



Research Article

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Studying Neurology in Latin America: Comparative Analysis of Academic Curriculum

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Abstract

This study analyzes neurology curricula in universities across Latin America, taking into account the diversity in medical education and the need to improve the training of specialists in a constantly evolving field. The objective of the research is to compare neurology educational programs in Latin America by evaluating admission requirements, curricular structure, and courses offered. A comparative methodology was employed to examine the curricula of various Latin American universities included in the QS ranking. Data collection was conducted between November 2023 and July 2024, using Python as the primary programming language for the development and implementation of algorithms, complemented by dolphin-2.7-mixtral. Findings indicate that Colombia and Chile have the highest number of universities offering specialization in neurology, predominantly within private institutions. Common admission requirements were identified, such as holding a medical degree and completing a rotating internship. However, significant differences were observed, including psychological testing and language proficiency requirements. The most common subjects include Clinical Neurology and Neurophysiology, although there is variation in the emphasis on specific topics. There is significant diversity in educational programs, but challenges remain in terms of accessibility and equity. Greater collaboration and standardization among institutions are recommended to improve neurology training in the region.

Keywords: neurology; curriculum; medical education; Latin America; Benchmarking

1. Introduction

Neurology is an independent medical specialty closely related to internal medicine, neurosurgery, and psychiatry (Tashiro, 1996), focusing on disorders of the nervous system, encompassing its structure, function, and diseases (Coles, 2019). Within this framework, the field of neurology has undergone a significant shift toward subspecialization, with trainees and junior specialists demonstrating strong preferences for specific areas of interest (Zis et al., 2018). This trend has been driven by the growing role of technology in neurological specialization, especially since the late 19th century (Lanska, 1997). However, this shift has also raised questions about the role of general neurology in a specialized world and the need for improved referral and care practices within subspecialties. In the related field of neurosurgery, a similar trend towards subspecialization is evident, with a growing number of trainees pursuing subspecialty fellowships (Flaster, 2010).

In the 1960s, neurology in Latin America was viewed as an under-resourced specialty in medicine (Barrow, 2016). However, it later became apparent that medical students require a strong neuroscience foundation for their clinical experiences (Rose, 1964). But what is the situation in Latin America today? This region still faces several primary factors contributing to the scarcity of local research on neurology, including limited financial resources (Gelb et al., 2021), lack of integration and participation in the international community of neurology societies (Fiestas et al., 2008), and insufficient specialized training programs (Ashfaq and Lazareff, 2017). This investigation particularly focuses on the latter aspect. Despite the region's economic, political, and social instability, formal initiatives have emerged to address these challenges, and this study delves into these efforts, highlighting the progress made in training within this medical specialty.

Neurology in Latin America faces significant challenges, such as an insufficient number of pediatric neurologists, underfunded public hospitals, and fragmented healthcare systems (Arango-Lasprilla, 2017). Language barriers limit access to updated information and hinder participation in the global neurosurgical community (Fiestas et al., 2008). Despite these challenges, opportunities for progress exist. The World Federation of Neurology has promoted neurology education in Latin America (Vidaurre and Weisleder, 2022), and virtual platforms have expanded access to both care and education (Arango-Lasprilla, 2017). The Latin American region, with its varied healthcare and educational landscapes, offers a unique context for examining neurology education programs. Specifically, healthcare systems face a range of challenges related to both communicable and non-communicable neurological conditions, underscoring the need for robust and adaptable medical training (Medina and Munsat, 2010). Nevertheless, the existing literature on medical education in Latin America has tended to focus on more general areas of medicine (Puschel, 2017).

In the Latin American context, successful collaborations between institutions in Brazil (Moura-Ribeiro et al., 2000) and Argentina (Correale et al., 2013) in the field of pediatric neurology provide a regional example of how shared expertise can enhance training quality. Highlighting such collaborations not only contextualizes the findings within a global framework but also inspires actionable strategies for fostering similar initiatives across Latin America.

