Journal of Professional Nursing 35 (2019) 499–504

Contents lists available at ScienceDirect

Journal of Professional Nursing

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

MSN perceptions of practice-based problems and research-based interventions

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ARTICLE INFO

Keywords:
Education/curriculum/learning
Distance learning/distant education/ nontraditional education/correspondence
Evidence-based practice
Research utilization
Qualitative methodology/qualitative research
Nursing practice
Critical care/intensive care
Curriculum

ABSTRACT

Background: Although faculty design Master of Science in Nursing courses to help students acquire knowledge in practice, evidence gaps exist in the literature. The purpose of this study was to describe problems identified by practicing graduate nursing students, match them with themes from the National Institute of Nursing Research, determine if sufficient published literature exists to guide research-based interventions, and identify gaps.
Method: Using the National Institute's research themes as the framework, 215 de-identified student papers were selected using two courses—a research methods/biostatistics and an ethics course. The Krippendorff method was used to identify practice-based problems and research-based interventions with gaps in the literature.
Discussion: Students identified pain, sleep difficulties, delirium, falls, hospital-acquired infections, noise, hypothermia, and stress as priority practice-based problems.
Conclusion: A lack of clear or administratively enforced clinical guidelines or educational strategies was identified as an area with information gaps in the literature.

Giving credence to the practice-based research questions that evolve from nursing practice is important in advancing nursing knowledge and science (Gyllstrom, Gearin, Nease, Bekemeier, & Pratt, 2019). Answers to these questions can be translated back into practice to improve the health and well-being of the people and the communities' nurses serve (Westfall, Roper, Gagliotti, & Nease, 2019). The nursing profession has unprecedented opportunities for collaboration among nurses in academia and in practice in filling salient knowledge gaps needed for nursing practice (Black, Ali, Baumbusch, McNamee, & Mackay, 2019). Graduate nursing students enrolled in a variety of master of nursing science (MSN) academic programs represent a rich source of nursing practice expertise. Mindful that many MSN students are employed in nursing practice while they pursue their graduate degrees, these licensed professional nursing students are often at times more aware than their faculty of the gaps in knowledge needed for nursing practice.

Nursing is a practice discipline that emphasizes both advanced clinical practice and rigorous scholarship (Buchholz, Linton, Courtney, & Schoeny, 2016). Thus, faculty teaching graduate level research courses has a unique opportunity to design learning experiences for students and faculty alike to critically evaluate the knowledge used and needed for experienced nurses immersed in nursing practice. Problematic to implementing research-based interventions is the fact that insufficient evidence exists to adequately answer relevant practice-related questions because complex health care systems undergo dramatic change, health inequities persist, and many people battle their illnesses with poorly managed symptoms in settings that may not reflect their needs or preferences (American Association of Colleges of Nursing, 2011; National Institute of Nursing Research, 2016).

The National Institute of Nursing Research (NINR) supports the strong clinical focus of nursing science in advancing knowledge through research that is needed to improve lives. The NINR Strategic Plan is organized around four key themes: (1) symptom science, (2) wellness, (3) self-management of chronic conditions, and (4) the science of end-of-life and palliative care. This plan was developed with input from scientists, clinicians, and others across the nation to make sure new ideas for nursing research would be dynamic and support science that could rapidly lead to improvements in health and better lives for individuals, families, and communities across the United States and the world (National Institute of Nursing Research, 2016). Just like the NINR reached out to clinicians for their ideas for research questions, nursing faculty can follow their lead and seek ideas for research questions from their MSN students, using these four themes as a conceptual basis.

Faculty teaching MSN research courses are in an excellent position to broaden their own understandings of the knowledge needed for practice while they also empower MSN students' ideas for research-based interventions. Practice-based clinical inquiry is important in

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https://doi.org/10.1016/j.profnurs.2019.09.007
Received 8 May 2018; Received in revised form 23 August 2019; Accepted 17 September 2019

identifying important knowledge gaps needed for practice (Ammerman, Smith, & Calancie, 2014; Bloch, Courtland, & Clark, 2016). Much is published on the need for nursing research faculty to be assigned to teach these courses; however, less is written about teaching assignments that enhance the ability of graduate students to develop skills in identifying practice-based problems based on their own clinical inquiries (Levin & Chang, 2014; Melynk, Gallagher-Ford, Long, & Fineout-Overholt, 2014; Zeleníková, Beach, Ren, Wolff, & Sherwood, 2014).

