







Original article

Psychiatry researchers from the Council for Scientific and Technological Development

Pesquisadores da área de psiquiatria do Conselho de Desenvolvimento Científico e Tecnológico

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Abstract

The aim of this study was to describe the profile and scientific production of research fellows of the Council for Scientific and Technological Development in the psychiatry area. A cross-sectional, census and quantitative study was conducted. We created a database containing 541 researchers who were CNPq fellows in Medicine, of which 45 (8.31%) worked mainly in psychiatry. The evaluation included 45 researchers, majority male (n=35; 77.77%) and grants in category 2 (n=17; 37.77%). All researchers were distributed in four Brazilian states, with the Southeast region being the most prevalent (n=31; 68.88%). The researchers published 11,022 papers in scientific journals, with an average of 244.93 articles per researcher. Over their careers, the 45 researchers advised 734 scientific initiation students, 702 master's degree students and 603 PhD students. The researchers in the field of psychiatry present a relevant scientific output from the quantitative and qualitative point of view.

Keywords: Bibliometric indicators. Scientific publication indicators. Physicians. Psychiatry.

Resumo

O objetivo deste estudo foi descrever o perfil e a produção científica dos bolsistas de pesquisa do Conselho de Desenvolvimento Científico e Tecnológico na área de psiquiatria. Foi realizado um estudo transversal, censitário e quantitativo. Criamos um banco de dados contendo 541 pesquisadores bolsistas do CNPq em Medicina, dos quais 45 (8,31%) atuavam principalmente na psiquiatria. Participaram do estudo 45 pesquisadores, maioria do sexo masculino (n=35; 77,77%) e bolsistas da categoria 2 (n=17; 37,77%). Todos os pesquisadores estavam distribuídos em quatro estados brasileiros, sendo a região Sudeste a mais prevalente (n=31; 68,88%). Os pesquisadores publicaram 11.022 artigos em periódicos científicos, com média de 244,93 artigos por pesquisador. Ao longo de suas carreiras, os 45 pesquisadores orientaram 734 alunos de iniciação científica, 702 alunos de mestrado e 603 alunos de doutorado. Os pesquisadores da área de psiquiatria apresentam uma produção científica relevante do ponto de vista quantitativo e qualitativo.

Palavras-chave: Indicadores bibliométricos. Indicadores de produção científica. Médicos. psiquiatria.

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Introduction

Brazilian scientific production presented important growth and international visibility. This influenced the country's position in the world ranking in the number of publications in journals indexed in the Scopus database. The country jumped from 17th in 2000 to 11th in 2018, among the most important producers of science, with an annual growth rate of 5.42%, surpassing Canada, Spain and Australia¹. However, such growth indicators need to be accompanied by continuous financial investments in order not to compromise this quantitative and qualitative expansion².

Among the funding agencies for Brazilian research, the National Council for Scientific and Technological Development (CNPq) have acted to encourage and foster scientific production through funding and research grants. Among the types of scholarships offered by CNPq is the productivity in research, which is granted to researchers based on various technical criteria³. According to CNPq Advisory Committee, the criteria for researchers selection and classification in Medicine include, among several indicators, scientific production with outstanding Impact Factor (IF), human resource training (supervision of scientific initiation students, master's, and PhD students), contribution to technological innovation, development of research projects with funding of research agencies and participation in editorial activities (<https://www.gov.br/capes/pt-br/aceso-a-informacao>).

Studies have assessed the profile and the scientific production of CNPq-supported researchers in several areas of knowledge, such as nephrology and urology⁴, pediatrics⁵, hematology/oncology⁶, tropical medicine, and infectious diseases⁷. Brazilian psychiatry has a growing relevance in the global scenario. During the last decades, in parallel to the economic growth, Brazil's share in global scientific output has also increased from 0.8% in 1995 to 2.7% in 2009⁸. Specifically, regarding psychiatry, Brazil moved from 21st in 1996 to 13th position in 2015 in the Country Ranking of psychiatry and mental health papers in the Scopus database (<https://www.scimagojr.com/>)⁹. The present study describes the profile and scientific production of recipients of CNPq scientific productivity scholarships in psychiatry.

