



Careers of PhD-prepared nurses: A global survey

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ABSTRACT

Background: PhD-prepared nurses uniquely contribute to nursing by conducting research required to address challenges in healthcare and nursing. However, there is limited understanding on the careers of PhD-prepared nurses.

Purpose: To describe careers, factors related to careers, and recommendations for the careers of PhD-prepared nurses.

Methods: A global cross-sectional study was conducted using a convenience sample of individuals with a Doctor of Philosophy degree in nursing science. A self-developed survey instrument was used.

Findings: Of the 1,308 PhD-prepared nurses, most worked in research and teaching positions. Most reported positions for PhD-prepared nurses being available within their organizations. Mentoring and development of career pathways, including clinical-academic positions, were recommended.

Discussion: PhD-prepared nurses pursue a variety of careers after the doctorate. Development of career pathways with positions with time for research, opportunities for professional development, and mentoring can support careers. Future research is suggested to support knowledge development in the field.

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Introduction

PhD-prepared nurses uniquely contribute to nursing by developing research evidence required to progress nursing and to address challenges in healthcare and nursing (DeVon et al., 2016; McKenna, 2021; Polomano et al., 2021). PhD-prepared nurses have a vital role in strengthening quality of care, and in educating future generations of nurses and nurse scientists (American Association of Colleges of Nursing [AACN], 2022a; Bullin, 2018; Negarandeh and Khoshkesht, 2022; Polomano et al., 2021; Margolis et al., 2023). Thereby, PhD-prepared nurses need to contribute to the public debate on health issues and to the development of local, national, and international policies and guidelines (Rugs et al., 2020; Salvage et al., 2019; Watson et al., 2021). Furthermore, PhD-prepared nurses have the responsibility to progress nursing science and preserve its uniqueness (American Association of Colleges of Nursing (AACN), 2022a).

There is a critical need for more PhD-prepared nurses to guide the development of the nursing discipline and to educate nurses and

nurse scientists (AACN, 2022b; Jarosinski et al., 2022). Although it has been argued that more nurses should achieve higher levels of education (Institute of Medicine (US) Committee on the Robert Wood Johnson Foundation Initiative on the Future of Nursing, 2011), enrollment into PhD programs has remained relatively flat in the last decade (AACN, 2022a; National Academy of Medicine, 2021). The exact number of nurses with doctoral degrees is unknown due to a lack of central registration. It is, however, estimated that 1% to 2% of the nursing workforce has either a PhD or a Doctor of Nursing Practice degree, with substantial differences between countries (Cheraghi et al., 2014; Kim et al., 2022). In line, there are differences in the viability, visibility, and impact of PhD-prepared nurses globally (Lewandowski, 2017; Thompson & McKenna, 2024).

PhD education for nurses first emerged in the United States in the 1930s (Kim et al., 2022). Globally, the introduction and development of doctoral education in nursing science varies significantly across countries as PhD programs were established in the United Kingdom in 1961, South Africa in 1967, the Republic of Korea in 1981, and India and Thailand in 1984 (Kim et al., 2022). Especially in the regions of North America and Europe, the number of PhD programs for nurses rapidly expanded in the 1970s (Carter, 2013; EUA Council for Doctoral Education, 2022a; European Union, 2020; Ketefian & Redman, 2015; Lahtinen et al., 2014). The past decade has seen a

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substantial expansion of nursing PhD programs across various countries and global regions (Dobrowolska, Chruściel, Pilewska-Kozak, et al., 2021; Hafsteinsdóttir et al., 2019; Weaver et al., 2023). Globally there are differences in curricula, admission criteria, supervision, and titles awarded in PhD programs (Dobrowolska, Chruściel, Pilewska-Kozak, et al., 2021). In contrast to the taught and more structured PhD programs in North America, PhD education in Europe focuses on the conduct of research to produce a thesis, and often includes required and optional theoretical and methodological courses (EUA Council for Doctoral Education, 2022b; European University Association, 2010; McKenna, 2018; McKenna & Cutcliffe, 2001; Seltrecht, 2016).

Careers are understood as an unique series of work experiences that unfold throughout an individual's life. These experiences encompass objective aspects of employment, such as positions and areas of work, but also career experiences of individuals. A comprehensive understanding of careers therefore requires consideration of both objective and subjective components (Brown & Lent, 2013; Greenhaus et al., 2010; Patton & McMahon, 2006). For the purposes of this study, a career is defined as the unique sequence of positions and the related experiences after obtaining a Doctor of Philosophy (PhD) degree in nursing science (Brown & Lent, 2013; Patton & McMahon, 2006). To broadly capture careers and career experiences, this study was not restricted to careers in certain fields of nursing (science).

PhD-prepared nurses pursue careers across various fields of nursing upon completing their doctoral education, however, most continue to have academic careers with research and/or teaching positions at institutions of higher education (AACN, 2022a; Negarandeh & Khoshkesht, 2022). Career paths for PhD-prepared nurses also emerge in nonacademic settings such as clinical, political, and industrial settings (Broome et al., 2021; Clarke, 2024; Dobrowolska, Chruściel, Markiewicz, et al., 2021). Challenges related to the careers and employment of PhD-prepared nurses have been reported (McKenna, 2021; Singh et al., 2022; van Dongen et al., 2023; van Dongen and Hafsteinsdóttir, 2022), including limited numbers of positions and opportunities for career advancement being available (Al-Nawafleh et al., 2013; Bleah et al., 2023; McKenna, 2021; van Dongen et al., 2023). Also, the need to develop additional competencies to become independent scientists or academic educators was reported (Bullin, 2018; Garner & Bedford, 2021; Grassley et al., 2020; McMillian-Bohler & Tornwall, 2023; McNelis et al., 2019; Nehls et al., 2016). PhD-prepared nurses also experience difficulties with work-life balance (Bagley et al., 2018; Bourgault et al., 2022; Matthews et al., 2021; Melnyk et al., 2023; Singh et al., 2022, 2020) and some experience disruptive behaviors such as bullying, harassment, and discrimination (Bice et al., 2019; Park & Kang, 2023). These challenges may not be exclusive to nurses with PhD degrees, as they are also prevalent among a broader group of academically trained nurses (Barken & Robstad, 2024; Singh et al., 2022). The career challenges of PhD-prepared nurses identified in this study are also similar to career challenges faced by postdoctoral researchers in other disciplines (Engels et al., 2024).

