

Scientific production and activities of graduates from a doctoral nursing program

Produção e atividades científicas de egressos de doutorado de um programa de pós-graduação em enfermagem
Producción y actividades científicas de egresados de doctorado de un programa de posgrado en Enfermería

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Keywords

Education, nursing, graduate; Health postgraduate programs; Nursing research; Scientific publication indicators

Descritores

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Descriptores

Educación de posgrado en enfermería; Programas de posgrado en salud; Investigación en enfermería; Indicadores de producción científica

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Abstract

Objective: To characterize the students of the doctoral nursing program and describe indicators of production and scientific activity.

Methods: This is a documental, descriptive and quantitative study. The sample was composed of 217 (96.9%) graduates who defended PhD thesis at the Paulista Nursing School between 1986 and 2016. Data were collected from the University Information System of the Federal University of São Paulo; Lattes Platform and Directory of Research Groups of the National Council for Scientific and Technological Development; and Sucupira Platform. Descriptive statistical analysis was carried out.

Results: The graduates were mostly nurses (89.4%); female (90.8%); with mean age of 43 years and working as professors (85.7%). Most of the PhD graduates (84.3%) performed supervision and mentoring, predominantly of undergraduate students (4,566), followed by 3,087 *Lato Sensu* students supervision and 609 *Stricto Sensu* students supervision; 22.6% of them were leaders for research groups. In the period, a total of 1,869 articles were published, 57.5% of these in the upper strata of Qualis-Capes 2016, a total number of 194 books and 860 book chapters. Three patents were registered.

Conclusion: Most graduates work as academics, advising undergraduates and graduates. There was an increase in funded projects and publications in well-qualified journals whereas the number of patents is restricted.

Resumo

Objetivo: Caracterizar os egressos do curso de doutorado de um programa de pós-graduação em enfermagem, e descrever indicadores de produção e atividade científica.

Métodos: Estudo documental, descritivo e de natureza quantitativa. A amostra foi constituída por 217 (96,9%) egressos que defenderam teses de doutorado na Escola Paulista de Enfermagem, período de 1986 a 2016. Os dados foram coletados do Sistema de Informações Universitárias da Universidade Federal de São Paulo; Plataforma Lattes e Diretório dos Grupos de Pesquisa do Conselho Nacional de Desenvolvimento Científico e Tecnológico; e, Plataforma Sucupira. Foi realizada a análise estatística descritiva.

Resultados: Os egressos, majoritariamente, são enfermeiros (89,4%); sexo feminino (90,8%); média de idade de 43 anos e atuavam na docência (85,7%). Considerável maioria (84,3%) dos doutores egressos, desenvolveram atividades de orientação, predominantemente na graduação (4566), sendo descrita orientação de 3087 alunos de *Lato Sensu* e 609 de *Stricto Sensu*; 22,6% atuavam como responsáveis por grupo de pesquisa. No período identificou-se publicação de 1.869 artigos, sendo 57,5% nos estratos superiores do Qualis-Capes 2016; 194 livros e 860 capítulos de livro. Foram registradas três produções de patentes.

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Conflicts of interest: nothing to declare.

Conclusão: A maioria dos egressos exerce atividade profissional na área acadêmica, com atividade de orientação de graduandos e pós-graduandos. Verificou-se aumento de projetos financiados e publicações em periódicos de boa qualificação, com menor número de depósitos de patentes.

Resumen

Objetivo: Caracterizar a los egresados de la carrera de doctorado de un programa de posgrado en Enfermería y describir indicadores de producción y actividad científica.

Métodos: Estudio documental, descriptivo y de naturaleza cuantitativa. La muestra fue formada por 217 (96,9%) egresados que defendieron tesis de doctorado en la Escola Paulista de Enfermagem, en el período de 1986 a 2016. Los datos fueron recolectados del Sistema de Información Universitaria de la Universidad Federal de São Paulo; de la plataforma Lattes y directorio de los Grupos de Investigación del Consejo Nacional de Desarrollo Científico y Tecnológico; y de la plataforma Sucupira. Se realizó un análisis estadístico descriptivo.