Methods

Participants

We initially established a database of 541 researchers registered as CNPq medical fellows based on a list provided by the research funding itself in December 2022. Of the 541 medical researchers, the main areas of investigation of 45 researchers were psychiatry. Researchers who are the recipients of this grant are currently classified into three main researcher categories: 1, 2, and senior. Category 1 researchers are subdivided into four levels: 1A, 1B, 1C, and 1D (<http://www.cnpq.br/web/guest/bolsistasvigentes>).

Instruments

Using the Lattes Curriculum directory publicly available on Lattes Platform (<http://buscatextual.cnpq.br/buscatextual/busca.do?metodo=apresentar>), it was constructed a database with information on each researcher comprising geographical and institutional distribution, time elapsed since earning the PhD degree, scientific production (published papers), and human resource training (scientific initiation students, master's, and PhD students).

Procedures

For the analysis of scientific production, it was considered all publications and advising of the researchers within the period between their first published scientific paper and December 2022. It was analyzed also the publications and advising from 2018 to 2022 (average duration of scholarship). The Thomson Reuters Web of Science (Institute for Scientific Information – <http://apps.JCRknowledge.com/>) database was also investigated to identify indexed scientific production.

Results

Among the total of 541 researchers in Medicine, 45 (8.31%) were identified as working in the area of psychiatry. The distribution of the 45 researchers by gender and fellowship category is summarized in Table 1. There was a predominance of male researchers (n=35; 77.77%) and grants in category 2 (n=17; 37.77%).

Table 1. Distribution of research fellows in psychiatry according to gender and CNPq classification (n=45).

Fellowship category	Male n (%)	Female n (%)	Total n (%)
1A	13 (37,2)	0 (0)	13 (29)
1B	3 (8,5)	3 (30)	6 (13,3)
1C	1 (2,9)	1 (10)	2 (4,4)
1D	6 (17,1)	0 (0)	6 (13,3)
2	11 (31,4)	6 (60)	17 (37,8)
Senior	1 (2,9)	0 (0)	1 (2,2)
Total	35 (100)	10 (100)	45 (100)

All researchers were identified only in four Brazilian states: São Paulo (n=21; 46.66%), Rio Grande do Sul (n=14; 31.11%), Minas Gerais (n=5; 11.11%), and Rio de Janeiro (n=5, 11.11%). Although psychiatry researchers were from 9 different institutions, 73.33% worked in only 3 of them, namely USP (n=15), UFRGS (n=12), and UNIFESP (n=6). The median time since the PhD degree had been obtained was 22.06 years (range, 5-44).

The 45 researchers published 11,022 papers in scientific journals, with an average of 244.93 articles per researcher (ranging from 50 to 959 articles), of which 5,731 or 52% were indexed at Web

of Science (Table 2 and Table 3). Most articles published during the 1A and 1B researchers' careers per absolute number (424 and 214.66 papers, respectively). Table 2 also shows scientific publications during the five-year period from 2018 to 2022. In this period also observed a greater number of publications among researchers 1A and 1B, in absolute numbers (98 and 63.16 papers, respectively). When evaluating only the articles published in the JCR, there is an overall reduction of 48%. This is observed at all levels of researchers, except at level 1D (Table 3).

Table 2. Distribution of researchers in the field of psychiatry, with a scientific productivity grant by the Brazilian Council for Scientific and Technological Development (CNPq), with respect to published papers.

Grant category (n=45)	Published papers (career)		Published papers (2018-2022)	
	n	%	n	%
1A (13)	5,518	50	1,274	44.46
1B (6)	1,288	11.68	379	13.21
1C (2)	315	2.85	85	2.96
1D (6)	1,244	11.28	312	10.88
2 (17)	2,235	20.27	730	25.46
Senior (1)	422	3.82	87	3
Total	11,022	100	2,867	100

Table 3. Distribution of researchers in the field of psychiatry, with a scientific productivity grant by the Brazilian Council for Scientific and Technological Development (CNPq), with respect to published papers, on the Web of Science (*Journal Citation Reports*).