An earlier review reported that there is limited understanding of the careers of PhD-prepared nurses (van Dongen et al., 2023). This review also identified differences in career experiences through factors related to careers of PhD-prepared nurses, including preparedness for postdoctoral positions, intrinsic motivation, support sources, work-life balance, workplace behaviors, as well as availability of structures for career advancement and access to educational opportunities (van Dongen et al., 2023). The current gap of knowledge concerns a lack of studies addressing careers and career experiences of PhD-prepared nurses from a global perspective. More knowledge about these issues is expected to strengthen the PhD-prepared nursing workforce, which ultimately may have a positive impact on health and workforce outcomes (Morris et al., 2021; NAM, 2021; Singh & Spadaro, 2022).

Purpose

The purpose of this study was to describe the careers of PhD-prepared nurses, factors related to careers, and recommendations for these careers.

The following research questions were used:

- What are the careers and in what work fields and work activities are PhD-prepared nurses engaged?
- What are PhD-prepared nurses' experiences with factors related to their careers, including preparedness for postdoctoral positions, support sources, value and facilitation of research, career pathways and positions, opportunities for professional development, work-life balance, and workplace behaviors?
- What are the recommendations to support careers of PhD-prepared nurses from their perspective?

Methods

Study Design

A cross-sectional survey study was conducted using a structured survey among the global PhD-prepared nursing workforce. The study was carried out between January 2022 and November 2024. The study was reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement for cross-sectional studies (von Elm et al., 2007).

Study Setting and Sample

The target population consisted of individuals with a PhD in Nursing or Nursing Science. A convenience sample of PhD-prepared nurses from the six World Health Organization (WHO) regions was used, including the region of Africa, America, Europe, the Eastern Mediterranean region, South-East Asia region, and the Western Pacific region (WHO, n.d.). A target of at least 1,000 PhD-prepared nurses was set to maximize the potential for capturing varied perspectives across geographic, institutional, and professional contexts, to provide meaningful insights into careers of PhD-prepared nurses (Polit & Beck, 2017). The inclusion criteria was having a Doctor of Philosophy (PhD) in Nursing or Nursing Science. No other criteria were applied to reflect the variability in careers of PhD-prepared nurses.

Recruitment

Snowball sampling was used to recruit potential participants (Parker et al., 2019). There is no central registration of PhD-prepared nurses at the global and, often, not at national levels. Various strategies were used to recruit PhD-prepared nurses. First, national, European, and international nursing (science) organizations were approached to distribute study information among their members.

Second, potential contacts in the global regions were identified from the research team's networks and through internet. The contacts were asked to forward study information to relevant persons in their organizations and to relevant organizations in their country. Also, they were asked to send reminders after 2 weeks. Third, study invitations were directly sent to potential participants identified on the webpages of organizations. Fourth, study invitations were shared on the research team's personal social media channels. Finally, respondents were asked to forward the study invitation to colleagues (Supplementary File A). Of the 23 organizations approached, three were global organizations, five were European organizations, and 15 were national organizations. Of these, two European nursing science organizations and two national associations distributed study

information among their members. In total, 454 contacts were approached. Moreover, 2,353 potential participants were directly approached. A detailed logbook was kept tracking the recruitment, including approached organizations and contact persons, date of approaching, and agreements as well as contact information of potential participants that were directly approached.

Survey Development and Data Collection

The survey instrument was created for this study. First, the researchers familiarized with the existing literature on careers and factors related to the careers. Each of the study variables was operationalized and a series of items were designed, mostly including multiple-choice questions or questions with visual analog scales.

The survey was developed in English, assuming English as the international language of science. Skip logic was used to reduce the burden on participants. Face validity was evaluated by a two-phase pilot (Polit & Beck, 2017). First, four doctoral students and two PhD-prepared nurses provided feedback on the survey's content, including the clarity of the items, and response categories as well as the layout and technical aspects. In the second phase, 12 PhD-prepared nurses from different global regions provided feedback on the aforementioned topics. Although these PhD-prepared nurses did not represent all global regions, they were chosen based on their recognition as international leaders in nursing science. The pilot resulted in minor changes in the items' wording. Most study variables included multiple single-item questions with different scale options, however, in study variables with theoretically bound variables, the Cronbach's alpha was calculated using data from this study (Kimberlin & Winterstein, 2008).

Data were collected between December 2022 and June 2023 using the survey tool software REDCap. Potential participants received a study invitation through email, a newsletter of a professional organization, or social media. The study information included a web-link to the webpage with the survey. Before starting with the survey, participants had to confirm compliance with the inclusion criteria: having a Doctor of Philosophy (PhD) in Nursing or Nursing Science.

Survey Instrument

The survey covered demographic characteristics, careers of PhD-prepared nurses, factors related to the careers, and recommendations for careers. The survey's measures, topics, questions, and response categories are detailed in [Supplementary File B](#).

Demographic Characteristics

Demographic information was collected using multiple-choice and open-ended questions on age, nationality and educational background, including information on the professional degree(s), master's degree(s), and doctoral degree(s). Similarly, information about work characteristics was collected, including type of working organization and fields of work (13 items).

Careers

Multiple-choice and open-ended questions were included on: (a) current position(s); (b) current work fields and work activities; and (c) positions in postdoctoral career (10–16 items).

Factors Related to Careers

Factors related to careers identified in the review of van Dongen et al. (2023) were used, and included: (a) preparedness for postdoctoral positions; (b) support sources; (c) value and facilitation of research; (d) career pathways and positions; (f) opportunities for professional development; (g) work-life balance; and (h) workplace

behaviors. All items refer to the respondents' current working situation, except the preparedness for postdoctoral positions.

The *preparedness for postdoctoral positions* was measured using the research competencies for PhD-prepared nurses (Numminen et al., 2019). The competencies and definitions were presented, and respondents were asked to rate their level of preparedness after doctoral education on a 100-mm visual analog scale ranging from "not at all" to "extremely well" prepared (Sung & Wu, 2018) (15 items). To improve readability, minor changes were made by shortening the descriptions of the competencies, in collaboration with the research team, ensuring that the original meaning was preserved. The Cronbach's alpha coefficient for these items was 0.935. Similarly, a 100-mm visual analog scale was used to explore preparedness for positions in research, education, administration/management, policy and business, and industry (five items). For these items, the Cronbach's alpha coefficient was 0.794. Open-ended questions were used to identify preferences for additional preparation during doctoral education and in current positions (two items).

