


Clinical and Research Activities of the Brazilian Productivity Fellows in Oral Medicine and Oral Pathology during the COVID-19 Era

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ABSTRACT

Objective: To evaluate the effect of the COVID-19 impacts on the activities of researchers in the field of Oral Medicine (OM) and Oral Pathology (OP). To assess the research activities and training of human resources by Brazilian productivity fellows in research (BPFR) in OM and OP in the COVID-19 Era. **Material and Methods:** Thirty-six BPFR in OM and OP areas, funded by National Council for Scientific and Technological Development (CNPq), received a virtual structured questionnaire by e-mail, on the Google Forms (Google®) platform, with questions regarding research activities and training of human resources (supervision of undergraduate and postgraduate students), during the COVID-19 pandemic. From the thirty-six BPFR in OM and OP, twenty-seven (75.0%) answered the questionnaire. **Results:** Most of them were males (n=20; 74.1%) and were distributed in four Brazilian regions and ten states of the federation, including the Federal District. Twenty-four (88.9%) BPFR reported having suspended clinical activities, while sixteen (59.3%) answered that histopathology practices are suspended. Twenty-five (92.6%) BPFR mentioned difficulties in conducting research projects and 55.5% stated having no difficulties in the supervision of undergraduates, master's and PhD students. **Conclusion:** The current scenario may significantly impact the diagnosis of oral diseases in Brazil. Moreover, a decrease in the scientific production of BPFR in OM and OP in the coming years is also considered.

Keywords: COVID-19; Oral Medicine; Pathology, Oral; Research.

Introduction

Science can be described as a complex, self-organizing, and constantly evolving multiscale network. Scientific knowledge is composed of principles and relationships integrated into research papers, books, patents, software, and other scientific instruments, organized into scientific disciplines and wider fields [1]. Notably, scientific discoveries, new technologies, and the intensive application of cutting-edge knowledge are key factors for success in a competitive global economy [2,3].

In Brazil, there are two main science funding agencies, CAPES (Coordination for the Improvement of Higher Education Personnel, a section of the Ministry of Education) and CNPq (National Council for the Development of Science and Technology, a part of the Ministry of Science and Technology). CAPES evaluates and supports postgraduate courses and CNPq is the funding agency that evaluates and funds researchers based on peer assessment of the merits of the proponents and their proposals. CNPq also provides a personal form of funding for researchers, called scientific productivity fellowship [4].

Numerous studies have examined the profile and the scientific productivity of Brazilian productivity fellows in research (BPFR) supported by the CNPq in several areas of knowledge [5-9] and highlighted the importance of Brazilian Oral Medicine (OM) and Oral Pathology (OP) in the international scientific scenario [4,10]. On February 26 (2020), approximately 56 days after the first reported case in China, Brazil officially registered the first patient with COVID-19, a 61-year-old man living in São Paulo who had recently returned from a trip to Italy [11]. Currently (May 9, 2021), Brazil surpassed 422,340 deaths and more than 13.7 million infected (<https://covid.saude.gov.br>).

Owing to the COVID-19 pandemic, various restrictive measures were implemented by the government, such as social distancing, closure of recreational areas, and closure of non-essential trade to reduce the contamination rate [12,13]. In Dentistry, several public and private offices had their functioning altered, as well as classes at universities, both in undergraduate and graduate levels, thereby limiting the progress of laboratory and clinical research with these restrictive measures [14,15]. Thus, in this scenario, we evaluate the research activities and training of human resources by CNPq BPFR in the areas of OM and OP in this COVID-19 Era.

Material and Methods

Study Design and Data Collection

This was a cross-sectional study (Research Ethics Committee # 4.091.568). In August 2020, of the two hundred and eighteen BPFR in Dentistry (<http://www.cnpq.br/web/guest/bolsistas-vigentes>), thirty-six (16.5%) described OM and/or OP as the main area of investigation. These thirty-six BPFR received a virtual structured questionnaire by email, on the Google Forms (Google®) platform, with seventeen questions. The questionnaire was structured containing sociodemographic questions, besides contemplating questions related to restrictions in their clinical and laboratory activities, access to research material and activities with postgraduate students.

