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Individual and Professional Predictors of Artificial Intelligence Use in Medicine: A Multivariate Analysis in Latin America.

Predictores Individuales y Profesionales del Uso de Inteligencia Artificial en Medicina: Un Análisis Multivariado en América Latina.

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Abstract. This study analyzes the individual and professional factors associated with the use of artificial intelligence (AI) in medical practice in Latin America. A cross-sectional, analytical study was conducted using a structured survey administered to 1,041 physicians from 18 countries. The survey included sociodemographic variables, academic background, statistical knowledge, familiarity with AI, attitudes, experience using AI, and decision-making in simulated clinical scenarios. The analysis included descriptive statistics, bivariate tests, and multivariate logistic regression. The mean age of the participants was 51.5 ± 13.5 years; 77.5% were specialists, and 50.5% were university professors. Although most reported having heard of AI, a basic level of knowledge predominated (51.8%), with a small proportion having advanced training (3.7%). A strong preference for human clinical judgment (86.0%) was observed, along with concerns related to a lack of empathy (28.0%) and limited personalization of care (25.0%). In the final multivariate model, familiarity with artificial intelligence was identified as the strongest predictor of AI use in medical practice (OR = 4.59; 95% CI: 3.10–6.81). Similarly, perceived AI usefulness was significantly associated with a higher likelihood of adoption (OR = 2.49; 95% CI: 1.07–5.81). In contrast, skepticism regarding AI's diagnostic capabilities and basic technical knowledge showed no significant independent associations after model adjustment. A favorable attitude toward AI was significantly related to a greater willingness to follow its recommendations in simulated clinical scenarios ($\chi^2 = 75.2$; $p < 0.001$). Taken together, the results indicate that the adoption of artificial intelligence in Latin American medical practice depends primarily on practical familiarity and perceived value, rather than advanced technical proficiency. These findings support the need for educational and regulatory strategies aimed at a critical, responsible, and contextualized integration of AI, while preserving the central role of human judgment in medical decision-making.

Keywords: Artificial intelligence, individual predictors, professional behavior, Latin American medicine, technology adoption

Resumen. Este estudio analiza los factores individuales y profesionales asociados al uso de la inteligencia artificial (IA) en la práctica médica en América Latina. Se realizó un estudio transversal y analítico mediante una encuesta estructurada aplicada a 1,041 médicos de 18 países, que incluyó variables sociodemográficas, formación académica, conocimientos estadísticos, familiaridad con la IA, actitudes, experiencia de uso y toma de decisiones en escenarios clínicos simulados. El análisis comprendió estadística descriptiva, pruebas bivariadas y regresión logística multivariada. La edad media de los participantes fue de 51.5 ± 13.5 años; el 77.5 % eran especialistas y el 50.5 % ejercía docencia universitaria. Aunque la mayoría manifestó haber oído hablar de IA, predominó un nivel básico de conocimiento (51.8 %), con una proporción reducida de formación avanzada (3.7 %). Se observó una marcada preferencia por el juicio clínico humano (86.0 %), junto con preocupaciones relacionadas con la falta de empatía (28.0 %) y la limitada personalización del cuidado (25.0 %).En el modelo multivariado final, la familiaridad con la inteligencia artificial se identificó como el predictor más fuerte del uso de IA en la práctica médica (OR = 4.59; IC 95 %: 3.10–6.81). Asimismo, la percepción de utilidad de la IA se asoció de manera significativa con una mayor probabilidad de adopción (OR = 2.49; IC 95 %: 1.07–5.81). En contraste, el escepticismo frente a la capacidad diagnóstica de la IA y el conocimiento técnico básico no mostraron asociaciones independientes significativas tras el ajuste del modelo. Una actitud favorable hacia la IA se relacionó significativamente con una mayor disposición a seguir sus recomendaciones en escenarios clínicos simulados (χ^2 = 75.2; $p < 0.001$). En conjunto, los resultados indican que la adopción de la inteligencia artificial en la práctica médica latinoamericana depende principalmente de la familiaridad práctica y del valor percibido, más que del dominio técnico avanzado. Estos hallazgos respaldan la necesidad de estrategias formativas y normativas orientadas a una integración crítica, responsable y contextualizada de la IA, preservando el papel central del juicio humano en la toma de decisiones médicas.

