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Call to action to support the success of midcareer nurse scientists

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ABSTRACT

Mid-career nurse scientists in academia are at risk for burnout and departing scientific careers, particularly those in research-intensive academic settings. With the shortage of nursing faculty and the public health need for high-quality nursing research, it is critical to retain current research-focused individuals in nursing. In this paper, we discuss definitions and expectations of mid-career scientists, challenges and barriers faced by mid-career scientists, and opportunities for mid-career scientists, informed by both nursing and non-nursing literature. Finally, we focus on definitions and expectations, challenges, and opportunities specifically related to mid-career nurse scientists in research-intensive academic settings.

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Midcareer scientists in academia are at risk for burnout and departing scientific careers, and midcareer nurse scientists are particularly vulnerable, particularly those in research-intensive academic settings (that is those referred to as "R1" institutions in the Carnegie classification; (Aquino, Lee, Spawn, & Bishop-Royse, 2018; Broome & Fairman, 2018; Indiana University Center for Postgraduate Education, n.d.). With the shortage of nursing faculty and limited number of PhD graduates each year, it is critical to retain current research-focused individuals in nursing. The discussion is based largely on literature from outside of the nursing discipline, highlighting the dearth of information from the nursing profession on this important issue. Finally, we focus on definitions, expectations, challenges, and opportunities specifically related to midcareer nurse scientists in research-intensive academic settings.

Defining "Midcareer"

A variety of definitions of the term "midcareer" in academia are present throughout the literature in both nursing and other fields. Most commonly, a midcareer scientist is defined by characteristics such as age, rank and tenure status, and time since receiving independent research funding.

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One of the most commonly used definitions of "midcareer" is the age of the researcher, particularly in the literature of non-nursing disciplines. In a frequently-cited paper on the shifting demographics of grant awardees at the National Institutes of Health (NIH), Charette et al. (2016) define midcareer researchers as those who fall within the ages of 41 to 55. Early stage researchers are defined as age 24 to 40 and established researchers as 56 and older (Charette et al., 2016). A commentary from NIH defines midcareer researchers as both those who are within 10 years of receiving their first major independent NIH award and/or are approximately age 41 to 55 (Lauer, Tabak, & Collins, 2017).

The second most common definition of "midcareer" is rank and tenure status. Much of the interdisciplinary academic literature, which is not solely biomedical, refers to "midcareer" as individuals who have achieved tenure and are at the associate professor rank at their respective institution (Campion, Bhasin, Beaudette, Shann, & Benjamin, 2016; Romano, Hoesing, O'Donovan, 2004). A white paper from the Collaborative on Academic Careers in Higher Education defines the midcareer stage as an associate professor with tenure and states that a large percentage of individuals in this stage report have no intent to submit a dossier for promotion to full professor (Mathews, 2014). Similarly, several papers out of single institutions (e.g., Rochester Institute of Technology; Michigan State University) define midcareer as the lengthy period after tenure is achieved which is marked by productivity and influential leadership/management roles and typically co-occurs with midlife (Baldwin & Chang, 2006; Baldwin, DeZure, Shaw, & Moretto, 2008; Canale, Herdklotz, & Wild, 2013). Baldwin et al. (2008) further categorize midcareer as early (1–5 years after receiving tenure), and late midcareer (6–20 years post-tenure).

A third definition, is the time from achievement of a major independent research award equivalent to an R01, is frequently used to describe the stage of a researcher particularly in literature from or regarding NIH. In 2007, a focus on early career researchers was initiated through the "early stage investigator" program at the NIH to focus research dollars on those within 10 years of their terminal degree. Later in 2016, recognizing the difficulty that many researchers face with maintaining stability of research funding, the "Next Generation Researchers' Initiative" concept was introduced. As a result, the National Academies of Sciences, Engineering, and Medicine compiled a comprehensive report outlining policies and recommendations to support future researchers (National Academies of Sciences, Engineering, and M. P. and G. A. B. on H. E. and W. C. on the N. G. I, 2018). Within this report, the authors describe the R01 grant mechanism as "an important benchmark for success on the path to independent research" and suggest that "initial career success is obtaining a tenure-track research position." Hence, these two milestones would mark the transition from early stage to midcareer. The report highlights a trend in NIH funding whereby the average age of first R01 grant increased from age 36 in 1980 to age 43 in 2016, not explained by delayed start or culmination of doctoral education. NIH recognized those who are "early established investigators," or a PI within 10 years of receiving their first R01 equivalent research award. This early established investigators status may be considered a marker for an individual's status as "midcareer." Leaders at NIH have stated that the hypercompetitive environment and stress on early- and midcareer researchers is an issue that keeps them "up at night," hence they developed a working group to consider how to support productivity of midcareer investigators in the biomedical research workforce (Lauer & Collins, 2018).