Resultados: Los egresados son mayormente enfermeros (89,4%), de sexo femenino (90,8%), con edad promedio de 43 años y ejercían la docencia (85,7%). Una mayoría considerable (84,3%) de los doctores egresados desarrollaron actividades de orientación, principalmente en carreras universitarias (4.566), que se describieron como orientación de 3.087 alumnos de *lato sensu* y 609 de *stricto sensu*; 22,6% actuaban como responsables de grupos de investigación. Durante el período, se identificó la publicación de 1.869 artículos, de los cuales el 57,5% era de estratos superiores del sistema Qualis-Capes 2016; 194 libros y 860 capítulos de libro. Se registraron tres producciones de patentes.

Conclusión: La mayoría de los egresados ejerce actividad profesional en el área académica, con actividad de orientación de estudiantes universitarios y de posgrado. Se verificó un aumento de proyectos financiados y publicaciones en revistas especializadas bien calificadas, con menor número de depósitos de patentes.

Introduction

The social functions of nursing can be characterized as the promotion of human health and well-being by the development and dissemination of scientific knowledge. The trajectory to reach this goal is combined with the relevant expansion of doctoral nursing programs in Brazil and worldwide.⁽¹⁻³⁾

Although there is a global demand to increase the number of researchers, the quantitative expansion must be followed by the permanent assessment of the quality of these programs, to achieve qualified training goals for researchers, thus producing and disseminating new knowledge, promoting the advancement of nursing science and health care.^(2,4,5)

Nursing research developed in doctoral courses is characterized as one of the most useful means for the development of scientific knowledge. The knowledge produced and disseminated is the result of research and should be analyzed by indicators of production and scientific activity in doctoral programs, to provide information on the contribution of research to the advancement of nursing science and practice in the country.^(6,7)

Among the many indicators used to assess graduate education, the capacity for innovation and dissemination of knowledge produced can be highlighted, especially in qualified scientific journals.⁽³⁾

The Nursing Graduate Program (NGP) of Paulista Nursing School (PNS) began in 1978 with the creation of the Master's Course. The opening

of the Doctoral Course in Maternal-Child Nursing was approved in 1986 and was transformed into a Doctorate in Nursing in 1994.⁽⁸⁾ Since 2005, all programs at the Federal University of São Paulo have conferred the Master's or PhD degree in Health Sciences, specifying in the title their area of knowledge, which increased the interdisciplinarity of the Program.⁽⁹⁾

In 2008, the NGP of the PNS was restructured in a single area and four lines of research, a configuration present nowadays.⁽¹⁰⁾ After completing 30 years of creation in 2016, some studies were conducted to assess PhD students, to describe indicators of production and scientific activity, providing subsidies that improve their qualification in the Program.⁽¹¹⁾

A recent study analyzed the field of work of doctoral nursing students from the NGP of the PNS.⁽¹⁰⁾ This study showed graduate education enables the development of researchers and research projects, this education also expands the construction of knowledge. The study also presented the lines of research as one of the guiding axes of these activities.⁽¹²⁾ Based on this information, the following question arose: What is the scientific production and activities of graduates of the doctoral nursing program?

In this context, the objective of this study was to characterize the doctoral students of a graduate nursing program, between 1986 and 2016, and to describe their scientific production and activities.

Methods

This is a documental, descriptive and quantitative study. The sample was composed of graduates who defended thesis in the Graduate Program of the Paulista Nursing School between 1986 and June 2016. This 30 year-period was selected for it reflects the beginning of the program until the 30th anniversary of its formation.

The sample characterization variables were: decade of thesis defense — categorized in first decade (between 1986 and 1995), second decade (between 1996 and 2005) and third decade (between 2006 and June 2016) —; sex; age; location of work; bachelor degree; field of work.

The following variables, related to scientific production and activities, were listed: supervision of scientific initiation; supervision in *Lato Sensu* and *Stricto Sensu* courses; leadership and/or participation in research group; number of research projects; number of published articles; Qualis-Capes classification of journals; number of published books; number of published chapters; number of registered patents. Data were collected from the Lattes platform and were often outdated, therefore it was not possible to include the work of the graduates in institutional or political management positions, since is difficult to extract this data from the platform.

The strategies for data collection were: the University Information System (UIS) of the Federal University of São Paulo (UNIFESP) to identify students and their respective dissertations; Lattes Platform of the Brazilian National Council for Scientific and Technological Development (CNPq) was used to characterize the graduates and their contributions, these data were compiled by the script Lattes V08 Software;⁽¹³⁾ the Sucupira Platform — which is a reference of the Brazilian National Graduate System; the Qualis Journals — 2013-2016 quadrennium, Nursing Area — was used to consult the classification of journals; and the CNPq Research Groups Directory was analyzed to verify research group leadership.

