Revista Brasileira de Saúde Funcional
ISSN on-line: 2358-8691.
DOI: 10.25194/rebrasf.v12i2.1728
UNIAENE | RBSF Revista Brasileira de Saúde Funcional

SCHOLARSHIPS OF SCIENTIFIC PRODUCTIVITY IN EPIDEMIOLOGY FROM THE NATIONAL COUNCIL FOR SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT

BOLSISTAS DE PRODUTIVIDADE CIENTÍFICA EM EPIDEMIOLOGIA DO CONSELHO NACIONAL DE DESENVOLVIMENTO CIENTÍFICO E TECNOLÓGICO

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Abstract: Objectives: To examine the profile of research productivity fellows in the area of epidemiology from the National Council for Scientific and Technological Development (CNPq) between 2022 and 2023. **Methods:** Quantitative, descriptive, cross-sectional and correlational research. Through the updated lists available on the Lattes Platform, data was collected from CNPq fellows in the area of epidemiology. The results were divided into categories for simple analysis. **Results:** The research showed

298 productivity grants in epidemiology from CNPq. Of these, 100% of scholarship holders in the highest category (Senior) are men. Furthermore, males predominate in most categories. The most of epidemiology research productivity grants are in the Southeast Region of Brazil, representing 54% of the total. The Central-West region had the greatest expressiveness with 92% of publications of 0 to 4 articles. Furthermore, 34% of productivity fellows in epidemiology do not advise anyone in scientific initiation.Conclusion: The majority of scholarships in category 1B belong to men. A significant percentage of scholarship holders in the area of epidemiology do not supervise any postdoctoral students. Regarding productivity, although the scholarships are found in the Southeast Region, there was greater emphasis on the South Region, with the highest percentage of scholarship holders with more than 100 published articles and in the North Region in relation to the number of book chapters published.**Conclusion:I**t is suggested to encourage diversity in epidemiological research, with greater availability of balls and guidance, and encouragement of female participation and the participation of the population from locations other than the central ones.

Keywords: Epidemiology; Statistical analysis; Scientific production indicators.

INTRODUÇÃO

Epidemiology first emerged in the 17th and 18th centuries as a way to deal with the aggravations and ills that arose in urban centers, standing out in the identification of issues of great social and collective importance, not limited only to the control of diseases and their causative agents, but mainly to the improvement of the health of the population. [1]

Thus, the connections that exist between epidemiology and public policies are diverse, both in government and in social movements, and are essential for decision-making. [1] In addition, despite the great methodological advances that have occurred in recent years, epidemiology is still a relatively new field. [1,2]

Research in Epidemiology in Brazil has grown rapidly. In fact, modern epidemiology in Brazil, Latin America and Europe shows an effort to overcome the traditional approach incorporating social and cultural aspects, seeking a social and critical epidemiology. [2,3]

On the other hand, epidemiology is more methodological, mathematized and scientific and dominates the northern hemisphere. In the southern hemisphere, on the other hand, a more consistent epidemiology, centered on theory and that essentially seeks human emancipation and is developing. [3]

Brazilian scientific production is the 13ª largest in the world and represents about 2% of world production, with 12.64% of public investments in health research in recent years.[4] The number of Brazilian publications indexed at the Institute for Science Information (ISI) has increased in recent years, indicating an increase in the country's scientific production. [4,5]

According to several studies, CNPq plays an important role in the unification of research

in Brazil, being one of the main public bodies responsible for promoting academic scientific research. In addition, the CNPQ offers researchers from all areas of knowledge that stand out among their peers the modality of Research Productivity (PQ) scholarship as a form of recognition for the research activities developed. [5]

It is a modality of scholarship hierarchical in six levels (PQ-Sr, PQ-1A, PQ-1B, PQ-1C, PQ-1D and PQ-2), very competitive that offers a differentiated status to the researcher and, indirectly, to the institution and the research group with which the researcher is associated. The CNPq forecast is a pyramid of concessions with level 2 as the base and level 1A as the top. The Sr (Senior) level is the highest and is aimed at individuals who stand out as leaders and examples in their area of expertise. Researchers must have been PQ or Technological Development and Innovative Extension (DT) scholarship holders for at least 15 years at levels 1A and/or 1B or for at least 20 years at levels 1A, 1B, 1C and/or 1D. [5]

It is important to consider how this funding contributed to the production of educational knowledge in Brazil through its researchers. [6] The realization of this exercise stimulates the discussion about the role of promotion in a scenario and the positions of researchers in the subnational context.