This study aims to enrich the existing literature through a comprehensive comparative analysis of neurology curricula in Latin America, focusing on three key dimensions: admission requirements for neurology programs, curriculum structure and content, and course patterns during specialization years. By addressing these aspects, the analysis seeks to map the current educational landscape in neurology training, identify exemplary educational practices and areas for improvement, and provide an empirical foundation to guide future educational reforms in the region.

This gap in the literature raises questions about the effectiveness and relevance of neurology curricula in the region: What are the common characteristics and significant differences among neurology curricula at higher education institutions in Latin America? How are these programs designed to address the specific neurological health needs of their local and regional contexts? To what extent do neurology curricula in Latin America incorporate recent advances in research and clinical practice?

2. Methodology

The general objective of this study is to comparatively analyze neurology specialization in Latin America by examining its geographic positioning, curricular content, integration of research and clinical practice, and its adaptability to rapid advancements in the field of neurology. From this, the following specific objectives were established: [1] Identify the countries and rank the universities that offer neurology specialization programs; [2] Determine the co-occurrences of admission requirements for neurology programs; [3] Examine the course patterns offered during the years of specialization in neurology.

This study employs a comparative design, a methodology that enables the contrast of similarities and differences among neurology education programs across various Latin American countries. This approach is suitable for examining how diverse socioeconomic, cultural, and healthcare contexts influence neurology training. The comparison is based on data collection and analysis from curricula of higher education institutions across the region. The main analytical criteria for this study are as follows:

Countries and University Ranking: Neurology curricula from universities in various Latin American countries will be analyzed. Representative universities from each country will be selected, and their national and international academic rankings will be classified. This classification will be based on recognized indicators such as academic quality, research output, and institutional reputation, providing a comparative perspective on neurology training within the region. The ranking will rely on the QS World University Rankings, one of the most globally recognized university ranking systems (Rybiński and Wodecki, 2022). This ranking is selected for its robust and comprehensive methodology, which includes indicators such as academic quality, employer reputation, international student ratio, and research productivity, offering a broad and comparative view of neurology education in the region.

Admission requirements: Admission requirements for neurology programs in Latin America typically include a set of criteria that candidates must meet to be accepted into the specialization (Cowley, 2006). These criteria commonly encompass holding a medical degree or equivalent, which ensures that candidates have a solid foundational medical education and are prepared for specialized training in neurology. Additionally, completion of a rotating internship is a common prerequisite, during which candidates gain practical experience in various areas of medicine—crucial for developing general clinical skills before specializing (Levaillant et al., 2020). Many programs require passing a specific entrance exam for neurology, designed to assess candidates' knowledge and aptitudes. Moreover, personal interviews are often used to evaluate the applicants' motivation, attitude, and interpersonal skills.

Courses offered during specialization years: The courses taught during the years of specialization in neurology consist of the specific classes and modules that residents must complete as part of their training (Yanagisawa, 2010). These courses are designed to provide an in-depth and specialized understanding of various aspects of neurology, combining theory with clinical practice (Keshavan et al., 2020). Reviewing these courses is essential to understanding how neurology training programs are structured and what competencies residents are expected to acquire throughout their specialization (Keyser, 2003). The analysis of courses offered will include an examination of the curricular content of neurology specialization programs at various universities in Latin America. Basic and clinical courses will be reviewed, typically covering fundamental topics such as neuroanatomy, neurophysiology, neuroimaging, and neurological semiology. These subjects provide the essential theoretical foundation for neurology practice and are usually covered in the initial years of specialization.

To obtain this information, data was collected from the official websites of Higher Education institutions from November 12th, 2023, to July 23th, 2024, focusing on those included in the QS ranking. The neurology curricula of selected universities in Latin American countries were reviewed, gathering detailed information on admission requirements, curricular content, and pedagogical

methodologies. Subsequently, the collected data was analyzed and compared to identify patterns, similarities, and differences in neurology education programs across the region.