Promoting assignments in core graduate nursing courses for students to examine a clinical problem that could be improved by using research knowledge or what is termed "evidence-based nursing practice" (EBP) during graduate studies is a high priority. Curricula, guided by the American Association of Colleges of Nursing's *The Essentials of Master's Education in Nursing*, are designed to meet the requirements of Essential IV, which specifies how the graduate nursing student will be prepared to translate and integrate scholarship into nursing practice (American Association of Colleges of Nursing, 2011). A key component of the rational for Essential IV is that, upon graduation, the MSN prepared nurse is expected to translate current evidence into practice and to identify gaps where evidence is lacking (American Association of Colleges of Nursing, 2011).

Striving towards evidence-based nursing practice raises the question about what evidence is needed to guide practice. Is there sufficient research to guide nursing practice based on the practice-based problems that nurses confront at the front lines while they care for patients and their families? To answer this question, the dynamic state of individual and population health and systems of health care delivery demands that nurses in practice, education, and research stay abreast of the knowledge needed for nursing practice by paying close attention to the practice-based problems. Thus, the purpose of this study was to describe the salient clinical nursing problems identified by practicing MSN students, match them with the priority research themes from the National Institute of Nursing Research, determine if sufficient information exists in the literature to guide research-based interventions, and identify pertinent knowledge gaps.

Review of the literature

In 2017, Lawrence Green suggested "if we want more evidence-based practice, we need more practice-based evidence". He further asserted "academics do not tend to conduct the research needed to guide prevention interventions in such a way as to provide relevant actionable evidence for those in practice" (Green, 2008). Westfall, Mold, and Fagnan (2007) suggested "practice-based research is where effectiveness can be measured, where new clinical questions arise, where readiness to change and adopt new treatments can be studied and addressed and where patient knowledge and preferences can be addressed and outcomes individualized." Others have suggested academic institutions can play an important role in collaborating with practicing clinicians to accomplish this yet this step is not completed as often as it should be (Bekemeier & Ensign, 2017). Larsen, Terkelsen, Carlsen, and Kristensen (2019) use a systematic review of 1280 records, where they described two major ways of incorporating evidence-based practice for students in academic settings. The first was through teaching using research courses and the second method was "collaboration with clinical practice." This last method was argued as a very effective way of having students who are also clinicians learn and incorporate evidence based practice into their clinical practice setting.

A number of authors have demonstrated the need for testing out interventions in the practice setting. Estabrooks et al. (2019) presented a systematic review of translational research which demonstrated the efficacy of using and testing interventions in clinical contexts. There the belief is that research should move from the development and pilot trials efficacy trials to effectiveness trials which includes staff who would implement trials. In nursing, treatment modalities are predetermined and practiced as the interventions without the conduct of routine trials to test out their effectiveness. Brownson, Fielding, and Green (2018) asserted the implementation of principles of evidence-based practice is critical for bridging the gap between new knowledge and implementation of that knowledge into the practice setting. Still there remains less clarity on the definition of evidence, how to find it and how and when to use it. This must be strengthened in order to fill in the gaps in knowledge. Others have suggested resolutions to this issue. Harrington (2017) suggested ways of closing the gap with the use of technology between evidence based practice to practice-based evidence. Shieh (2006) described practice-based evidence by turning her everyday experiences in the practice setting into research while Swisher (2010) did the same thing in the physical therapy setting while taking care of cardiopulmonary patients. Thus, these suggestions are important ways to translate and back translate our nursing interventions so they are based on evidence and continuously updated.

Methods

Research design

This study was a secondary analysis of existing data from student papers that were submitted in the core research and ethics courses in an MSN program at a university in the northeastern United States during the 2015–16 academic year. Analysis of the papers used in this study was done the following year.

Data source, abstraction, and analysis

Data source

Each practicing MSN student (n = 215) who had completed an online research methods and biostatistics course and an ethics core course during the 2015–16 academic year was selected by an honest broker from files stored in the Blackboard Learn management system. Papers from these students were used as the aggregate data source. An honest broker at the university removed all student identifiers from the papers to maintain student anonymity as required by the university institutional review board, thus generating aggregate data for analytical use by the researchers.