All CNPq BPFR in OM and OP received the link (<https://forms.gle/LJNGAgDwuFkwU9A59>), through personal e-mail, with information about the objectives of the study and administrative procedures. After reading and agreeing to the free and informed consent form, the participants accessed the questionnaire. The questionnaires were anonymous to ensure the confidentiality and reliability of the data.

Data Analysis

Data were collected and stored in a database and processed using the statistical program SPSS® version 24.0 (Statistical Package for Social Sciences for Windows, Inc., Chicago, IL, USA), to assess the variables of interest.

Results

Of the thirty-six CNPq BPF in OM and OP, twenty-seven (75.0%) answered the questionnaire. The twenty-seven BPF, predominantly males (n=20; 74.1%), being 25.9% female, were distributed in four Brazilian regions and ten States of the federation and the Federal District (Table 1). As for the institution of origin, the BPF were spread over sixteen different institutions in the country.

Table 1. Distribution of researchers in the areas of oral medicine and oral pathology according to the Brazilian regions and states.

Regions of Brazil	State	Researchers in Oral Medicine and Oral Pathology N
Southeast	Minas Gerais	5
	Rio de Janeiro	1
	São Paulo	14
South	Rio Grande do Sul	1
Northeast	Bahia	1
	Ceará	1
	Paraíba	1
	Pernambuco	1
Midwest	Distrito Federal*	1
	Goiás	1
	Total	27

*The Federal District encompasses the capital of Brazil, Brasília.

Regarding clinical activities of dentistry, histopathology biopsy service and supervision of undergraduate, master's and PhD students, activities related to community services and the basis for many researches, some aspects were observed. Twenty-four (88.9%) BPF reported having suspended clinical activities, while sixteen (59.3%) asserted that histopathology practices were suspended, five (18.5%) reported performing only virtual histopathological analysis, five (18.5%) stated both virtual and face-to-face histopathological analysis routine, and one (3.7%) informed face-to-face histopathological analysis routine only. Fifteen (55.5%) BPF mentioned having no difficulties in the supervision of undergraduate, master's and PhD students, and twelve (44.4%) reported difficulties (Table 2).

Twenty-five (92.6%) BPF mentioned difficulties in conducting research projects. These limitations included receiving materials and equipment (74.1%), difficulties in using research facilities (88.9%), limitations in the use of digital tools and platforms (11.1%), data collection (88.9%), and difficulties in communicating with other researchers (22.2%) (Table 2).

Table 2. Activities limitation of the CNPq productivity fellows in the area of oral medicine and oral pathology during the COVID-19 pandemic.

Variables	N (%)
Histopathology laboratory activities	
Activities were suspended	16 (59.3)
Remotely	5 (18.5)
In person and remotely	5 (18.5)
In person	1 (3.7)
Clinical activities	

Activities were suspended	24 (88.9)
Remotely	1 (3.7)
In person and remotely	1 (3.7)
In person	1 (3.7)
Difficulty in the supervision of undergraduate or graduate students	
Yes	12 (44.4)
No	15 (55.6)
Research activity limitation	
Yes	25 (92.6)
No	2 (7.4)
Difficulty on receipt of research supplies or equipment	
Yes	20 (74.1)
No	7 (25.9)
Difficulty of locomotion to the research location	
Yes	24 (88.9)
No	3 (11.1)
Limited access to the internet or other digital tools	
Yes	3 (11.1)
No	24 (88.9)
Inclusion of research using digital platforms for data collection	
Yes	14 (51.9)
No	13 (48.1)
Limitations on data collection or similar	
Yes	3 (11.1)
No	24 (88.9)
Difficulty communicating with research collaborators	
Yes	6 (22.2)
No	21 (77.8)

Regarding the general considerations made by the BPFRR in OM and OP, some were common, such as: rethinking the use of information technologies for research and postgraduate practices, delay in completing master's and PhD projects, flexibility in deadlines for final research reports, motivation and concern for mental health, and a longer time for writing papers.

