



Intracerebral haemorrhage management practices and adherence to the INTERACT3 care bundle in Latin America: Results from an international survey

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ABSTRACT

Objective: To assess intracerebral hemorrhage (ICH) management practices and adherence to the INTERACT3 care bundle across Latin American countries.

Methods: We conducted a multi-national survey among neurologists, neurosurgeons, intensive care specialists, and emergency physicians. From August to December 2024, the survey was distributed across 19 Latin American countries. It assessed hospital characteristics, availability of an ICH code, adherence to INTERACT3 measures, and resource availability. Stroke leaders from the surveyed countries were involved in developing and disseminating the survey.

Results: Out of 580 respondents (mean age 40.25 years; 61.6% male), most worked in teaching (86%) and public hospitals (53.6%). Only 27.9% reported an ICH code at their institution. Adherence to INTERACT3 measures ranged from 57.2% (anticoagulation reversal) to 84.7% (blood pressure control), with just 44.5% reporting adherence to all four measures. Time-to-target was not measured by 65%, and only 53.9% maintained interventions for one week. Neuroimaging, neurosurgery, and hematology services were higher in private compared to public and mixed hospitals ($p < 0.001$). ICH code availability was associated with private hospitals and emergency care specialists, while full adherence was more likely among intensive care specialists.

Conclusions: ICH management in Latin America is evolving, with increasing adoption of evidence-based practices. However, variability in adherence underscores the need for regional initiatives to standardize ICH care and ensure equitable implementation of best practices.

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Introduction

Intracerebral hemorrhage (ICH) accounts for 10% to 15% of strokes in high-income countries (HIC) and up to 25% to 55% in low- to middle-income countries (LMIC).¹ Despite this burden, these conditions have historically received less attention compared to ischemic stroke.² In Latin America, a region composed mainly of middle- and upper-middle-income countries,³ disability-adjusted life years (DALY) due to ICH have increased from 2013 to 2021, contrasting the trend in other regions, such as in the European Union and Africa.¹

Acute hospital-based interventions for ICH have not gained the same momentum or urgency compared to acute ischemic stroke. Most treatment approaches to ICH care continue to rely on non-standardized basic clinical support.⁴ However, recent trials are changing the ICH management landscape. In 2023 and 2024, breakthrough studies addressing different treatment strategies for acute ICH were published, some showing compelling benefits.⁵⁻⁹ Among these, the hyperacute care bundle proposed in the INTERACT3 trial showed the most promising outcomes: enhanced functional status (odds ratio (OR): 0.86; 95% CI, 0.76–0.97) and reduced mortality at 6 months (OR: 0.77; 95% CI, 0.63–0.95).⁵

The INTERACT3 measures are widely applicable and can be followed even in low-resource settings with access to essential hospital equipment, making them an accessible intervention in the Latin American context. The INTERACT3 care bundle includes early intensive lowering of systolic blood pressure (target 130–140 mm Hg), strict glucose control (110–140 mg/dl in those without diabetes and 140–180 mg/dl in those with diabetes), antipyresis treatment (target body temperature $\leq 37.5^{\circ}\text{C}$), and rapid reversal of warfarin-related anticoagulation (target international normalized ratio, INR <1.5) within 1 hour of emergency department admission and 6 hours of symptoms onset maintained for 7 days.

The emergence of INTERACT3 measures provides evidence to enhance ICH care in Latin America. In recent years, Latin American countries have implemented coordinated efforts to improve stroke care, including regional ministerial meetings to share best practices, promote the implementation of policies aimed at reducing the stroke burden, and foster the accreditation of hospitals to provide standardized stroke care.^{10,11} Recognizing that adherence to evidence-based practices is crucial for improving patient outcomes, we aim to identify effective management practices and assess adherence to the INTERACT3 care bundle in Latin American countries.

Methods

The methods are presented according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement checklist for cross-sectional studies.¹²

Study design and setting

This research was designed as a cross-sectional study. The study employed a structured, anonymous questionnaire in Spanish and Portuguese, covering the two most widely spoken languages in Latin America. Data collection took place from August 2024 to December 2024. The study was conducted across multiple Latin American countries, including Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Uruguay, and Venezuela.

