



# Where are nurse-scientists? Academic nursing research at critical crossroads

Joan R. Bloch, PhD, CRNP, FAAN<sup>a\*</sup>,  
Mary Ellen Smith Glasgow, PhD, RN, ANEF, FAAN<sup>b</sup>

<sup>a</sup>College of Nursing and Health Professions, Drexel University, Philadelphia, PA

<sup>b</sup>School of Nursing, Office of Research and Innovation, Duquesne University, Pittsburgh, PA

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## ABSTRACT

**Background:** Academic nursing research is at a critical impasse after the great retirement and resignation during COVID-19. Sustaining and replenishing senior nurse-scientist faculty that are clinical experts with real-world clinical practice is critical. Leveraging the mission of nursing scholarship within the business of building and sustaining externally funded research enterprises in schools of nursing presents conundrums, especially with persistent nursing faculty vacancies.

**Purpose and Methods:** Through a lens of intersectionality within the context of academic bias and nursing education regulation, we address challenges in NIH funding for nurse-scientist faculty. Publicly available data reveal equity, inclusion, and advancement issues that make it an unequal playing field for nurse-scientist faculty if expected to achieve similar NIH funding as faculty in schools of public health and medicine.

**Discussion:** Understanding research enterprises requires appreciation of the complex interplay between academic nursing units, university infrastructures, and academic budgetary models. Creative support for both nursing deans and their faculty is needed.

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## Introduction

Academic nursing is at critical crossroads as we bear witness to the havoc brought on by the global COVID-19 pandemic and society's awareness of racism that permeates much of American society (Bridges, 2019; Jeffries, 2020; Yoshinaga et al., 2022). Pausing and pivoting, strategies are also needed as senior nursing faculty have retired in larger than ever numbers

(Matthews et al., 2021). Investing in the current and the next generation of nurse-scientists is one of the pressing problems facing our discipline if we are going to solve problems plaguing nursing and the health concerns addressed by nurses.

Supportive academic environments that encourage and promote nurse-scientists' career trajectories are needed. As faculty in academic nursing units, nurse-scientists are accountable to high disciplinary standards of the tripartite mission of research, teaching,

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DOI of original article: . \*Corresponding author: Joan R. Bloch, PhD, CRNP, FAAN, College of Nursing and Health Professions, Drexel University, Philadelphia, PA.

E-mail address: [jrb68@drexel.edu](mailto:jrb68@drexel.edu) (J.R. Bloch).

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and service, guided by academic policies set forth by the American Association of University Professors ([American Association of University Professors \[AAUP\] 2015](#)), which are upheld by many universities for faculty. While it is quite an honor and privilege to be part of the professoriate, these are particularly taxing times for nurses in their tripartite academic mission. Sustaining active research programs is particularly challenging in schools of nursing ([Bourgault et al., 2021](#); [Kinser et al., 2019](#)). Much has been written about challenges academic nursing faculty confront ([Dreher et al., 2012](#); [Matthews et al., 2021](#); [Smeltzer et al., 2017](#)).

Much dialogue and debate commenced after Schnall ([Schnall, 2020](#)) published data describing recent trends of National Institutes of Health (NIH) funding to schools of nursing during the years 2014 to 2018. Most provocative were the data highlighting the percentages of non-nurses who are nursing faculty in schools of nursing receiving NIH funding. This has sparked important dialogue and debate about issues related to hiring larger numbers of interdisciplinary or multidisciplinary, non-nurse tenure-track or tenured faculty who are better positioned in securing NIH dollars ([Algase et al., 2021](#); [Broome, 2021](#)). How this trend affects nurse-scientist faculty and their opportunities to build and sustain programs of research deserves more dialogue and review. It also requires deep reflection on what is nursing science and who should teach it. Further discussion is needed on best practices on how non-nurse faculty (NNF) who are hired in Schools of Nursing can support nursing faculty and their nursing research enterprises, but not replace them.

Understanding research enterprises within schools of nursing requires appreciation of the complex interplay between academic nursing units, university infrastructures, and micro and macro-level budgetary models for academic research, including the context of NIH funding. Schnall ([Schnall, 2020](#)) provided us with the following data, illuminating NIH's investment in research to schools of nursing. Overall, as expected, the National Institute of Nursing Research (NINR) provided most of the NIH funding to schools of nursing from 2014 to 2018, ranging from \$56,761,827 in year 2014, to \$64,342,872 in year 2018. Although other NIH institutes funded research to schools of nursing, the amounts were considerably less. In 2014, the National Cancer Institute (NCI) was the second highest funder at \$14,804,347, which was 26% of the amount funded by NINR. By 2018 that changed, and the National Institute of Aging (NIA) was the second highest funder at \$22, 705,963, which was 35% of the amount funded by NINR. Other NIH institutes funded research to schools of nursing, but at lower amounts. NINR has been the key NIH institute building nursing scientific capacity. *However, it is one of the lowest funded institutes of the 27 NIH Institutes and Centers.* In 2021, \$175 million dollars was allocated to NINR, 0.04 % of total NIH dollars ([Congressional Research Service 2021](#)).