Support sources were explored using a 100-mm visual analog scale on support of colleagues with a nursing background, colleagues with another professional background, management, and family and friends (four items). Mentoring included a multiple-choice question on organizational support for mentoring (one item). The *value and facilitation of research* was explored with a 100-mm visual analog scale concerning the value of nursing research by the organization and the facilitation of research (two items). *Career pathways and positions* were using multiple-choice questions on the availability of positions and career pathways (three items). Suitable positions were defined as positions that include competencies acquired through PhD education. *Satisfaction with the work-life balance* was explored using a 100-mm visual analog scale (one item). *Opportunities for professional development* were explored using multiple-choice questions on access to postdoctoral programs and other educational opportunities and a 100-mm visual analog scale to explore satisfaction with these opportunities (three items). *Workplace behaviors* were explored with multiple-choice questions on bullying, sexual harassment, age discrimination, and discrimination linked to ethnic background, race, and/or sexuality (four items).

Recommendations for Careers

Recommendations to support careers were identified by the PhD-prepared nurses using one open-ended question.

Data Analysis

Data were exported from REDCap into IBM SPSS Statistics 29. Available case analysis was conducted, and univariate descriptive statistics were used to summarize categorical (i.e., frequencies and percentages) and numerical (i.e., mean, SD, and range) data for the total sample as well as for each of the global regions (Portney & Watkins, 2014). A similar approach was followed to describe outcomes for countries with more than 10 responses. A statistician was consulted during the preparation phase.

Textual data were transferred into NVivo (version 11). A summative content analysis was used in which the researchers familiarized themselves with the data, categorized the data based on similarities, and then counted the categories (Hsieh & Shannon, 2005). This process was checked by a second researcher.

Ethical Issues

The study was conducted according to the European Code of Conduct for Research Integrity (European Federation of Academies of Sciences and Humanities, 2023) and General Data Protection Regulation (European Union, 2016). The study protocol was evaluated by the Ethics Committee for Human Sciences of the University of Turku

Table 1
Sample Characteristics

	Total Sample (n = 1,308)*	Africa (1.7%, n = 16) */†	America 28.3% (n = 271) */†	Europe (61.7%, n = 590) */†	Eastern Mediterranean Region (0.8%, n = 8) */†	South-East Asia Region (1.6%, n = 15) */†	Western Pacific Region (6%, n = 57) */†
	Mean (range)						
Age in years	50.1 (24–83)	51.1 (38–67)	55 (27–83)	47.6 (25–69)	52.3 (34–78)	47.4 (27–35)	52.8 (24–74)
Age completing nursing degree	23.7 (17–58)	26.1 (21–37)	24 (17–58)	23.5 (17–48)	22.9 (20–30)	25 (21–40)	24.3 (18–49)
Age completing master degree	31.9 (19–56)	33.6 (25–43)	31.9 (23–55)	31.6 (16–53)	30.6 (21–44)	29.3 (19–56)	35.1 (25–50)
Age completing PhD degree	41.3 (23–65)	44.1 (35–56)	42.3 (24–64)	40.4 (23–62)	39.1 (27–50)	40.4 (22–62)	44.4 (28–63)
Gender	% (n)						
Female	82.8 (794)	93.8 (15)	89.6 (240)	79 (463)	87.5 (7)	73.3 (11)	91.2 (52)
Male	16.8 (161)	6.3 (1)	9.3 (25)	20.8 (122)	12.5 (1)	26.7 (4)	8.8 (5)
Other	0.2 (2)		0.4 (1)	(0.2) (1)			
Rather not say	0.2 (2)		0.7 (2)				
Professional degree‡							
Nursing	97.5 (905)	87.5 (14)	94.8 (257)	94 (554)	100 (8)	93.3 (14)	93 (53)
Midwifery	2.8 (26)	6.3 (1)	2.2 (6)	2.2 (13)	12.5 (1)	26.7 (4)	1.8 (1)
Psychology	1.6 (15)		2.2 (6)	1.2 (7)			3.5 (2)
Sociology	1.3 (13)	6.3 (1)	0.7 (2)	1 (6)			5.3 (3)
Occupational therapy	0.1 (1)					6.7 (1)	
Physical therapy	0.1 (1)			0.2 (1)			
Other	4.7 (62)		7.7 (21)	5.8 (34)			10.5 (6)
Nursing degree‡							
Bachelor degree in Nursing	76.2 (674)	81.3 (13)	84.1 (227)	63.2 (372)	87.5 (7)	86.7 (13)	
Diploma in Practical Nursing	19.9 (176)	6.3 (1)	7 (19)	24.4 (144)	12.5 (1)	13.3 (2)	15.8 (9)
Associate degree in Nursing	7.6 (67)		14.1 (38)	4.4 (26)		6.7 (1)	68.4 (39)
Other	15.8 (140)	6.3 (1)	11.5 (31)	15.8 (93)		26.7 (4)	15.8 (9)
Master degree‡							
Master of Science in Nursing	64.7 (584)	31.3 (5)	73.7 (199)	58.1 (343)	75 (6)	73.3 (11)	31.6 (18)
Master of Health Sciences	7.8 (70)		3 (8)	10 (59)		6.7 (1)	3.5 (2)
Master of Education	5.3 (48)	6.3 (1)	4.4 (12)	4.7 (28)	12.5 (1)		7 (4)
Master of Public Health	5.3 (48)	31.3 (5)	3.3 (9)	5.6 (33)			1.8 (1)
Master of Advanced Nursing Practice	5.2 (47)	12.5 (2)	4.1 (11)	4.7 (28)	12.5 (1)	6.7 (1)	8.8 (5)
Master of Science in Administration	1.9 (17)		1.1 (3)	2.4 (14)			
No Master degree	4.8 (43)		5.2 (14)	3.6 (21)			14 (8)
Other	15.3 (138)	12.5 (2)	12.2 (33)	13.2 (78)	12.5 (1)	6.7 (1)	36.8 (21)
Current position‡							
Professor	24 (195)	25 (4)	28.9 (77)	17.1 (101)	25 (2)		19.3 (11)
Assistant professor	19.2 (156)		26.3 (70)	12.1 (71)	50 (4)	26.7 (4)	8.8 (5)
Associate professor	18.9 (153)	25 (4)	16.6 (53)	13.2 (78)	25 (2)	20 (3)	17.5 (10)
Postdoctoral researcher	15.8 (128)	25 (4)	3 (8)	19.2 (113)		6.7 (1)	3.5 (2)
Lecturer, Master education	12.8 (105)	18.8 (3)	1.5 (4)	14.2 (84)		33.3 (5)	15.8 (9)
Nurse scientist	11.5 (93)	12.5 (2)	9.8 (26)	10.7 (63)			1.8 (1)
Lecturer, Bachelor education	10.7 (87)	12.5 (2)	1.1 (3)	12.2 (72)		33.3 (5)	7 (4)
Clinical nurse specialist	6.5 (53)	12.5 (2)	3.4 (9)	6.6 (39)			3.5 (2)
Senior manager (strategical level)	5.2 (42)		3.8 (10)	4.8 (28)		6.7 (1)	5.3 (3)
Nurse practitioner	4.6 (37)		6.4 (17)	2.9 (17)		6.7 (1)	
Project manager	4.3 (35)		0.4 (1)	5.1 (30)		6.7 (1)	5.3 (3)
Clinical nurse	3.9 (32)		3.8 (10)	3.4 (20)			3.5 (2)
Dean of Nursing (School of Nursing/University)	3.6 (29)		3.4 (9)	2.9 (17)			5.3 (3)
Clinical lecturer	3.6 (29)		1.5 (4)	3.7 (22)		6.7 (1)	1.8 (1)
Director of Nursing	3 (24)		2.3 (6)	2.5 (15)			3.5 (2)
First-line manager	2.3 (19)			3.1 (18)			
Owner of company/business	2.1 (17)		3.4 (9)	1.2 (7)			1.8 (1)
Chief Nursing Officer	2 (16)			1.9 (11)			1.8 (1)
Dean of Health Sciences	1.1 (9)	6.3 (1)		1.2 (7)			
Policy officer	0.7 (6)		0.4 (1)	0.8 (5)			1.8 (1)
Head of University	0.1 (1)						
Other	20.1 (163)	6.3 (1)	24.8 (66)	13.2 (78)	12.5 (1)		24.6 (14)
Type of current working organization‡							
University	62.7 (570)	50 (8)	77 (208)	50.2 (296)	75 (6)	40 (6)	71.9 (41)
University medical center	25 (228)	31.3 (5)	17.8 (48)	27.5 (162)	12.5 (1)	13.3 (2)	15.8 (9)
University of Applied Sciences	11.6 (106)		3.7 (10)	15.4 (91)	12.5 (1)	20 (3)	3.5 (2)
General hospital	7.7 (70)		4.8 (13)	8.3 (49)	12.5 (1)		10.5 (6)
Research institute	4 (36)		2.6 (7)	4.4 (26)		6.7 (1)	3.5 (2)
Specialty hospital	2.8 (25)	6.3 (1)	2.6 (7)	2.4 (14)			5.3 (3)
Community care	2 (18)		1.1 (3)	2.4 (11)			1.8 (1)
Governmental agency	1.8 (16)		1.1 (3)	12 (12)		6.7 (1)	
Public healthcare organization	1.4 (13)		0.7 (2)	1.7 (10)		6.7 (1)	

