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Relationship between quota-based admission and academic performance of Medical students

Relação entre acesso por cotas e rendimento acadêmico de estudantes de Medicina

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ABSTRACT

Introduction: The quota policy aims to expand access to higher education for historically underrepresented groups. However, its impact on the academic performance of medical students remains controversial.

Objective: To analyze the academic performance, measured by the General Academic Performance Coefficient (GPA), of medical students admitted to the Federal University of Pará (UFPA) between 2010 and 2018, comparing quota and non-quota students.

Method: This was an observational, cross-sectional, and quantitative study analyzing data from 1,340 medical students at UFPA's Belém campus. GPA scores were compared between groups using the independent samples Student's t-test and quartile analysis. Categorical variables were analyzed using the chi-square test (χ^2), with a significance level of $p<0.05$.

Results: The overall mean GPA was 7.55±1.18. Quota students had a lower mean GPA than non-quota students (7.35±1.22 vs. 7.78±1.09; $p<0.001$). The performance gap was more pronounced in the first quartile (6.4%) and decreased in higher quartiles.

Conclusion: The lower academic performance of quota students—particularly those in the lower quartiles—highlights persistent inequalities that influence academic trajectories. These findings emphasize the importance of institutional support and retention policies that address the socioeconomic conditions of students, thereby promoting equity in medical education.

Keywords: Academic performance; Public policies; Affirmative actions; Medical students.

RESUMO

Introdução: *A política de cotas visa ampliar o acesso de grupos historicamente excluídos ao ensino superior. Contudo, ainda há controvérsias quanto ao impacto dessa política no desempenho acadêmico de estudantes de Medicina.*

Objetivo: *Este estudo teve como objetivo analisar o desempenho acadêmico, medido pelo coeficiente de rendimento geral (CRG), de estudantes de Medicina ingressantes na Universidade Federal do Pará (Ufpa) entre 2010 e 2018, comparando cotistas e não cotistas.*

Método: *Trata-se de um estudo observacional, transversal e quantitativo, com análise de dados de 1.340 estudantes do curso de Medicina do campus de Belém da Ufpa. O CRG foi comparado entre os grupos por meio do teste t de Student para amostras independentes e análise por quartis. Analisaram-se variáveis categóricas com o teste do qui-quadrado (χ^2), com nível de significância de $p < 0,05$.*

Resultado: *A média geral do CRG foi de 7,55 ± 1,18. Os cotistas apresentaram média inferior à dos não cotistas (7,35 ± 1,22 versus 7,78 ± 1,09; $p < 0,001$). A diferença foi mais acentuada no primeiro quartil (6,4%), diminuindo nos quartis superiores.*

Conclusão: *O desempenho inferior dos estudantes cotistas, especialmente entre os de menor rendimento, revela desigualdades persistentes que impactam a trajetória acadêmica. Os achados reforçam a importância de políticas de permanência e apoio institucional que considerem as condições socioeconômicas dos discentes, contribuindo para a equidade no ensino médico.*

Palavras-chave: *Desempenho Acadêmico; Políticas Públicas; Ações Afirmativas; Estudantes de Medicina.*

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INTRODUCTION

Affirmative actions (AA) encompass policies aimed at guaranteeing rights historically denied to minority groups, such as Black people, women, and people with disabilities and it is based on the understanding that equal rights alone do not guarantee equal opportunities. Therefore, it would be necessary to offer unequal access conditions to those who have been historically, and therefore structurally, treated unequally, with the aim of correcting decades of lack of opportunities[1].

Universidade do Estado do Rio de Janeiro (UERJ) was the pioneer in 2003 by reserving places for students from public schools, followed by Universidade de Brasília (UnB) in 2004, which made racial quotas available. Universidade Federal do Pará (UFPA) also stood out as a pioneer in adopting AA. In the 2008 selection process, people who completed their entire high school education in the public school system were entitled to 50% of the vacancies [2]. By 2012, there were already 162 public universities with similar programs [3].

In line with these initiatives, the Brazilian government enacted Law N. 12,711, which, since August 29, 2012, regulates admission to federal universities and federal secondary technical education institutions, and has undergone several updates. This law, known as the "Quota Law," guarantees a 50% reserve of vacancies per course and shift for students who completed their entire secondary education in public schools (school quota). Of this number, 50% must be occupied by students with a *per capita* family income equal to or less than one and a half minimum wages (income quota), with this value being updated to one minimum wage in 2023. Furthermore, within the total 50% of vacancies, the law guaranteed a proportional reserve for self-identified Black, Brown, and Indigenous people (BBI), according to IBGE data for each federation unit. In 2016, persons with disabilities (PWD) were included, and in 2023, *quilombolas* were included. The remaining 50% of vacancies are reserved for general admission (GA)[4].