The generated papers for the assignments in these two core courses were designed to have the MSN students identify a practice-based problem from their clinical setting- using similar instructions and case studies for completion. There were commonalities in the assignments in both courses. A key learning objective in both courses was to align the students' learning experiences with relevant nursing practice issues. The instructions for students were that they should identify some problem encountered in their clinical practice, formulate research questions, and then search databases for the literature related to their selected practice-based problem. Students then were to analyze the literature for scientific evidence related to research-based interventions that dealt with those identified practice-based problems. It was at this point that the students were to identify gaps in the literature on their chosen topics. Box 1 illustrates the student assignment as given in both core courses. Both assignments focused on delving deeper into their identified clinical problem using evidence-based interventions published in peer reviewed scholarly journals.

Data abstraction

Narrative data were abstracted from the original student papers in both the research methods and biostatistics and ethics courses by the researchers. Prior to this activity, an honest broker at the university who was not a faculty member or a student but was a hired staff member appointed by the Associate Dean of Nursing at the university de-identified student identities so they would remain anonymous to the researchers. An honest broker was a neutral person who was not one of the researchers or the research team but an individual who removed all

Box 1

Assignment guidelines for the nursing practice-based problem identification and analysis paper for both the ethics and the research methods courses.

1. Introduce the nursing practice-based problem
2. Provide the background to the problem, significance of the problem, and current state of the problem.
3. Select research studies pertaining to the selected concepts or variables. Identify and describe the steps of the research process in nursing, addressing the following elements of the research process:

   a. Research problem/purpose and hypotheses (if any), literature review
   b. Design
   c. Sampling strategies
   d. Data (including descriptive and/or inferential statistical) statistics used
   e. Limitations of the study
   f. Summary/conclusions in each of your selected articles.
4. Provide a summary of the results illustrated from each research study.
5. Provide a summary of the practice-based problem and research-based interventions as identified in all of the reviewed research studies. Identify gaps in the literature.

identifiers from student papers, sent the papers to the nurse researchers, and then sent the demographic data directly to Survey Monkey, an online data depository. Identification of practice-based problems were then coded by the nurse researchers, according to a typology using the NINR themes (2016) as an organizing framework; (2) research-based interventions identified by the students for each of those practice-based problems; and (3) gaps in the literature identified by the students. Priorities from the NINR agenda (National Institute of Nursing Research, 2016) included (1) symptom science, which included promoting personalized health strategies such as adverse symptoms resulting in pain and many others across diverse populations and settings; (2) wellness: promoting health and preventing illness, which included physical, behavioral, and environmental causes of illness, behaviors that lead to a healthy lifestyle, and choices to develop evidence-based interventions to promote wellness; (3) self-management: improving the quality of life for individuals with chronic illnesses, which included strategies to help individuals and their caregivers to deal with chronic conditions to create a better understanding for management of their illness; and (4) end-of-life and palliative care: the science of compassion, which included managing the symptoms of life-limiting conditions and planning for end-of-life decisions. Two final themes included (1) promoting innovation: technology to improve health, which included the science of promoting innovation and finally (2) innovative strategies for research careers that included the development of a strong cadre of nurse scientists.

Sample characteristics

Analyzing the sample characteristics of the population from whom the papers were drawn, the majority of the students were female (88%), age 23–39 years (69%), worked full time (95%), and were white (73%). Most students were nurse practitioner students with the primary care/acute care nurse practitioner specialization being the largest group. Geriatric nurse practitioner students, psychiatric/mental health or women's health nurse practitioner students were the next largest group. Nurse Anesthesia students were then the next smallest group of students with Leadership, or Nursing Education majors coming in the smallest group of the population of papers.

Data analysis

The Krippendorff (2005) method of content analysis, which is a method of content analysis where experts code open-ended interview data into analyzable terms, was used to identify the key categories or themes of practice-based problems within a typology perceived by the advanced practice nursing students. This method was used by the two researchers to identify practice-based problems and research-based interventions categorized under the NINR themes with gaps in the literature identified by the MSN students. Formal content analysis was conducted by the researchers in all the de-identified data from the student papers using a coding sheet for each NINR theme identifying practice-based problems with research-based interventions. Those problems and interventions were then placed in a hierarchical typology listing the highest number of problems first, identifying what they were, with the lowest ones last. Gaps in the literature for all problems with corresponding interventions were identified. Both faculty researchers concurred on these typologies for the practice-based problems and research-based interventions along with corresponding gaps in the literature.