Palabras clave: Inteligencia artificial, predictores individuales, comportamiento profesional, medicina latinoamericana, adopción tecnológica

1. Introduction

Artificial intelligence (AI) has positioned itself as a key technology to transform healthcare (1). In healthcare, it is defined as the use of computer systems capable of performing tasks typical of human intelligence, such as machine learning, deep learning, and natural language processing (2). Its clinical application in diagnostic imaging, event prediction, hospital management, and personalized medicine has generated expectations regarding its capacity to improve the quality, efficiency, and accessibility of healthcare services (2–5). These tools allow for increased diagnostic accuracy, reduced medical errors, and support for clinical decisions based on large volumes of data, which is especially relevant in resource-limited settings (6–8). However, its adoption has been slower than expected due to a lack of training, poor interoperability, the opacity of algorithms, and ethical, regulatory, and security challenges (9–11). In Latin America, these barriers are intensified by the fragmentation of healthcare systems, the digital divide, and limited technological infrastructure, coupled with the region's economic and social inequalities (12). The willingness of physicians to use AI depends on their training, clinical experience, confidence in the technology, and level of familiarity (13–15).

Although some Latin American countries have begun to develop national strategies and regulatory frameworks for its implementation (16–19), there is still a need to understand how physicians perceive, use, and integrate AI into their daily practice, since limited adoption could restrict its benefits (20). Recent studies indicate that, despite growing interest, the use of AI in clinical practice remains low, and doubts persist about its usefulness, reliability, and applicability (21). Among the main barriers are a lack of specialized training and an institutional culture that is not very innovation-oriented (22). Digital literacy and training in artificial intelligence (AI) are now essential competencies in medical education, necessary for the critical, ethical, and safe use of emerging technologies in healthcare. Organizations such as the WHO and UNESCO recommend integrating these skills into health curricula to strengthen professional preparedness for digital transformation (23–25). . The effective acceptance of AI also depends on pedagogical models that promote critical thinking and technical understanding in future doctors (26-27)..

Unlike high-income countries, empirical evidence on artificial intelligence adoption in Latin America remains limited, with studies primarily conducted locally, having small sample sizes, and limited regional comparability. This lack of comprehensive research hinders the design of effective implementation strategies, even though the region presents unique conditions—a digital divide, heterogeneous training, and nascent regulatory frameworks—that cannot be extrapolated from other contexts (12, 28). Despite growing interest in artificial intelligence applied to medicine, its adoption in Latin America remains incipient, influenced by individual, professional, and institutional factors that are still poorly characterized. This gap highlights the need to understand which elements facilitate or hinder its integration into clinical practice.

In this context, the present study analyzes the factors associated with the use of artificial intelligence by physicians in 18 Latin American countries using a multivariate approach. Variables related to digital training, clinical experience, peer influence, and attitudes toward technology were evaluated, with the aim of generating evidence to guide educational strategies and adoption policies adapted to the regional context.

2. Methods

2.1 Study design

study was conducted using a structured survey administered to physicians in various Latin American countries. The objective was to examine the factors associated with the use of artificial intelligence (AI) in medical practice, as well as related attitudes, perceptions, and knowledge.

2.2 Population and sample

The target population consisted of practicing physicians and physicians in training in Latin America. The final sample comprised 1,041 healthcare professionals, selected using non-probability sampling of available units. This technique addressed the need to include accessible and willing participants, allowing for heterogeneous representation in terms of country, medical specialty, level of training, and professional experience. Physicians from a total of 18 Latin American countries participated, including Mexico, Argentina, Colombia, Venezuela, Peru, Bolivia, Paraguay, Honduras, and the Dominican Republic, among others.

2.3 Data collection instrument

A self-administered structured questionnaire, developed on the Google Forms platform and distributed in Spanish, was used. The instrument included a total of 53 questions, grouped into sections that addressed: sociodemographic data (age, sex, country, year of graduation, medical specialty), professional status (teaching role, research activity), knowledge of statistics, knowledge of and attitudes toward AI, prior use experiences, ethical perceptions, and willingness to use AI in clinical practice. The dependent variable of the study was the use of artificial intelligence (AI) in medical practice. This was defined as the active or occasional use of AI-based tools during the last 12 months in clinical settings. AI tools were considered to be those used for diagnostic support, analysis of medical images, processing of clinical data, risk prediction, or automated generation of clinical reports. Participants classified their level of use into three categories: no use, occasional use (1–3 times per month), and frequent use (weekly or daily). This operational definition made it possible to evaluate both the frequency of use and the type of clinical application, strengthening the measurement validity of the dependent variable.