In this bias, knowing the scientific work of the main researchers in epidemiology allows to establish indicators of progress and advancement in the area of science and technology, as well as to evaluate the impact of this education in professional practice. [7] Therefore, this study aimed to examine the academic and scientific profile of research productivity fellows in the area of epidemiology of the National Council for Scientific and Technological Development (CNPq) between 2022 and 2024.

METHODOLOGY

The present study is developed as a descriptive, cross-sectional and correlational quantitative research, in which data were obtained from scholarship researchers of scientific productivity in the area of epidemiology of CNPq. Researchers cited in the annual lists of scholarship holders of the CNPq website were integrated into the work, excluding those with an interrupted scholarship from the research. Data were included between the years 2022 and 2023.

An instrument was developed to collect information on the Lattes Platform of CNPq aiming to contemplate fundamental criteria for the understanding of the profile of the most recent researchers in the field of epidemiology in Brazil, which boosted the development of this research from the data of the CNPq scholarship holders.

In this sense, the following data were combined in tables: PQ scholarship category, sex, Brazilian region of origin of the researchers, number of articles published in the last 5 (five)

years, number of chapters of books published in the last 5 (five) years and percentage of orientation based on the level of orientation.

The data were crossed with information about gender, Brazilian regions for which the research productivity grants were allocated and productivity scholarship categories (Senior, 1A, 1B, 1C and 1D). The data were tabulated and statistical calculations were made.

After the collection of the data and the systematization of the results, a bibliographic survey was carried out in order to argue and correlate the data found in order to develop the discussion.

RESULTS

The research in the annual lists of productivity scholarship holders of the CNPQ revealed 298 productivity scholarships in research in the area of epidemiology that are in force. Of these, 56% are women and belong to category 2. Category 1B has 70.5% of men, while the senior and 2F categories have not found scholarships for women. In addition, it is remarkable that most candidates in category 2 are women; however, men are the most productive candidates of all scholarships.

Regarding the category and sex of the productivity bag, represented in table 1, 100% of the scholarship holders who have the highest category (Senior) are men. In addition, the male sex predominates in most categories; categories 1B, 1C, 1A and 1D have 70.5%, 65.5%, 58% and 51% of men, respectively. The exception is category 2, in which women correspond to about 56%, being the highest among female researchers. The 1D category is in second place with 49%, almost equal to 51% of male researchers. Category 1B has 29.5% of women scholarship holders, the lowest percentage compared to all other categories that the researchers examined. Category 1C has 34.5% of women scholarship holders. In addition, category 1B has the greatest disparity between male and female researchers, with about 50% of researchers being male. On the contrary, no sex fills category 1F.

Table 1 - Scholarship researchers presented by Categories and Sex in Epidemiology of CNPq.

Category	**Women**	Men
Senior	0%	100%
1A	42%	58%
1B	29,5%	70,5%
1C	34,5%	65,5%
1D	49%	51%
2	56%	44%

2F	0%	0%

Source: CNPq Lattes Platform (lattes.cnpq.br).

According to the results in table 2, the Southeast region of Brazil is home to the majority of the productivity scholarships in research in Epidemiology, representing 54% of the total scholarships. The South and Northeast regions have a relatively similar proportion of scholarship holders, with about 26.85% and 12.10%, respectively. The North region occupies the second place in descending order, with 4.70% of the exchanges. Last but not least, the Midwest, which has only 2.35% of the research productivity grants in the area of epidemiology.

Table 2. Brazilian region of origin of the researchers scholarship in Epidemiology of CNPq.

