline by semester.

Semester 1: evidence-based professional nursing I		
Module	Course objective	Learning/teaching strategies
1	Apply critical thinking, collaboration, independent judgment, research, and decision making to selected situations and plans of care.	Library searching, plagiarism quiz, APA format

Semester 2: nursing research for evidence-based practice		
Module	Course objective	Learning/teaching strategies
1–3	Critically evaluate nursing research studies as to the application and incorporation in evidence-based nursing practice.	Human participants certificate, article critique paper, literature review paper
4	Outline an integrated approach to literature review for evidence-based practice and developing oral presentation related to selected research project.	Research proposal presentation

Semester 3: leadership and management of nursing care		
Module	Course objective	Learning/teaching strategies
1–4	Evaluate leadership skills needed to supervise care staff and to coordinate with other healthcare professionals.	IRB submission, data collection with mentor within the study community. Write up proposal

Semester 4: evidence-based professional nursing II		
Module	Course objective	Learning/teaching strategies
1–3	Apply critical thinking, collaboration, independent judgment, research, and decision making to selected leadership situations and plans of care, including delegation responsibilities	Collect and analyze data with mentor, write up research report
4	Critically reflect on the nursing role and functions related to caring, teaching/learning, role theory and development, and health promotion and wellness to develop understanding of the mutual and interactive relationship of nursing to people, health, communities, and healthcare delivery environments.	Present research report at senior student academic symposium

experience where they must identify a clinical issue, consider possible solutions, select the most feasible and effective alternative and develop a teaching plan to communicate the chosen solution to the staff. In the capstone course, the student selects their project from a need that they have identified, research alternative solutions and present a change in care process to improve patient care quality and safety. Examples of capstone projects include educating staff regarding the importance of cleaning computers and personal cell phones to stop the spread of bacteria, the importance of scrubbing the hub of the IV port and consequences if not done properly, and the current Stroke and ATP guidelines. The students are able to experience the satisfaction of knowing that all of their hard work to become a nurse is resulting in immediate improvements in patient care. Their confidence in their ability to take on the challenges of professional nursing is palpable and very satisfying for students and mentors.

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