Challenges for Midcareer Faculty and Scientists

Existing literature about midcareer challenges primarily focuses on academic medicine or addresses general (e.g., non-nursing) midcareer faculty concerns. Although midcareer academics are the largest and potentially the most productive portion of faculty and have been described as "the keystone of the academic enterprise" (Baldwin & Chang, 2006), issues of meaning, identity, and legacy often surface during the midcareer stage. Campion et al. (2016) suggest that midcareer academic medicine faculty may question personal and professional identity stemming from midcareer limitations. For example, evidence suggests that physicians in midcareer years' experience increased levels of burnout (Shanafelt, 2009), low vitality or "midcareer malaise" (Dyrbye et al., 2013). Similarly, academics in general report greater dissatisfaction in midcareer (Romano et al., 2004). The longer faculty remain in the associate rank, the more dissatisfied they become with their work, colleagues, leaders, and level of recognition (Mathews, 2014), impacting their desire and ability to contribute to their field. Moreover, midcareer faculty often perceive a shortage of opportunities for mentoring, feedback, and professional development that can lead to feelings of isolation (Canale et al., 2013).

In many disciplines including nursing, a productive academic career consists of teaching, research, and service. Increasingly competitive federal funding for midcareer awardees make it particularly difficult to sustain research in academe (Broome & Fairman, 2018). Thus, sustaining a productive academic career is particularly challenging for research-focused faculty and those in research-intensive universities and departments. Mentoring and resources are frequently directed to early stage scientists, leaving those in the midcareer stage feeling neglected and overlooked (Baldwin et al., 2008; Nowell, Norris, Mrklas, & White, 2017). Vague and inconsistent expectations about promotion from school administrators requiring midcareer scientists to constantly reassess and adapt their workload, can eventually lead to disengagement or

even attrition (Baldwin et al., 2008). In the same way, expectations about research may be unclear. Midcareer scientists are often advised to both broaden their program of research and refine and/or reframe their focus (National Institute of Nursing Research, 2016).

Little is published about the unique challenges facing midcareer nursing faculty and scientists. To date, the Midwest Nursing Research Society (MNRS) Midcareer Scholars Task Force was the first to examine midcareer issues in nurses. The aim of their cross-sectional survey of all active MNRS members was to identify perceived institutional support and determine organizational activities that could benefit the research and careers of midcareer scholars (Hershberger et al., 2018). MNRS respondents ($N = 286$; 22.9% response rate; 27.3% associate professors) identified conference attendance and librarian assistance as the most common institutional support provided. Of the almost 15% who reported "no perceived support," six (7.7%) were associate professors and two (4.5%) were full professors. Open-ended survey responses identified institutional barriers such as support that focused primarily on pretenure faculty and lack of formal mentoring at midcareer. Hershberger et al. (2018) concluded that targeted mentoring and career planning through academic institutions and professional organizations is needed to advance midcareer scholars. In a recent literature review of 34 articles describing 30 mentorship programs for academic nurses, Nowell et al. (2017) found that the majority of mentorship programs were focused on new and junior faculty, with no programs targeting those in midcareer. The most common program objectives were to develop new faculty and maximize faculty achieving tenure ($n = 16$), facilitate transition from clinician to educator ($n = 7$), enhance faculty collegiality and socialization ($n = 6$), or increase research productivity ($n = 6$). These findings suggest an opportunity for mentorship programs for midcareer nurse scientists.

Finally, midcareer faculty/nurse scientists may be at a life stage where they must balance increased responsibilities of home and work. For faculty, especially women, to be promoted and retained in academia, they must make personal decisions (e.g., child or elder care) at the same time they face organizational policies, practices, and culture that challenge them at this stage of career development (Canale et al., 2013). Women and faculty of color in midcareer often have additional demands on their time because of continuous requests to sit on committees and serve as student and junior faculty advisors (Baldwin et al., 2008; Canale et al., 2013; Topp, Hershberger, & Bratt, 2017).