Region	**n**	**%**
Southeast	161	54%
South	80	26,85%
Norh East	36	12,10%
North	14	4,70%
Midwest	7	2,35%
Total	**298**	**100%**

Source: CNPq Lattes Platform (lattes.cnpq.br).

In table 3, the numbers of articles produced by the scholarship holders of scientific productivity in epidemiology were analyzed. The data were calculated using the scholarship holder's area. The North region did not select candidates who produced between 0 and 6 articles or more than 100 articles. Despite this, 66% of researchers in the North region published between 07 and 55 articles, while 34% published between 56 and 100 articles. Most researchers published between 07 and 50 articles, with the Northeast region having the highest number of publications, with 89.5%. The southern region, on the other hand, had the scholarship holders with the highest productivity between 56 and 100 articles, representing 15.5% of the total scholarship holders. Regarding the production of more than 100 articles, the South region obtained the highest percentage, with 12.50% of the total scholarship holders, followed by the Southeast and Northeast regions, with 6.70% and 4% of the scholarship holders, respectively.

Table 3 - Percentage of Published Articles, presented by region.

Region	0-6	7 - 55	56 - 100	>100
Southeast	6,50%	73,50%	13,30%	6,70%
South	2%	70%	15,50%	12,50%
North East	1%	89,50%	5,5%	4%
North	0%	66%	34%	0%
Midwest	1%	55%	42%	2%

Source: CNPq Lattes Platform (lattes.cnpq.br).

Table 4 presents a statistical analysis of the productivity of book chapters of productivity fellows in Epidemiology. The Northern and Midwest fellows had no more than ten chapters of books published. The Midwest region had the greatest expressiveness, with 92%, in publications of 0 to 4 articles. The Northeast region had the second highest level, with 91%. On the other hand, 26% of researchers worked in the Southeast region with more than 5 (five) to 10 (ten) publications. The North region was the one that obtained the most prominence, with the highest percentage of scholarship holders with more than 10 chapters published, totaling 3.5% of the scholarship holders in the region, followed by the Northeast and Southeast regions, with a percentage of 3% and 2% of their total scholarship holders, respectively.

Table 4 - Percentage of Published Book Chapters, presented by region.

Region	0 - 4	5 - 10	>10
Southest	72%	26%	2%
South	84%	16	0%
North East	91%	6%	3%
North	82,5%	14%	3,5%
Midwest	92%	8%	0%

Source: CNPq Lattes Platform (lattes.cnpq.br).

Table 5 shows that most scholarship holders in the area of epidemiology do not guide any post-doctoral student, about 60% and 20% guide 1 to 3 post-doctoral students. Most doctoral students guide between 4 and 6 (six), about 35.50 %, with only 8.50% who do not guide anything. In the master's degree, 40% of students guide from 4 to 6 master's students; the following is the percentage of 21.50% that guides from 7 to 9 master's students and the percentage of 5.50% that does not guide any master's student. Most epidemiology researchers guide 1 to 3 (three) scientific initiation fellows, which represents 41% of the total. In addition, 34% of epidemiology productivity scholarship holders do not guide anyone from scientific initiation.

Table 5 - Percentage of guidelines according to Orientation Level.

Guidelines	**0**	**1 - 3**	**4 - 6**	**7 - 9**	**≥10**
Postdoctoral	63%	20%	13%	2%	2%
Doctorate	8,50%	27%	35,50%	17%	12%
Master's degree	5,50%	12,50%	40%	21,50%	20,50%
Initiation	34%	41%	13%	10%	2%

Source: CNPq Lattes Platform (lattes.cnpq.br)

DISCUSSION

Epidemiological studies have great importance in society with regard to evaluating variants of various sectors, which influences the entire population political organization, especially with regard to health. [8] Research in this area has a great influence on this scenario, generating results that imply the modification of these variables and the viability of the structuring of projects applicable in society. Science then comes as a generator of knowledge and dissemination of knowledge, and should be valued and encouraged from research grants such as CNPq.