Participants

The eligibility criteria for participants included being a healthcare professional involved in ICH management (such as neurologists, neurosurgeons, intensive care specialists, and emergency specialists) and

conducting clinical practice in a Latin American country, regardless of the years of experience. Participants from non-Latin American countries or those who responded to the questionnaire but declined to share their answers for analysis and publication were excluded from the study. Responses from multiple individuals at the same hospital were included. A unique code was assigned to each participant, and only one response was allowed per participant.

Questionnaire development

We developed the initial questionnaire, which underwent two rounds of review and revision before reaching a consensus by an international and multi-specialty stroke care related scientific committee composed of regional stroke leaders from various Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Panama, Paraguay, Peru, Puerto Rico and Uruguay). The scientific committee members were selected based on their expertise in stroke. Once the scientific committee agreed on the questionnaire's content, it was piloted with five respondents from different specialties to identify sections that required further clarity or contained missing or unnecessary questions. There were no major changes in the questionnaire. After the pilot, the questionnaire was translated from Spanish to Portuguese by a native speaker proficient in both languages. An English version of the questionnaire is provided in **Supplementary Material 1**.

Data collection

Responses were collected using Google Forms, which enabled secure and anonymous data capture and export for analysis. Upon obtaining participant consent, the questionnaire collected data on demographics and specialization, hospital characteristics, ICH code availability, adherence to the INTERACT3 care bundle, and 24/7 resource availability (i.e., hematologist, neurosurgeon, blood test, neuroimaging). Hospital characteristics included the size of the hospital based on the number of beds (<50 , 50–100, 101–500, and >500), hospital ownership (public, private or mixed), and if the hospital was a teaching hospital (i.e., being an academic or university hospital).

Participants were asked about their adherence to each of the INTERACT3 measures and the duration of implementation for the care bundle measures. All questions were asked based on self-reported institutional practices.

Sample size

A non-probabilistic convenience sampling strategy was employed, drawing participants from the authors' contact networks. A sample size of 544 participants was estimated using a 99% confidence level and a 5% margin of error based on an assumed pool of 3,000 professionals. This calculation was intended to guide recruitment targets rather than to imply statistical representativeness, given the non-probabilistic nature of the sampling method. A committee of local leaders was created to spread the survey through national and regional stroke care-related organizations, including the Ibero-American Stroke Association (IASO/SIECV) and the Young Stroke Latin American Taskforce (ALATAC), as well as national societies such as AMEVASC (Mexico), ACEVE (Chile), Red Brasil AVC (Brazil), SNA (Argentina), and SATI (Argentinian Society of Critical Care). Local leaders were responsible for diversifying the sample of participants, ensuring responses came from healthcare professionals from multiple cities. Distribution was conducted via email and social media platforms, including WhatsApp groups affiliated with these organizations. The survey was sent eight times, and we considered individuals who did not respond to any of these attempts as non-respondents. Participation was voluntary.

Statistical analysis

A descriptive analysis of participant responses was conducted. Categorical variables were summarized as proportions, while numerical variables were presented as either the mean ($\pm$ standard deviation) or median (interquartile range), depending on the data distribution, as determined by the Shapiro-Wilk test. Comparisons between categorical variables were performed using the Chi-square test or Fisher's exact test, depending on the sample size. A binary logistic regression analysis was conducted to identify hospital characteristics and respondent specializations associated with the availability of an ICH code and adherence to the INTERACT3 care bundle. The adjusted odds ratios (AORs) were calculated by adjusting the binary logistic regression for hospital type (public vs. private vs. mixed; teaching vs. non-teaching), capacity (number of beds), and specialty. The variables in the model were selected based on previous literature.¹³⁻¹⁶ Collinearity was assessed by calculating the variance inflation factor (VIF) of each predictor. Multicollinearity was considered problematic if the VIF was >10 . A p-value < 0.05 was considered statistically significant. All data analysis was performed using SPSS software for Windows, version 23 (SPSS, Inc., Chicago, IL, USA).