Increasing investments in federal programs that support the research enterprises in schools of nursing using a multi-prong approach are critical as we look to strengthen the nursing workforce. Creative support for both deans and their faculty are needed ([American Association of Colleges of Nursing \[AACN\] 2022a](#)). Fang and Kesten ([Fang and Kesten, 2017](#)) projected that total retirements in 2016 to 2025 would equal one third of faculty in 2015. It has recently been reported that COVID-19 also took a physical and emotional toll on nursing faculty who are now retiring at an accelerated pace including tenured nurse scientists ([National League for Nursing 2021](#)). The pipeline for sustaining and replenishing senior nurse-scientist faculty is at a critical impasse during these times of the great retirement and resignation ([Bourgault et al., 2022](#); [Smeltzer et al., 2017](#)). The passage of the 2022 Omnibus bill reflects an increase budget commitment to nursing research ([National Institute of Nursing Research \[NINR\] 2022a](#)). With optimism, we hope we have turned the corner, leaving behind the period of continual cutting of federal research funding budgets and are now entering times where research will be better supported ([National Institute of Nursing Research \[NINR\] 2022b](#)). Thus, as we recover from the COVID-19 pandemic and support for nursing research looks good, we continue the dialogue started by Schnall ([Schnall, 2020](#)) and Algase et al. ([Algase et al., 2021](#)) that has led to a flurry of responses, including 11 editorials by 40 co-authors published in just one issue of *Nursing Outlook* (July/August, 2021).

Our key concerns raised by Algase et al. ([Algase et al., 2021](#)) and Schnall ([Schnall, 2020](#)) can be summarized in one thought-provoking question: Are NNF leading doctoral nursing education and securing large visible grants in disproportionate numbers among nursing faculty? While we do not answer this question explicitly in this paper, our aim is to continue a dialogue. We extend the conversation by discussing contextual issues for nursing faculty committed to the professoriate's tripartite mission of academic nursing. Specially, our attention is on nurse-scientist faculty with expertise in clinical areas (e.g., perinatal, cardiovascular, oncology) that are aligned with real-world clinical health care practice. Thus, the purpose of this paper is to broaden the conversation to challenge our understandings with new ideas and ways to push forward this critically important dialogue.

### *Framing the Dialogue*

Pushing forward this dialogue with constructive ideas for action is an imperative given the growing number of nursing faculty vacancies. Each year, thousands of nursing students are turned away because of the faculty positions remain vacant ([American Association of Colleges of Nursing \[AACN\] 2022b](#)). Through a lens of intersectionality ([Cho et al., 2013](#)) within the context of academic bias and nursing education regulation, we address challenges for nurse-scientist faculty.

Leveraging the mission of nursing scholarship within the business of building and sustaining externally funded research enterprises presents conundrums. Academic leaders and their faculty in schools of nursing are challenged. Research infrastructure and leadership within a school of nursing and its university are instrumental in creating supportive or non-supportive work environments for nurse-scientists. In this section, we share public data to quantify the magnitude of these contextual issues. Inequitable workload expectations and decreased disciplinary respect for nursing faculty roles creates an uneven playing field for nurse-scientists expected to be just as competitive for NIH funding.

### *Using a Lens of Intersectionality: Nurse-Scientists and Nursing Faculty*

With important attention to diversity, equity, and inclusivity (DEI), language and its intent are important (Villarruel and Fairman, 2021). Through certain words, blaming and shaming others can result in normalizing degradation and exclusion of groups of people (Gribble et al., 2022; Holtzblatt, 2022; Thompson, 2022). Thus, we clarify that when we use the term non-nurse nursing faculty (NNF), we use it for conceptual clarity, not to be exclusive. We define NNF simply as faculty members that have full-time nursing faculty positions that are not nurses. We define the term nurse-scientist in nursing faculty roles as PhD-prepared licensed registered nurses who received training to conduct research. There is no discriminatory or ill intent.

We introduce intersectionality to the dialogue, a term introduced by legal scholar, Kimberly Crenshaw (Bridges, 2019). Intersectionality provides a useful lens (Cho et al., 2013) to this dialogue to be sensitive and raising awareness of possible stigma, marginalization, implicit bias, and micro-aggressions perpetuating within academe. It can shed light on the reaction to this growing phenomenon of hiring NNF for tenure-track full-faculty positions in schools of nursing. Are NNF hired because they are more valued as researchers? Are the necessary resources to support nurse-scientist faculty and PhD nursing students at stake given limited resources and intersectionality?

Nursing faculty are tasked with helping to alleviate social injustices and health disparities that arise from unequal power relations (Van Herk et al., 2011). Yet, nursing faculty, nurses, and non-nurses, may themselves experience degrees of academic gender bias, classism, and racism related to professional respect among academic communities in research funding and recognition (Lampman et al., 2016). As a predominantly female profession with roots in caregiving, issues of academic equity prevail (Boamah, 2022). Thus, nursing faculty and leaders need to amplify our individual and collective voices to explore issues of power, privilege, and oppression within and against the profession.