Data was systematically processed using Python as the primary programming language for developing and implementing algorithms, supplemented by the Dolphin-2.7-Mixtral open-source language model for generating question-and-answer-based text. Regular expressions were used to model and manipulate text sequences. Advanced natural language processing (NLP) was performed with Spacy and NLTK for tasks such as tagging, dependency parsing, and text categorization. TheFuzz, based on Levenshtein distance, was employed to calculate fuzzy string matching for identifying textual differences. Numpy was used for high-performance mathematical and statistical operations on multidimensional arrays, while Pandas facilitated data structure manipulation and analysis. Pygal was utilized for creating dynamic SVG charts, and Yfile for generating node-based graphics.

Furthermore, Python’s libraries facilitated advanced natural language processing tasks, such as text tagging and categorization. Regular expressions were used to standardize and extract textual data from diverse curricular formats, ensuring consistency and accuracy in the analysis.

Dynamic visualizations were created using Pygal, enabling clear representation of complex data relationships, such as the network of curricular subjects. Additionally, TheFuzz library was utilized for fuzzy string matching, addressing inconsistencies in institutional nomenclature and course titles. This comprehensive integration of Python-based tools not only ensured methodological rigor but also enhanced the replicability of the study’s findings.

3. Results

3.1 Countries and University Rankings

To conduct this analysis, Higher Education Institutions (HEIs) included in the QS ranking were identified, with selections made within the period from November 12, 2023, to March 23, 2024. The following composition represents the distribution of HEIs by region:

Table 1. Distribution of Higher Education Institutions offering neurology specialization by country

Country	Number of institutions	Institutions
Colombia	9	Universidad Simón Bolívar Universidad del Rosario Universidad Javeriana Universidad de la Sabana Universidad del Valle Fundación Universitaria de Bogotá - José Tadeo Lozano Universidad Militar - Nueva Granada Universidad ICESI Universidad Nacional de Colombia
Chile	6	Universidad del Desarrollo Universidad Mayor de Chile Universidad de los Andes Universidad de Valparaíso Universidad de la Frontera Universidad Católica de la Santísima Concepción
Peru	2	Universidad Nacional Federico Villareal Universidad Nacional San Agustín
Argentina	2	Hospital Italiano de la Universidad de Buenos Aires Universidad de Favaloro
Bolivia	1	Universidad Mayor de San Andrés
México	1	Universidad Autónoma de Nuevo León
Ecuador	1	Universidad de las Américas
Paraguay	1	Universidad Nacional de Asunción
Uruguay	1	Universidad de la República

Regarding the composition of HEI distribution by region, information is contrasted between universities and the QS Ranking of Latin American countries, allowing for an analysis of the average positioning relative to the number of HEIs offering a Neurology specialization. This analysis serves as the initial criterion for selecting the corpus of HEIs used in the study.

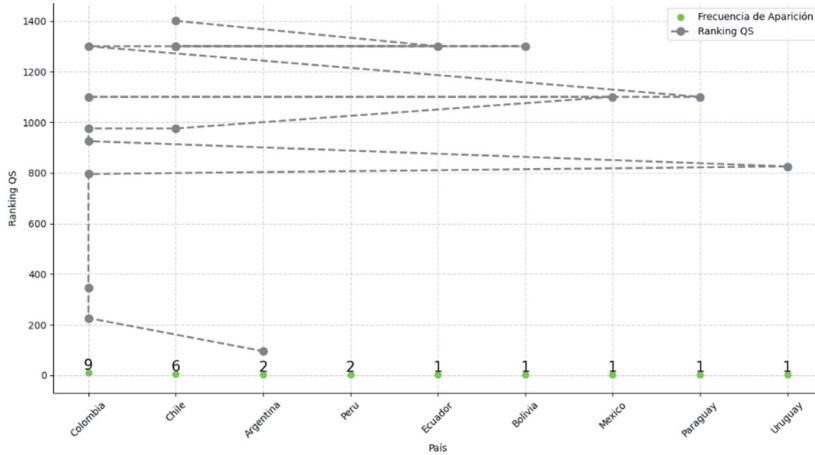


Figure 1. Distribution of Higher Education Institutions by Region and QS Ranking

It was identified that countries such as Colombia and Chile have a higher number of categorized universities; however, these institutions are positioned within higher QS Ranking ranges, indicating that as their valuation increases, their ranking positioning declines. This evidence, however, is not entirely causal. Neurology training in South America has been shaped by a profound and enduring admiration for European education, which influenced the establishment of this discipline in the region. In fact, the initial steps in neurology training in South America occurred almost simultaneously with those in European countries, particularly in Argentina, Brazil, Uruguay, Chile, and Peru (Allegrí, 2008).