(continued on next page)

Table 1 (continued)

	Total Sample (n = 1,308)*	Africa (1.7%, n = 16) * [†]	America 28.3% (n = 271) * [†]	Europe (61.7%, n = 590) * [†]	Eastern Mediterranean Region (0.8%, n = 8) * [†]	South-East Asia Region (1.6%, n = 15) * [†]	Western Pacific Region (6%, n = 57) * [†]
Mental healthcare organization	0.7 (8)		1.1 (3)	0.7 (4)			
Nursing home	0.9 (8)		0.7 (2)	1 (6)			
Commercial company	0.7 (6)		0.7 (2)	0.7 (4)			
Rehabilitation institute	0.3 (3)			0.3 (2)			1.8 (1)
Other	6.2 (56)		8.5 (23)	4.7 (28)	12.5 (1)	20 (3)	
Areas of current work [‡]							
Research	73.6 (610)	50 (8)	57.4 (152)	67 (394)	87.5 (7)	35.7 (5)	66.7 (38)
Education	78 (647)	68.8 (11)	75.7 (200)	62.6 (369)	75 (6)	60 (9)	75.4 (43)
Management/administration	25.7 (213)	12.5 (2)	24.2 (62)	21.1 (124)	50 (4)	20 (3)	21.1 (12)
Clinical practice	22.8 (189)	18.8 (3)	17 (45)	21.1 (124)	12.5 (1)	13.3 (2)	21.1 (12)
Policy development	8.8 (73)		6.8 (18)	9.2 (54)			1.8 (1)
Business/industry	1.3 (11)		1.8 (5)	0.7 (4)			3.5 (2)
Politics	0.7 (6)		0.8 (2)	0.5 (3)	12.5 (1)		
Other	4.2 (35)		6 (16)	2.7 (16)	12.5 (1)		3.5 (2)
Type of current contract [§]							
Full-time	87.3 (796)	92.3 (12)	92.7 (241)	85.3 (474)	87.5 (7)	92.3 (12)	81.8 (45)
Part-time	12.7 (116)	7.7 (1)	7.3 (19)	14.7 (82)	12.5 (1)	7.7 (1)	18.2 (10)
Multidisciplinary research team							
Yes	78.3 (720)	92.3 (12)	76.6 (203)	78.4 (438)	75 (6)	85.7 (12)	80.4 (45)
No	21.7 (199)	7.7 (1)	23.4 (62)	21.6 (121)	25 (2)	14.3 (2)	19.6 (11)
Career stage							
Early career stage	31.5 (265)	25 (3)	23.9 (59)	35.1 (178)	25 (2)	40 (4)	35.2 (19)
Mid-career stage	39.5 (332)	41.7 (5)	31.6 (78)	44.8 (227)	25 (2)	50 (5)	27.8 (15)
Late career stage	29 (244)	33.3 (4)	44.5 (110)	20.1 (102)	50 (4)	10 (1)	37 (20)

*The numbers of the samples of the global regions do not add up to the total for the region or to the total sample all cases due to missing data.

[†]Responses per region:

Region of Africa: Benin (1), Ghana (5), Kenya (2), Nigeria (4), and South Africa (4).

Region of America: Argentina (1), Brazil (5), Canada (46), Chile (2), Costa Rica (1), Ecuador (2), Mexico (8), and United States of America (206).

Eastern Mediterranean region: Afghanistan (1), Bahrain (1), Egypt (1), Lebanon (1), and Saudi Arabia (4).

Countries region of Europe: Austria (14), Belgium (50), Bulgaria (1), Cyprus (1), Czech Republic (22), Denmark (17), Estonia (1), Finland (20), Germany (53), Greece (7),

Iceland (13), Ireland (9), Israel (13), Italy (58), Kazakhstan (3), Lithuania (6), Luxemburg (2), Malta (5), Netherlands (48), Norway (26), Poland (7), Portugal (34), Slovakia (19), Slovenia (1), Spain (24), Sweden (13), Switzerland (20), Tajikistan (1), Turkey (51), and United Kingdom (51).

