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Eduardo Jorge da Fonseca Lima, Beatriz Queiroz da Apresentação Cavalcanti, Ana Cecília Capane Bonagura Cavalcante, Pedro Henrique Lins Martins, Karine Ferreira Agra & Afra Suassuna Fernandes

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Reasons for Choosing a Reference Hospital During the Application for Medical Residency Programs: A Cross-Sectional Study

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Eduardo Jorge da Fonseca Lima^{1,2}

Beatriz Queiroz da

Apresentação Cavalcanti¹

Ana Cecília Capane Bonagura Cavalcante¹

Pedro Henrique Lins Martins¹

Karine Ferreira Agra^{1,2}

Afra Suassuna Fernandes²

¹Faculdade Pernambucana de Saúde (FPS), Recife, Brazil; ²Instituto de Medicina Integral Prof. Fernando Figueira (IMIP), Recife, Brazil

Introduction: Medical residency (MR) programs consist of medical education systems based on the healthcare network as a teaching place. The Instituto de Medicina Integral Prof. Fernando Figueira (IMIP) is a referral center for several medical specialties and presents one of the largest MR programs in Brazil.

Objective: To assess the main reasons why residents choose a reference hospital to apply for a medical residency position.

Methods: Cross-sectional study performed with 165 medical residents of a reference hospital (IMIP) located in the Northeast region of Brazil between 2019 and 2020. Sociodemographic characteristics, medical formation, preparation for the residency exam, expectations regarding the program, and the reasons leading the residents to choose the IMIP were assessed.

Results: Most participants initiated the residency program 2 to 3 years after graduating the medical school. Most of the sample (78.8%) took preparation courses for the residency. The main expectations that led the residents to choose the IMIP were: the complexity of cases (81.2%), the number of patients (79.4%), technical quality of the preceptors (76.4%), prestige of the institution (75.1%), and preceptors' motivation (57.6%).

Conclusion: Medical residents join residency programs based on expectations of medical practice scenarios that enable an adequate number of patients and quality preceptorship.

Keywords: internship, residency, specialization, motivation

Introduction

Medical residency (MR) programs are postgraduate courses for medical doctors based on the healthcare network (especially large hospitals) as a teaching place. The first MR program was founded in 1889 at the John Hopkins Hospital and covered the surgery and medical clinic areas. In Brazil, the first MR program was created in 1945 in the orthopedics division of the Hospital das Clínicas (University of São Paulo).¹ From a hospital in the USA to a worldwide model, MR programs are the gold standard in the development of specialist training.¹⁻⁶

The Instituto de Medicina Integral Prof. Fernando Figueira (IMIP), founded in 1960, is a philanthropic entity that operates in medical-social assistance, community health extension, teaching, and research. The IMIP hospital presents one of Brazil's most important structures, and it is the referral center for several medical specialties.⁷ The residency program in pediatrics, created in 1966, is one of the leading MR programs in Brazil.⁸ In the 1970s, the IMIP's medicine program in

Correspondence: Eduardo Jorge da Fonseca Lima
Rua dos Coelhos, nº300, Boa Vista –
Recife, Pernambuco, Brazil
Tel +55 81 2122-4166
Email eduardojorge@imip.org.br

pediatrics was the first to receive recognition, which has increased the demand for medical doctors from other states in the Northeast region. Currently, the IMIP residency program is one of the largest in Brazil, presenting more than 426 vacancies in 48 MR programs and approximately 520 preceptors.^{9,10}

Substantial differences can be observed when considering the number of occupied residency vacancies per 100 thousand inhabitants in Brazil. There are 23.7 resident doctors per 100 thousand inhabitants in the Southeast and 19 in the South Brazilian regions, while this ratio is 8.1 and 8.7 in the North and Northeast regions, respectively. This number is also below the national average (ie 16.9 per 100 thousand inhabitants), demonstrating the relevance of the IMIP in providing high-quality residency courses.⁶

Despite the above-mentioned, the reasons why residents seek a specific MR is not known. Thus, we aimed to determine why residents choose the MR program at IMIP. This study will contribute to strengthen institutional management processes and improve other MR programs in Brazil.