Underlying power differentials within hierarchal academic institutions are often at play (Erstad et al., 2021; Roberts and Glod, 2013), unfortunately negatively impacting the perceived worth and value of nurse scientists who strive to be competitive for NIH funding within their schools of nursing. Thus, consider how academic intersectionality of gender, class and nursing plays out when coveted tenure nursing positions are given to a large cadre of non-nurses in schools of nursing. Inquiry guided by feminist and critical theory (Hesse-Biber, 2012) could provide meaningful data for deeper understandings of experiences that nurse-scientists have in schools of nursing, especially in those schools with NNF securing NIH funding.

### *NIH Funding Differences Between Disciplines*

NIH funding is critical in supporting academic units' research enterprises for many reasons, including the indirect costs paid by large research grants to cover overhead expenses (Holbrook and Sanberg, 2013). For academic nursing departments, it is not an equal playing field when it comes to receiving NIH funding compared to other academic health disciplines. This point is emphasized to highlight the need for realistic expectations for nurse-scientists' ability to sustain their programs of research in nursing faculty positions, especially when compared to faculty colleagues holding appointments in schools of public health or medicine. Issues of intersectionality and academic bias may partly explain the flurry of responses to Schnall (Schnall, 2020) and Algase et al. (Algase et al., 2021) articles.

Because interdisciplinary research teams are essential, our attention turns to schools of public health. Public health, by definition, is multidisciplinary with the mission and scope aligned with the discipline of nursing (American Public Health Association [APHA] 2022). Supporting the argument of welcoming NNF into schools of nursing as full-time faculty (Hayes et al., 2021; Lee et al., 2021), we explored if nurses are welcomed and hired as full-time faculty in other research-intensive academic departments, especially those aligned with nursing's mission. Since public health is interdisciplinary, we explored this by looking at the top 5-highest NIH ranked funded schools of public health. First, we were curious about a relative comparison between NIH funding amounts to schools of public health, medicine, and nursing within the top ranked schools of public health. To explore this, we accessed data available from the Blue Ridge Institute for Medical Research (BRIMR), an independent nonprofit organization. BRIMR provides annual NIH rankings of health science schools based on NIH data released each year through the NIH Research Portfolio Online Reporting Tool (RePORT) (Parslow and Roskoski, 2022). Their data are widely cited and publicly available ([http://www.brimr.org/NIH\\_Awards/](http://www.brimr.org/NIH_Awards/)).

Table 1 lists the amount of NIH funding to the top five NIH-funded schools of public health (SOPH) for

**Table 1 – NIH Funding Amounts to the 5-Highest Ranked Schools of Public Health and their respective Schools of Medicine and Nursing, Fiscal Year 2020\***

| Schools of Public Health (SOPH) | SOPH Rank NIH \$ | SOPH Total Amount of NIH funding (FY 2020) | School of Medicine's (SOM) Rank NIH \$ | School of Medicine's (SOM) Total Amount of NIH funding (FY 2020) | School of Nursing's (SON) Rank NIH \$ | School of Nursing's Total Amount of NIH Funding (FY 2020) |
|---------------------------------|------------------|--|--|--|---------------------------------------|---|
| Johns Hopkins University        | 1                | \$182,457,373                              | 3                                      | \$533,502,805  | 1                                     | \$13,181,413  |
| Harvard University              | 2                | \$137,789,225                              | 38                                     | \$169,951,393  | —                                     | no nursing school   |
| University of North Carolina    | 3                | \$75,356,804                               | 17                                     | \$345,729,473  | 15                                    | \$4,996,234   |
| Emory University                | 4                | \$58,919,747                               | 14                                     | \$395,173,435  | 5                                     | \$9,291,373   |
| Brown University                | 5                | \$53,396,710                               | 66                                     | \$61,523,616   | —                                     | no nursing school   |

\* BRIMR was the source for these data (retrieved January 11, 2022 from [http://www.brimr.org/NIH\\_Awards/2020/default.htm](http://www.brimr.org/NIH_Awards/2020/default.htm)).

fiscal year 2020 along with the amount of NIH funding to the schools of medicine and nursing in those universities. Obvious from the data is that the schools of nursing do not garner nearly the same amounts of NIH funding. In 2020, Johns Hopkins University's SOPH and nursing were both ranked as number one in NIH funding. Yet, the school of nursing received substantially less NIH funding than their schools of public health and medicine.