Region of South-East Asia: India (7), Sri Lanka (1), and Thailand (6).

Western Pacific region: Australia (24), China (11), Japan (1), Malaysia (6), New Zealand (12), Philippines (3), and Taiwan (1).

[‡]Respondents could select multiple answers.

[§]According to the regulations in the country participants work in.

(reference number: 14/2022). Presidents of professionals organizations were approached for permission and all participants received study information prior to participation. Informed consent was signed digitally. No directly identifiable data were collected.

Findings

Sample Characteristics

The sample included 1,308 PhD-prepared nurses from 57 countries, with 732 complete and 576 partially completed responses. Most responses were from the United States, Italy, Germany, Turkey, and the United Kingdom. Most respondents were female and were appointed as professor, associate professor, or assistant professor and the majority worked at universities (Table 1). Twenty percent reported having an "other" position. A variety of positions was found with head or director of program ($n = 23$), senior researcher ($n = 13$), senior lecturer ($n = 16$), research fellow ($n = 12$), head of a research or clinical department ($n = 11$), associate dean ($n = 9$), consultant ($n = 8$), program coordinator ($n = 6$), and president of a nursing organization ($n = 3$) being reported. Six respondents reported being retired. Sample characteristics per country are presented in Supplementary File C.

Careers

Most respondents currently work in education (78%, $n = 647$), research (74%, $n = 610$), and/or management (26%, $n = 213$), while

less worked in clinical settings (23%, $n = 189$) and industry (1%, $n = 11$). Those working in research spent, on average, 41.5% of their working hours on research, while those who worked on teaching, on average, spent 41% of working hours on teaching. Respondents, on average, engaged in 10 working activities (range 1–26) with reviewing for scientific journals, supervision of master students, participation in national research projects, mentoring of students, and teaching courses in masters programs being most common (Table 2). Most respondents had one position within one organization (50%, $n = 416$); 28% ($n = 231$) had multiple (separate) positions, and 18% ($n = 148$) had more than one position, which were integrated within one organization.

Factors Related to the Careers

Preparedness for Postdoctoral Roles

The respondents felt best prepared for positions in research (72.6, SD 20.1), followed by positions in education (53.6, SD 27.5), policy development (41.2, SD 27.7), management (39.4, SD 27.4), and business or industry (25.4, SD 25.6). The respondents felt best prepared for the competencies focusing on management of research ethics and research skills, while feeling least prepared management of pedagogical competencies and career management (Table 3). Development of leadership competencies was included in doctoral programs of 27% of the sample ($n = 206$).

Of the sample, 47% ($n = 365$) preferred additional preparation during doctoral education. The following areas were reported most often: pedagogical and teaching competencies ($n = 39$), career

Table 2
Current Working Activities (n = 826)

Working Activities*	% (n)
Research	
Reviewer for scientific journals	67.1 (554)
Participation in national research projects	54.6 (451)
Leading own research program	37 (306)
Principal investigator in national research projects	35.1 (290)
Participation in international research projects	34.3 (283)
Leading a research group	31.5 (260)
Project management	30.3 (250)
Editor of scientific journals	16.3 (135)
Principal investigator in international research projects	11.1 (92)
Teaching	
Supervision of master students	57.6 (476)
Mentoring of students	54.4 (449)
Teaching courses for master's students	54 (446)
Supervision of PhD/Doctor of Nursing Practice students	50.7 (419)
Mentoring of colleagues	50.6 (418)
Teaching courses for undergraduate students	48.5 (401)
Supervision of undergraduate students	48.5 (401)
Course coordination	32.3 (267)
Teaching professionals	30.8 (254)
Teaching courses for PhD/Doctor of Nursing Practice students	29.7 (245)
National and institutional consultation/advisory role on research expertise	16.3 (135)
Clinical care	
Conducting clinical quality improvement projects	20.2 (167)
Conducting direct patient care	12.2 (101)
Policy and politics	
Contributing to organizational procedures, protocols, and guidelines	40.8 (337)
Contributing to national procedures, protocols, and guidelines	28.5 (235)
Contributing to the national public debate on healthcare and nursing	24.6 (203)
Contributing to international procedures, protocols, and guidelines	12.1 (100)
Participating in an advisory board of politicians	1 (8)
Management	
Management of staff at team level	22 (182)
Management of staff at organizational level	14 (116)

*Respondents could select multiple options.

development and planning (n = 39), grant applications (n = 37), implementation and dissemination (n = 21), and personal leadership (n = 21). Within current positions, 65% (n = 493) preferred to additional preparation with grant applications (n = 66), teaching and pedagogical competencies (n = 46), research methodologies (n = 45), leadership competencies (n = 39), team leadership (n = 32), and research project management (n = 32) being reported most (Supplemental File D).

Support Sources

Highest levels of support were provided by family and friends and by colleagues with a nursing background, whereas support the management was rated lowest (Table 4). Mentoring in various career stages was supported by working organizations according to 41% (n = 302) of the sample.

Value and Facilitation of Research

Nursing research within the respondents' working environment is valued with a score of 70.4 (SD 26.4) on the visual analog scale. Facilitation of research work was rated with a score of 58 (SD 29.3).

Career Trajectories and Positions

In the sample, 72% (n = 532) reported that positions for PhD-prepared nurses are available at their organization. Regarding the number of positions, 54% (n = 403) of respondents indicated there are not enough positions available. Half of the organizations had career trajectories in place for PhD-prepared nurses (50%, n = 368).

Table 3
Required Competencies for a Research Career (Numminen et al., 2019), Self-Evaluation on a Visual Analog Scale