Aligned with this context, Figure 1 illustrates Latin American countries with the highest number of neurology specializations by type of access, distinguishing between public and private universities. The results reveal that most programs are concentrated in private universities, suggesting that access to postgraduate training might be constrained by tuition costs in these institutions compared to public offerings. Moreover, this trend may drive competition, potentially resulting in lower public investment in programs, infrastructure, or student subsidies, which can affect both the quality and accessibility of education in this specialization. Another significant factor potentially linked to this disparity is that graduates from private universities may be more likely to practice in urban or economically developed areas, leaving rural areas underserved.

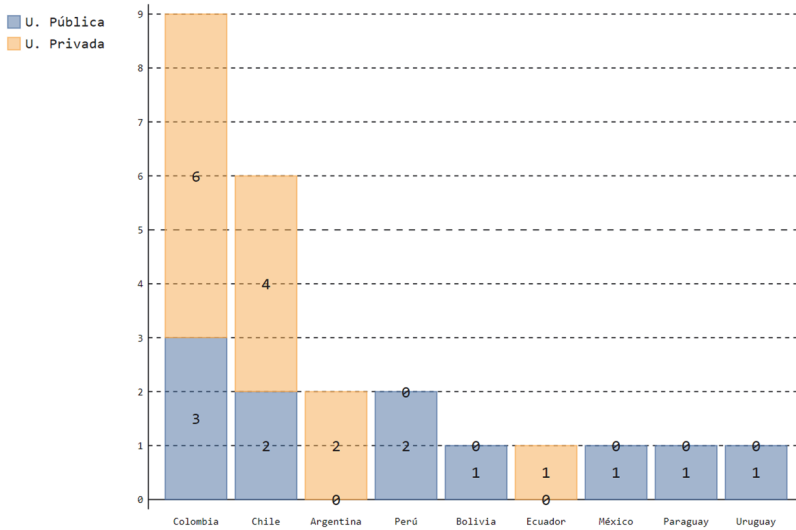


Figure 2. Latin American Countries with Neurology Specializations

The analysis of the distribution of neurology specializations in Latin America, particularly in Colombia (Figure 2), highlights a potential correlation between the availability of specialized educational programs and various socioeconomic factors alongside medical infrastructure. Data from Colombia indicate a significant 44% increase in the number of hospitals offering neurology services from 2015 to 2020, rising from 1,145 to 1,652 facilities. This statistic not only demonstrates quantitative growth but also suggests an active response from the health sector to the rising demand for specialized neurological services.

There is a clear variance in the participation of public and private sectors in neurology training. Countries like Colombia and Chile exhibit a strong private sector presence, while others, such as Uruguay and Paraguay, rely primarily on public institutions, highlighting certain challenges in strengthening regional collaboration and knowledge exchange. Furthermore, these values contrast with the density of neurologists across Latin American countries, presenting a complex landscape regarding the interaction between educational offerings and specialist availability. This ranges from 2.9 neurologists per 100,000 inhabitants in Argentina (Somoza and Melcon, 2015) to 0.497 in Bolivia (Giuliano et al., 2018).