Methods to Address Challenges of Midcareer Scientists

Based upon higher education literature, there are several methods to address the challenges of midcareer scientists' loss of enthusiasm or purpose and lack of resources. First, for faculty members experiencing a loss of enthusiasm and clear sense of purpose at midcareer, there is a great opportunity to re-evaluate and make positive changes for the future. In the past, one suggestion for midcareer faculty was to shift focus to teaching and to rethink teaching styles and strategies (Baker-Fletcher, Carr, Menn, & Ramsay, 2005). However, this strategy could cause a faculty member to lose his/her focus on the research agenda, particularly in the competitive funding environment of today. Instead, mentoring programs and career workshops may be helpful for reigniting a faculty member's enthusiasm for their program of research. As an example, formal mentoring programs exist, such as the "ADVANCE" midcareer mentoring initiative which focuses on intentional career planning using a 6-step process with trained mentors (Buch, Huet, Rorrer, & Roberson, 2011); the program allows faculty to write a career plan and be held accountable for that plan. Others suggest a mentoring program geared toward women faculty in the form of mentoring communities, or "Communities of Practice," in which members connect through common themes and may address feelings of isolation and lost momentum (Rees & Shaw, 2014). Peer mentoring groups may be another reasonable option, given the increasing dearth of senior nurse scientists (Brody et al., 2016; Heinrich & Oberleitner, 2012).

Similarly, career workshops may provide the opportunity for intentional reflection and clarification of purpose for faculty who experience aspects of burnout, such as mental and physical exhaustion, when they reach midcareer (Aquino et al., 2018). Reflection includes an honest assessment of career choices (both positive and negative) that have had an impact on current attitudes and developing plans to refresh research goals. This reflection can help scientists identify their strengths and creativity, aspects of work that are fulfilling, and work to reintegrate that fulfillment into their everyday work lives (Mathews, 2014; Strage & Merdinger, 2015; West, 2012).

Second, many midcareer researchers report a lack of resources and difficulty getting to the next level in their research career (e.g., sustained research funding to facilitate movement to full professor). Although midcareer faculty must take personal responsibility for their own careers (Strage & Merdinger, 2015), higher education literature supports the importance of administrators in providing opportunities for scientists at midcareer. A key role of leadership is in knowing the strengths of faculty and bringing teams together to achieve common goals (Strage, Nelson, & Meyers, 2008). Essential initiatives led by administration would provide support for faculty who want to improve aspects of teaching; research support time for faculty who may be pursuing their program of research or developing another direction in research; and awards and recognition specifically for midcareer faculty (Baldwin & Chang, 2006).

Challenges and Opportunities for the Nursing Profession

As with other disciplines, information about expectations, needs, and challenges of midcareer nurse scientists is inconsistent and difficult to access. This is primarily due to the lack of agreement about what constitutes the midcareer period for nurse scientists and whether the specifications and expectations would change based on the employing agency. Further, the specifications and expectations may change based on whether the midcareer nurse scientist is expected to do research as part of their role or would like to do research. Midcareer nurse scientists employed in academia may have differing expectations, positions, needs, and challenges from those in the industry, military, or other government entity (e.g., NIH). For example, nurse scientists employed in clinical institutions may have a greater part of their effort focused on research and less on teaching or service. Similarly, nurse scientists in less research-intensive academic settings may have greater expectations of teaching and service, with minimal expectations for externally-funded research. Hence, nurse scientists who move between institutions which are not all research-intensive may have confusion about expectations and roles.

As discussed previously, the academic literature is not explicit about specific definitions of midcareer scientists; however, for nurse scientists in academia, "midcareer" is most often viewed as the time between when the rank of associate professor and tenure is achieved and when the rank of full professor is achieved (National Institute of Nursing Research, 2016). Conflicting definitions from other fields (e.g., amount of grant funding; Lauer et al., 2017) or from NIH (e.g., time since first R01 equivalent) may cause nurse scientists to be unclear as to when midcareer begins and ends and the ambiguity may also depend upon the setting (e.g., research-intensive vs. not). Further, ambiguity about midcareer parameters can cause confusion about what constitutes the senior scientist position. In some clinical institutions employing nurse scientists, the role of nurse scientist is evolving and designations of levels of nurse scientists are not identified.