Box 2 summarizes the method used in this study:

Findings

Box 3 illustrates the typology of practice-based problems identified by the MSN students using the NINR themes of symptom science, self-management: improving quality of life with chronic illness, and end-of-life care, because these were the three themes most often selected by the MSN students.

Research-based interventions for symptom science and self-management (improving quality of life) included (1) early recognition and treatment of the adverse problem by nurses; (2) adequate nurse workload (including ratios); (3) rounds by nurses; (4) standardized protocols for nurses; and (5) educational guidelines for dealing with the adverse problems. Research-based interventions for end-of-life care included

Box 2

Summary of relevant questions answered by this Krippendorff content analysis.

1. **Which data are analyzed?** MSN student papers from a research course and ethics course
2. **How are data defined?** Narrative data from student papers.
3. **From what population are data drawn?** MSN students who took a research methods/ethics course during the 2015–16 academic year.
4. **What is the relevant context?** Identified practice-based problems and research-based interventions from assigned case studies.
5. **What are the boundaries of the analysis?** Data obtained from student papers during the 2015–16 academic year
6. **What is to be measured?** Content analysis from typologies of NINR themes of Practice-based problems and research-based intervention.

Box 3

Typology of practice-based problems identified by the MSN students using the National Institute of Nursing Research themes.

Symptom science
1. Pain
2. Inadequate sleep
3. Delirium
4. Falls
5. Hospital-acquired infections
6. Noise in the environment
7. Hypothermia
8. Stress and anxiety in families

Self-management: improving quality of life with chronic illness
1. Non-adherence to MEDICAL REGIMEN (patients with congestive heart failure)
2. Effects of polypharmacy on readmissions
3. Caregiver stress and anxiety

End-of-life care (planning for end-of-life decisions by family)
1. Persistent vegetative state or on a ventilator with no hope, with family disagreement
2. Patient who wants physician-assisted suicide
3. Family presence during resuscitation

communication with the health care team. The MSN students identified a lack of clear, universally used guidelines or protocols for health care team members for communicating about end-of-life care.

The gaps in the literature for symptom science and self-management (improving quality of life) identified by the MSN students included a lack of clear guidelines or protocols for universally used treatments for patients with adverse symptoms. Some examples cited by the MSN students included a lack of guidelines related to nurses' attitudes towards pain management, pain assessment techniques in the non-verbal patient, a lack of sedation protocols for use in the intensive care unit (ICU), or detection strategies for sepsis to be used by the nurses. The second major gap cited by the MSN students was a lack of universal administrative enforcement of guidelines for nurses' workloads. Some cited a scarcity of guidelines used by institutions. A final major gap identified by the MSN students was a lack of educational strategies for nurses in the assessment and treatment of adverse symptoms in environmental noise and sleep quality, particularly in the critical care units. A lack of educational strategies in the prevention of hospital-acquired infections was also cited by the MSN students as being paramount.

Discussion and recommendations

Seeking insight into the salient problems that nurses encounter in nursing practice from graduate nursing students was illuminating. Most of the students were concurrently employed and could inform faculty, through their assigned coursework, of their clinical practice problems, possible research interventions, and where the key gaps were in the scientific basis for evidence-based nursing practice. It was interesting to find that most of the practice-based problems selected by the MSN students were aligned with the agenda of the NINR (2016) for symptom science. The next area most frequently chosen by the MSN students was end-of-life care or palliative care with self-management; improving the quality of life for individuals with chronic illness was chosen as the final category of patient problems. No problems were selected that fit any of the remainder of the NINR themes.

It appears that the majority of the problems identified by the study participants were those encountered by nurses caring for patients in the hospital setting. Perhaps the reason for this is that the hospital setting is where most of the nurses were employed. Even though about half of the students were enrolled in the nurse practitioner program, they probably had not yet been exposed to the practice-based problems more often encountered when working in ambulatory care community-based settings. These settings are distinctly different from hospital-based settings. So, caution is needed in interpreting those findings as not representative of all clinical nursing practice problems. Nevertheless, the results of our study provided an important glimpse into the problems that need scientific attention for nurses employed in hospital settings. Future research should specifically target bridging academic nurses with MSN students who are predominantly employed in ambulatory care and community settings. Another option is to repeat this assignment at the end of the MSN program after students complete all their clinical practicums. It would be interesting to take the opportunity to learn their perceptions of practice-based problems as they transition to their new roles as advanced practice nurses, many of which will be outside of a hospital setting. Perhaps repeating this learning experience of thinking critically about practice-based nursing problems will stimulate their curiosity and interest in the pursuit of research doctoral nursing education.