Ethical considerations

Ethics approval for this study was granted by the Vice Chair of the Humanities, Social and Health Sciences Research Ethics Panel at the University of Bradford on 23rd July 2024 (EC28349).

Results

We collected 585 responses from health professionals distributed in 19 Latin American countries. Five participants were excluded due to not approving sharing their responses for analysis, resulting in a final sample size of 580 participants (Figure 1). Most respondents were male (61.6%), with a mean age of 40.25 ± 9.75 years and a median of 6 years (IQR, 3–13) of clinical practice experience. Most respondents were neurologists (37.8%), followed by intensive care specialists (27.2%) and emergency care specialists (9.7%). The majority of the respondents' hospital types were teaching (86%), public (53.6%), and with capacity ranging from 101 to 500 beds (49.5%). Blood test services were available 24/7 in 99.8% of hospitals, and neuroimaging services in 89.5%. Less than one-third (27.9%) mentioned having an ICH code in their hospital.

The most common INTERACT3 measures followed were blood

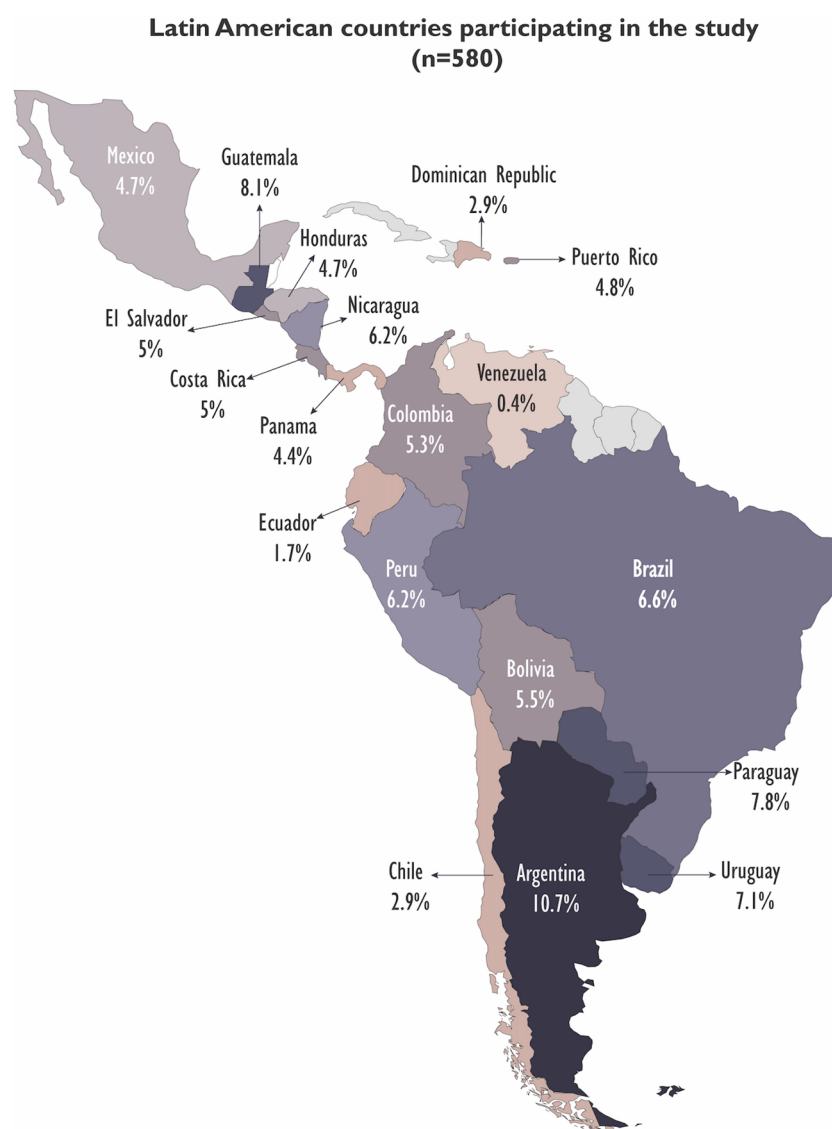


Figure 1. Geographical distribution of respondents.

pressure (84.7%) and blood glucose targets (79.1%). Most respondents (65%) reported not measuring the time it takes to reach the INTERACT3 measure targets. Similarly, just over half of the respondents (53.9%) mentioned maintaining the INTERACT3 measures for a week (Table 1).