	Total Sample*		Africa		America		Europe		Eastern Mediterranean		South-East Asia Region		Western Pacific Region	
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)
Research ethics management	777	78.7 (19.4)	12	80.5 (18.9)	222	82.8 (18.2)	455	75.9 (19.8)	6	77.5 (27.9)	10	90.4 (10)	52	84.3 (13.4)
Research skills management	780	76.4 (18.4)	12	77.8 (20.3)	229	78.2 (17.8)	457	75.5 (18.3)	6	75.8 (24.7)	10	79.8 (15.4)	53	78.9 (18.5)
Self-management	769	75.7 (22)	12	84.2 (14.2)	229	73.7 (24.2)	447	75.1 (21.6)	6	72.8 (24.1)	10	91.1 (7.8)	52	85.8 (14.3)
Cognitive management	774	73.7 (21.4)	12	72.6 (22.1)	229	78.2 (19)	454	70.6 (22.5)	5	79.6 (24.7)	10	80.7 (14.9)	52	79.9 (17.3)
Research communication management	773	72.8 (21.6)	12	80.3 (15.6)	230	73 (23.1)	451	71.9 (20.8)	5	82 (19.1)	10	83.4 (11.6)	52	76.9 (22.8)
Research field management	767	67.3 (23.1)	11	71.8 (21.7)	226	65.5 (23.6)	450	67.3 (22.9)	5	77.2 (23.8)	10	81.3 (16.4)	52	72.3 (21.5)
Team working management	770	63.8 (25.7)	12	72.7 (20.8)	230	62.5 (27.6)	451	63.7 (24.6)	5	81 (25.7)	9	75.8 (16.3)	52	65.6 (27.5)
Future vision management	762	58.7 (25.7)	11	70 (19.4)	226	57.9 (26.3)	444	57.6 (25.6)	6	70 (24.1)	10	66.3 (24.8)	52	66.7 (24.1)
Intercultural management	757	58.2 (28.1)	10	65.9 (31.1)	226	61 (28.2)	441	54.7 (27.8)	6	71 (23.4)	10	81 (22.7)	50	68.5 (25.4)
Team leadership management	771	56.7 (27)	12	71.1 (20.6)	228	56.1 (28.3)	451	55.5 (26)	6	74 (26.3)	9	70.8 (29.2)	52	63 (28.3)
Implementation management	754	56.1 (27.7)	10	73 (26.5)	224	52.3 (28)	444	56.4 (27)	6	68.8 (21.9)	10	77.1 (17.7)	48	61.9 (31.3)
Technology management	748	55.5 (26.7)	10	75 (18.1)	226	58.6 (26.5)	435	51.7 (26.8)	6	65.7 (25.2)	10	76.7 (19.1)	50	66.6 (21.8)
Resource management	764	54.6 (27)	12	70.7 (26)	226	53.1 (28.5)	448	54 (25.8)	6	73.8 (25)	9	73.7 (29.7)	50	56.9 (28.8)
Career management	763	53.5 (27.6)	12	71.9 (23.6)	227	55 (28.3)	444	51.4 (26.7)	6	71.5 (22.6)	10	59.4 (28.4)	53	60.2 (29.1)
Pedagogy management	770	51.9 (28.2)	12	64.8 (31.8)	227	51.8 (29.4)	451	49.8 (27.2)	6	71.3 (24.9)	10	75.5 (21.9)	51	56 (28.1)
Mean of the sum score	63.6		69.2		64		62.1		74.1		77.5		69.6	

* The numbers of the regions do not add up due to missing data regarding the origin of the respondents.

Table 4
Overview of Global Regions: Factors Related to Careers

Support Sources*	Total Sample (n = 657) Mean (SD)	Africa (n = 10)	America (n = 205)	Europe (n = 405)	Eastern Mediterranean Region (n = 5)	South-East Asia Region (n = 9)	Western Pacific Region (n = 48)
Family and friends	79 (SD 21.3)	88.4 (SD 12.8)	82.2 (SD 20)	77.6 (SD 21.8)	71.8 (SD 31.3)	84.4 (SD 13.5)	76.3 (SD 23.1)
Support from colleagues with a nursing background	68.7 (SD 23.7)	69.1 (SD 23.1)	73.1 (SD 24.1)	66.2 (SD 23.8)	63.4 (SD 27.8)	60.8 (SD 28)	73.5 (SD 16.6)
Support from colleagues with another (non-nursing) professional background	65.3 (SD 23.9)	75.5 (SD 21.4)	69.8 (SD 24.8)	62.5 (SD 23.4)	63 (SD 24.7)	57.4 (SD 23.6)	69.2 (SD 21.9)
Support from management	64.3 (SD 28.3)	58.4 (SD 28.8)	68.5 (SD 28.9)	62.5 (SD 28.1)	49.4 (SD 35.1)	33.3 (SD 31.5)	70.2 (SD 24.1)
Support Source: Mentoring	Total Sample	Africa	America	Europe	Eastern Mediterranean Region	South-East Asia Region	Western Pacific Region
Mentoring supported by organizations	41% (n = 302)	36.4% (n = 4)	51.2% (n = 108)	33.6% (n = 144)	60% (n = 3)	30% (n = 3)	61.2% (n = 30)
Value and facilitation of research*	Mean (SD) Total Sample (n = 687) 70.5 (SD 26.4)	Africa (n = 11) 71.7 (SD 28.9)	America (n = 205) 78.2 (SD 23.6)	Europe (n = 420) 66 (SD 27.2)	Eastern Mediterranean Region (n = 5) 71.6 (SD 29.6)	South-East Asia Region (n = 9) 83.7 (SD 24.9)	Western Pacific Region (n = 49) 73.1 (SD 23.4)
Nursing research is valued within the working environment	58 (SD 29.3)	62.1 (SD 36.2)	61.5 (SD 29.2)	55 (SD 28.9)	70 (SD 27.3)	80.3 (SD 18.9)	61.1 (SD 30.2)
Facilitation of research work	Total Sample	Africa	America	Europe	Eastern Mediterranean Region	South-East Asia Region	Western Pacific Region
Career Trajectories and Positions	72% (n = 532)	81.8% (n = 9)	84.8% (n = 178)	65.5% (n = 279)	80% (n = 4)	40% (n = 4)	75.5% (n = 37)
Availability of positions within current organizations	50% (n = 360)	80% (n = 8)	67.6% (n = 142)	39.3% (n = 166)	60% (n = 3)	30% (n = 3)	62.5% (n = 30)
Availability of career trajectories	Total Sample	Africa	America	Europe	Eastern Mediterranean Region	South-East Asia Region	Western Pacific Region
Opportunities for Professional Development	51% (n = 355)	60% (n = 6)	54.6% (n = 113)	49.2% (n = 203)	0%	25% (n = 2)	43.8% (n = 21)
Access to postdoctoral education	Mean (SD) Total Sample (n = 695) 56.4 (SD 27.2)	Africa (n = 10) 74.2 (SD 27.1)	America (n = 204) 56.7 (SD 29.1)	Europe (n = 416) 55.5 (SD 25.9)	Eastern Mediterranean Region (n = 5) 65.8 (SD 23.1)	South-East Asia Region (n = 9) 43 (SD 29.5)	Western Pacific Region (n = 48) 62.3 (SD 26.4)
Work-life balance*							

* Measured with a 100-mm VAS scale. Higher scores indicate higher levels of support/value/facilitation/satisfaction.

Career advancement was discussed regularly in 54% ($n = 392$) of the sample.