Data obtained were stored in Microsoft Excel® spreadsheets, and a descriptive statistical analysis was performed.

Results

The Doctoral Nursing Program graduated 224 professionals, and the sample was composed of 217 (96.9%) graduates, due to the absence of registration in the Lattes Platform. Of these, 10 (4.6%) graduates defended thesis in the first decade, 64 (29.5%), in the second decade, and 143 (65.9%), in the third decade.

We verified that 197 (90.8%) graduates were women and their age was 43 ± 13.4 years, ranging between 28 and 65 years.

In regard to bachelor degrees, 194 (89.4%) students were graduated in Nursing, and from the second decade on, they came from other areas such as Pharmacy, Biochemistry, Physical therapy, Psychology, Medicine, Archival science, Music therapy, Economics, Pedagogy, Nutrition and Physical education.

We observed that the field of work of doctoral researchers was concentrated on the Southeast and South regions of Brazil in the three decades. Based on the second decade, we found graduates working also in the Midwest and Northeast and, in the third decade, an increase in the North region.

In regard to the field of work, 186 (85.7%) graduates were professors, 18 (8.3%) worked in healthcare settings and 13 (5.8%) in other areas.

Of the total, 183 (84.3%) graduates performed supervision activities; of these, 10 (5.5%) were from the first decade, 64 (35.0%), of the second, and 109 (59.5%), of the third.

Table 1 shows the predominance of undergraduate academic supervision activities, followed by *Lato Sensu* and *Stricto Sensu*. In *Stricto Sensu*, the doctoral supervision represents the lowest frequency.

Table 1. Number of academic work advised by PhD graduates for each level of education presented by decade

Supervision	1st decade n(%)	2nd decade n(%)	3rd decade n(%)	Total n(%)
Undergraduation	254(5.5)	1,719(37.7)	2,593(56.8)	4,566(100)
<i>Lato Sensu</i>	149(4.8)	1,447(46.9)	1,491(48.3)	3,087(100)
<i>Stricto Sensu</i>	188(30.9)	342(56.1)	79(13)	609(100)
Master's degree	149(28.9)	297(57.5)	70(13.6)	516(100)
Doctoral Degree	39(42.0)	45(48.3)	9(9.7)	93(100)
Total	591(7.1)	3,508(42.5)	4,163(50.4)	8,262(100)

Regarding the leadership of research groups, 49 (22.6%) graduates were leaders of one group, five (10.2%) of these in the first decade, 20 (40.8%), in the second, and 24 (49%), in the third decade.

In the period assessed, graduates participated in 933 research projects, 422 (59.3%) of these projects were under their coordination and 236 (55.9%) studies were funded. The funding came from CNPq (43.6%), Coordination for the Improvement of Higher Education Personnel (6.8%), research grant foundations (23.7%), educational institutions (13.5%), health institutions (5.6%), and companies (6.8%).

The number of publications was also verified and most of them occurred in Brazilian journals (n=1,869), with 307 (16.4%) in the first decade, 1,018 (54.5%), in the second, and 544 (29.1%), in the third. We identified a total of 490 publications in foreign journals.

As to the journal classification— regardless of the country of publication — 1,155 (57.5%) were in stratum A1, A2 and B1, with 231 (20%) in the first decade, 599 (51.9%), in the second, and 325 (28.1%), in the third. The other publications were distributed between the stratum B2 to B5, C and unclassified journals.

In regard to the publication of books and chapters, graduates published 194 books, and 15 (7.7%) of these were distributed in the first decade, 137 (70.6%), in the second, and 42 (21.7%), in the third decade. A total of 860 chapters were published, with 54 (6.3%) of these in the first decade, 591 (68.7%), in the second, and 215 (25%), in the third.

Regarding patents, we observed that three patent productions were registered with the participation of three graduates in 2005, 2006 and 2012, related to educational software, ruler for measuring head of bed elevation angles and instruments for assessing professional skills.