There were no statistically significant differences among private, public, and mixed hospitals in meeting the individual INTERACT-3 targets for blood pressure (83%–87%, $p=0.811$), body temperature (69%–71%, $p=0.456$), blood glucose (77%–81%, $p=0.726$), or rapid anticoagulation reversion (52%–63%, $p=0.258$), nor in implementing all four measures (38%–47%, $p=0.409$). Similarly, no association was found between hospital size and teaching type (results not shown). However, the availability of an ICH code, neuroimaging, neurosurgery, and hematology services was higher in private compared to public and mixed hospitals (Table 2).

Although the questionnaire asked for self-reported institutional practices, we observed that adherence to INTERACT3 measures varied by specialty (Table 3). Body temperature targets were more commonly

Table 1
Characteristics of the respondents, hospitals, and ICH management.

Variable	N=580
Sex, male	357 (61.6%)
Age, mean $\pm$ SD	40.25 $\pm$ 9.75
Years in practice, median (IQR)	6 (3 – 13)
Respondent's medical specialty	
Neurologist	219 (37.8%)
Intensive care specialist	158 (27.2%)
Emergency care specialist	56 (9.7%)
Neurosurgeon	40 (6.9%)
Other	107 (18.4%)
Hospital type, teaching	
Teaching	499 (86%)
Non-teaching	77 (13.3%)
Not specified	4 (0.7%)
Hospital type, ownership	
Mixed	92 (15.9%)
Public	311 (53.6%)
Private	176 (30.3%)
Not specified	1 (0.2%)
Hospital capacity, number of beds	
<50	73 (12.6%)
50–100	120 (20.7%)
101–500	281 (48.5%)
>500	106 (18.3%)
ICH management team composition	
Neurologist	397 (68.5%)
Neurosurgeon	475 (81.9%)
Neurovascular	181 (31.2%)
Intensive care specialist	397 (68.5%)
Neurocritical care specialist	171 (29.4%)
Service availability (24/7)	
Neuroimaging	519 (89.5%)
Blood tests	573 (98.7%)
Neurosurgeon	475 (81.9%)
Hematologist	254 (43.8%)
ICH code available	162 (27.9%)
INTERACT-3 measure	
Blood pressure target	491 (84.7%)
Body temperature target	407 (70.2%)
Blood glucose target	459 (79.1%)
Anticoagulation reversion	332 (57.2%)
All measures	258 (44.5%)
None	49 (8.5%)
Do you measure the time to target for...	
Blood pressure	161 (27.8%)
Body temperature	108 (18.6%)
Blood glucose	122 (21%)
Anticoagulation	107 (18.5%)
We don't measure any target	377 (65%)
For how long are the measures kept?	
24 hours	143 (24.6%)
1 week	313 (53.9%)
Time not measured	123 (21.2%)
Not specified	1 (0.2%)

Table 2

Adherence to INTERACT3 care bundle and ICH code availability by hospital ownership type.

Variable	Private hospital (n=176)	Public hospital (n=311)	Mixed hospital (n=92)	P value
INTERACT3 measure				
Blood pressure	146 (82.9%)	264 (84.9%)	80 (86.9%)	0.678
Body temperature	126 (71.6%)	216 (69.5%)	65 (70.7%)	0.881
Blood glucose	136 (77.3%)	251 (80.7%)	71 (77.2%)	0.592
Anticoagulation reversion	110 (62.5%)	173 (53.7%)	48 (52.2%)	0.194
4 measures	83 (47.2%)	140 (45%)	35 (38%)	0.352
ICH code available	65 (36.9%)	73 (23.5%)	24 (26.1%)	0.013
Available services (24/7)				
Neuroimaging	170 (96.6%)	265 (85.2%)	83 (90.2%)	<0.001
Neurosurgery	161 (91.5%)	234 (75.2%)	79 (85.9%)	<0.001
Hematology	111 (63.1%)	103 (33.1%)	40 (43.5%)	<0.001
Blood test	171 (98.9%)	308 (99%)	90 (97.8%)	0.254