The questionnaire was designed based on the *Technology Acceptance Model (TAM)* and *the Unified Theory of Acceptance and Use of Technology (UTAUT),* which explain technology adoption based on perceived usefulness, ease of use, social influence, and enabling conditions—dimensions reflected in the instrument's knowledge, attitude, and behavior sections (18). Likert-type scale items were also included to assess attitudes toward AI, along with closed-ended and dichotomous questions to explore behavior and clinical judgment in simulated scenarios. The questionnaire was drafted by the research team and subsequently validated by three experts with training in statistics, research methodology, and clinical medicine. Validation focused on item clarity, variable relevance, the instrument's logical coherence, and its applicability to the Latin American medical context. Minor adjustments were made based on expert recommendations to optimize comprehension and content validity. The survey was distributed through instant messaging groups, primarily WhatsApp chats comprised of physicians from different countries, facilitating broad regional dissemination. In total, 1,044 responses were received, of which 1,041 were considered valid for analysis, representing a success rate of 99.7% in retaining useful responses.

2.4 Weighting procedure

To correct for sample imbalances between countries and ensure a more reliable representation of the actual distribution of physicians in the region, a country weighting procedure was applied, based on the number of physicians per country reported by the World Health Organization (2022) (29). The weighting adjusted the weight of each observation according to the number of physicians per country in relation to its proportion within the sample, correcting for the overrepresentation or underrepresentation of certain national groups.

2.5 Statistical analysis

A univariate descriptive analysis was performed (frequencies, percentages, measures of central tendency and dispersion), followed by bivariate analyses (Chi-square, Mann-Whitney U tests and ANOVA, depending on the nature of the variables). Prior to estimating the binary logistic regression model, the assumptions of independence and collinearity between the predictor variables were verified using an auxiliary linear regression analysis. Tolerance values ranged from 0.916 to 0.987, and VIF values ranged from 1.013 to 1.092, demonstrating adequate independence between predictors and an absence of significant collinearity (criterion: $VIF < 5$).

The model showed a significant overall fit ($\chi^2 = 158.389$; df = 13; $p < 0.001$), with a Nagelkerke R^2 of 0.362, reflecting moderate explanatory power consistent with observational models in health sciences. The Hosmer–Lemeshow test was not significant ($\chi^2 = 5.508$; df = 8; $p = 0.702$), indicating good model calibration. The overall classification rate was 74.7%, with a sensitivity of 79.6% and a specificity of 70.3%. ROC curve analysis yielded an AUC of 0.599 (95% CI: 0.564–0.634), indicating limited discriminatory power, although superior to chance. The most relevant model coefficients indicated that greater familiarity with AI ($B = 2.296$; $p < 0.001$) and perceived usefulness ($B = 1.490$; $p = 0.002$) significantly increase the likelihood of using AI tools in medical practice. Finally, internal validation was performed using bootstrap (1000 resamples), the results of which confirmed the stability and lack of overfitting of the estimated parameters.

In the bivariate analyses, the statistical assumptions of normality, homogeneity of variances, and minimum sample size were verified before applying each test. Normality was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests, considering the distribution of the quantitative variables. Since several of them did not meet this assumption ($p < 0.05$), equivalent non-parametric tests (Mann–Whitney U, Kruskal–Wallis, and Spearman's rank correlation) were used to ensure the validity of the inferences.

In the case of multiple comparisons, significance adjustments were applied using the Bonferroni procedure to control for cumulative type I error and maintain an overall confidence level of 95%. Effect sizes (Cramer's V, Spearman's r, or partial η^2, depending on the variable type) were also reported in addition to the *p- values.*

To assess predictive associations, a binary logistic regression model with maximum likelihood estimation was applied, using AI use in medical practice as the dependent variable. Associations with $p < 0.05$ were considered significant. An AI attitude index was also constructed by combining six related items, and its internal reliability was calculated using Cronbach's alpha coefficient. The Cronbach's alpha value obtained was 0.613, indicating an acceptable level of internal consistency for exploratory research. This value suggests that the items of the AI attitude index are coherently related and allow for a reasonable aggregate measurement of the attitudinal construct. Although it does not reach the ideal threshold of 0.7 recommended for confirmatory studies, it is considered adequate for preliminary research seeking a diagnostic or hypothesis-generating approach.