However, given that an important argument supporting NNF in schools of nursing was inclusivity of others (Lee et al., 2021; Villarruel and Fairman, 2021), we thought it would be informative to examine other disciplines inclusivity of employing nurse-scientists as full-time faculty, especially in highly NIH-funded SOPH, which are multidisciplinary and interdisciplinary in its research. We reviewed the websites of the five schools of public health listed in Table 2. Identifying SOPH departments that would be most likely to overlap with nursing (e.g., community health, behavioral and social sciences, global health, & health services), data in Table 2 shows that of 1,044 full-time faculty listed in the five top ranked NIH funded SOPH, only 1.1% ( $n = 11$ ) of full-time public health faculty were identifiable as nurses. They were identified as a nurse by having a nursing credential (e.g., RN) listed in their bios or CVs that were accessed through their faculty websites. For comparison's sake, we also looked at the visibility of physicians as full-time public health faculty. As seen in Table 2, physicians represented 13.6% ( $n = 142$ ). From just an initial dive by scanning the websites at one point in time, we can already see a disconcerting trend when we look at the interdisciplinary field of public health. Nurse-scientists are not visible.

### Implications of These Data

Expecting nurse-scientists to harness NIH grants can be quite a challenge, especially if they are hired in schools of nursing that do not have well-developed research infrastructures. Faculty are more apt to be successful in securing NIH grants in academic environments that have the appropriate research infrastructure consisting of decreased workload, mentorship, peer-review, and editorial assistance (Gitlin and Lyons, 2014).

Advocacy for nurse-scientists as members of multidisciplinary research teams is needed, regardless of whether that research team is primarily housed in a school of nursing or not. When certain NIH institutes provide minimal support to the science of clinical specialties/foci/areas of nurse-scientist faculty, how are those faculties in schools of nursing supported within their academic home, their universities, and even the NIH? For example, many nurse-scientists complete their PhDs, post-docs by developing their programs of research from their clinical nursing expertise (e.g., maternal child health, cardiovascular, neurology, oncology). Yet, oftentimes, their success depends on research collaborations with scientists that do not hold faculty appointments in nursing schools. How can we support and champion these nurse-scientists in their research? Advocacy for nurse-scientists as members of multidisciplinary research teams is needed, regardless of whether that research team is primarily housed in a school of nursing or not.

The practice of nurse-scientists teaching high course loads while also maintaining clinical competence makes for an unfair playing field compared to other disciplines especially in the context of increasing nursing student enrollments (Hudgins et al., 2022;



**Table 2 – A Website Scan Assessing Visibility of Nurses as Full-time (FT) Faculty Members in Academic Public Health Departments among the 5-Highest Ranked NIH Funded Schools of Public Health, FY 2020\***

| School of Public Health      | Ranking | Academic Departments in SOPH that are aligned with Areas of Nursing Science and Practice | Total Number of FT Faculty Listed on Website | FT Faculty Who are Nurses | FT Faculty Who are Physicians |
|------------------------------|---------|--|--|---------------------------|-------------------------------|
| Johns Hopkins University     | 1       | Health Policy & Management   | 64   | 0                         | 7                             |
|                              |         | Health, Behavior & Society   | 193  | 4                         | 24                            |
|                              |         | International Health   | 259  | 3                         | 30                            |
|                              |         | Mental Health  | 58   | 0                         | 4                             |
|                              |         | Population, Family, Reproductive Health  | 50   | 0                         | 11                            |
| Harvard University           | 2       | Global Health & Population   | 31   | 0                         | 4                             |
|                              |         | Health Policy & Management   | 32   | 0                         | 8                             |
|                              |         | Social & Behavioral Sciences   | 23   | 1                         | 3                             |
| University of North Carolina | 3       | Health Behavior  | 33   | 0                         | 3                             |
|                              |         | Health Policy & Management   | 35   | 0                         | 1                             |
|                              |         | Maternal Child Health  | 28   | 0                         | 7                             |
|                              |         | Public Health Leadership   | 13   | 0                         | 2                             |
| Emory University             | 4       | Behavior, Social, Health Education Sciences  | 40   | 1                         | 2                             |
|                              |         | Global Health & Population   | 13   | 0                         | 3                             |
|                              |         | Health Policy & Management (HPM)   | 28   | 0                         | 1                             |
|                              |         | Executive (no FT listed)   | 0  | 0                         | 0                             |
| Brown University             | 5       | Behavioral & Social Sciences   | 58   | 1                         | 2                             |
|                              |         | Health Services, Policy & Practice   | 86   | 1                         | 30                            |
| Totals                       | —       | —  | 1,044  | 11                        | 142                           |

\* FT faculty positions were counted during website searches conducted January 11-18, 2022. Every website was different so faculty bios and CV's were checked when available to identify faculty with nursing and physician credentials. Faculty with adjunct, emeriti, or secondary faculty appointments in the SOPHs were not included in the count. Note that among these five SOPHs that had Schools of Nursing (SON), many nurses with FT appointments in their SONs also had secondary appointments in the SOPHs.

Caution is warranted when viewing these data for they were intended to provide only a snapshot view. It is possible that some of the SOPH faculty that we viewed were nurses, but their nursing credentials and education were not listed on the website at the time the data were accessed.