A major challenge that influences research productivity of the midcareer nurse scientist in research-intensive academic settings is the shortage of faculty and the expected numbers of faculty retirements (Fang & Bednash, 2014; Smeltzer et al., 2014a). With a national faculty vacancy rate of 7.9% and increasing numbers of faculty retiring (Nowell et al., 2017), midcareer nurse scientists are often required to teach more to compensate for vacancies (Smeltzer, Sharts-Hopko, Cantrell, Heverly, Wise et al., 2017), thus limiting the time for research and scholarship activities. In a study of nursing faculty from 71 schools of nursing, 187 respondents to an open-ended item identified senior faculty retirements and subsequent increased doctoral faculty workload as the number one issue (Smeltzer, Sharts-Hopko, Cantrell, Heverly et al. 2017). Similarly, participants in a focus group of nurse faculty identified the demands of teaching as one of the major factors that affect scholarship (Smeltzer, Sharts-Hopko, Cantrell, Heverly et al., 2017). Further, there is a shortage of PhD prepared faculty, so midcareer nurse scientists must serve on more doctoral committees and assume more responsibility for mentoring early career nurse scientists, often before their programs of research are established (Broome & Fairman, 2018; Smeltzer, Sharts-Hopko, Cantrell, Heverly et al., 2017). Much of this work is invisible and not considered in workloads or documented in annual reports (Smeltzer et al., 2014b). Thus, both faculty and administrators may be unaware of the amount of time expended in these efforts. Finally, midcareer nurse scientists may be asked or required to assume administrative positions that curtail research-related activities (Sharts-Hopko, 2016).

A fluctuating and demanding work environment can present a distinct challenge to midcareer nurse faculty (Candela, Gutierrez, & Keating, 2013). For example, midcareer nurse scientists are frequently required to supervise student Doctor of Nursing Practice (DNP) projects (Broome & Fairman, 2018; Nelson, Cook, & Raterink, 2013), which can restrict the time available for research-related activities. Further, with greater numbers of students at all levels, the student-to-faculty ratio continues to increase, demanding more faculty time for teaching and evaluation, again diminishing time and energy available for research efforts (Brady, 2010; Smeltzer et al., 2016; Smeltzer, Sharts-Hopko, Cantrell, Heverly et al., 2017). In addition, given that nursing is a practice discipline, requiring students to have clinical experience at both the undergraduate and graduate level, academic midcareer nurse scientists may be required to provide direct supervision of students, particularly undergraduate students that may extend for 1 or 2 workdays. Midcareer nurse scientists assigned to clinical teaching and supervision roles may have less time for research activities and as a result not able to accomplish their research goals (Smeltzer et al., 2015). Similarly, midcareer nurse scientists who had significant protected time in a postdoctoral position or junior faculty position may be ill prepared for the myriad of responsibilities that arise once promotion/ tenure is achieved. Further, as a practice discipline, nursing students have a limited degree of exposure to research in baccalaureate and master's-level programs, hence limiting the pipeline of nurses in PhD programs and the pool of postdoctoral nurse scientists. In this regard, Broome and Fairman (2018) note the limited number seeking PhDs and the implications for the future needs of the discipline.

Another factor that can influence midcareer nurse scientists is their age upon completion of the PhD. Many nurse scientists earn their PhD in midlife, thus truncating their years as a nurse scientist. The mean

age of associate professors of nursing (considered midcareer) is 57.6 years (American Association of Colleges of Nursing, 2017). Recent studies suggest that the age of a PhD-prepared faculty member and reported levels of emotional exhaustion (a component of burnout) are significant factors involved in intent to leave academia (Aquino et al., 2018). Further, many may retire earlier than scientists in other fields (Berlin & Sechrist, 2002; Smeltzer et al., 2014a). This allows less time to accomplish research-related goals in their post PhD worklife (Berlin & Sechrist, 2002).

Finally, the majority of nurse scientists are women, which are a small portion of science faculty at research universities. As such, they typically receive fewer resources and less support than men and are less represented in academic leadership positions due to unintentional biases and institutional structures that hinder advancement of women (Magrane et al., 2012). With regard to NIH funding, midcareer nurse scientists now face a hypercompetitive funding environment with historic underrepresentation of women and nurse scientists, yet without the advantages of early investigator status. For example, in 2017 funding success rates for all NIH research grants was 18.7% (range: 8.9%–30.6%), however, the National Institute of Nursing Research success rate was only 8.9% (National Institutes of Health, 2018). Nurse scientists do receive funding from other sources, but numbers and success rates are difficult to determine. Midcareer academic challenges, therefore, are intensified by the inherent vulnerabilities of women, faculty of color, and nurse scientists. The most important aspects of faculty retention, stable institutional leadership that is supportive of individual and family life, that uses clear communication strategies, and that provides a culture of support. (Lee, Miller, Kippenbrock, Rosen, & Emory, 2017).

