

# Profile analysis of post-graduates in Medicine (Radiology) at the School of Medicine of Universidade Federal do Rio de Janeiro, RJ, Brazil\*

*Análise do perfil dos egressos do Programa de Pós-Graduação em Medicina (Radiologia) da Faculdade de Medicina da Universidade Federal do Rio de Janeiro*

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**Abstract** **OBJECTIVE:** To identify the students' profile and their motivation to attend the Course of Post-Graduation in Medicine (Radiology) at the School of Medicine of Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil, as well as to quantitative and qualitatively evaluate their scientific production. **MATERIALS AND METHODS:** A questionnaire comprised of both open and closed questions was sent to 183 post-graduates, and 148 returned with answers. Expectations, professional destiny and scientific production were evaluated. **RESULTS:** Technical and scientific improvement (39.08%) and docent career progression (26.82%) were the primary motivating factors for students to attend the post-graduation course. The changes resulting from the conclusion of the course were: improvement of technical knowledge (33.33%) and higher confidence in their professional performance (17.83%). This survey has demonstrated that 60.42% of the respondents work in higher education institutions and 39.58% do not, and that 84.93% of the scientific papers about themes of theses/dissertations were published. **CONCLUSION:** The course has met the essential requirements for researchers and docents education. Also, the survey has demonstrated the necessity of a more effective performance of the program docents besides curricular changes with the introduction of a discipline dedicated to the preparation of scientific papers.

*Keywords:* Post-graduates; Profile; Post-graduation; Radiology; UFRJ.

**Resumo** **OBJETIVO:** Identificar o perfil dos alunos e as motivações que os levaram a cursar o Programa de Pós-Graduação em Medicina (Radiologia) da Faculdade de Medicina da Universidade Federal do Rio de Janeiro, bem como avaliar a produção científica, quantitativa e qualitativamente. **MATERIAIS E MÉTODOS:** Foi enviado questionário contendo perguntas abertas e fechadas a 183 ex-alunos. Responderam 148 egressos. Avaliaram-se expectativas, destino profissional e produção científica. **RESULTADOS:** O aprimoramento técnico-científico (39,08%) e a evolução na carreira docente (26,82%) foram os aspectos que mais motivaram os egressos a cursar a pós-graduação. As mudanças decorrentes da finalização do curso foram: melhor conhecimento técnico (33,33%) e maior confiança no desempenho de suas funções (17,83%). Verificou-se que 60,42% estão atuando em instituições de ensino superior e 39,58% não, e que 84,93% dos artigos científicos sobre os temas das teses/dissertações foram publicados. **CONCLUSÃO:** O curso tem cumprido os requisitos essenciais para a formação de pesquisadores e docentes. Identificou-se a necessidade de atuação mais efetiva dos docentes do programa e de modificações curriculares, inserindo-se uma disciplina dedicada à elaboração de trabalhos científicos.

*Unitermos:* Egressos; Perfil; Pós-graduação; Radiologia; UFRJ.

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## INTRODUCTION

Post-graduation programs have gained relevance in the Brazilian higher education system, and experienced a marked devel-

opment in the nineties<sup>(1)</sup>. Post-graduation courses were created to educate professionals committed to prepare researchers. This professional should develop his/her criticism capacity<sup>(2,3)</sup>. These courses are designed exclusively for persons with proven vocation to teach and/or research, and for this reason they constitute processes of education of professors and researchers<sup>(4,5)</sup>.

Post-graduation courses are involved in the development of researches covering the

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study of the widest array of themes, where credits must be accomplished by master and PhD fellows attending courses of both mandatory and optional disciplines. At the end, the students undergo an evaluation based on the submission of a thesis or dissertation to an examination board consisting of specialists in the area of study. These studies are publicized by means of publication in periodic journals of interest of the scientific community for updating on developed techniques and studies<sup>(6)</sup>.

Nowadays, the Program of Post-Graduation in Medicine (Radiology) of Faculdade de Medicina da Universidade Federal do Rio de Janeiro (FM-UFRJ) keeps count of 326 submitted, 235 of them corresponding to master degree dissertations and 91 to PhD degree theses. The program is developed by docents of the Department of Radiology at the School of Medicine, of other departments such as Anatomy, Surgery and Medical Practice, and of Instituto de Biofísica Carlos Chagas Filho.