However, in Brazil, the effectiveness of reserved vacancies on academic performance is controversial. Silva et al., analyzing the cycles of the National Student Performance Exam (ENADE, *Exame Nacional de Desempenho dos Estudantes*) between 2011 and 2016, found that the group taking the ENADE with Medicine, which includes most health and agricultural sciences programs, benefited most from AA, accounting for 19.25% of graduates during this period. This study showed that quota students had, on average, a 11.8% lower performance than students admitted through general admission[5]. However, Queiroz et al. observed that there were no significant differences in academic performance between students admitted through school quotas and those admitted through GA to courses at a federal university, highlighting the variability of results across different studies[6].

Studies show that the expansion and diversity of students in Higher Education (HE) pose significant challenges for Higher Education Institutions (HEIs), which must ensure embracement and sustainable conditions for student academic performance and retention. This context reinforces the importance of providing ongoing pedagogical support, especially for students beginning their undergraduate studies, a critical period of adaptation to new demands for autonomy and interpersonal relationships[7].

In August 2004, the Federal Council of Medicine's website published an article entitled "Medicine Says No to Quotas," in which a traditional Brazilian HEI publicly opposed the implementation of quotas to reserve vacancies, fearing that this would affect the quality of education. At the time, the institution highlighted the risks that the precariousness of basic education could reflect on higher education, and that the adoption of quotas could increase dropout rates and hinder students' adaptation to medical school, since the training requires full-time dedication and generates significant costs[8].

Twenty years have passed since the aforementioned article was published, and the scarcity of studies on the topic prevents an in-depth debate about it. Therefore, understanding whether the educational performance of students admitted through reserved vacancies is indeed a predictor of low performance in the current medical education scenario is essential for guiding educational policies not only for access but also for the retention of these students in the course.

Therefore, aiming to contribute to this important discussion, this study was designed to analyze the academic performance of medical students, using the General Performance Coefficient (GPC) of students as a parameter, between those admitted through the quota system and those admitted through GA.

METHOD

An observational, cross-sectional study was conducted that analyzed data provided by the Academic Registration and Indicators Center (CIAC) at UFPA, focusing on the access method (quota vs. non-quota) and the GPC of UFPA Medical School students, on the Belém campus, who entered the institution between 2010 and 2018.

The GPC measures academic performance and is calculated based on the weighted average of grades obtained in curricular activities. UFPA uses the following formula to calculate the GPC: $CRG = [\sum (Ni\ x\ Ci)] / \sum Ci$, where Ni is the final grade obtained in course i, Ci is the course load for discipline i, and ∑ indicates the sum of all terms[9].

Data from 1,340 students were analyzed. Quota students were those admitted through the institutional

quota system, which reserves vacancies for PwD (Persons with Disabilities), BBI (Black, Brown, and Indigenous people), Income Quota, School Quota, as well as those admitted through the Special Selection Process (PSE) for Quilombola, Indigenous, and Affirmative Academic Mobility. The remaining students were classified as non-quota students or as having access through general admission.

The inclusion criteria were students from the Medical School (Belém) who were admitted between 2010 and 2018 and used the aforementioned access methods. The period was chosen because the Institutional AA has been progressively implemented since 2008[2] but has been fully established since 2010. Similarly, the current GPC calculation was implemented in 2008, being therefore in effect during the analyzed period. It should be noted that, by definition, the GPC refers to academic performance for the entire academic period, unlike the Academic Period Performance Coefficient (CRPL), which refers to performance in each academic period. Therefore, by using the GPC for students entering from 2010 to 2018, the data from students who completed all their curricular components between 2016 and 2020 are being analyzed. The exclusion criteria included students who entered through other access methods.

Data Analysis and Representation

The data were organized in Microsoft Office 365 Excel® spreadsheets. Quantitative variables were presented using descriptive and inferential statistical methods, as well as measures of central tendency and variation. Qualitative variables were presented using absolute and relative frequency distributions. The chi-square test and Student's t-test were used, with a significance level of $p<0.05$. Statistical processing was performed using IBM SPSS Statistics 29.0.2.0® software.

Ethical Aspects

The research met the ethical and legal requirements for research involving human subjects, according to Resolution N. 466/2012 of the National Health Council and the precepts of the Nuremberg Code and the Declaration of Helsinki. The project was approved by the Research Ethics Committee of the Institute of Health Sciences - Universidade Federal do Pará, under opinion number 6,979,761, dated August 2, 2024. (CAAE number 80731824.6.0000.0018).

RESULTS

Table 1 shows the general characteristics of the analyzed sample, indicating a predominance of males (55.7%) and access through the HEI Quota system (53.6%).