Grant category (n=45)	Published papers (career)	
	n	%
1A (13)	2,696	47,1
1B (6)	942	16,4
1C (2)	210	3,7
1D (6)	544	9,5
2 (17)	1,010	17,6
Senior (1)	329	5,7
Total	5,731	100

Over their careers, the 45 researchers advised 734 scientific initiation students, (median of 16.31; range: 0–65), 702 master's degree students (median of 15.6; range: 2–35) and 603 PhD students (median of 13.4; range: 0–46) (Table 4). When corrected by the scholarship, the highest average of advising of undergraduate students, master's degree and PhD students advisory was in 1A researchers (19.46; 21.92; 21.38 students, respectively) (Table 4).

Table 4. Distribution of researchers in the field of neuroscience, with a scientific productivity grant by the Brazilian Council for Scientific and Technological Development (CNPq), with respect to training of human resources.

Grant category (n=45)	Training of human resources (career)		
	SIS ^a n (%)	MT ^b n (%)	PhD ^c n (%)
1A (13)	253 (34.47)	285 (40.6)	278 (46.1)
1B (6)	78 (10.63)	102 (14.53)	87 (14.43)
1C (2)	25 (3.40)	8 (1.14)	18 (2.99)
1D (6)	65 (8.86)	85 (12.10)	44 (7.3)
2 (17)	310 (42.24)	188 (26.79)	133 (22.05)
Senior (1)	3 (0.4)	34 (4.84)	43 (7.13)
Total	734 (100)	702 (100)	603 (100)

^aScientific initiation students; ^bMaster; ^cPhD.

Discussion

A relevant finding that emerges from our cross-sectional study on CNPq researchers in the field of psychiatry is the concentration of scientific output in a few Brazilian states. Four states contain 100% of researchers and a single state (São Paulo) for remarkably 47% of the CNPq researchers in psychiatry. Although the 45 researchers in the field of psychiatry are distributed in nine institutions, approximately 73.5% worked in only three of them, USP (n=15), UFRGS (n=12), and UNIFESP (n=6). These findings in the area of psychiatry have been observed by us in previous studies, both in medical clinic¹⁰ and in the area of neuroscience¹¹. In medical clinic, five states of the Brazilian were responsible for approximately 90% of the researchers, and the state of São Paulo accounted for about 60% of them. Six institutions were responsible for approximately 70% of researchers¹⁰. Often, the high concentration of researchers in certain Brazilian states and institutions is related to the training centers and locations that have the oldest and most consolidated postgraduate programs, as observed in a study we conducted in pediatrics¹².

Another important aspect of the present study was the concentration of male researchers, representing almost 78% and classified as level 2. When we evaluated the 542 medicine researchers at CNPq, there was an overall predominance of males (63.5%) and grants in category 2 (54.1%). There was a significant difference in the distribution of categories between genders¹⁰. Analyzing the researchers' profile, we noticed the predominance of male gender involving other areas, such as Chemistry¹³ and Dentistry¹⁴. However, this fact has been changing in the last years, in areas such as Nursing¹⁵ and Physical Therapy¹⁶, in which we observe the predominance of the female gender among the grant holders of CNPq, alongside with the history of feminization of jobs.

In general terms, the smaller number of females with productive grants in researches of CNPq can be explained by the late insertion of women in the science and technology system (C&T)¹⁷. Studies indicate that part of women who go through the first stages of training and education for the scientific activities deviate themselves a long this path or simply do not get the recognition from their peers through awarding their grants, including some kind of prejudice in the grants awarding system, especially those with a higher hierarquic¹⁸. To this factor adds the difficulty of women to conciliate their scientific career with their family lives, including gestation and maternity¹⁹.