A key theme that emerged from the students' perceptions in seeking research interventions to address their practice-based problems was the overall lack of clinical guidelines to guide nursing care when addressing the problems they identified. Published research studies were found that do include relevant interventions. However, the lesson learned from the analysis of this assignment is that graduate students as practicing nurses want more than just single isolated research interventions. These practicing professional nurses identified the need for clinical guidelines based on research to guide evidence-based nursing practice in addressing salient nursing problems when caring for patients with an array of symptoms. For nursing scholars, this is an important area for nursing science development.

Although advancing symptom science is a priority for the NINR, the idea of translating symptom science research into “clear” clinical guidelines was a priority for our student participants. Developing clinical guidelines to guide decision making in clinical practice is not new. In the 1990s, developing scientifically based clinical guidelines was prioritized, and the construct of evidence-based practice took hold (Craig & Smyth, 2012). Since then, the development of clinical practice guidelines has proliferated, and they can be found in a variety of sources (Craig & Smyth, 2012; Institute of Medicine, 2011; Melnyk, 2014; Melynk et al., 2014).

Based on the study findings that there were gaps in clear clinical guidelines, the authors began to explore what clinical practice guidelines were available specific to the identified symptoms. The first search was for clinical practice guidelines for pain. The searches in PUBMED and CINHAL were daunting because they identified so many guidelines. A “gold standard” clinical guideline for pain did not appear. So, a simpler approach was used to see if any clarity would appear. As

suggested by Melynk et al. (2014), a Google search was executed. Using the keywords "clinical practice guidelines—pain" yielded 43,400,000 results within 0.08 s (https://www.google.com/search?q=clincal+practice+guidelines+-+pain&ie=utf-8&oe=utf-8&client=firefox-b) (retrieved 10/18/17).

On the surface, when the researchers read the concerns of the study participants about the lack of clear clinical guidelines, the magnitude of the confusion regarding which published clinical guidelines were the best to use was not appreciated. Only when a Google search was executed did the absurdity of having so many clinical guidelines become evident—within seconds. No wonder clinical guidelines are underutilized in practice (Meisel et al., 2016). Thus, an important barrier to using clinical guidelines in real-world nursing practice is the confusion caused by having too many guidelines. Clarity and trustworthiness of deciding which guideline to use at the point of care are practice-based problems.

Agreeing that the plethora of guidelines is indeed a problem for health care professionals, the United States Congress, through the *Medicare Improvements for Patients and Providers Act of 2008*, requested further study (Institute of Medicine, 2011). The Institute of Medicine assembled key experts to study how to develop standards to establish the trustworthiness of clinical practice guidelines. For further guidance on their results, readers are encouraged to read the full report (Institute of Medicine, 2011). Eight standards for developing rigorous, trustworthy clinical practice guidelines were established. The key federal agency in the United States spearheading the proper evaluation of the standards for the development of clinical practice guidelines and for health care quality and outcomes is the Agency for Health Care Research and Quality (Institute of Medicine, 2011).

Informed by this study were the students' requests for more educational strategies for nurses in the assessment and treatment of adverse symptoms in the hospital setting. So, as the NINR promotes the advancement of symptom science, the contextual settings where the symptoms occur need to be considered. This area is ripe for research into environmental matters. Environmental noise impacting sleep quality, particularly in the critical care units, was addressed by students. Additionally, a lack of educational strategies for the prevention of hospital-acquired infections was also cited by the MSN students as paramount. For those in the field of home care, how living environments mitigate or exacerbate adverse symptoms needs further research.

The second major gap cited by the MSN students was the lack of universal administrative enforcement of guidelines for nurses' workloads. Some cited a scarcity of guidelines used by institutions whereas others suggested a lack of implementation of those guidelines. Nurse workload is associated with patient outcomes (Duffield et al., 2011). Many studies have produced the need for better control of a nurse's workload, which yields better patient outcomes (Stimpel, Sloan, & Aiken, 2012). Yet nurses still complain this is one area of concern in their practice environment. There are wide gaps in the translation of research into practice and policies that mandate enforcement of these guidelines. These gaps highlight the need for advocacy at legislative levels for enforcement of nursing policy.