With the engagement of professors and students through high-quality teaching and research, the course is assigned grade 5 by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes).

Tosta de Souza & Goldenberg<sup>(7)</sup> have already quoted Hossne, Rigatto, Nigro and Braga unanimously suggesting that the best method to evaluate *stricto sensu* post-graduation programs is to know the performance of masters and PhDs as innovative elements of knowledge on the social reality of the country<sup>(8-11)</sup>.

Based on the above scenario, the present study was aimed at identifying students' profile and their motivation to attend the Program of Post-Graduation in Medicine (Radiology) at FM-UFRJ, evaluating the achievement of their expectations after the conclusion of the doctorate and mastership courses, establishing the relationship between education and the professional destiny of masters and PhDs, considering the objectives of post-graduation courses, and quantitative and qualitatively evaluating their scientific production.

## MATERIALS AND METHODS

The present study covered a survey undertaken in a database, reference to records

in documents such as minute books, and application of a questionnaire with both open and closed questions, in the period between June 2008 and September 2008. Descriptive analysis was the methodology utilized in the present study. The questionnaire was sent by email to post-graduates (masters and PhDs) of the period 1977–2007 in the Program of Post-Graduation in Medicine (Radiology), and 148 returned with answers.

The sampling model was based on values (variance) resulting from the application of a pilot sample that was also utilized to correct eventual flaws in the data collection tool. The utilization of a probabilistic model of simple random sample was contemplated.

The questionnaire covered the students' profile, their motivations, expectations, professional destiny and scientific production.

All the post-graduate students of the Program of Post-Graduation in Medicine (Radiology) were included in the present study. Those who did not answer the questionnaire and whose address/phone number was not updated and for this reason could not be contacted were excluded. One post-graduate had died.

## RESULTS

Among the 148 post-graduates who answered the questionnaire, 61.49% had concluded only the master degree, 18.24% only the PhD degree, and 20.27% had concluded both master and PhD degrees in the program.

Among the masters, 63 (52.06%) were men, and 58 (47.93%) were women. Among the PhDs, 34 (59.64%) were men, and 23 (40.35%) were women. The post-graduates' ages ranged from 29 to 67 years (mean, 43.55 years).

As regards the university of origin, 27.66% graduated in the UFRJ and 72.34% came from other higher education institutions. Time elapsed from graduation ranged between 1 and 31 years. Among the 148 respondents, 43.06% were informed about the course in their own university, 44.44% by friends, 11.11% by other means, and 1.39% through the internet.

States where the post-graduates are developing their activities are the following:

Rio de Janeiro (82.43%), Rio Grande do Sul (6.08%), Minas Gerais (2.03%), Paraná (2.03%) and Santa Catarina (2.03%).

Among the respondents, the option for the Course of Post-Graduation in Medicine (Radiology) was motivated by improvement of technical and scientific skills (39.07%), progression in the docent career (26.82%), personal satisfaction (19.16%), knowledge recycling (8.05%) and improved remuneration (6.90%).

As regards previous teaching activities, the respondents' answers were the following: 52 (42.97%) masters did not develop any activity before the course, and 69 (57.03%) did, while 8 (14.04%) PhDs did not develop any activity before the course, and 49 (85.96%) did.

Considering that the Program of Post-Graduation in Medicine (Radiology) accepts professionals from similar areas of activity, the professions with higher number of ex-students were: medicine, with 103 (70.07%), dentistry, with 17 (11.56%), physics, with 13 (8.84%), biomedicine, with 3 (2.04%), and psychology, with 3 (2.04%).

As regards medical specialties, the following were indicated: 63 (61.17%) in radiology, 12 (11.65%) in nuclear medicine, 9 (8.74%) in gynecology, 8 (7.77%) in mastology and 3 (2.91%) in radiotherapy.

As regards evaluation of the course, 47.46% of masters and 54.38% of PhDs rated the course as optimum; 44.91% of masters and 36.84% of PhDs as good; and 7.63 of masters and 8.78% of PhDs as regular.