The analysis suggests that the concentration of neurology programs in certain countries, particularly Colombia and Chile, may reflect broader socio-economic and educational dynamics within Latin America. The predominance of private universities in offering neurology specializations, as identified, likely correlates with disparities in public sector funding. This trend may indicate that access to specialized medical education could be more accessible to individuals from higher socio-economic backgrounds, thereby influencing the demographic profile of trained neurologists across the region. Furthermore, the notable presence of these programs within universities ranked highly in the QS system may indicate that resources and academic prestige play pivotal roles in developing advanced neurological education. This centralization of resources may have implications for the availability of specialized neurological care, potentially creating geographic and socio-economic gaps in service provision

3.2 Admission requirements for neurology specialization

It began with the consolidation of a comprehensive knowledge base that includes a total of 215 admission requirements. This base accounts for the inherent redundancy in admission criteria across

the various institutions analyzed, enabling the identification of requirements based on their frequency (requirements mentioned in more than four universities) and relevance. Tables 2 and 3 provide a detailed view of the similarities and differences in selection criteria among the HEIs.

Table 2. Admission requirements for neurology specialization

Common requirements	
1.	Medical Doctor (M.D.) degree or equivalent
2.	Identification document
3.	Updated curriculum vitae with supporting documents
4.	Undergraduate transcript or GPA certificate
5.	Professional license or equivalent
6.	Recent photographs
7.	Approved national medical knowledge examination
8.	Interviews
9.	Social or rural service
10.	Publications and research

Specific Requirements	Institutions
<ul style="list-style-type: none"> Malpractice insurance 	Hospital Italiano de la Universidad de Buenos Aires, Universidad de los Andes
<ul style="list-style-type: none"> Psychological or psychometric exams 	Universidad del Desarrollo, Universidad Nacional Federico Villareal, Universidad de la Frontera
<ul style="list-style-type: none"> Letters of recommendation 	Universidad del Desarrollo, Universidad de los Andes, Universidad de la Sabana
<ul style="list-style-type: none"> Proficiency in a foreign language 	Universidad Javeriana: Segunda lengua, Universidad de las Américas: Inglés nivel A1
<ul style="list-style-type: none"> Time limit since graduation 	Universidad Mayor de Chile: Máximo 10 años
<ul style="list-style-type: none"> Specific vaccination requirements 	Universidad de los Andes: Hepatitis-B, Influenza, Covid-19, Universidad de Valparaíso: Hepatitis B
<ul style="list-style-type: none"> Minimum GPA requirement 	Universidad Nacional de Colombia.
<ul style="list-style-type: none"> Specific work experience 	Universidad Nacional Federico Villareal

This detailed identification of requirements helps facilitate potential academic mobility between countries and programs. By establishing uniform standards that are recognized and valued by various institutions, it enables access to comparable academic and professional training, regardless of the institution of origin. This contributes significantly to reducing bureaucratic or academic barriers that may exist in this context.

The variability observed in admission requirements across institutions—such as language proficiency, psychological assessments, and mandatory research experience—underscores the diversity in educational approaches to neurology in Latin America. This heterogeneity may reflect differences in institutional expectations regarding the skills and attributes necessary for neurology practice. The additional requirements identified in several programs suggest an increasing emphasis on interpersonal skills and psychological resilience, perhaps in response to the rigorous demands of neurological specialization. Moreover, these distinctions may indicate a regional trend toward standardizing neurology education, particularly as institutions with stringent requirements are often associated with higher QS rankings, which could serve as benchmarks for other universities.

3.3 Curriculum content

This study includes a comprehensive analysis of the curricular content of neurology specialization programs in the region's Higher Education Institutions (HEIs). The aim is to identify common

subjects across various program offerings (spanning three years of training, with a fourth year in cases where applicable), detect variations in the depth and emphasis of certain topics, and recognize innovative or unique approaches within the curriculum structures. The analysis is based on a knowledge base comprising 123 subjects present in the different programs offered by the region's HEIs. Using this information, an intelligent textual analysis system was applied, which enabled the identification of substantial correlations between subjects.

The findings highlight that while core subjects are uniformly present across programs, the inclusion of specialized areas such as Pediatric Neurology, Neuroimaging, and Movement Disorders may reflect regional priorities in healthcare and disease prevalence. This tailored curriculum structure implies a response to local neurological care needs, with certain institutions likely adapting their training to address specific regional demands. The presence of research methodology and evidence-based medicine within early training years also suggests a commitment to integrating scientific inquiry within clinical practice. This integration is crucial in building a cadre of neurologists capable of contributing to both patient care and academic advancement, ultimately enhancing the field of neurology within Latin America.