Discussion

The doctoral program of the Paulista Nursing School has much to celebrate when analyzing the forma-

tion of 217 graduates, and it also has to reflect about the paths already taken, aiming at new growth and expansion goals. Since its inception, the Paulista Nursing School has contributed to the field of nursing within the national graduation system, whose researchers and advisers have made a great effort to approve and continually maintain by CAPES.⁽¹⁴⁾

The training of doctoral researchers is still small considering the number of nurses with a Doctoral degree in the country, which — according to the Brazilian Federal Council of Nursing — is 19,539 and corresponds to 4.7% of active nurses.⁽¹⁵⁾ The first doctoral courses were associated with Medical School in the Southeast region of Brazil in the 1970s, and until 1984, there were few PhD researchers in the area.⁽¹⁶⁾ The number of doctoral researchers in Nursing increased significantly during the 1990s, mainly for the expansionary policy in the National Graduate System, with the largest increase in doctoral programs in the field of Health Sciences between 1996 and 2004.⁽¹⁶⁾

Nowadays, 38 academic doctoral Nursing programs are recognized in Brazil.⁽¹⁷⁾ The importance of the programs and its influence on the visibility of Brazilian nursing graduate students can be highlighted by the continuous growth in the number of graduates in PNS — number presented in the decades studied — and consequently, these graduates advise other doctoral students. In spite of the fact that PNS is a public school, it is relevant to think about the return to society in academic actions; the graduates can promote the formation of students, acting as coordinators and dedicating themselves to scientific production as professors and advisors over the years.⁽¹⁴⁾

In this study, most graduates are women, corroborating the Brazilian nursing profile in which 86.2% of nurses are women and 66.6% of these are up to 40 years old. This result is expected and reflects the representativeness of the profession, and it also converges with results of other studies on the production of knowledge by researchers with CNPq productivity grants.^(15,18) According to CAPES, women are the majority in Brazilian graduate programs; however, the same scenario is not present on the social reality of the country, considering the

gender inequality, increased violence against female rates and income inequality.⁽¹⁹⁾ Thus, the doctoral program — by forming a larger female contingent — contributes to changes, visibility, as well as to a new configuration of society.

The insertion of professionals from areas other than Nursing, reflects UNIFESP determination, since 2005, for all graduate students to contemplate a variety of multidisciplinary approach, thus, unifying the title of Doctor or Master in Science.⁽²⁰⁾

Although doctoral researchers work mainly in the Southeast region — fact explained by the region in which the School is located — the expansion to other regions of the country can be evidenced.⁽²¹⁾ This result reflects the appreciation of interinstitutional programs, such as the Interinstitutional Master's Course (Minter) and Interinstitutional Doctorate Course (Dinter), which train students from other regions of the Brazilian territory, far from the consolidated centers for teaching and research.

^(7,22) This collaboration also supports the creation of new programs in these regions, and six programs in this modality were carried out. In CAPES 2013-2016 evaluation, no program in the North region could be found and, currently, of the 38 recognized doctoral programs in Brazil, 15 of those are hosted in the North and Midwest. Notably, the NGP of the PNS graduated 14 Masters in 2014 and will graduate 16 professors from the Federal University of Acre with the Interinstitutional Program — DINTER until 2020.

Regarding the field of work, it is mostly academic, corroborating with CNPq data, where 61.5% of Brazilian doctors work in teaching and research and 38.5% in the technical and administrative area.⁽²³⁾ Furthermore, to work in the academic universe as a doctoral researcher is a requirement for the composition of the teaching staff of Higher Education Institutions. However, the graduates who pursue an academic career may not be motivated only by the desire to act in teaching or to conduct research, but by the exhaustion of healthcare activity and the need for professional enhancement, and salary improvement.⁽²⁴⁾

Although the academic activity is vital, the work of a PhD implies also in developing scien-

tific and technological research to solve critical problems that affect health practices to provide other benefits to the Brazilian society. Nowadays, technological development enables a scientific discovery to bring social and economic benefits in a short time, and universities are responsible for this short-time benefit.^(25,26)

On the other hand, the work of a doctoral researcher in the care field is a challenge within health care institutions in Brazil. In this study, we could not identify the composition of this work; however, countries such as the United States of America use the graduated nurse as Doctor of Nursing Practice, whose work is to educate nurses in their fields of clinical practice, enabling their development in diagnosis, advanced practice and treatment, making these nurses autonomous professionals from the clinical point of view.⁽²⁷⁾