Discussion

Despite all the financial limitations involved in supporting Brazilian research [16,17], the BPFRR contribute with publications in the main journals in OM and OP, resulting in a valuable international scientific production [4,10]. According to the Advisory Committee for Dentistry of CNPq (2018-2020), the criteria for selection of scholarship include number of publications and impact factor of the journals, number of PhD theses supervised (tutored and approved), contribution to innovation, coordination and participation in research projects, leadership of research groups, participation in editorial activities, and scientific management management.

Of the 27 BPFRR who participated in the study, 74.1% were male. Analyzing the profile of the BPFRR, we noticed the predominance of male gender involving other areas, such as Chemistry [7] and Medicine [6,18]. However, this fact has been changing in the last years, especially in Nursing and Physiotherapy, in which we observed the predominance of females among the CNPq BPFRR [19,20]. Regarding the geographic distribution of BPFRR, the present study pointed out a greater concentration of grants in the Southeast region (74.1%), a fact that corroborates studies involving other areas of knowledge [6,17,23,24].

The services of OM and OP in Brazil are concentrated in public and private universities and in the unified health system, particularly in a program called the Access and Quality Improvement Program of the

Centers of Dental Specialties (PMAQ-CEO). With the COVID-19 pandemic, all face-to-face classes were suspended in Brazil, including interruption of ongoing research activity, clinical trials and case studies [25]. Moreover, most public and private dental services were encouraged to attend only urgencies [26]. The Brazilian scenario associated with the diagnosis and treatment of oral diseases, including cancer and biopsies, is greatly impaired [27,28], with no prospect of returning to normal. In the present study, 88.9% of the BPFRR reported having suspended clinical activities, while 59.3% answered that histopathology practices were suspended. Even with this scenario, some pathology laboratory service has used digital means of work in order to circumvent restrictive measures [29].

During this quarantine period, tele(oral)medicine has been shown to be important [27,30,31]. In Brazil, there is still no legislation on dental tele(oral)service. An example of its importance is the high incidence of oral cancer in the country. The number of new cases of oral cancer expected in Brazil for each year of the 2020-2022 triennium will be 11,180 cases in men and 4,010 in women (<https://www.inca.gov.br/tipos-de-cancer/cancer-de-boca>). In recent studies, the average number of OM clinical consultations in Brazil in the pre-pandemic period compared with the pandemic period revealed a reduction of 65.59%, changes observed even in the treatment of head and neck cancer no longer being the surgical treatment as the first choice [32, 33].


One of the most important activities of CNPq BPFRR is the training of human resources. Our results showed that 44.5% of the BPFRR mentioned having difficulties in supervising undergraduate, master's and PhD students. As the COVID-19 pandemic passes, there is a concern that these numbers may worsen, specially highlighting that BPFRR mentioned possible involvements with mental health. This lack of psychological structure to confront the pandemic can lead to loss of motivation reflecting further on their activities [34]. In another study, we demonstrated that CNPq BPFRR in OM and OP, throughout their career, counseled 483 undergraduate students in research (median 14.20), 326 master's students (median 9.58), and 241 PhD students (median 7.08). The median Hirsch Index of the Institute for Scientific Information (Hindex ISI) of the fellows is 15.14.






A significant proportion of BPFRR (92.6%) reported that they are having difficulties in conducting research projects. Several factors were emphasized, such as: receipt of supplies and/or equipment, difficulties in the use of research facilities, limitations in the use of digital tools and platforms, data collection and difficulties in communicating with other researchers.

Conclusion

The COVID-19 pandemic has intensified the deep crisis of research funding in Brazil that is affecting the BPFRR in OP and OM. The majority of the BPFRR revealed that histopathology laboratory and clinical activities were suspended and some difficulties in performing research projects, including obtaining materials and equipment, difficulties in using research facilities, limitations in the use of digital resources and networks, data collection, and difficulties in interacting with other researchers. Considering the number of publications by the BPFRR, in addition to the deficiency of human resources training due to suspended activities, together, this current scenario can result in a significant impact on the diagnosis of oral lesions and in a decrease in the scientific production of Brazilian OM and OP.

Authors' Contributions

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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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