The average GPC score of the analyzed students was 7.55±1.18. Regarding the difference in GPC scores between quota and non-quota students, Figure 1 indicates that the average GPC score of quota students was statistically lower than that of non-quota students ($p<0.001$). The standard deviation among the quota group reveals a greater variation in performance in this group than in the non-quota group.

When comparing quartiles, there is a variation between the group means, which is more relevant in the first quartile (p25), with a difference in GPC of 6.4% between the groups, reducing to 4.9% in the 50th percentile and to 3.7% in the 75th percentile (Figure 2).

DISCUSSION

The findings of this study indicate that UFPA quota students in the medical program had lower academic performance than non-quota students, as measured by the GPC. This difference, more pronounced among the lowest-performing students (first quartile), may suggest the influence of multiple factors beyond simply the type of university admission.

Similar to a study conducted at Universidade Federal da Bahia (UFBA) in 2016, the results confirm that the overall performance of non-quota students is superior to that of quota students at all levels, considering the overall average or quartiles. Although the study in Bahia was conducted with

Table 1. Characteristics of the analyzed medical students (Belém) (sex, year of admission, type of access), admitted between 2010 and 2018, at Universidade Federal do Pará.

Variable	n (1340)	%	P
Sex			<0.001
Male	746	55.7*	
Female	594	44.3	
Year of admission			0.995
2010	145	10.8	
2011	149	11.1	
2012	146	10.9	
2013	145	10.8	
2014	153	11.4	
2015	152	11.3	
2016	147	11.0	
2017	144	10.7	
2018	159	11.9	
Quotaholder			0.009
Yes	718	53.6*	
No	622	46.4	

*Chi-square
Source: prepared by the authors.

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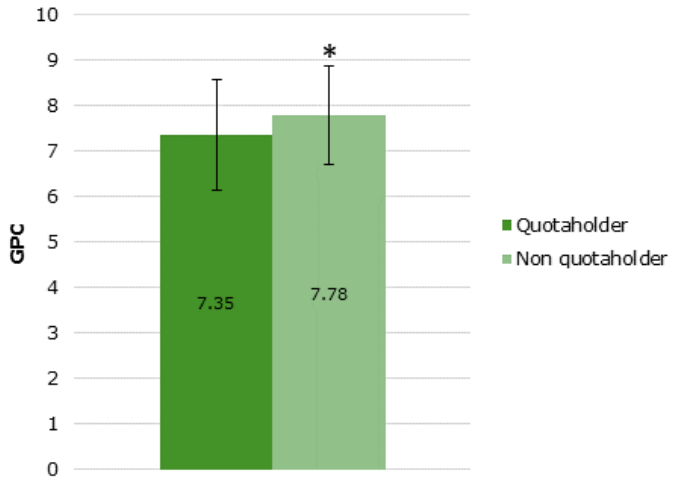
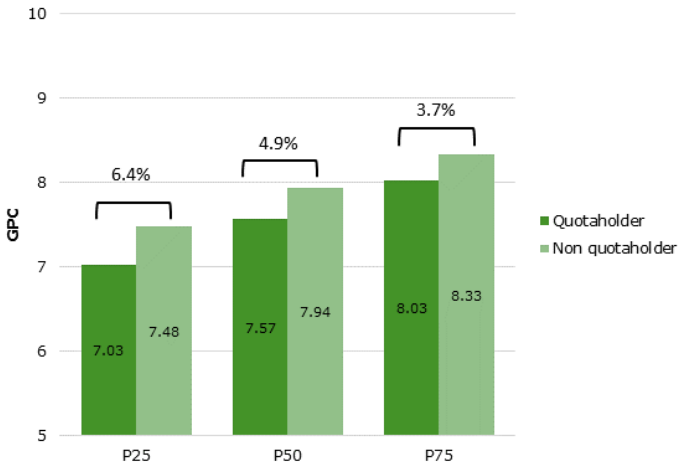
Figure 1. Comparison between the GPC of quotaholder and non-quotaholder students of the Medicine Course (Belém), admitted between 2010 and 2018, at Universidade Federal do Pará.



*p<0.001 T test for Independent samples.
Source: prepared by the authors.

Figure 2. Comparison between the GPC percentiles of quotaholder and non-quotaholder students of the Medicine Course (Belém), admitted between 2010 and 2018, at Universidade Federal do Pará.



Source: prepared by the authors.

graduates from various courses, the data found at UFPA's medical program follow the same trend. When the data are separated and the lowest-performing students (25%) are compared, the GPC difference is 6.4%, dropping to 4.9% when the groups are split in half. This difference drops to 3.7% when analyzing the upper portion of the sample (75th quartile), suggesting that the performance of the best quota students is similar to that of the best non-quota students[10].

