

Evaluation of the Interest in the Academic Career of Physicians Specializing in Anesthesiology

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Summary: Meurer GH, Kozuki H, Oliveira Filho GR – Evaluation of the Interest in the Academic Career of Physicians Specializing in Anesthesiology.

Background and objectives: A trend toward the lack of interest in academic careers has been observed in Medicine, including in the area of Anesthesiology. The objective of the present study was to research the interest of physicians specializing in Anesthesiology in following an academic career, as well as identify the determinant factors of this choice.

Method: The present was a prospective and cross-sectional study. A simple probabilistic sample of physicians specializing in Anesthesiology was selected and a questionnaire was sent to each participant. The answers were submitted to uni and multivariate analyses to determine the frequency of academic predisposition in the sample and to determine the independent predictive factors of academic predisposition.

Results: A total of 155 questionnaires were analyzed (rate of response = 38.7%). Sixty-nine participants (44.5%) manifested their interest in following an academic career. The multivariate analysis identified the following as independent predictive factors of academic predisposition: attending the first year of specialization (OR = 2.52; 95% CI = 1.19 – 5.38); presenting a scientific work at medical event (OR = 3.78; 95% CI = 1.84 – 7.78) and being located in the southeast region (OR = 2.66; 95% CI = 1.31 – 5.39).

Conclusions: A significant number of Brazilian physicians attending a specialization course demonstrated interest in following an academic career after the end of the course. In comparison with the probability of not manifesting academic predisposition, the physicians attending the first-year specialization course presented a 2.5-fold higher chance of manifesting interest in an academic career; those presenting a scientific work at a medical event had a 3.78-fold higher chance; those associated to Teaching Centers in the southeast region had a 2.66-fold higher chance of manifesting academic interest.

Keywords: ANESTHESIOLOGY: education.

[Rev Bras Anesthesiol 2010;60(6): 567-576] ©Elsevier Editora Ltda.

INTRODUCTION

Studies carried out with resident doctors or those specializing in several area of Medicine, including Anesthesiology, have demonstrated a certain universal trend toward the progressive loss of interest for academic careers. Bureaucracy, low pay, scarcity of tutors or structured research centers are pointed out as the main factors responsible for this phenomenon ¹⁻⁷.

The academic environment is characterized by the production of knowledge. Academicians are individuals that produce knowledge in their respective areas of specialization. In Brazil, the incentive to academic activities has been considered small or nonexistent ⁸. The main indicator of this fact is the still modest Brazilian contribution to the global amount of medical publications, represented by 1.9% of international publications ⁹ and by 0.38% of the international publications in the area of Anesthesiology ¹⁰. Therefore, it seems convenient that more individuals be interested in an academic career as a way to propel the country towards a better representation in the

world's scientific community. This concern has been the focus of discussions on the subject at national level.

Several predisposing and limiting factors can interfere with the physicians' choices regarding the specialization, concerning their career objectives after the end of the medical residency.

To know these factors is therefore of crucial importance for the educators and other members of the scientific community interested in promoting the national scientific development. Considering the scarcely encouraging environment for an academic career ⁸, the hypothesis of the present study was that only a minority of residents in Anesthesiology would manifest interest in following a career directed at research and education after the conclusion of the post-graduation course.

The aim of the study was to quantitatively evaluate the interest of Brazilian physicians in following an academic career in Anesthesiology and identify the predisposing factors for this choice.

METHOD

The study was approved by Ethics Committee in Research of Hospital Governador Celso Ramos, being a prospective, cross-sectional, voluntary and anonymous study. A simple probabilistic sample consisting of residents in Anesthesiology of both sexes, attending the first, second and third years of the specialization course at Teaching and Training Centers (TTC) accredited by the Brazilian Society of Anesthesiology (SBA) in 2008 were included in the study. Each study participant received a questionnaire sent by the Internet and a Free and Informed Consent Form through the respective e-mail address registered at the SBA website. The questionnaire aimed at collecting the following information: year at the medical specialization course (MS1, MS2 and MS3),

Received from CET/SBA Integrado de Anestesiologia da SES-SC, Hospital Governador Celso Ramos, Florianópolis, SC, Brazil.

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Submitted on February 5, 2010.

Approved on June 2, 2010.