Note: The “not specified” (n=1) hospital ownership was excluded from the analysis.

followed by neurologists (77.2%) and intensive care specialists (74.7%), while anticoagulation reversion was more frequently followed by intensive care specialists (70.9%). Despite the variation across specialties, none of the specialists reported full adherence to body temperature targets (<90%). The availability of an ICH code was higher among emergency care specialists (50%).

Table 4 presents the results of two binary logistic regressions; all VIF values were below 1.4, indicating no significant multicollinearity in the final model. Private hospitals (AOR 2.172; 95% CI 1.366 – 3.54) and emergency care specialists (AOR 3.834; 95% CI 2.018 – 7.286) were more likely to have an ICH code available. On the other hand, adherence to the four INTERACT-3 measures was more commonly followed by intensive care specialists (AOR 1.539; IC95%1.009 – 2.348).

Discussion

Our research explored the availability of ICH codes and adherence to the INTERACT3 care bundle in Latin America, making it, to our knowledge, the largest study to date to explore ICH management since the publication of the INTERACT3 measures. The survey revealed that ICH codes are not widely available throughout the region. This is not surprising, as groundbreaking trials identifying effective management strategies for ICH were published only in the last two years. The concept of an ‘ICH code’ is largely derived from these recent findings, and ICH codes are yet to be implemented even in high-resource settings.¹⁷ The availability of ICH codes in almost a third of the hospitals suggests an emerging uptake of evidence-based care. However, hospitals and specialists in the region should utilize these findings to expedite the implementation of evidence-based ICH management and improve patients' health outcomes.

Although the INTERACT3 care bundle is designed as a low-cost, evidence-based approach to ICH management, its successful implementation still depends on the broader infrastructure and support systems available within a hospital. Our findings indicate that private hospitals are more likely to have established ICH codes and offer critical 24/7 services, such as neuroimaging, neurosurgery, and hematology, that facilitate the prompt and effective application of these measures. In contrast, public hospitals, despite their commitment to evidence-based practices, may face limitations due to disparities in financial and human resources.¹⁴ This suggests that even low-cost interventions like the INTERACT3 bundle require a certain level of organizational support to achieve their full potential.

Policymakers and healthcare leaders in Latin America should, therefore, focus on strengthening the foundational resources for ICH

Table 3
Adherence to INTERACT3 care bundle and ICH code availability by specialty.

Variable	Emergency care (n=56)	Intensive care (n=158)	Neurosurgery (n=40)	Neurology (n=219)	Other (n=107)	P value
INTERACT3 measure						
Blood pressure	49 (87.5%)	139 (88%)	32 (80%)	185 (84.5%)	86 (80.4%)	0.424
Body temperature	38 (67.9%)	118 (74.7%)	22 (55%)	169 (77.2%)	60 (56.1%)	<0.001
Blood glucose	44 (78.6%)	130 (82.3%)	30 (75%)	173 (79%)	82 (76.6%)	0.776
Anticoagulation reversion	30 (53.6%)	112 (70.9%)	22 (55%)	121 (55.3%)	47 (43.9%)	<0.001
4 measures	25 (44.6%)	87 (55.1%)	14 (35%)	97 (44.3%)	35 (32.7%)	0.006
ICH code available	28 (50%)	49 (31%)	11 (27.5%)	48 (21.9%)	26 (24.3%)	0.001

Note: “Other” includes non-specialist doctors, geriatricians, internal medicine, radiologists, rheumatologists, and nurses.

Table 4
Binary logistic regression for ICH code availability and INTERACT3 care bundle.