According to the post-graduates (both master and PhD degrees), the most relevant disciplines were: biostatistics (30.38%), curricular planning (26.52%), radiology education (16.58%), and scientific methodology (16.02%).

As regards the students' expectations, for 70.14% of them they were completely met, for 28.47%, partially met, and for 1.39%, their expectations were not met at all.

The program professors' performance during the course was considered as effective and constant by 59.72% of the post-graduates; for 25.69% the participation occurred in occasional meetings; and for 14.58%, the participation was superficial. Additionally, such evaluation extended to

their advisors' performance demonstrated the following results: the participation was effective and constant for 89.66%; the participation occurred in occasional meetings for 8.97%; and the participation was superficial for 1.38%.

As regards the relevance of the course for the development of the docent career, it was considered as essential by 33.91% of the masters and 36.84% of the PhDs; very important by 56.52% of the masters and 56.14% of the PhDs; and dispensable by 9.57% of the masters and 7.02% of the PhDs.

When asked about the changes in their lives after the course completion, the answers were the following: higher confidence level (33.33%), higher remuneration (19.77%), higher level of technical knowledge (18.22%), new job/position (17.83%), and other achievements (10.85%).

As regards the application of the learned skills in their professional activity, the answers were the following: 35.68% of the respondents applied the knowledge in research, 34.67% in docency, 19.10% in radiological studies, and 10.55% in other activities.

When asked about their willing to participate in some activity of the program, 54.95% of the respondents said yes, 28.17% said no, and 16.90% were already participating. The majority of respondents with master degree who do not hold a PhD yet are just interested in returning to accomplish the doctorate.

Scientific articles about the theme of theses/dissertations developed by 84.93% of the post-graduates were published, while 15.07% could not publish their articles yet. Among these publications, 95 occurred in Brazilian periodicals and 34 in international periodicals. The impact factor ranged between 0.44 and 4.45 and the journals indexation was: 8 Brazilian journals (corresponding to 5 Qualis A, 2 Qualis B and 1 Qualis C); 22 international journals (corresponding to 10 Qualis A, 7 Qualis B and 5 Qualis C).

Additionally, regarding other publications both before and after PhD and master's defense, 492 articles were published before, and 572 articles were published after master's defense. On the other hand, PhD post-graduates reported 561

articles published before, and 559 after the PhD defense.

As regards connections with higher education institutions, 60.42% of the post-graduates answered positively, and 39.58% negatively.

Table 1 shows the distribution of activities developed in these institutions.

**Table 1** Activities performed at higher education institutions.

Activities	Master degree		PhD degree	
	n	%	n	%
Assistants	14	10.77	12	11.32
Docents	52	40.00	36	33.96
Researcher	35	26.92	31	29.24
Publication	29	22.31	27	25.48

n, number of post-graduates.

## DISCUSSION

The profile of post-graduates of the Program of Post-Graduation in Radiology is similar to the other programs in Brazil, from the increase in the number of female post-graduates to the increasingly younger contingent of students seeking specialization.

No similar study developed by other *stricto sensu* program of post-graduation in radiology. Most of times, these studies refer to *lato sensu* post-graduation (medical residence), both at national and international levels.

The authors observed that a great number of post-graduates come from post-graduation courses in Rio de Janeiro as well as other states, demonstrating the existence of partnerships with other higher education institutions, especially in the Southern region.

According to the respondents, expectations in relation to the course were met in their majority; some of them, however, mentioned the necessity of a discipline approaching the preparation of scientific papers, and other commented the campus decentralization which affected the students mobility.

Technical and scientific development, docent career progression, and personal satisfaction were the most motivating factors for the ex-students to attend the post-

graduation course, demonstrating that, most of times students have equivocally sought the post-graduation course for professional improvement or titles acquisition, with no interest in docency or research which constitute the actual objectives of post-graduation courses.

As the majority of the respondents rated the post-graduation course as very important for their docency activity, considering the course as good and mentioning the learning of classes structuring and research development essential in the development of projects, the authors consider that the effort and the constant and effective participation of their advisors represented a significant contribution to this learning.