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age, sex (male/female), geographical region (North, Northeast, Midwest, Southeast and South), participation in scientific studies (yes, no), perception of the incentive to perform research in his/her TTC (frequently, sporadically, rarely or never) and interest in following an academic career (yes, no). When the study participant had taken part in research projects, he/she was asked to inform what phase(s) of the study project he/she had participated in (project, data collection, statistical analysis, manuscript preparation, presentation at medical event). When there was interest in following an academic career, the participant was asked to report his/her areas of academic interest (teaching, research, teaching and research, undecided), intended academic title (specialization, Master's degree, Doctor's degree, Post-Doctorate) and the main obstacles to be overcome to obtain the title (bureaucracy, financial compensation, working hours, requisite for publication, physical resources, supervision). When there was no interest in following an academic career, the participant should declare such lack of interest or report the time during his or her formation when this interest was lost stating the main reasons why this decision was made (bureaucracy, financial compensation, working hours, requisite for publication, physical resources, supervision, etc.).

To calculate the sample we estimated that the percentage of participants interested in following an academic career would be around 10% or one-third of the percentage of residents with academic inclinations in studies carried out in developed countries where this percentage is approximately 30%⁶. Considering a confidence level of 95% and an estimated response rate of 30%^{11,12} it was estimated that 480 physicians attending a specialization course had to be invited to participate in the study.

Electronic mail containing the questionnaire was sent to 480 physicians attending a specialization course, of which electronic addresses were selected through random numbers generated electronically and attributed to the 1,065 electronic addresses of aspiring members available at the SBA website. The questionnaire was sent two more times to the participants who did not respond after the first time the questionnaire was sent, with monthly intervals between them.

The data obtained were submitted to the following statistical analyses (SPSS v.12, SPSS Inc., Chicago): descriptive statistics and analysis of internal consistency of the questionnaire (Cronbach's alpha coefficient). The data were submitted to univariate analyses through Fisher's, Chi-square and Student's *t* tests. The variables that showed to be significant in the comparisons between the participants that manifested predisposition or not to follow an academic career were used in the construction of a logistic regression model to identify the independent prediction factors for predisposition of the physician attending ME (medical specialization) toward following an academic career. The level of significance was set at 5% of probability of type I error.

RESULTS

Of the 480 e-mails sent, 46 presented failure when sending the email and were discarded, whereas 168 were answered from a total of 434, which generated a return rate of 38.7%. Among the answered emails, 11 questionnaires were disregarded due to errors when they were filled out and were not included in the analysis of the study, which led to a number of 155 participants in accordance with the previous sample

calculation. Cronbach's alpha coefficient of the questionnaire was 0.7. The demographic characteristics of the study participants are shown in Table I. The percentages of response to the questionnaire items are shown in Tables II, III and IV.

Sixty-nine participants (44.5%) gave an affirmative answer to the question: "Are you interested in following an academic career", which characterized the subgroup of MS physicians that presented the predisposition to follow an academic career. Considering as dependent variable the MS physician having or not interest in an academic career and considering all other variables as independent variables, when submitted to the univariate analysis, the following were considered significant: category "MS1" from the variable "year of specialization"; categories "southeast" and "south" from the variable "region related to the TTC"; categories "project" and "presentation at medical event" from the variable "phase of the research during which the individuals worked"; category "national publication" from the variable "published study authorship" and category "physical resources" from the variable "obstacles to scientific production (Table V).

Table I – Demographic Data

	n	%
Sex *		
Male	87	56
Female	67	44
Age (years)**	27.33 ± 2.23	
Year of specialization*		
MS1	49	32
MS2	52	33
MS3	54	35
Region*		
Southeast	84	54
South	27	17
Midwest	23	15
Northeast	18	12
North	3	2

* Categorical variables expressed as frequency (n) and respective percentages (%);

** Continuous variable expressed as mean and standard deviation and respective ranges.

Table II – Descriptive Statistics of the Questions Answered by all Participants

	n	%
Participation in scientific works		
Yes	115	74.2
No	38	24.5
Did not answer	2	1.3
Phases of the research during which the individuals that participated in the scientific studies worked*		
Project	86	74.8
Data collection	99	86.1
Statistical analysis	63	54.8
Manuscript preparation	82	71.3
Presentation at medical event	72	62.6
Published work authorship*		
No	81	52.2
Yes, national publication	56	36.1
Yes, international publication	18	11.6
Incentive to do scientific work during residency		
Frequently	49	31.6
Sporadically	55	35.5
Rarely	40	25.8
Never	11	7.1

* Question allowed more than one answer; thus, the sum of the number of answers in each question might not be the same as the total number of study participants.