Variable	ICH code availability (n=570)		All INTERACT3 measures followed (n=576)	
	AOR	CI 95%	AOR	CI 95%
Hospital ownership				
Public hospital	–	–	–	–
Mixed hospital	1.152	0.655 – 2.026	0.800	0.487 – 1.315
Private hospital	2.172	1.366 – 3.454	1.114	0.733 – 1.694
Teaching hospital	1.624	0.879 – 3.003	1.558	0.901 – 2.696
Hospital capacity (beds)				
<50	–	–	–	–
50-100	0.678	0.330 – 1.340	0.883	0.476 – 1.639
101-500	0.446	0.247 – 0.804	1.229	0.705 – 2.143
>500	0.678	0.343 – 1.340	1.428	0.749 – 2.722
Specialty				
Neurology	–	–	–	–
Emergency care	3.834	2.018 – 7.286	0.970	0.530 – 1.776
Intensive care	1.419	0.877 – 2.296	1.539	1.009 – 2.348
Neurosurgery	1.504	0.684 – 3.308	0.685	0.335 – 1.400
Other	1.279	0.724 – 2.257	0.597	0.360 – 0.989

Note: Four cases were excluded due to missing data on the teaching hospital type. “Other” includes non-specialist doctors, geriatricians, internal medicine, radiologists, rheumatologists, and nurses.

management to ensure that the benefits of standardized ICH care are equitably realized across all hospital settings. This requires, for example, that public and private insurers offer reversing agents for anticoagulant-related ICH, including those from direct-acting oral anticoagulants. To operationalize a regional approach to ICH care, we propose the development of standardized protocols tailored to the Latin American context, supported by regional stroke societies (IASO/SIECV and national stroke societies). Additionally, we encourage participating in clinical stroke registries (i.e., ResQ, Safe Implementation of Treatments in Stroke (SITS)), which include ICH to facilitate benchmarking, enable outcome tracking, and inform future quality improvement initiatives. Joint training programs and virtual education platforms, facilitated through IASO/SIECV and the World Stroke Organization, could further strengthen regional capacity, reduce practice variability, and promote the consistent implementation of evidence-based interventions.

Our study found that the respondents’ specialty was associated with adherence to the INTERACT3 care bundle measures, with intensive care specialists showing greater adherence. The finding may be explained by the availability of specialists trained to manage ICH, which is likely skewed towards academic and private hospitals in the region, possibly due to the constrained availability of specialized medical equipment in public hospitals.¹⁸ Equally important, the nature of the study design is subject to response bias, as we asked for self-reported institutional practices.¹⁹ Therefore, our results should be interpreted carefully.

The respondents’ organizational context also influences the availability of resources and adherence to evidence-based care. A population-based study exploring the role of medical specialty in stroke patients’ outcomes found no difference between neurologist and non-neurologist care. Instead, the authors attributed the adherence to evidence-based

care to the availability of a dedicated stroke unit.¹⁶ It is well recognized that dedicated stroke units are an effective intervention to enhance stroke care due to the improved organization and coordination of care.²⁰ This evidence has motivated the increase of stroke units in Latin America in recent years.¹⁰ Therefore, expanding the implementation of evidence-based care for ICH management could synergize with the infrastructure and accumulated experience in providing organized care in dedicated stroke units in Latin America.

Blood pressure control was the most followed INTERACT3 measure, but adherence remained below 90 percent across all specialties. This finding aligns with a study by Bettschen et al., conducted in Switzerland, who reported that 66% of eligible ICH patients received blood pressure control.²¹ Moreover, two-thirds of respondents reported not measuring the time-to-target despite INTERACT3 measures being time-driven, and most centers could not follow the INTERACT3 measures for a week. Blood pressure control is the measure attributed to having the highest impact on the patient’s prognosis,²² and among the four, it is the most familiar and easiest to measure. However, a Delphi study conducted in Latin America revealed that the main barrier to adequate blood pressure control lies in the availability of intravenous antihypertensive drugs.²³ Future studies should explore whether the lack of full adherence to these measures comes from limited physical or human resources or the lack of a standardized approach to ICH care. Understanding this rationale would provide a practical approach to ensure the INTERACT3 measures are implemented and kept long enough to provide the greatest benefits.