Materials and Methods

This is a cross-sectional study conducted according to the Declaration of Helsinki and approved by the research ethics committee of the IMIP (n° 3,519,249). All subjects signed an informed consent form.

The IMIP is a hospital with more than one thousand beds that attends approximately 600 thousand patients per year. All these visits are 100% offered by the Unified Health System (SUS). The institution was one of the first in Brazil to obtain a teaching hospital certificate and is currently the head office of undergraduate and postgraduate (*lato sensu* and *stricto sensu*) programs.

A convenience sample composed of 275 medical residents approved in the residency exam between 2019 (n=135) and 2020 (n=140) were included. All residents were contacted using message apps to schedule the day, time, and place to respond to a survey containing questions about choosing the MR program in the above-mentioned institution. Those who were not present or could not participate or answer the survey on the scheduled day were excluded.

The survey was divided into four items: (1) sociodemographic characteristics (age, gender, ethnicity, marital status, and the Brazilian state of origin), (2) medical formation and preparation for the MR exam (year of medical

graduation, name and type of institution [public or private], preparation for the MR exam, approval for other MR exams between 2019 and 2020, other MR attempts in the same medical area before IMIP's approval, area of MR approval), (3) expectations regarding the MR program (case complexity, sufficient number of patients for good medical formation, technical quality and commitment of preceptors, presence of motivated preceptors, the institution's prestige and theoretical quality, access to technology and complementary exams, and professor's indications), and (4) study habits (weekly hours dedicated to the medical literature and periods chosen for this activity). The third item (expectations) had five response options: totally disagree, partially disagree, neither agree nor disagree, partially agree, and totally agree.

The reasons that led the residents to choose the IMIP were also assessed. For this, all residents were asked to indicate the main reasons based on the following options: institution's prestige, number of patients, structure, the tradition in medical residency teaching, quality of preceptorship, number of vacancies, ease of approval, professors, and former residents' opinion. The main five reasons were highlighted in order of relevance.

Statistical Analysis

A Likert scale was used to assess agreements related to residency program expectations.¹¹ The scale was composed of five points (0–5), ranging from “total disagreement” to “total agreement”.

Data were analyzed using the Epi-Info program, version 7.2. The results were inserted twice at different moments by two different researchers (double entry). Databases were compared to correct errors and inconsistencies, and a final database was generated for analysis. Descriptive statistics were used to characterize the residents. Data are shown as absolute and relative frequencies (for categorical variables).

Results

One hundred and sixty-five residents were included (110 could not participate on the scheduled day and were excluded). Of these, 91 initiated the residency in 2019 (67% of the residents enrolled in 2019) and 74 in 2020 (53% of those enrolled in 2020). Most of the sample was female (n=101, 61.21%) aged between 26 and 30 years (n = 88, 53%). Sociodemographic characteristics are shown in Table 1. One hundred and seven residents were from direct access areas and 58 from specialty areas.

Table 1 Sociodemographic Characteristics of the IMIP's First-Year Residents

	N (165)	%
Biological		
Age (years)		
22–25	39	23.6
26–30	88	53.3
31–35	34	20.6
> 35	4	2.4
Sex		
Male	64	38.8
Female	101	61.2
Ethnicity		
White	92	55.8
Black	5	3.0
Brown	66	40.0
Yellow	1	0.6
Not declared	1	0.6
Sociodemographic		
Marital status		
Not married	122	73.9
Married/Stable Union	41	24.8
Divorced	2	1.2
State of origin		
Pernambuco	85	51.5
Northeast States	72	43.6
Other states	3	1.8

Note: Data are shown as absolute and relative frequencies.

Regarding the study habits of the residents, 50.3% (n=83) use to read academic texts 2 to 3 days per week, while 30% (n=51) read with a frequency of more than four days. Ninety-three residents (56.3%) dedicated 4 to 10 hours per week to reading, and 90% of this reading was performed at night.

The medical formation, the MR program preparation, and the distribution of residents in the MR areas are described in [Table 2](#).

One hundred and twenty-six residents (76.4%) chose the IMIP as the first MR choice. The remaining residents (n=39, 23.6%) reported less time available for individual study, excessive workload, overcharging, and the high number of patients as reasons for not choosing the IMIP as a first option.