Mariani, 2022; Smeltzer et al., 2017). Nursing faculty who are not conducting research often have little understanding of what it takes to prepare and submit NIH proposals and successfully implement them if funded. Additionally, nurse-scientists are subject to micro-aggressions and incivility between faculty at times (McGee, 2021; Stalter et al., 2019; Sue, 2010). Equitable and creative opportunities for nurse-scientists to sustain research engagement within their nursing faculty appointment needs closer attention.

Tenure and promotion requirements must have nursing disciplinary guidelines that reflect nuances among PhD-prepared nurse-scientists. Close attention to how nursing departments choose their peer colleges is critical when many schools of nursing may not be at nearly the same research intensiveness, despite high Carnegie classifications for their universities. Fewer nursing faculty successfully achieve tenure than other disciplines. There is speculation that these low numbers have been attributed to underperformance in the area of scholarship by nursing faculty who are predominantly female and socialized to be service oriented. (O'Connor and Yanni, 2013). Nursing faculty workload tends to be higher than other disciplines. We need to closely examine if nursing faculty receive the same benefits as other faculty disciplines (start-up packages, mentoring, conference support, grant peer review, editorial support, compensation levels,

restricted service obligations, and teaching loads. Academic nursing needs to pay close attention to the promotion rates of nursing faculty especially those in the tenure stream (Smith Glasgow et al., 2020). Having NIH-funded NNF in schools of nursing may further skew faculty research productivity for those schools and may not be fair for PhD-prepared nurse-scientist faculty within those schools of nursing. An urgent equity issue for nurse-scientists in underfunded clinical specialty areas (e.g., maternal-child health) is fairness in choosing appropriate peer colleges for promotion and tenure reviews of nurse-scientist faculty (Bourgault et al., 2022). Additionally, the ratio of tenure-track/tenured faculty that are nurses to non-tenured faculty who are nurses in schools of nursing must be acknowledged in an era when tenure is challenged and challenging (Ashcraft et al., 2021; Bice et al., 2019).

We must leverage the privilege afforded to the dominant biomedical research model to advocate for nursing science and the profession at large. Academic biases that render nurses with PhDs as scientists less than others needs attention from within our schools of nursing and health care communities. Many schools must resort to filling vacant tenure-track faculty positions with NNF with established NIH funded programs of nursing. Do our academic nurse leaders have the tools and know-how of how to champion their faculty

who are nurses (Hudgins et al., 2022)? As a discipline, we must position nursing faculty on boards, scientific panels, public health departments, and as government officials to change perceptions of the profession as credible researchers and clinical scientists and strongly advocate, empowering nurses.

### **Nursing Educational Trends and the Research Enterprise**

As we consider how to invest in nurse-scientists, we must also examine PhD academic preparation (American Association of Colleges of Nursing [AACN] 2022a). The PhD is a research-focused degree that prepares individuals to create, translate, and communicate new knowledge as leaders within institutions of higher education and outside of academia. In the discipline of nursing, the PhD graduate is expected to steward the profession, develop its science, define its uniqueness, maintain its professional integrity, and educate the next generation of nursing professionals (AACN, 2022a). AACN has issued a new landmark report on research-focused doctoral programs and provided recommendations for student diversification and support, faculty composition and infrastructure needs, and curriculum and evaluation strategies. Implementing AACN's excellent recommendations will be impossible unless more resources are invested. Creative financial incentives for collaboration across universities and disciplines are an imperative, especially to push forward nursing science that is relevant to clinical practice.

### **Continual Curricular Changes**

In nursing education, we have several issues that threaten the growth of nursing research and nurse-scientist faculty members in schools of nursing. One of which is that we [nurse academics] tend to over-regulate our nursing education programs rather than focus on innovative ways to grow the academic research enterprise, thus improving patient care. Nursing faculty spend enormous amounts of time serving their academic nursing units in revising curriculums. Actions such as incorporating Next Gen into the NCLEX-RN and requiring massive curricular changes by professional organizations during a pandemic create immeasurable stress for nursing faculty during an already acute nursing faculty shortage. Especially problematic is that some decisions were made without consideration of timing or an adequate evidence base to show that such changes are warranted or will result in the desired effect. Academic nurse leaders need to evaluate what we need to "let go of" concerning internal regulations that diverts attention away from nursing research and patient care objectives (Smith Glasgow and Colbert, 2022). Nursing faculty are a precious resource, and we need to protect their time to focus on high impact research.

### **Attention to Academic Rigor**

The lack of consideration to academic rigor requires equal attention. A troubling trend has been health systems selecting to partner with academic nursing programs from for-profit universities for nurses' institution-wide (Buerhaus et al., 2014; Pittman et al., 2019). Research on nursing program outcomes showed a 14-fold increase in the number of graduates from for-profit university nursing programs between 2007 and 2016 (rising to 14.2% of total graduates in 2016), and yet for-profit university nursing programs have the lowest pass rates on the NCLEX (68.1%, compared to 88.2% in public and 84.1% in non-profit universities (Pittman et al., 2019). As we know, a strong foundation in research and associated fundamental course work is important for academic preparation for graduate school. Generally, graduates from for-profit universities are not exposed to research-active faculty with active research programs. As leaders, we should guide nurses to enroll in academic programs that prepare them to provide the best patient care and to generate or translate research, not the most cost-effective educational option (Smith Glasgow and Colbert, 2022). While our health system medical colleagues attend prestigious academic institutions for medical school, the nurses at these same institutions are encouraged due to tuition remission practices to seek a higher degree at a for-profit institution.