However, it is perceived, from the present study, the prevalence of the male sex among the various categories of the annual lists of productivity scholarship holders of the CNPq, with no women in the highest category. This indicates the non-full dissemination of research in a satisfactory way between genres in the scope of epidemiology in this circumstance. [9]. In this sense, although it is concrete that factors such as motherhood influence this scenario, which directly interferes with the prevalence of women of older age in relation to the male sex conquering scientific scholarships [10], it is assumed that it no longer makes sense, in modernity, there are still obstacles to female scientific production, which has been proving from the decades its equal ability to acquire positions as high as men.

However, this is not the reality in the context of the research, from the lists of CNPq productivity fellows. This is corroborated by analyzing the results that point to the male predominance in most categories - 1B with 70.5%; 1C with 65.5%; 1A with 58% and 1D with 51% of men - and as the highest category among women, category 2, has about only 56% of active women. The senior category, the largest of the categories, does not contain female researchers.

This disparity directly influences the rates of inequality between women and men, even though this contrast has been reducing in recent decades. [9]

The factors that induce this disparity relate to the prejudice rooted in Brazilian culture that, despite the new political conducts aimed at reducing it, are still recurrent, such as the stereotype that the woman does not have the ability to manage certain activities, but rather dedicate herself to motherhood and the home [11]. This disparity has also been revealed in studies in other areas, which reflects this cultural character.

Another factor that influences epidemiology research in Brazil is the disparity and prevalence of scholarships in restricted regions of the country, since 54% of scholarships are from the southeast region. It is known that regional inequality in the country is related to inequality of income and investment and distribution of Brazilian capital [12] and that, despite the search for greater rights and equality between the various regions of Brazil, aspects that are directly influenced by the economy remain disparate, such as research.

However, it is a fact that other regions of Brazil are gradually developing as new generating poles of science, technology and innovation beyond the southeast region, with emphasis on the northeast region [12]. Currently it is possible to see the stimulus for the depolarization of research, increasing the distribution of scholarships according to the development of new research headquarters, and public universities are great incentives for the expansion of new research and scientific development groups from the emergence of more researchers with a doctoral level, for example [12].

However, despite the various advances with regard to research, it cannot be said that Brazil coexists with scientific knowledge since only 12% of the active population has a university level [12]. This translates the aforementioned polarization indices of sex and region, since the country still needs more incentives for scientific development, especially with regard to epidemiological research.

Another result that the reality of little scientificity influences is the number of articles published by scientific productivity respondents, since most researchers have published between 07 and 50 articles and the number of chapters published is also still small in relation to the potential that Brazilian researchers have to develop research in the country.

In addition, another factor that influences the ineffectiveness of research in Brazil is the absence of guidance by scholarship holders in the area of epidemiology, because about 8.5% of doctoral students are not oriented, 5.5% are not guided in the master's degree and 34% of productivity scholarship holders in Epidemiology do not guide anyone of scientific initiation. This ends up demotivating the researcher since the scholarships are incentives for research development and are often retained instead of used for better scientific development in Brazil.

These still expressive indices contribute to the imbalance in the insertion of the academic in scientific initiation and research, which interferes both in the development of the country and in the personal development of the researcher.

CONCLUSION

The study found that most researchers belong to the male gender, with no predisposition to this. In addition, a significant percentage of epidemiology fellows does not guide any postdoctoral student. Although the Southeast received more scholarships, the South region had the highest productivity, with the highest number of scholarship holders with more than 100 articles published; the North had the highest number of chapters of books published. In this bias, the study concludes that there is a need for greater incentives for female research, particularly in management, to create a more equitable scientific environment and facilitate global changes and improvements, particularly in developing countries such as Brazil.

The demand for reduced concentration of scientific production in specific regions of Brazil is evident due to the country's ability to develop quality scientific research in several dispersed areas. The fact that more researchers are encouraged to develop research, particularly in epidemiology, in their regions will lead to more assertive results and better conditions of progress.

In epidemiological research, it is necessary to promote diversity through greater availability of scholarships and guidelines, as well as encouraging the participation of women and people from locations disparate of the centrals that still dominate science and capital. Thus, more research will be produced by scholarship holders of scientific productivity in epidemiology in all regions of the country and the greater will be the ability to mobilize policies according to the needs of each territory.

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