This variability may reflect educational trajectories marked by unequal access to educational resources. This hypothesis can be corroborated by results found in a study conducted with students at Universidade Estadual Paulista (UNESP), which found no difference between quota and non-quota students[11]. The results of this study were attributed to the fact that the Medical program at the Botucatu School of Medicine is the most competitive program at UNESP, as well as one of the most competitive medical programs in Brazil, assuming a ratio of 261.4 applicants per vacancy for the 2022 entrance exam. Furthermore, the quota system adopted during the study period used only the school quota and the BBI quota, not the income quota.

This trajectory is not only related to academic merit but can also be the result of structural inequalities that impact this educational trajectory, both before and during college. A study conducted at the Medical School of Universidade Federal do Maranhão, which has a quota-based admissions system more similar to that of UFPA, also found differences in the performance of the quota and non-quota groups and suggests that this difference is related to the student's family income[12].

Ribeiro (2011) already emphasized that parents with better financial resources offer greater educational opportunities to their children, which perpetuates a cycle of social inequality between generations, extending the elitism to access to public higher education, with an emphasis on the most competitive programs[13]. However, this smaller dispersion in performance does not necessarily imply academic superiority, but rather stability that can be influenced by various factors, such as family support and better pre-university educational structures.

Therefore, what is most relevant is not just the difference in results, but the underlying conditions that can influence these performances during the course. Lower academic performance may be associated with a higher likelihood of dropout or psychological distress among quota students, phenomena that still lack systematic monitoring at HEIs. Strategies such as psychopedagogical support and expanded access to retention grants are essential to mitigate these risks.

In this regard, the Ministry of Education (MEC) created the Permanence Grant Program in 2013, which was updated in 2023. Its goal is to minimize social, ethnic, and racial inequalities and contribute to the retention and graduation of students, especially for Indigenous, *Quilombola*, and socioeconomically vulnerable undergraduate students enrolled in federal higher education institutions (IFES)[14].

UFPA offers various types of scholarships, exemptions, and psychological and pedagogical support. Student assistance plays a crucial role in the retention and academic success of quota students. Chaves (2016) emphasizes that programs like Permanence not only provide financial assistance but also offer

psychosocial support, contributing to student integration and well-being[15]. However, the effectiveness of these policies must be continually evaluated to ensure they truly meet students' specific needs.

Although this research allowed us to broaden our perspective on AA policies in medical school, because it was a study using secondary data from the institutional database, some gaps could not be addressed, such as students' family income, pre-university academic background, treatments used, pedagogical adaptations, etc.

In any case, it is hoped that these gaps can be addressed in further research using different methodological approaches. Furthermore, it is worth highlighting another possible development of this research: a comparative analysis between the different types of quotas, seeking differences between them that could even help explain why the academic performance of the best quota students approaches that of the best non-quota students. Perhaps this group of students has unique characteristics that are relevant to highlight in future studies, by this or other research groups.

Finally, it is well known that education is one of the main means of social advancement, and academic training provides access to professional positions with better pay. Therefore, the implementation of affirmative action policies must be accompanied by strategies that provide additional support and aim to reduce inequality of conditions for university success. Therefore, by removing barriers to the success of educational democratization, we will contribute to the dismantling of social inequality. This is a matter of equity, ensuring that all students, regardless of their admission profile, have equal opportunities for academic development.

CONCLUSION

The results of this study show that, although the quota policy has expanded access to higher education, inequalities in academic performance persist, especially among students with greater socioeconomic vulnerability. The lower GPC observed among quota students reinforces the need for institutional strategies that promote not only admission, but also, more importantly, the retention and success of these students.

More than confirming disparities, this study contributes to the debate on the conditions that influence academic performance, highlighting the importance of student support policies combined with inclusive pedagogical practices. Ensuring that all students, regardless of their admission method, fully enjoy the university experience is essential for higher education to fulfill its transformative role and truly promote equity in access to knowledge and professional opportunities.

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AUTHORS' CONTRIBUTIONS

Maykon Leal Brandão contributed to Writing – Original Draft and Writing, Review, and Editing; Denise Maria Sampaio Guimarães contributed to Writing – Original Draft and Writing, Review, and Editing; Julieta Cristina de Andrade Jatahy contributed to Methodology, Validation, and Writing – Review, and Editing; Nara Alves de Almeida Lins contributed to Methodology, Validation, and Writing – Review, and Editing; Cezar Augusto Muniz Caldas contributed to study conception and Design; Methodology, Validation, and Writing – Review, and Editing.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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DATA AVAILABILITY STATEMENT

Research data are available in the body of the document

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