3.3.1 1st year of especialization

In the first year, the curriculum structure emphasizes foundational topics like Neuroradiology, Internal Medicine, and Neuroanatomy, aligning with the goal of establishing a comprehensive base in clinical and theoretical knowledge. This foundational approach highlights the importance of equipping trainees with essential diagnostic skills and a broad understanding of neurological conditions. The inclusion of Introduction to Research and Evidence-Based Medicine suggests a pedagogical strategy that not only prioritizes clinical competency but also encourages an early engagement with scientific inquiry and critical analysis. By introducing research principles in the first year, these programs appear to support the development of neurologists who are as skilled in clinical application as they are in understanding and potentially advancing neurological research.

Figure 3 presents a quantitative visualization of the subjects most frequently mentioned in the first year of neurology specialization programs offered by the analyzed HEIs. This reflects the prominence of subjects such as Neuroradiology and Internal Medicine, indicating a traditional approach that prioritizes the consolidation of general clinical competencies, medical ethics, and specialized skills from the earliest stages. In this context, the inclusion of subjects like Introduction to Research and Evidence-Based Medicine demonstrates a commitment to the initial training of neurologists with a research-oriented profile, fostering critical thinking and reflective practice.

The second year continues to build on core competencies with a strong focus on Clinical Neurology, Neurophysiology, and Psychiatry. This progression reflects an increasing specialization, with a balance between theory and clinical exposure. The curriculum's emphasis on Clinical Neurology and Psychiatry suggests a recognition of the intersection between neurology and mental health, a crucial area given the prevalence of neurological disorders with psychiatric components. Additionally, the inclusion of Research Methodology and Neuroradiology in this year indicates a deepening of scientific training. By reinforcing research capabilities, the curriculum supports the development of neurologists who can contribute both to patient care and to evidence-based practices. This dual focus on clinical skills and research training ensures that trainees are well-prepared for the demands of complex neurological cases and capable of contributing to the field's growing body of knowledge.

3.3.3 3rd and 4th year of specialization

For the third year, and in applicable cases, a fourth year of training, there is an observed evolution of the training program from more specialized areas, including mental health (Psychiatry) and surgical interventions (Neurosurgery), to the fourth year, with a particular emphasis on Pediatric Neurology and specific disorders such as Epilepsy (Figures 7 and 8). This progression reflects a comprehensive training program covering everything from the fundamentals of basic neurology to its more specific applications, further reinforced by essential research components that complement the scientific production profiles required in these areas of specialization.

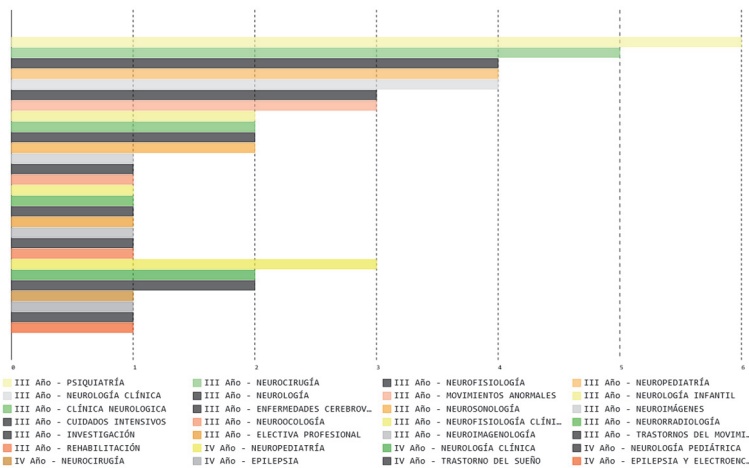


Figure 7. Most Repeated Subjects in the Third and Fourth Years of Neurology Training