Nursing science will suffer if we consider the cost of nursing education without equal attention to outcomes. We must pay attention to promotion and tenure outcomes among our nurse-scientists. Valuing high-quality nurse educators for the nursing workforce demonstrates that academic leaders care about the development of nurses, nursing science, and the profession. Students may also not aspire to be nurse-scientists without the appropriate role modeling of research-oriented nursing faculty that are also clinical experts, which are largely missing at for-profit institutions. Distinctions between 'non-for profit' and 'for-profit' universities and their impact on academic and clinical nursing are beyond the scope of this paper. Yet, those in academic nursing have witnessed a rise in for-profit institutions' enrollment and representation in the media.

### **Economic Drivers**

Many higher education organizations are under immense economic pressure related to demographic changes, further exacerbated by the COVID-19 pandemic. Based on findings from AACN's latest 2-year survey conducted in 2020 and 2021, significant increases in enrollment were found in entry-level baccalaureate (3.3%) and Doctor of Nursing Practice programs (4.0%). Master's level students decreased by 3.8% while PhD programs, research focused doctoral enrollment decreased by 1.9% (American Association of Colleges of Nursing [AACN] 2022b). Although many

nursing programs have experienced enrollment growth over the last several years, they, too, bear the budgetary cuts applied to all other University schools and departments. At the same time, schools of nursing are receiving pressure to increase the number of BSN graduates to address the major loss of nurses in the Great Resignation (Smith Glasgow and Colbert, 2022). These competing demands place academic nursing in a tenuous situation about where to invest limited fiscal resources.

Given the demand to teach BSN students, resources and faculty lines are given to the undergraduate programs. Replacing or sustaining faculty for PhD nursing students may be hard to justify with intense economic pressure to enroll and graduate BSN students. The declining number of PhD students is an area needing immediate intervention. Low nursing faculty salaries as compared to clinical practice salaries is one of the driving forces (American Association of Colleges of Nursing [AACN] 2020). It is concerning that a new clinical nurse could earn more than a PhD-prepared nurse faculty. Additionally, under resourced research infrastructures for PhD-prepared nurse-scientists in schools of nursing must be addressed with creative solutions.

### Investing in Nurse-Scientists

Academic nursing must broaden our repertoire of fostering supportive work environments for nurse-scientists that sustains critically important team science engagement within and across schools of nursing. At the highest ranked schools of nursing receiving NIH funding with established research enterprises capable of supporting high volume of NIH funding, current systems may be working (Hayes et al., 2021). As a discipline, we tend to focus on a small group of universities with highly ranked, highly funded schools with respect to research. However, nursing faculty who represent the majority of nursing faculty in this country are employed in other schools rather than this small minority of visible research schools of nursing. Many of their PhD graduates and post-doctoral research fellows are recruited to other academic institutions because of their beginning research training. Creativity is needed to support their continued productivity.

As we see it, the principal issue is how we as a discipline empower the majority of nursing faculty to contribute to nursing science in meaningful ways by creating manageable workloads, appropriate compensation, mentorship, and support mechanisms. Dedicated to stewarding the nursing discipline forward by building scientific capacity among nurses, we briefly share how we have done this in our respective roles as a dean and a nurse-scientist. Our examples are valuable because they show how to push forward when your school of nursing does not have an academic health system or when your nursing department has limited tenured nursing faculty members, despite

being in a Carnegie classified R1 or R2, doctoral university.

**Example 1: The Duquesne Model. Leveraging research capacity with NNF.** As a dean, I view leveraging faculty capabilities equitably largely as a leadership issue. Deans must oversee faculty workload ensuring equity and research developmental opportunities for all faculty. NNF cannot teach clinical courses due to State Boards of Nursing requirements; therefore, the range of courses open to NNF for teaching is limited. Depending on volume of NNF in an individual school of nursing, this shift would create a shift in teaching assignments of faculty, who are nurses away from teaching research-oriented courses to more clinical-oriented courses, where the workload is heavier. Consequently, nursing faculty would have less time to devote to research and subsequently their research would have less exposure within doctoral courses and among doctoral students. Thus, our choice to hire NNF was strategic with a vision to enhance the nursing discipline by hiring specialized faculty where gaps exist or to develop clusters of expertise in a particular research area that build on areas of strength or meet aspirational research goals.