In a study composed of 135 graduates from a total of 224 doctoral researchers, most of the graduates worked in federal institutions, and its majority teaches at *Lato Sensu* level. Furthermore, these graduates are also conducting research with undergraduate and *Lato Sensu* and *Stricto Sensu* graduate students.⁽¹⁰⁾

Regarding supervision, the findings show the involvement of the graduates with research, even though in greater number at the undergraduate level, followed by the *Lato Sensu* level as the beginning of the professional life of the new doctoral researcher. Thus, those professionals who work as advisors contribute to the teaching-learning process, as well as participate in the qualification of new professionals. A study highlights the importance of specialist training, a professional that seeks to broaden and deepen the ability in a specific area of knowledge, as a way to make scientific and technological advances.⁽²⁵⁾

On the other hand, a part of doctoral researchers' goals is the desire to thrive in the career through graduate programs, although CAPES organization and functioning system — based on productivity requirements and goals — causes distress and dissatisfaction for many professionals.⁽²⁴⁾

The creation of research groups promotes the strengthening of research lines. Thus, the impor-

tance of including undergraduate students which are developing final course papers or scientific initiation research — supporting the insertion of these students in graduate programs.⁽²⁴⁾

The CNPq Directory of Research Groups in Brazil presents an inventory of scientific and technological research groups that develop permanent activities in Universities, Higher Education Institutions with undergraduate courses, and scientific and technological research institutes.⁽²⁸⁾ In the last census conducted in 2016, there was an increase of 149% in the number of groups registered compared with the 2002 census, totaling 37,640 groups, with 199,566 researchers; of these, 129,929 were doctoral researchers. Their participation in the registered groups increased by 278%. This value reinforces the importance of training for these professionals through graduate programs, and it also reinforces the impact on the development of scientific and technological activities.⁽²⁸⁾

The dissemination of graduate studies results was predominantly carried out in journals indexed in consolidated databases, with a predominance of strata A1 to B1 and in national journals. According to the Sucupira Platform, in the classification conducted in 2013-2016 quadrennium, in the field of Nursing assessment, one Brazilian journal can be found in stratum A1, four journals in stratum A2 and seven journals in stratum B1.⁽²⁹⁾ Furthermore, the quality of the journal and its accessibility to the general public by *Open Access*— i.e. its Portuguese version available electronically — support the consumption of research by professionals.

The preparation of books and chapters by the graduates shows another way to disseminate the scientific production developed in doctoral programs, although their evaluation presents singularities, compared with the journals. These books and chapters constitute reference for the construction of basic knowledge on professions, schools of thought, theoretical references, among other aspects that detail and deepen issues related to the development of the Nursing science.⁽²⁶⁾ This study shows a decrease in the production of books and chapters evidenced in the third decade, and this

decrease may be related to the lack of appreciation of this type of production, an aspect which is being reviewed by CAPES.⁽³⁰⁾

Regarding the development of products that enable the registration of patents by graduates, we verified a small number, compared with the other intellectual production. This finding converges with the results of a study developed to assess the performance of scientific production, patent generation and training of researchers with a CNPq scholarship in the area of nursing, in which restricted patent production was demonstrated, reinforcing the distance between scientific and technological production. Brazil, including Brazilian nursing, does not have disseminated technical-scientific innovation platforms and policies that support a wide development of technologies, an area that has a great possibility to evolve.⁽¹⁸⁾

Conclusion

This study enabled the analysis of the trajectory of graduate students from Paulista Nursing School in the doctoral course, between 1986 and 2016, listing their main activities. Most graduates work as academics, specifically at the undergraduate level and with the supervision of graduate students. There was an increase in funded projects and publications in well-qualified journals, in response to indicators established by CAPES for the evaluation of graduate programs. On the other hand there is a small production in the number of patents, which may be an indicator of the need to invest in partnerships with technological areas. PNS doctoral program has contributed to the qualification of professionals and leaders in the academic, health, political and educational fields of Brazilian nursing.

Collaborations

Lopes JL, Bohomol E, Avelar AFM, Monreal FO, Roza BA and Pedreira MLG declare they collaborated with the project design, data analysis and interpretation, article writing, relevant critical review

of the intellectual content and final approval of the version to be published

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