During their academic career, psychiatry researchers of CNPq published 11,022 papers in scientific journals, with an average of 244.93 articles per researcher (ranging from 50 to 959 articles), of which 5,731 or 52% were indexed at Web of Science (Table 2 and 3). Most articles published during the 1A and 1B researchers' careers per absolute number (424 and 214.66 papers, respectively). Table 1 also shows scientific publications during the five-year period from 2018 to 2022. In this period also observed a greater number of publications among researchers 1A and 1B, in absolute numbers (98 and 63.16 papers, respectively). When evaluating only the articles published in the JCR, there is an overall reduction of 48%. This is observed at all levels of researchers, except at level 1D. These quantitative values of psychiatry are higher than the general average of the medical clinic¹¹.

Gerolin *et al.*²⁰ showed that the expansion of Brazilian academic psychiatry seems to be linked to the expansion in internationalization, increasing number of Master and PhD programs, and more stringent criteria for these postgraduation programs in Brazil. Reflecting rising quality and internationalization of Brazilian psychiatric scientific output, three of the four most influential Brazilian psychiatry journals started in the last years to publish only papers in English and the other journal publishes a mix of papers in Portuguese and English²⁰.

One of the important missions and activities of CNPq researchers is the development of students in the scientific initiation students, master and PhD. Here we can see an important participation of the psychiatry researchers in the education of new researchers. Overall, the researchers formed 2,030 students in total. In absolute numbers, the 45 research productivity fellows trained 45¹¹ students in the scientific initiation students, master and PhD, as a general average. A greater productivity among the grant holder in category 1A both scientific initiation, master's and PhD. The level 2 researchers were also highlighted in the training of undergraduate students and 1B scholarship holders in the master's and doctoral studies. These important indicators of scientific quality were also observed in the areas of Dentistry, Public Health and Nursing^{15,19,21,22}.

Unfortunately, economic crises resulting in cuts in federal and state science funding, hinder Brazilian research and hinder the increase of scientific production⁷. In recent years, Brazilian scientists have faced a drastic reduction in financial support for research and graduate programs².

However, it should be highlighted some recent actions aimed at reversing this scenario of devaluation of Brazilian science, such as the increase in the value of scientific initiation and postgraduate scholarships, as well as the increase of 500 new scholarships of productivity in research by CNPq (<https://www.gov.br/cnpq/pt-br/assuntos/noticias/cnpq-em-acao/mcti-e-cnpq-anunciam-aumento-do-numero-de-bolsas-de-produtividade>).

A clear limitation of this study was that it considered only the recipients of CNPq productivity scholarships in the analysis. It is relevant to know that the qualified universe of researchers in Brazil, in medicine in general, as well as in psychiatry, goes far beyond CNPq researchers.

Conclusion

The present study reveals that, among Brazilian CNPq researchers identified in the field of psychiatry, there is a predominance of males. It was also observed that there is a concentration of researchers in only four states in the Southeast region of Brazil. Among the analyzed researchers, it was found that about half of their publications belong to journals indexed in Web of Science. These researchers were also involved in supervising a large number of undergraduate, master's, and PhD students. Education policies are necessary to promote the inclusion of women in re-search, as well as to provide conditions for researchers to conduct their respective studies in other regions of Brazil.

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Author contributions

Hercílio Martelli Júnior and Árlen Almeida Duarte de Sousa: collaborated with the study conception, data collection, analysis and interpretation of the results and critical reviewing of intellectual content. **Gilmerson Prates Souza:** collaborated with data collection, analysis and interpretation of the results, and critical reviewing of intellectual content. **Marcelo José da Silva de Magalhães, Janini Tatiane Lima Souza Maia and Mariane Silveira Barbosa:** collaborated with the study conception and critical reviewing of intellectual content. All authors have approved the final version of the manuscript and declared themselves to be responsible for all aspects of the work, including ensuring its accuracy and integrity.

Conflict of interests

The authors have no conflicts of interest to declare.

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