The reasons that led the residents to choose the IMIP were also assessed. The five main reasons mentioned were highlighted, in order of relevance, in [Figure 1](#).

[Table 3](#) shows the positive expectations for the MR program. More than 80% of residents fully agreed that the complexity of clinical cases generated a positive

Table 2 The Medical Formation, Preparation for the Exam, and Medical Residency Programs of the IMIP's First-Year Residents

	N (165)	%
Medical formation		
Year of graduation		
2004 to 2013	22	13.3
2014	11	6.7
2015	19	11.5
2016	26	15.8
2017	12	7.3
2018	51	30.9
2019	24	14.5
Type of institution		
Public	101	61.2
Private	62	37.6
Institution		
UFPE	23	13.9
UPE	30	18.2
FPS	25	15.2
UNIVASF	5	3.0
Residency preparation		
Participation in preparatory courses		
Yes	129	78.8
No	36	21.8
Previous participation in the selection for the same medical area		
Yes	37	22.4
No	128	77.6
Approval in other selections in 2019/2020		
Yes	51	30.9
No	112	67.9
Medical residency programs - 2019/2020		
Direct Access		
Pediatrics	25	15.2
Diagnostic Imaging	24	5.4
Anesthesiology	17	10.3
Gynecology and Obstetrics	16	9.7
Medical clinic	11	6.7
Psychiatry	8	4.8
General surgery	6	3.6
Surgical Specialties		
Pediatric surgery	4	2.4
Cardiac surgery	4	2.4
Plastic surgery	2	1.2
Urology	2	1.2
Vascular surgery	2	1.2
Gastrointestinal Surgery	1	1.2
Pediatric Specialties		
Neonatology	10	6.1
Gastroenterology	4	2.4
Pneumology	4	2.4
Cardiology	4	2.4

(Continued)

Table 2 (Continued).

	N (165)	%
Endocrinology	2	1.2
Nephrology	2	1.2
Clinical Specialties		
Endocrinology	6	3.6
Cardiology	4	2.4
Hematology	3	1.8
Hepatology	3	1.8
Oncology	1	0.6

Note: Data are shown as absolute and relative frequencies.

Abbreviations: UFPE, Federal University of Pernambuco; UPE, Pernambuco University; FPS, Faculdade Pernambucana de Saúde; UNIVASF, Federal University of Vale do São Francisco; MR, Medical residency.

expectation. The number of patients and the technical quality of the preceptors were also indicated.

Discussion

Residency is an essential step for the medical career; thus, choosing the MR program institution is critical. In this sense, some reasons prevail the choice for a teaching hospital, such as expertise in teaching, diagnostic support, the presence of a multidisciplinary team with various training programs, a large number of patients, and qualified preceptors. Conversely, excessive demand for complex patients may be interpreted as a disadvantage by

young medical doctors due to less time available for study and/or parallel activities.¹²

Most residents were single and aged between 26–30 years, corroborating with the mean age of professionals who join MR programs in Brazil (26.9 years).¹³ Currently, an increased number of women are joining universities and residency programs,¹⁴ a fact that was also verified in our study (61.2% were female).

The state of Pernambuco is the greatest breadbasket of the Northeast region for professional training because the IMIP is recognized as a reference center in Brazil, which may also explain why most residents were from other Northeast states. The remaining residents from other Brazilian states reflect the lack of training institutions and search for professional improvement. We emphasize that the state of Pernambuco offers one of the highest numbers of MR vacancies in the Brazilian Northeast region (700 annual vacancies for direct access programs), and the tradition of medical courses in the state may also contribute to choosing the MR program at IMIP.^{15,16}

It is known that MR is the main contributor to professional retention in Brazil, and it is more significant than the location where the graduation was performed.¹⁷ Once this fact may hinder the return of professionals to their home states, good MR programs are essential to reduce the loss of professionals to other regions.¹⁸