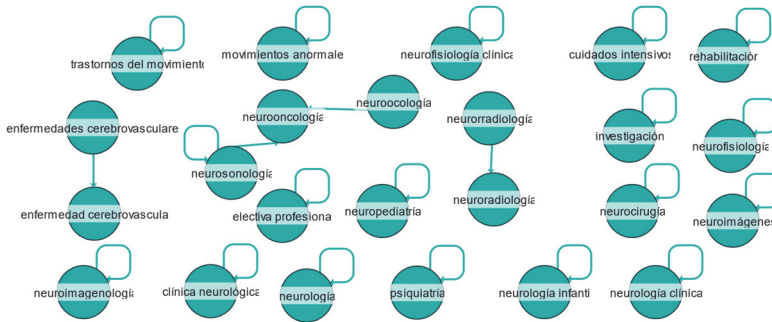


Figure 8. Map of Relationships Between Third- and Fourth-Level Subjects in Neurology Specialization Programs

Analyzing the curriculum within a global context of specialization, it is valuable to conduct this segmented approach by year of training, allowing for a more precise evaluation of the similarities and differences between the academic offerings of various institutions. This approach also enables an analysis of how knowledge, skills, and competencies are distributed across each training stage, facilitating the identification of common patterns as well as specific emphases or unique features that each institution prioritizes in certain aspects of the specialization program.

In the third year, and in cases where a fourth year is offered, the curriculum transitions towards highly specialized areas such as Pediatric Neurology, Epilepsy, and Neurosurgery. This advanced training stage reflects a comprehensive model where trainees not only gain expertise in general neurology but also acquire skills in managing complex, specific conditions. Pediatric Neurology, in particular, underscores the necessity for neurologists trained to address developmental and childhood neurological disorders—a critical area of need in the region. The strong emphasis on Epilepsy and Neurosurgery in the final years further aligns with a clinical demand for specialists who can handle intricate diagnostic and surgical interventions. This approach not only provides a holistic neurological education but also ensures that graduates are prepared to take on roles in underserved specialties within neurology, potentially filling critical gaps in healthcare access across Latin America.

4. Conclusions

This study has provided a comprehensive analysis of neurology specialization programs in Latin American universities, addressing the three specific objectives established: identifying the countries and QS-ranked universities that offer neurology specializations; determining the co-occurrences of admission requirements for neurology programs; and examining subject patterns taught during the years of neurology specialization.

Firstly, the study successfully identified the Latin American countries that offer neurology specialization programs, with Colombia and Chile standing out as having the highest number of educational institutions offering this specialization, according to the QS university ranking. Most of these universities are within the higher ranking tiers, suggesting that institutions with greater resources and academic reputation are more likely to offer programs in this specialty. This finding is fundamental as it reveals a pattern of concentration of neurology academic offerings in countries with more developed higher education systems, potentially limiting access to this training in nations with less academic infrastructure.

Regarding the second objective, the study identified a series of co-occurrences in admission requirements for neurology programs. The findings show a common baseline in requirements, such as the need for a medical doctor degree, completion of a rotating internship, and passing a specific

entrance examination. However, significant differences among institutions were also identified, especially in additional requirements such as psychological exams, letters of recommendation, foreign language proficiency, and specific work experience. This variability reflects the diversity in expectations and academic standards among universities in the region. This detailed identification of requirements is crucial as it contributes to potential academic and professional mobility for candidates, promoting partial standardization that facilitates access to high-quality neurology programs across different countries.

For the third objective, the examination of subject patterns taught during the years of neurology specialization reveals a largely shared curricular structure across the universities analyzed, with subjects such as Clinical Neurology, Neurophysiology, and Internal Medicine occupying a central place over the four years of training. However, variations in the emphasis and depth of certain subjects, such as Pediatric Neurology, Neuroimaging, and Movement Disorders, were also identified, reflecting differentiated pedagogical approaches tailored to local and regional neurological care needs. The inclusion of subjects related to research methodology and clinical practice indicates a commitment to training neurologists with not only clinical but also research capabilities, thus promoting the integration of research into professional practice.