Opportunities for Professional Development

Approximately half of respondents had access to postdoctoral programs (51%, $n = 355$) and 88% of respondents ($n = 631$) had the opportunity to participate in educational courses or programs. The overall satisfaction with professional development opportunities was rated with a score of 56.7 (SD 27.3) on the visual analog scale in the total sample.

Work-Life Balance

Satisfaction with work-life balance was rated with a score of 56.4 (SD 27.2).

Workplace Behavior

Bullying at the current workplace was experienced by 23% ($n = 164$) in the last year. Age discrimination was reported by 15% ($n = 109$) and discrimination linked to ethnic background, race, or sexuality was reported by 8% ($n = 56$). Sexual harassment was reported by 3% ($n = 21$) of the sample.

Recommendations for Careers

Mentoring was the most reported recommendation by PhD-prepared nurses to support their careers ($n = 66$). Respondents provided two recommendations regarding career pathways: development of structured and diverse career pathways ($n = 40$) and implementation of clinical-academic positions ($n = 36$). Recommendations regarding facilitation of PhD-prepared nurses' work included increasing opportunities for research funding ($n = 21$), ensuring protected time for research ($n = 14$), and securing of better salaries ($n = 12$). Investment in postdoctoral training opportunities was also recommended ($n = 18$) (Supplementary File D).

Discussion

This study provided knowledge on the PhD-prepared nurses' careers, factors related to careers, and recommendations for careers. Variation in careers of PhD-prepared nurses was found. In line with earlier studies, most PhD-prepared nurses worked in research and teaching positions within institutes of higher education (Chavez et al., 2021; Rugs et al., 2020; Sørensen et al., 2019). The variation and the relatively high number of respondents in research and teaching positions may reflect the sampling technique used and therefore require cautious interpretation. There was variance in the extent to which respondents felt prepared on the competencies for research careers, with many respondents preferring additional preparation after doctoral education and within current positions. The findings showed opportunities that could be used to support PhD-prepared nurses' careers, including access to mentorship and postdoctoral training opportunities as well as the implementation of career pathways and facilitation of research work. Findings for the global regions and countries indicated potential differences in factors related to careers; these outcomes, however, should be interpreted carefully since the samples are limited and not representative (see Limitations). The sample included relatively large numbers of nurses from the United States compared with other regions and countries, which may be explained by the long history in academic nursing education (Carter, 2013; Ketefian & Redman, 2015; Seltrecht, 2016). Also, differences in the state of nursing science between countries and global regions are important to take into consideration in the interpretation (Hafsteinsdóttir et al., 2019; Kim et al., 2022; Thompson & McKenna, 2024; Watson et al., 2021; Yanbing et al., 2021). This study can be seen as a first step in understanding careers of PhD-prepared nurses. Further research is needed to shed light on

the global, regional, and local situation. Our findings may support identification of areas for future research.

Careers of PhD-Prepared Nurses

Our findings show that most PhD-prepared nurses work in positions with research and teaching, while being involved in a broad palette of activities, corresponding with results of earlier national studies (Chavez et al., 2021; Rugs et al., 2020; Sørensen et al., 2019). Positions with research and teaching responsibilities are important to advance nursing since this innovative knowledge can guide clinical practice and nursing education (McKenna & Thompson, 2024; Negarandeh & Khoshkesht, 2022; Polomano et al., 2021). It was initially planned to analyze career pathways focusing on all positions held after the doctorate to reveal patterns in careers; however, this was not possible, due to the large variations in the reporting of positions. Therefore, this study addresses a limited part of careers of PhD-prepared nurses.

For years, more innovative positions have been called for (Fairman et al., 2021; Polomano et al., 2021), where PhD-prepared nurses disseminate their knowledge across a spectrum of healthcare services (Broome et al., 2023). Different positions have been developed and nursing science has progressed in many countries (Hafsteinsdóttir et al., 2019; Yanbing et al., 2021). It is, however, unclear what kind of additional positions may be needed. It is imperative that PhD-prepared nurses need to work in positions allowing them to engage in the debate on nursing practices as well as on issues and policies affecting nursing and healthcare on national and international levels (AACN, 2022a). Based on our findings, it may be argued that these positions may already have been introduced, since PhD-prepared nurses reported many responsibilities in different areas of nursing, affecting local, national, and international practices and policies on healthcare and nursing. Also, some PhD-prepared nurses were leading organizations, departments, and programs. However, this involved a limited part of the sample and our sample is expected to be not representative. Therefore, it could be cautiously argued that more PhD-prepared nurses are needed in strategic positions—roles that involve determining strategic directions and decision power to exert influence on care delivery, healthcare systems and processes, and professional education.

Factors Related to Careers and Recommendations for the Careers

The results on the factors related to careers show that there are differences and potential for optimization of work experiences of PhD-prepared nurses. PhD-prepared nurses in this study felt best prepared for positions in research and teaching, while findings also indicate that pedagogical competencies require attention. Internationally, the PhD is the main criterion required for teaching in Master's and PhD programs (Kim et al., 2022; Watson et al., 2021). Development of these competencies is important, since PhD-prepared nurses have a crucial role in the preparation of nurse scientists, following standards of university disciplines (European University Association, 2018; McKenna & Thompson, 2024; Watson et al., 2021). Given the fact that courses on teaching and pedagogical competencies are often available during doctoral education (Bullin, 2018; Dobrowolska, Chruściel, Pilewska-Kozak, et al., 2021; Fang et al., 2016), further exploration is needed regarding the needs of PhD-prepared nurses.

Regarding the support for careers, findings indicated that support for careers was often provided by family, friends, and colleagues. In line, earlier studies indicated that this support was important for the development of careers (Adynski et al., 2023; Bice et al., 2019; de Lange et al., 2019; Kippenbrock et al., 2022; Rice et al., 2020). Collegial support comprises (informal) opportunities to learn from each other and discuss work challenges, while family and friends were

involved in career discussions and/or sharing the load of family responsibilities (Adynski et al., 2023; Bice et al., 2019; de Lange et al., 2019; Loerzel et al., 2021; Poronsky et al., 2012). Based on this, PhD-prepared nurses are advised to be aware of the importance and invest in supportive networks.

Another relevant finding was that disruptive behaviors, such as bullying, age discrimination, and discrimination linked to ethnic background, race, or sexuality, can occur at workplaces of PhD-prepared nurses. With the prospect of shortages of PhD-prepared nurses (Jarosinski et al., 2022; Stanfill et al., 2019), it would be important to secure safe and inspiring workplaces to prevent them leaving their positions. The first step is to investigate workplace experiences followed by addressing potential issues (McKenna, 2023; Park & Kang, 2023). Leadership, mentoring, and postdoctoral programs focusing on psychological strength and empowering of PhD-prepared nurses are recommended to equip them to deal with disruptive behaviors.