Table III – Descriptive Statistics of Questions Answered only by the Participants with Interest in an Academic Career (n = 69)

	n	%
Area of work		
Teaching	33	47.8
Teaching and research	31	44.9
Research	3	4.3
Undecided	1	1.4
Did not answer	1	1.4
Main obstacles to scientific production*		
Bureaucracy	20	29
Financial compensation	22	31.9
Working hours	32	46.4
Requisites for publication	7	10.1
Physical resources	13	18.8
Supervision	13	18.8
Intended level of schooling		
Specialization only	8	11.6
Master's degree	11	15.9
Doctor's degree	35	50.7
Post-Doctorate	12	17.4
Did not answer	3	4.3

* Question allowed more than one answer; thus, the sum of the number of answers in each question might not be the same as the total number of study participants.

Table IV – Descriptive Statistics of Questions Answered only by the Participants without Interest in an Academic Career (n = 86)

Question	n	%
Period during which the interest for the academic career was lost		
Never existed	29	33.7%
Lost during Graduation	25	29.1%
Lost during MS1	19	22.1%
Lost during MS2	5	5.8%
Lost during MS3	5	5.8%
Did not answer	3	3.5%
Main reason that contributed to the loss of interest for the academic career*		
Bureaucracy	28	32.6%
Financial compensation	26	30.2%
Working hours	32	37.2%
Requisites for publication	6	7%
Physical resources	6	7%
Lack of supervision	18	20.9%

* Question allowed more than one answer; thus, the sum of the number of answers in each question might not be the same as the total number of study participants.

Table V – Comparisons Between the Participants with and without Interest in an Academic Career regarding the Study Variables and their Respective Categories

Variable Category	Academic Interest (n = 69)		No Academic Interest (n = 86)		p**
	Present*	Absent*	Present*	Absent*	
Period of specialization					
MS1	28 (40.6%)	41 (59.4%)	21 (24.4%)	65 (75.6%)	0.038
MS2	18 (26.1%)	51 (73.9%)	34 (39.5%)	52 (60.5%)	0.089
MS3	23 (33.3%)	46 (66.7%)	31 (36.0%)	55 (64.0%)	0.738
Sex					
Male/Female	42 (60.9%)	27 (39.1%)	40 (47.1%)	45 (52.9%)	0.333
Region related to TTC					
North	1 (1.4%)	68 (98.6%)	2 (2.3%)	84 (97.7%)	1.000
Northeast	8 (11.6%)	61 (88.4%)	10 (11.6%)	76 (88.4%)	1.000
Midwest	8 (11.6%)	61 (88.4%)	15 (17.4%)	71 (82.6%)	0.368
Southeast	46 (66.7%)	23 (33.3%)	38 (44.2%)	48 (55.8%)	0.006
South	6 (8.7%)	63 (91.3%)	21 (24.4%)	65 (75.6%)	0.011
Participation in scientific studies					
Yes/No	55 (80.9%)	13 (19.1%)	25 (29.4%)	60 (70.6%)	0.188
Phases of the research during which the individuals that participated in the scientific studies worked					
Project	45 (65.2%)	24 (34.8%)	41 (47.7%)	45 (52.3%)	0.035
Data collection	45 (65.2%)	24 (34.8%)	54 (62.8%)	32 (37.2%)	0.867
Statistical analysis	32 (46.4%)	37 (53.6%)	31 (36.0%)	55 (64.0%)	0.249
Manuscript writing	39 (56.5%)	30 (43.5%)	43 (50.0%)	43 (50.0%)	0.517
Presentation at event	42 (60.9%)	27 (39.1%)	30 (34.9%)	56 (65.1%)	0.002
Published work authorship					
No	18 (26.1%)	51 (73.9%)	33 (38.4%)	53 (61.6%)	0.123
Yes, national publication	34 (49.3%)	35 (50.7%)	22 (25.6%)	64 (74.4%)	0.003
Yes, international publication	11 (15.9%)	58 (84.1%)	7 (8.1%)	79 (91.9%)	0.206
Incentive to scientific work during residency					
Frequently	23 (33.3%)	46 (66.7%)	26 (30.2%)	60 (69.8%)	0.730
Sporadically	23 (33.3%)	46 (66.7%)	32 (37.2%)	54 (62.8%)	0.736
Rarely	16 (23.2%)	53 (76.8%)	24 (27.9%)	62 (72.1%)	0.581
Never	7 (10.1%)	62 (89.9%)	4 (4.7%)	82 (95.3%)	0.219
Main obstacles/reasons to scientific production					
Bureaucracy	22 (31.9%)	47 (68.1%)	28 (32.6%)	58 (67.4%)	1.000
Financial compensation	23 (33.3%)	46 (66.7%)	26 (30.2%)	60 (69.8%)	0.730
Working hours	32 (46.4%)	37 (53.6%)	32 (37.2%)	54 (62.8%)	0.256
Requisites for publication	7 (10.1%)	62 (89.9%)	6 (7.0%)	80 (93.0%)	0.565
Physical resources	13 (18.8%)	56 (81.2%)	6 (7.0%)	80 (93.0%)	0.029
Supervision	15 (21.7%)	54 (78.3%)	18 (20.9%)	68 (79.1%)	1.000