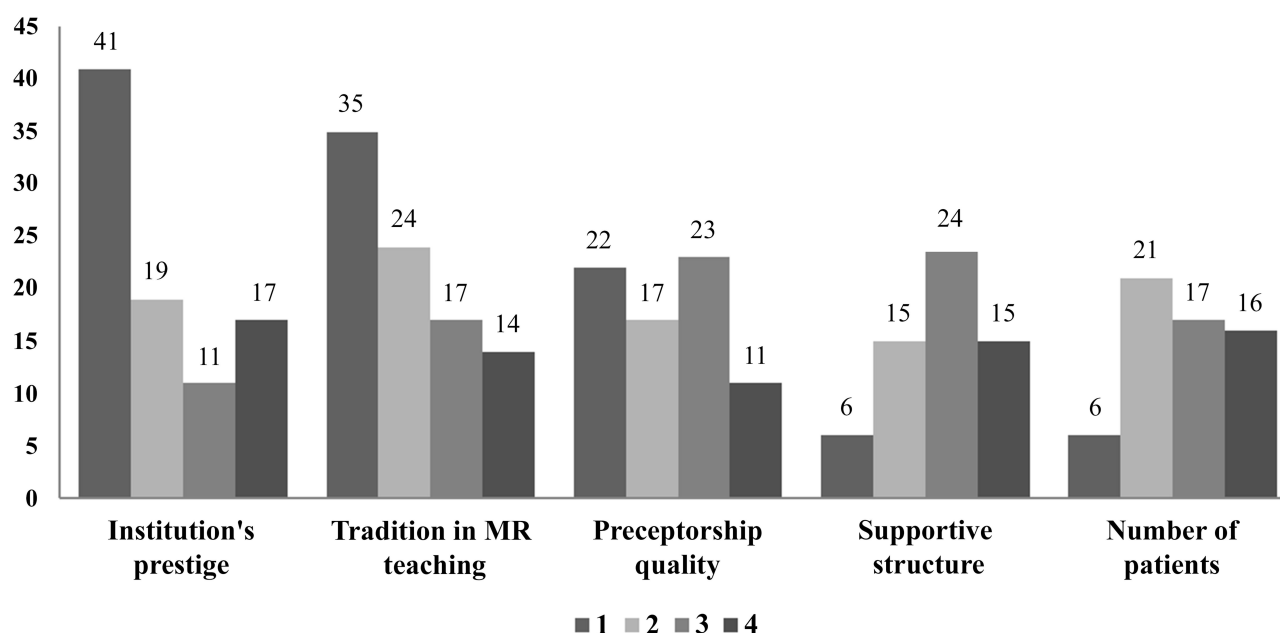


Figure 1 Reasons for choosing the IMIP as the first option. Numbers (1, 2, 3, and 4) represent the order of relevance of the five most cited choices. Data are shown as absolute frequencies.

Abbreviation: MR, medical residency.

Table 3 Positive Expectations for the Program Among the IMIP's First-Year Residents

N=165	Totally Disagree		Partially Disagree		Neither Agree nor Disagree		Partially Agree		Totally Agree	
	n	%	n	%	n	%	n	%	n	%
Complexity of clinical cases	0	0.00	2	1.20	4	2.40	22	13.30	134	81.20
Sufficient number of patients	0	0.00	3	1.80	3	1.80	26	15.80	131	79.40
Technical quality of the preceptors	0	0.00	1	0.60	5	3.00	32	19.40	126	76.40
Prestige of the institution	1	0.60	5	3.00	0	0.00	35	21.20	124	75.10
Preceptors committed to teaching	1	0.10	5	3.00	4	2.40	30	18.20	124	75.10
Quality of theoretical activities	0	0.00	5	3.00	5	3.00	43	26.10	101	65.50
Motivated preceptors	1	0.60	1	0.61	9	5.40	52	31.50	100	60.60
Indication/suggestion of professors	0	0.00	5	3.03	9	5.40	54	32.70	95	57.60
Access to technology and complementary exams	4	2.40	5	3.03	28	17.00	47	28.50	79	47.90
Complexity of clinical cases	3	1.80	7	4.24	19	11.50	71	43.00	63	38.20

In addition to the residency workload (ie 60 hours per week), most residents are employed, impacting the number of hours dedicated to theoretical studies. In our study, 20% of the residents studied less than 2–3 times per week. This is worrisome, especially during a professional improvement period, since MR requires reading dedication for practical learning consolidation. A multicenter study performed in the USA showed that residents study more as the MR training progresses, probably due to the intense workload, precluding the possibility of having other ties. Furthermore, the annual scholarship of American residents is ~45 thousand dollars (against US\$ 7,800 in Brazil).^{19,20}