The authors would argue that there is a real substantive role for NNF in schools of nursing that can complement the existing nurse-scientist faculty expertise. At Duquesne University, NNF who are distinguished scholars in their field (e.g., psychology, sociology, ethics, biostatistics) make valuable contributions to the school's research program and teaching across the curriculum, BSN to PhD. Courses taught include human development, health promotion, social psychology, ethics, pedagogy, biostatistics, and research methods. Duquesne does not have an academic health center, so creativity was needed to build an infrastructure to support a research enterprise where nurse-scientists could thrive. Nurse-scientists continue teaching their clinical expertise, exposing students in required clinical courses to real-world nurse-scientists with clinical expertise and passion.

**Example 2: Bloch's Translational Perinatal Health Disparities Research Group.** Throughout my nursing journey, interdisciplinary collaboration has been germane to my research and practice. Early on, translating research into practice meant pioneering the women's health nurse practitioner role and many other novel practice-based initiatives. Later it meant transitioning into a nurse-scientist trained in maternal-infant health outcomes research, where I use innovative data-driven strategies to address racial and ethnic perinatal health disparities. Troubled that the interdisciplinary research I was involved in had minimal translation to practice, I formed this research group for faculty, students, and community stakeholders. This allowed me to disseminate perinatal health disparities research findings to those who influence real-world practice and help build their scientific capacity. I

**Table 3 – Suggestions for Strategic Actions to Enhance Careers of Nurse-Scientists: Investing in Nurse-Scientists Needs a Multi-Level Approach**

| Level of Action        | Strategic Actions   | Suggested Ideas and Explanations for Implementation   |
|------------------------|---|---|
| Academic Nursing Unit  | Dean & Nursing Faculty: Provide awards for nursing scholarship.   | Be creative and provide opportunities for internal funding and recognition. This is especially important in areas where NIH funding lacks or other scientists are not incentivized to collaborate with nurse-scientist faculty in their NIH funded programs of research.  |
|                        | Dean & nurse-scientists: Give careful attention to hierarchical structures and microaggressions.  | The culture of each academic unit and department varies. COVID-19 pandemic and the great resignation are game changers. There is a severe nursing shortage. Attention must be given to the environmental climate that influences recruitment and retention of nursing faculty and PhD students that either fosters or hinders faculty success, health, and enjoyment of purposeful, rewarding, and impactful academic nursing careers.                                  |
|                        | Dean or Associate Deans: Listen authentically and meet regularly with nurse-scientists.   | The Dean sets the tone for valuing all faculty and supporting nurse-scientists and NNF. Understanding the reality of its research enterprise is critical and how best to leverage the university and other research networks for faculty are important. Meet with nurse-scientists individually at least yearly to understand their research and how to help support their research as it will contribute to the strength of the unit's research enterprise.            |
|                        | Nurse-scientist: Broaden understandings of AAUP academic policies and how other PhD scientists manage their tripartite expectations.              | Tenure-track faculty appointments are not work-for-hire teaching appointments. Socialization is needed for nurses who transition into tenure-track academic positions. This is especially important if the nursing leadership are not tenured or nurse-scientists. Realistic expectations of receiving NIH funding are needed, especially recognizing adequacy of the research enterprise within the nursing unit once the grant is funded. Feasible workarounds exist. |
|                        | Nurse-scientist: Broaden network of champions within your nursing unit.   | Be creative if your program of research evolves from your clinical practice expertise. You may be the only tenure-track nurse-scientist in your clinical specialty. Invest your time and attention to cultivating collegial and trusting relationships with faculty colleagues that have similar real-world clinical nursing experience and expertise.  |
|                        | Dean & nurse-scientist: Collaborate across borders.   | Be sure to champion research conducted by nurse-scientists and NNF. Create empowering forums for nursing faculty and students to learn, share, and collaborate across programs in the nursing unit. Provide invited speaking opportunities. Scientists are curious about understanding the truths of the world. Create opportunities where all can safely learn from each other and about each other.   |
| University-level       | Pay Equity for Nursing Faculty  | Deans need to lobby for pay equity. Nurses make more in clinical practice and often less than faculty in other fields (e.g., business, engineering, law, medicine).   |
|                        | Promotion & Tenure  | The research enterprise of the nursing unit must be considered when nurse-scientists are reviewed. Teaching assignments and practice requirements are often non-comparable to PhD-prepared faculty in other disciplines in R1 and R2 universities   |
|                        | Research start-ups and bridge funding<br>Dean   | Nurse-scientists need support comparable to other male-dominated science and non-nursing health care fields. Teaching load is commensurate with other high-intensive research disciplines. Nursing is a STEM.   |
| Across Nursing Schools | Be creative in recruiting future pipeline of PhD students that bring expert nursing practice experience and exposure to academic health research. | Create part-time PhD programs that attract highly respected clinical nursing experts who want their PhDs, who have access to highly funded research teams in their clinical specialty at their academic health center, and want to continue working there part-time during their studies and afterwards   |

(continued)