The next key gap identified by the MSN students was the lack of educational strategies for nurses in the assessment and treatment of non-therapeutic issues related to the hospital environment. Environmental noise, particularly in the critical care units, was identified. The impact of noise on patients' sleep and the effectiveness of noise reduction are on-going issues in intensive care units (Xie, Kang, & Mills, 2009). It is commonly known that intensive care units exceed the WHO guidelines for sound levels on a daily basis (Darbyshire & Young, 2013). Only those patients in side rooms in the intensive care unit, when equipment is switched off, escape some of the noise issues. Sound-absorbing techniques can be one way of dealing with the noise. Sound masking appears to be the most effective method in deterring the noise in the intensive care unit. Most of the pertinent articles in the literature suggest using noise reduction programs or mechanical means of isolating patients by using side rooms or ear plugs to assist in noise reduction.

Although several studies seem to suggest that noise influences sleep quality in patients in the ICU, other studies disagree about the importance of sleep disturbances from noise in the ICU (Darbyshire & Young, 2013). Other factors, such as the patient's age, duration of stay in the ICU, type of ICU, and the method used to evaluate sleep, all play a role in determining the effect of sleep disturbance on the patient because of noise (Darbyshire & Young, 2013). Sleep disturbances can result from delirium and cardiovascular, immunologic, and neurological issues as well. Other studies have suggested the anxiety and depression all play a key role in a patient's ability to sleep (Ding, Redeker, Pisani, Yaggi, & Knauert, 2017). Thus, these issues need to be considered when discussing sleep disturbances in patients in the ICU. Guidelines recommend cluster care in caring for sleep disturbances in patients in the ICU, which includes dealing with their anxiety and depression.

Another gap that was paramount to the MSN students was a lack of educational strategies for preventing hospital-acquired infections. This identified gap is an important message for academic faculty. The emphasis of the fundamental nursing principle of practicing excellent aseptic technique continues to be critically important in prelicensure and post-licensure nursing education. A study by Elegant and Sorce (2017) identified nurse-driven care in the pediatric intensive care unit as an important factor in improving quality and patient safety in hospital-acquired infections. Although educational initiatives are currently being developed, the nurses felt that a more formal educational process needs to occur to implement any policies developed in ICUs regarding care of a patient with the potential for hospital-acquired infections. One such program was developed in Europe.

In 2012, a European Delphi study was one of the top pediatric critical care nursing research priorities (Tume et al., 2015). Nurses and interdisciplinary team members focused on getting the hospital-acquired infection rates down and were successful in doing so with the creation of a quality improvement strategy for hand-washing along with one-hour workshops for staff. These workshops focused on the prevention of hospital-acquired infections among patients with endotracheal tubes, central venous lines, and urinary catheters.

A key question all educators should ponder is if we adequately emphasize and reinforce the fundamental nursing principles for health promotion and disease prevention that include best practices for aseptic technique in our high-tech hospital environments. It is important for educators to remember that our graduate nursing students will be the next generation of nurse educators in practice and academia.

Limitations

Limitations to this study include the following. Study participants may or may not be expert nurses as the years of experience were not assessed in this study. Even though it might be inferred, as more than half of the age of the population was beyond entry level for years of nursing practice, no hard data were assessed. Even though the population was graduate students, some of the nurses may not have had lengthy years of experience. Another issue to consider is students may have chosen a practice based problem based on a topic that they could write about instead of choosing one which originated from their clinical practice as assigned in the paper. A final point to consider is that the population was not diverse in this study. Most of the students in this study were white so a more diverse population is a welcome future study.

Conclusions

Faculty and graduate students learn from each other. In nursing, practice-based problems are relevant for research that can improve nursing practice and education. As this study showed, carefully

designed MSN assignments can, by design, create bridges between academic and practicing professional nurses who are enrolled in MSN programs, to push forward nursing science. Students are empowered when their practice-based clinical inquiry assignments generate important research questions. Furthermore, the experience helps set the stage for MSN students to consider future doctoral education. Practicing nurses who are MSN students know that their nursing practice and their practice-based insights are needed to continue to build the science for evidence-based nursing practice.

Funding

This research did not receive any specific grants from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

None of the authors has any competing interests to declare

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