PhD-prepared nurses, leaders of universities and healthcare organizations, and leaders of the nursing (science) organizations may need to unite to identify and realize sources of support for the careers. Among other support sources, various programs focusing on professional development, including postdoctoral and leadership and mentoring programs, have been developed and positively evaluated on a range of professional and career outcomes (AACN, 2022a; Buser et al., 2021; Busby et al., 2022; Carter et al., 2020; Gillespie et al., 2023; Hafsteinsdóttir et al., 2017; Kelley et al., 2023; Nowell et al., 2017; Rollins Gants & Hafsteinsdóttir, 2023; Rosser et al., 2020; Sherry et al., 2013; Shieh and Cullen, 2019; van Dongen et al., 2023; Weaver et al., 2023; Welk et al., 2021). Universities, healthcare organizations, and professional organizations are recommended to collaborate and explore opportunities to adapt and utilize these programs to support a larger group of PhD-prepared nurses (Buser et al., 2021; Clarke, 2024; Hafsteinsdóttir et al., 2017).

Despite the importance of development of institutional support sources for careers such as career pathways, mentoring programs, and opportunities for professional development (Heaton & Weaver, 2021; Thompson & McKenna, 2024; van Dongen et al., 2023), it is also important to note that PhD-prepared nurses need to lead their careers and not depend on support sources being offered. PhD-prepared nurses are recommended to be proactive in seeking support sources that often are available such as colleagues and peers support and/or mentoring (Joseph et al., 2021). PhD-prepared nurses and their managers are advised to work together to explore opportunities for career advancement and facilitation of research work.

Methodological Considerations and Limitations

Multiple methodological considerations and limitations were encountered in the design and conduct of the study. Snowball recruitment was used since there are no global registers available, making it difficult to reach this group and provide reliable data based on a representative sample. The snowball recruitment may have introduced bias into the sample, since the research team had the strongest connections in Europe, with most contacts working in academia, resulting in PhD-prepared nurses working outside academia may be underrepresented (Parker et al., 2019). Also, this may have influenced the findings, which indicate that most PhD-prepared nurses have positions in research and teaching. Also, factors related to careers may probably be most representative for the academic work settings. Most respondents originate from the regions of America and Europe, indicating that the sample is not representative for the global workforce. Given the limited data on the state of nursing science and the size of the PhD-prepared nursing workforce at national, regional, and global levels, future research should also focus on defining and obtaining a representative sample. The current sample included PhD-prepared nurses in different

career stages, however changes in doctoral curricula have occurred (Weaver et al., 2023; Yanbing et al., 2021); therefore, retrospective views of those obtaining their doctorate longer ago may not represent the current situation on doctoral education. It is also important to acknowledge that this study addresses a limited part of the careers of PhD-prepared nurses as career pathways after the PhD were difficult to analyze due to the large variety in positions and limitations in the understanding of the meaning of the positions and therefore this study mostly focuses on current positions.

A self-developed survey instrument was used. The instrument development followed a step-by-step process, including deductive reasoning in the concepts under study, operationalization of concepts and development of items based on earlier research (Numminen et al., 2019; Rugs et al., 2020; van Dongen et al., 2023), as well as assessment by experts (Kimberlin & Winterstein, 2008). However, it is important to acknowledge certain considerations regarding the instrument. Also, many partially completed surveys were encountered, indicating that the survey may have been too long. Incomplete surveys were analyzed to optimally use the available data. Also, in many of the survey items, participants could select multiple answers, however, no analysis of combinations of responses was conducted. Also, data on relevant work activities of PhD-prepared nurses, such as research funding and dissemination of results, were not collected. Despite these challenges and limitations, this study may be seen as a first step to capture careers of PhD-prepared nurses.

Further Research

Further research is recommended on careers of PhD-prepared nurses, including differences in doctoral preparation and working environments using a representative sample allowing for comparisons among global regions and countries. A more coherent global approach is needed in future research to provide outcomes supporting the workforce and to contribute to improvement of health and educational systems (WHO, 2023). A register with reliable data on the PhD-prepared nursing workforce, on national, regional, and global level, is necessary, allowing a systematic analysis and monitoring of careers. A deeper understanding of careers of PhD-prepared nurses is needed to adequately support them (AACN, 2022a) and these insights can contribute to strategic policies and recommendations for career support. Future research should also focus on nurses with other types of doctoral degrees (McNett et al., 2021; Reid Ponte & Nicholas, 2015).

Conclusion

This study showed that PhD-prepared nurses have careers in different areas of nursing and nursing science, with most working in academic positions within institutes of higher education. Variation was found regarding preparedness for postdoctoral careers and opportunities to support careers were identified through implementing of career pathways and an increasing number of positions and optimization of facilitation of research work. PhD-prepared nurses recommended diverse career pathways, including clinical-academic positions, while increasing access to mentoring, postdoctoral training, and research funding. It is important that PhD-prepared nurses, policymakers, leaders of universities and healthcare organizations, and leaders of nursing (science) organizations, take shared responsibility to advance careers of PhD-prepared nurses by offering of support sources and adequate facilitation of the work.

This is the first large-scale international study exploring the careers of PhD-prepared nurses, offering important insights into the current careers and experiences of the PhD nursing workforce as well as methodological challenges related to conducting global

research on this area. To be able to conduct research with samples representative of the global PhD-prepared workforce, national and global registries with PhD-prepared nurses should be developed. Future research is important to understand careers, unravel differences among global regions, and monitor the progression of careers. It is recommended to develop a consortium comprising representatives from all global regions to ensure representative sampling, support contextual interpretation, and facilitate the translation of recommendations into local settings. Thereby, PhD-prepared nurses will be supported to use their expertise to their fullest potential to contribute to the health and well-being of individuals and communities.

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Lisa van Dongen: Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. *Thóra B. Hafsteinsdóttir*: Writing – review and editing, Validation, Methodology, Supervision, Investigation, Conceptualization. *Helena Leino-Kilpi*: Writing – review and editing, Validation, Supervision, Methodology, Investigation, Conceptualization. *Riitta Suhonen*: Writing – review and editing, Supervision, Methodology, Investigation, Conceptualization.

Declaration of Competing Interest

The authors declare no conflicts of interest.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.outlook.2025.102521](https://doi.org/10.1016/j.outlook.2025.102521).

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