In summary, this research has shown that, while there is a diverse offering of programs in the region, significant challenges remain regarding accessibility, standardization of admission requirements, and equity in the distribution of educational resources. It is recommended that educational and public health policies in the region focus on promoting greater collaboration and standardization among higher education institutions, as well as implementing programs that foster equity in access to neurology specialization. Moreover, it is essential to continue investigating how training programs can better adapt to recent advancements in research and clinical practice, ensuring that neurology trainees are well-prepared to address emerging challenges in the field.

This research faced several obstacles that future studies in this field should consider. The lack of standardized and updated data on many higher education institutions' websites complicated the collection and comparison of relevant information on neurology specialization programs. Additionally, the heterogeneity in presenting admission requirements, curricular structure, and pedagogical approaches required significant effort to normalize data and ensure fair and accurate comparison.

The limited integration of Latin American universities into international academic networks, reflected in the scarcity of scientific publications and detailed reports on their training programs, restricted access to complementary secondary sources. This academic isolation also translates to fewer opportunities for inter-institutional collaboration, which could help improve program quality and foster greater sharing of best practices. Another relevant obstacle was the difficulty in accessing qualitative data on the perceptions of students, faculty, and neurology professionals in training regarding current programs, which could have provided an additional dimension to the program evaluation. The lack of prior comparative studies on neurology education in the region also presented a challenge, as it required developing a methodological framework almost from scratch.

While the policies and practices articulated in this study provide valuable insights into neurology education in Latin America, it is crucial to address potential barriers to their implementation. These barriers include financial constraints, limited technological infrastructure, resistance to institutional change, and socio-economic disparities. For instance, while private universities dominate neurology specialization offerings, the associated high tuition costs often exclude candidates from lower socio-economic backgrounds. This inequity underscores the need for policies promoting subsidized education and expanded public sector programs. Furthermore, cultural and linguistic differences across the region can complicate the adoption of standardized practices, necessitating tailored approaches that respect local contexts.

To mitigate these barriers, it is recommended that policymakers focus on enhancing inter-institutional collaboration, increasing public investment in neurology education, and establishing cross-border agreements that facilitate the exchange of resources and expertise. Emphasizing equity

in access to training programs and ensuring that infrastructure development accompanies curricular reforms will ensure more inclusive and effective implementation of proposed practices.

Also, The study's reliance on QS-ranked universities presents certain limitations that warrant discussion. While QS rankings provide a globally recognized measure of institutional quality, they often prioritize research output and internationalization over other metrics, such as teaching quality and community engagement. This focus may exclude smaller or emerging institutions that excel in these areas but lack the resources to achieve high QS rankings. As a result, the findings may not fully represent the diversity of neurology education programs in the region.

To address this limitation, future studies should incorporate a broader range of institutions, including those not featured in QS rankings, to capture a more comprehensive picture of neurology education in Latin America. Additionally, alternative ranking systems or locally developed criteria could be used to evaluate institutions based on regional priorities and challenges.

For future researchers interested in delving into this field, it is recommended to expand qualitative data collection through interviews, surveys, and focus groups to gain a more comprehensive view of the strengths and weaknesses of the programs from an experiential perspective. It is also essential to promote inter-institutional collaboration, encouraging partnerships between universities from different Latin American countries and institutions from other regions to facilitate the exchange of best practices, educational resources, and innovative methodologies.

Potential avenues for exploration include longitudinal studies to assess the long-term impact of curricular reforms, particularly in underserved areas. Additionally, research could investigate the effectiveness of integrating digital tools and virtual platforms in neurology training, particularly in contexts with limited physical resources. Another promising area is the comparative analysis of graduate outcomes across public and private institutions, providing insights into how institutional frameworks influence professional trajectories and healthcare accessibility.

Furthermore, future research should examine the alignment of neurology curricula with regional healthcare demands, particularly concerning pediatric neurology and the management of non-communicable diseases. Collaboration with international institutions could also foster comparative studies that highlight best practices and innovative approaches in neurology education globally.

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