Table 3 – (Continued)

| Level of Action     | Strategic Actions   | Suggested Ideas and Explanations for Implementation   |
|---------------------|---|---|
|                     | Clinical research consortiums for nurse-scientists                | with a nursing faculty appointment. Academic pipelines for research, practice and teaching are needed for clinical nurse experts. An untapped group of nurses are clinical research nurses (CRN) who are the backbone of successful clinical research. They bring expertise in implementing complex research protocols.<br>Creative infrastructures across schools of nursing for research consortiums in clinically focused-areas so nurse-scientists who build their programs of research from their clinical expertise have an intra-disciplinary research team as well as their other intradisciplinary research teams. Creative ways to support this would be for several universities to fund a senior nurse-scientist position to support their PhD students with their specific clinical practice expertise (e.g., perinatal, oncology, cardiac). <i>This can be modeled after Bloch's Translational Perinatal Health Disparities Research Group.</i> |
|                     | AACN Guidelines for Promotion & Tenure for nurse-scientists       | Equitable weighting guidelines for nurse-faculty under review are needed that accounts for the research environment of the school of nursing. With many universities depending on non-tenure track nurses to teach, there are fewer tenured nurse-scientist faculty to serve as external reviewers. An equitable weighting system could consider the record of NIH funded grants to other nurse-scientists in the school, ratio of tenure to non-tenure faculty, teaching assignments, and if their research area is one that is underfunded. Peer universities may not have the appropriate peer school of nursing.  |
|                     | Recognize and reward Deans for supporting nurse-scientist faculty | National recognition should be given to Deans that have records of promotion and tenure of nurse-scientist faculty. Given leadership is in transition in many schools of nursing, mentorship for Deans are needed so our Deans are transformative verses only transactional. Deans need support in their negotiating abilities with other non-nursing deans and university leadership.  |
|                     | Lobbying Efforts  | Advocate and lobby for increased funding to NIH institutes, increased nursing faculty compensation, and PhD student nursing scholarships (part-time and full-time).   |
| Across Universities | Showcase nursing research and nurse-scientists                    | Influence presidents, provosts and other stakeholders of higher education and clinical affiliates.<br>Model employment arrangements like those given to clinical medical scientists (e.g., pay equity for clinical appointments; research start-up, membership in interdisciplinary research centers focused on clinical research such as CTSAs).   |

strategically mentor others for success, empowering them with opportunities to be first authors, PIs on grant applications, and lead presenters at prestigious scientific meetings. Outcomes over the last 12 years have been many; but, most salient for this paper was the promotion with tenure of nurse-scientist faculty ( $n = 5$ ) across several universities. Additionally, this research group, which still meets, turned out to be a creative way to sustain a research team as a tenured faculty member in an academic nursing unit where the mission for nursing research changed dramatically after leadership changed.

#### *Moving Forward: Multi-level Strategy to Leverage and Support Nurse-scientists*

Interdisciplinary research is critical in addressing our societies' complex health problems (Solis, 2017). As

the largest health care discipline, nursing has a responsibility and perhaps a burden to rapidly advance our evidence base and positively influence health from real-world clinical insights. Promoting innovation and developing the nurse scientists of the 21st century, are underscored in all areas of NINR's research programs ([National Institute of Nursing Research \[NINR\] 2022c](#)). Yet, as shown above, we have a very disturbing inverse disproportional relationship in part due to the allocation of research dollars. Strong advocacy is required to address this disturbing long-term trend. Enhancing careers for nurse-scientists for success requires collaboration among multi-level stakeholders within and outside nursing. Creativity, respect, and equity are needed so the role of the nurse-scientist is attractive to those in the pipeline and rewarding enough to retain those in their nursing

faculty positions. [Table 3](#) provides some suggestions to stimulate more thought and dialogue of how to move forward.

## Conclusions

Nurse-scientists build upon their clinical nursing knowledge and experience bring a unique perspective on the human condition within the context of illness and health ([Cashion and Pickler, 2018](#)). This perspective is critical in identifying clinically relevant research questions, which is at the heart of nursing, a practice discipline. As nursing faculty, we should not lose sight of what we bring to nursing science and would argue that we should rely on our interdisciplinary colleagues to leverage their expertise to enhance research on the human condition within the context of illness and health but not replace nursing faculty. Investments are needed in the nursing research enterprise at the funding level, graduate education level, school/college infrastructure level, and individual nursing faculty level so that research-focused nurse-scientist nursing faculty do not become an endangered species.

## Credit Statement

Each author contributed significantly to the conceptualization and writing (review and editing) of the manuscript. Regular meetings were held to conceptualize, write, and edit the drafts until the final manuscript was agreed upon.

*Joan Rosen Bloch:* As the lead author, I led the initial meetings where we both conceptualized the paper and acquired secondary data that was publicly available. I continued to contribute significantly to the conceptualization and writing (review and editing) of the manuscript.

*Mary Ellen Smith Glasgow* contributed significantly to the conceptualization and writing (review and editing) of the manuscript.

## Author Contribution

Each author contributed significantly to the conceptualization and writing (review and editing) of the manuscript.

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