* Values expressed in frequencies (percentages), extracted from 2 x 2 contingency tables used to perform Fisher's exact test.

** p value refers to the comparisons described above by two-tailed Fisher's exact tests.

The logistic regression identified the following independent predictor factors for the predisposition to follow an academic career: to be MS1 – attending the first year of specialization (OR = 2.52; 95% CI = 1.19 – 5.38); presenting a scientific work at medical event (OR = 3.78; 95% CI = 1.84 – 7.78) and belonging to a TTC in the southeast region (OR = 2.66; 95% CI = 1.31 – 5.39). The percentage of correct classification of the model applied to the original sample was 69%.

DISCUSSION

A significant number of the residents that participated in the study (44.5%) demonstrated interest in following an academic career. At the end of the 1980s, Hillman et al. reported a prevalence of academic predisposition of 28% among radiologists and 19% in radiology residents¹. In 2006, Reck et al. reported a prevalence of academic predisposition of 36.9% among the residents of Dermatology and of 72.5% among those aspiring to residency in this medical specialty. Considered together and taking into account the possibility of selection bias, the results of these three studies suggest an increase in the academic predisposition among resident doctors. In favor of this hypothesis is the fact that the questionnaire items used in the present survey were extracted from two aforementioned studies, which allows qualitative comparisons to be made. This possible increase in the academic interest observed throughout the years is compatible with the significant increase in the national contribution to international scientific literature, which, even though is small when compared to the total, places the country among the four presenting the highest growth rates in the last decade⁹.

To promote a growing interest for the academic career must be the focus of the formation centers, by searching for factors that can encourage it. According to the study by Lynch et al., carried out with academic dermatologists, the two most important factors when choosing an academic career were the high regard for professors-tutors during the residency and the teaching experiences with the undergraduate medical students⁴. The independent factors found in the present study were: presenting a scientific study at a medical event, being associated with a TTC located in the southeast region and being a first-year MS resident. As observed by Hillman et al¹, a higher academic inclination was observed among residents that belonged to institutions that were better classified by the respective medical societies. The southeast region of Brazil concentrates the largest universities and research centers of the country. To be associated with a medical residency program located in this region was an independent predictor factor of the predisposition to follow an academic career. Moreover, it is very probable that during the process of academic formation in the southeast region, the individual has more chances to be exposed to the company of academics in Anesthesiology, who can function as model, guiding and stimulating the students. Lynch et al. observed that most of the residents

in Dermatology that participated in the study, had decided to follow the academic career after the second year of residency⁴. In the present study, being a first-year Anesthesiology resident was an independent factor of prediction for the predisposition to follow an Academic career.

Cultural differences in specialty or of methodology can eventually explain this difference between the current study and the aforementioned one⁴. The reason for that is because the present study has a cross-sectional characteristic and the fact that the MS1 resident has just started the residency can function as a bias, as he or she could be more enthusiastic about the specialization and the academic environment and thus be more predisposed to manifest interest in following an academic career. This bias could be overcome with a future study of prospective characteristics, following the MS resident throughout the three years of specialization.