The relevance of disciplines such as biostatistics, scientific methodology, didactics and pedagogy in the docency activity testified by Camillo-Coura<sup>(12)</sup>, Tosta de Souza & Goldenberg<sup>(7)</sup>, Sousa<sup>(13)</sup> and Pinho<sup>(2)</sup> was corroborated by the results observed in the answers of the post-graduates in radiology.

Another quite relevant aspect was the result regarding the professors' and advisors' performance, demonstrating a significant number of respondents considering their participation as "sporadic meetings".

A balance was observed between number of masters who were or not involved in docency activities before the course, while most of the PhDs were already involved in docency and research activities before the course, demonstrating a previous academic vocation. Similar results have also been reported by Tosta de Souza & Goldenberg<sup>(7)</sup>, regarding post-graduates in operative technique and experimental surgery at Escola Paulista de Medicina.

As regards the application of the learned skills in the professional life, it is observed that the objective of specialization implied in the post-graduation course for both levels was achieved, considering the high number of post-graduates engaged in research and docency activities.

When asked about their willing to participate in some activity of the program, the post-graduates with master degree who did not hold a PhD yet were interested in returning to accomplish the doctorate; and those who already held the PhD were willing to return and engaging in docent and

advisory activities, and participating in examination boards.

According to Moreira & Velho<sup>(14)</sup>, the Brazilian post-graduation is based on strictly academic principles of quality recognition, and the awarding is related, among other criteria, to the publications and production of knowledge according to a linear standard, from basic to applied science, and to scientific development and production. The Capes evaluation criteria lead to an increased struggle of courses for resources in association with the achievement of higher recognition levels. In this context, the scientific community members are compelled to demonstrate an increasing scientific productivity, especially in terms of publication in the most reputable academic periodicals of the respective fields, resulting in competition, not only among scientists seeking editorial space or permanence in a circle of prestige and influence, but generating a continuous struggle of the researchers to surpass their own performances in terms of number of published papers.

Based on the study developed by Hortale & Koifman<sup>(15)</sup> one can observe the similarities between the processes of evaluation of post-graduation courses in Argentina and Brazil. Both the organs involved in the area of post-graduation — Coneau (National Committee for Universities Evaluation and Accreditation) in Argentina, and Capes, in Brazil — do not evaluate the quality of courses and programs. According to Spagnolo & Calhau<sup>(16)</sup>, the Capes system of evaluation is primarily focused on research rather than on the education quality. The evaluation tool adopted does not include an appropriate indicator for evaluation of educational methods; the quality inference is based on the analysis of the number of publications, the qualification of the docent body, orientation activities accomplished, and docents work load in the program<sup>(15)</sup>.

The change in the criteria for evaluation of *stricto sensu* post-graduation programs implemented by Capes as from 1997, is

reflected in the number of published articles, demonstrating a quite productive group. The post-graduates who have not published their papers entered the program before the establishment of the obligatoriness of publication of papers for thesis/dissertation defense. Although Kerr-Pontes<sup>(17)</sup> affirms that the process of evaluation accomplished by Capes has culminated in a lowering of many courses and disaccreditation of others in Brazil. Differently from others, the Program of Post-Graduation in Medicine (Radiology) of FM-UFRJ rose from 4 to 5 in the ranking.

## CONCLUSION

The education and academic degree awarding of an increasing number of researchers has been occurring in the last years all over the country. The academic environment demands a permanent encouragement of new scientists. An even early specialization in radiology has been observed in the last years, in parallel with the increase in the number of women in post-graduation courses almost matching the number of men.

As far as the scientific production is concerned, an increase has also been observed in the number of publications both in Brazilian and international journals.

Another important finding was that the majority of post-graduates are engaged in teaching & research activities in higher education institutions.

In the authors' opinion, a curricular change is required, with the introduction of a discipline approaching the preparation of scientific papers. Additionally a more effective and frequent performance from the part of the professors in the program is required to compensate the deficit reported by a considerable number of post-graduates regarding the sporadic docents' participation in meetings.

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