It was observed that 61.21% of those who joined the MR program were from public universities, despite the greater number of private medical colleges in Brazil. This may be due to the offered training and the fact that more medical doctors are graduating and the residency vacancies did not increase in the same proportion.¹⁵

Most of the residents (78.8%) took a preparatory course for the MR exam. As most medical students enroll in these courses, a “collective awareness” regarding the importance of taking them is generated. There is also a general concern that the contents addressed in medical schools do not cover and/or are not focused on residency exams since the university trains general practitioners. Also, personal and group expectations for MR approval is a factor that leads the students to seek complementary preparation.^{15,21}

Most residents initiated the MR programs 2 or 3 years after graduation. This phenomenon has been observed in the last ten years either because the residents dedicate themselves to work activities and obtain immediate financial resources or due to the difficulty in passing the most

competitive exams. This corroborates with data from a study performed in the state of Bahia (Brazilian Northeast region) that observed the following reasons for residency disinterest: financial, transfer to another city, and unpreparedness for the exam.²¹ Another study estimated that only part of new medical doctors joined MR programs.²²

Only 30.9% of the residents were approved for other MR exams but opted for the IMIP, suggesting that this hospital has the necessary attributes for good professional training in different medical areas.

The “partially agree” and “totally agree” options shown in Table 3 indicate the institution's expected quality. However, if only the “totally agree” item is considered, the IMIP strengths would be the following: the complexity of clinical cases, sufficient number of patients for good medical formation, technical quality of preceptors, prestige of the institution, and number of patients attended (ie variables with a concordance index >75%). The other variables (preceptors committed to teaching, quality of the theoretical activity, efficient and motivated preceptors, the indication of professors, and access to technology and complementary exams) were not decisive aspects for choosing the MR since they were below 66% in the “totally agree” item.

Regarding the preceptors' motivation, 57.6% of residents believed they were motivated. Although this indicator is relevant, motivation was not the most relevant point in the residents' perspective, probably due to other decisive factors (ie number of patients and institution's tradition and infrastructure). It is also necessary to reflect that preceptors need to be prepared with teaching techniques because gaps are still present in the pedagogical training of these professionals (eg specialization in the area of

education is still rare). Thus, institutions or governments should support and/or encourage the implementation of pedagogical preparations before engaging in teaching activities. These professionals are placed in preceptorship functions after finishing their residency; thus, they do not feel stimulated and/or trained for this function, leading to excessive attributions and difficulties in teaching-learning processes.²³ Therefore, pedagogical training involving active methodologies and research incentives is essential for these professionals.²³

The main reason for choosing the MR program was the institution's prestige, followed by tradition in teaching, quality preceptorship, supportive structure, and the number of patients. These factors correlate with positive expectations since they are part of the student judgment regarding the intended institution to initiate the medical residency.

We observed that the IMIP is a suitable teaching environment for future residents, reflecting the institution's expertise in this modality.^{6,7,9,24}

Study Limitations

Although the Likert scale allowed evaluating aspects related to perception and/or expectations, it is possible that a qualitative study design using small groups would allow a better analysis of these issues. Although the study was conducted in a single institution, it may serve as a reference for other institutions to become attractive after incorporating characteristics, such as quality of clinical staff, research development during the MR, and an increased number of diagnostic and therapeutic resources.

Conclusion

Medical doctors join residency programs based on expectations of medical practice scenarios that enable an adequate number of patients and quality preceptorship.

This choice reflects the search for complete education with an emphasis on teaching infrastructure. In this context, policymakers should adequate MR programs based on the expectations of the residents. Furthermore, the preceptors' pedagogical training needs to be improved, together with research incentives and active methodologies.

Ethical Approval

Approved by the research ethics committee of the IMIP (n° 3519249).

Author Contributions

BQAC, ACCBC, and PHLM elaborated the project and study design, performed data collection, drafted, critically revised the manuscript, and agreed to take responsibility and be accountable for the contents of the article. EJFL, KFA, and ASF collated, interpreted data, drafted and revised the paper, performed the final edition prior to submission, and agreed to take responsibility and be accountable for the contents of the article. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors declare no conflicts of interest in this work.

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