Lastly, similar to the INTERACT3 four measures, we observed disparities in adherence to targets based on the specialty. This may be explained by the availability of resources and internal protocols in intensive care and stroke units. The variability we identified suggests the need to standardize ICH care, and, given the region’s similar challenges, a regional approach to managing ICH may be considered. This would not be the first time Latin American countries have come together to develop clinical guidelines. For example, the Latin American Society of Hypertension and the Latin American Federation of Endocrinology recently developed guidelines on hypertension management and vitamin D maintenance in Latin America, respectively.^{24,25} However, any guidelines developed for the region should take into consideration the health systems’ fragmentation and segmentation within countries.²⁶ It will also be paramount that the guidelines are co-developed with clinicians from the various specialties involved in ICH management, including those from public and private hospitals, as well as from any subsystems within the country’s health system. An example of this is the recent Latin America multidisciplinary consensus panel on the management of severe bleeding in the anticoagulated patient.²⁷

Our study is not without limitations. First, due to the anonymity of the survey, we are unaware if responses referred to the same hospital. However, we attempted to overcome this by ensuring a great number of responses per country. This was achieved by collecting over 15 responses from most countries, apart from Ecuador (11) and Venezuela (2). Second, our findings are subject to response bias, particularly when asking for adherence to evidence-based practice. Future studies must evaluate adherence by reviewing clinical records or conducting registry-based research. Third, we contacted potential participants through

regional stroke networks, which are predominantly composed of members from academic institutions. This likely introduced a selection bias, reflected in the high proportion of teaching centers represented in the survey. Lastly, although the survey was open to multiple specialties, the distribution strategy, primarily through stroke organizations and networks, may have resulted in an overrepresentation of neurologists, which could result in specialty-related bias. Future research should consider using population-based approaches to generalize the findings to the region and explore the rationale behind non-adherence in detail through interviews with clinicians involved in ICH management and hospital administrators.

However, our study also has important strengths, adding significant value to ICH care research in Latin America. For example, we collected a large sample of responses from the region and per country. Likewise, we obtained information from 19 countries, providing valuable insights into ICH management in Latin America that could inform future research and practice. Finally, we allowed only one response per participant, thereby avoiding duplicates.

Conclusions

Evidence-based management of ICH is being adopted early across Latin American countries, as reflected by the growing implementation of ICH codes. However, we identified significant disparities between public and private hospital settings, particularly regarding the availability of ICH codes and critical support services such as neurosurgery, neuroimaging, and hematology, which may limit the equitable application of the INTERACT3 care bundle. Additionally, differences in adherence to ICH management protocols were observed across medical specialties, underscoring the need for further investigation through registry- and population-based studies. Addressing these systemic and specialty-related gaps is essential to ensure that evidence-based ICH care is accessible and sustained across diverse healthcare environments, regardless of institutional resources or clinical background. These findings highlight the importance of a coordinated regional approach, leveraging shared challenges and existing collaborative frameworks to standardize and strengthen ICH care throughout Latin America.

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During the preparation of this work the authors used ChatGPT (GPT-4o) in order to improve the readability of the manuscript. After using this tool/service, the authors reviewed and edited the content as needed and takes full responsibility for the content of the published article.

CRediT authorship contribution statement

Julieta Rosales: Writing – review & editing, Methodology, Investigation, Conceptualization. **Leonardo Augusto Carbonera:** Writing – review & editing, Methodology, Investigation. **Ana Cláudia De Souza:** Writing – review & editing, Methodology, Investigation. **Eva Rocha:** Writing – review & editing, Investigation. **Vanessa Cano-Nigenda:** Writing – review & editing, Investigation. **Karen D. Orjuela:** Writing – review & editing. **Rodrigo Guerrero:** Writing – review & editing, Methodology, Investigation. **Carlos Delfino:** Writing – review & editing, Methodology, Investigation. **Marilaura Nuñez:** Writing – review & editing, Methodology, Investigation. **Paula Muñoz Venturilli:** Writing – review & editing, Methodology, Investigation. **Alejandro Gonzalez-Aguines:** Writing – original draft, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

We declare no competing interests.

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Supplementary materials

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