On the other hand, to have knowledge of the factors that can discourage the individual to follow an academic career and try to minimize them is part of a strategy that seeks to strengthen the academic environment. Bergstresser¹³ cited that among the obstacles to follow an academic career are financial questions, lack of control over one's career, need to adopt a political posture within the institution and little time for attending to the demands of academic production. In the study carried out by Reck et al.⁶, the obstacles identified were: bureaucracy, financial questions, lack of supervision and guidance, scarcity and inadequacy of environment for academic practice. Hillman et al.¹ cited, in decreasing order of importance, the following obstacles: finding time for academic practice, pressure to undertake clinical practice, obtaining resources for research, difficulty to find knowledgeable colleagues, insufficient support services, personal and family obligations, pressure to undertake teaching activities, difficulties to obtain good ideas for research and the respective publication. In the present study, the main obstacles pointed out by the participants in search of an academic career were the working hours, bureaucratic questions related to research and financial compensation, understood as the depreciation of academicism in relation to the private practice. However, none of these factors showed to be significant when submitted to the multivariate analysis and thus, cannot be considered independent factors of prediction.

As in the study developed by Reck et al.⁶, most of the participants of the present study that manifested a predisposition to follow an academic career reported teaching as the main focus of academic activities. Academicism is characterized by the production and transmission of knowledge and its respective publication. The scarce interest demonstrated by the participants with an academic predisposition in dedicating to research deserves consideration, suggesting certain confusion in relation to the meaning of an academic career.

The limitations of the present study refer to its design, present in any research that includes data collection by electronic means: external validation of the obtained data, obtaining a sample that is representative of the population and an adequate response rate^{11,12}. In this type of study, in addition to the fact that the response rates are low, it is possible the oc-

currence of a selection bias, as many participants that answered the questionnaire could be exactly those with a higher predisposition to follow an academic career. Another limitation is due to the fact that this was a cross-sectional study, which does not allow a prospective follow-up of the residents along the three years of the medical residency program.

Finally, this study suggests that in order to incentive the formation of academic anesthesiologists the medical residency programs could incentive medical residents, especially during the first year of specialization, to carry out scientific studies including the respective presentation at scientific events.

Moreover, it is also important to emphasize the importance of creating strategies for the development of capacities related to teaching during the medical residency program, as much of the interest demonstrated by the participants is focused on this area. Not only researchers, but also teachers are necessary for the formation of the academic environment.

The results of this study also suggest that improvements in the scientific production and the educational environment of the medical residency programs could positively stimulate residents to follow an academic career.

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Resumen: Meurer GH, Kozuki H, Oliveira Filho GR – Evaluación del Interés en la Carrera Académica de los Médicos en Especialización en Anestesiología.

Justificativa y objetivos: Se ha venido observando una cierta tendencia a la pérdida del interés académico en las diversas áreas de la Medicina, incluso en la Anestesiología. El objetivo de este estudio fue investigar el interés de los médicos en especialización (ME) en Anestesiología, para continuar una carrera académica, como también identificar los factores determinantes de esa elección.

Método: El estudio fue prospectivo y transversal. Se seleccionó una muestra probabilística sencilla de médicos en proceso de especialización en Anestesiología. Un cuestionario fue enviado a cada participante. Las respuestas se sometieron al análisis uni y multivariado para determinar la frecuencia de la predisposición académica en la muestra y determinar los factores predictivos independientes de predisposición académica.

Resultados: Fueron analizados 155 cuestionarios (tasa de respuesta = 38,7%). Sesenta y nueve participantes (un 44,5%), manifestaron interés en seguir una carrera académica. El análisis multivariado identificó como factores independientes de previsión de la predisposición académica: estar cursando el primer año del curso de especialización (razón de chances [RC] = 2,52; intervalo de un 95% de confianza [IC 95%] = 1,19 – 5,38), haber presentado un trabajo científico en un evento médico (RC = 3,78; IC 95% = 1,84 – 7,78) y pertenecer a la región sudeste (RC = 2,66; IC 95% = 1,31 – 5,39).

Conclusiones: Una parte significativa de los MEs brasileños demostró interés en seguir una carrera académica después del término del curso de especialización. En comparación con la probabilidad de no manifestar predisposición académica, los médicos del primer año del curso de especialización presentan chances 2,5 veces mayores de manifestarse interesados en una carrera académica. La presentación de un trabajo científico en eventos médicos aumentó esa chance en 3,78 veces. Pertenecer a CETs de la región sudeste aumentó en 2,66 veces el chance de manifestar interés académico.

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