Call to Action

In the past 10 years, close to 15% of full-time faculty have left their positions each year, with up to 30% of attrition due to retirements, close to 50% due to leaving for nonacademic positions, and 20% of attrition due to leaving for administrative positions (Candela, Gutierrez, & Keating, 2015; Fang & Bednash, 2014). Further, although nurse scientists may not leave academia altogether, the challenging funding environment may promote movement into an administrative or teaching path. This reduces their research capacity to contribute to the body of knowledge and foster the next generation of nurse scientists (Broome & Fairman, 2018). Given that one-third of nurse faculty members are projected to retire by 2025, many of whom are senior nurse scientists (Fang & Kesten, 2017), retention of midcareer nurse scientists is essential. Support of midcareer nurse scientists will enhance the maintenance of a stable faculty and enhance the educational and research environments of academic institutions (Lee et al., 2017).

Given that supportive institutional leadership is one of the most important factors of faculty retention (Candela et al., 2015); we call for deans and other administrators to demonstrate a genuine commitment to address the rapid attrition of midcareer nurse scientists in academia. This must include thoughtful attention to the current challenging funding environment and creative methods to support faculty's efforts to maintain their programs of research. Many of the challenges for midcareer nurse faculty are unique to nursing, hence schools/colleges of nursing must take responsibility for fostering their faculty members' successes. The support must start within the school/college itself, without being dependent upon university-level initiatives. The profession of nursing is at a critical juncture in which we will lose an entire segment of faculty and years of research experience without close attention to creative methods to enhance resources for these faculties.

Clearly, the time is now to address the challenges faced by midcareer nurse scientists. With the relatively limited number of PhD graduates in nursing (Broome & Fairman, 2018), the older age of current nurse PhDs and the retirements of nurse PhDs (American Association of Colleges of Nursing, 2017), it is critical to retain midcareer nurse scientists and ensure they thrive. In addition to lost enthusiasm/sense of purpose and burnout, the many challenges that may particularly affect midcareer nurse scientists are the competitive funding environment/limited resources for research success, shortage of PhD-prepared faculty in schools of nursing, large student-to-faculty ratios, clinical teaching, higher age at completion of PhD, and assumption of administrative positions. We propose that academic leaders consider the opportunities described above such as, but not limited to, the following:

- consider developing new institution-specific and/or nurse scientist-specific midcareer mentorship programs and other supportive research/career/wellness workshops;
- explore the use of resources already available such as the Midcareer Technical Workshop videos from National Institute of Nursing Research (National Institute of Nursing Research, 2016) and midcareer mentorship programs in professional organizations (e.g., Society of Behavioral Medicine Leadership Institute for midcareer faculty);
- acknowledge the current challenges in the funding environment and develop inventive methods to further the programs of research of midcareer nurse scientists;
- evaluate innovative ways to reduce or shift workload to allow for focused efforts for the program of research (e.g., reduce service on DNP committees, evaluate efficient methods to mentor junior faculty and PhD students) and develop workload policies that acknowledge the "hidden" activities overloading midcareer nurse scientists; and,
- provide administrative support for new or established individual and family policies that allow midcareer nurse faculty to thrive.

Further, support is warranted for other types of scholarship which may have significant impact. For example, nurse scientists can make substantial national and international contributions in areas of health policy (Ellenbecker & Edward, 2016) and in nursing education research (Oermann & Kardong-Edgren, 2018).

One challenge for administrators and faculty may be a lack of common language regarding the definition of a "midcareer" nurse scientist. We propose that, from this point forward, nurse scientists in research-intensive academic settings use the rank of associate professor (with tenure, as relevant) as an indicator of midcareer status. We acknowledge that this definition may not apply in all settings but this clarification may assist academic institutions create resources specific to midcareer nurse faculty.

There are opportunities to understand further the challenges and opportunities faced by midcareer nurse scientists. In particular, we call for future research to evaluate nurse scientists' and administrators' perceptions about current challenges and resources available to this sector of the faculty. In addition, we call for midcareer nurse scientist to declare/decide/claim what resources would be most beneficial to them in advancing to the next level of senior scientist. Nurse scientists at the midcareer stage are advised to review resources available to them and be ready to engage in honest conversations with leadership (Topp et al., 2017). These conversations, combined with findings from future research about the unique needs of nurse scientists, are critical to assisting administrators and academic institutions in developing or maintaining support programs and resources for midcareer faculty. This will allow them to actuate the full extent of their research and leadership abilities. Our discipline and nursing science may depend on addressing concerns related to midcareer nurse scientists.

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