To ensure proportional representation of participating countries and reduce potential sample imbalances arising from convenience sampling, a country weighting procedure was applied based on the medical density reported by the World Health Organization (WHO, 2022).

The weight assigned to each observation (w_i) was calculated using the formula:

$$w_i = \frac{(N_j / N_T)}{(n_j / n_T)}$$

where $N_j$represents the total number of physicians in country *j* according to WHO records, $N_T$the sum of physicians in all included countries, $n_j$the number of participants from that country in the sample, and $n_T$the total number of respondents. This procedure adjusted the relative contribution of each country, so that the weighted proportion reflects the actual distribution of physicians in the region.

To avoid distortions caused by extreme values in countries with very high or very low representation, weight truncation was applied at the 5th and 95th percentiles, preventing individual cases from disproportionately influencing the inferential analyses. Finally, the weights were normalized so that the total sum matched the original sample size ($\sum w_i = n_T$), maintaining consistency between the weighted and unweighted analyses.

2.5 Ethical considerations

The study was conducted in accordance with the ethical principles of research involving human subjects. All participants voluntarily provided their digital informed consent after reading the objectives and nature of the study. The data were anonymized, coded, and securely stored. According to the current institutional regulations of the principal author's affiliated university, observational, non-interventional studies that do not involve clinical procedures or manipulation of sensitive data, and that are based on anonymous professional opinion surveys, are exempt from requiring formal approval from an ethics committee. This exception applies provided that confidentiality, voluntary informed consent, and respect for the integrity of the participants are guaranteed—conditions that were fully met in this study.

3. Results

A case weighting procedure was applied to correct for potential sample imbalances and ensure proportional representation by country, based on the data available for 2022 (Table 1). The mean age of the participants was 51.52. ±13.54 years, with an approximately normal distribution (skewness coefficient: -0.322; kurtosis: -0.825). The sample was balanced by sex (49.8% men, 49.6%

women, and 0.5% other genders). Regarding the year of graduation, 39.3% of respondents trained between 1980 and 1995, while 17.3% obtained their degree from 2016 onward, demonstrating a generational shift toward an increasingly digitalized medical practice. Sociodemographic data show a wide dispersion in terms of age ranges, gender, and training cohorts, allowing for a representative and nuanced analysis of the professional profile of the physicians included in the study (Table 2). The most represented specialties were Internal Medicine (45.6%), Family Medicine (6.4%), and General Medicine (4.2%). The remaining medical disciplines were grouped under the category of "other specialties," which together represented 43.8% of the sample.

Table 1. Sample weighting according to the number of doctors per country in Latin America (WHO, 2022) (30).

Country	Sample obtained	Weight	Adjusted sample	Doctors by country
Dominican Republic	510	0.027	14	20,017
Mexico	92	2.39	220	314,724
Argentina	90	1.38	124	177,599
Bolivia	50	0.17	9	12,186
Peru	47	0.67	32	45,416
Colombia	26	3.18	83	118,407
Paraguay	22	0.26	6	8,095
Honduras	101	0.03	3	4,952
Venezuela	8	6.57	53	75,256
Others	94	5.29	497	712,171
Total	1040		1040	1,488,823

Note: The weighting corrects the sample representation according to the actual proportion of doctors per country (WHO, 2022).

The data show that 72.3% of respondents have statistical knowledge without formal qualifications, 9.4% have certified training, and only 18.2% lack knowledge in this area. Regarding AI, 51.8% reported basic knowledge, 21.6% intermediate, and 3.7% advanced; only 0.5% had never heard of the topic (Table 3). The vast majority of respondents (86.0%) expressed greater confidence in the clinical judgment of medical professionals compared to AI (2.6%) or patient autonomy (6.6%).

Among the main concerns associated with the use of AI in medicine were the lack of empathy (28.0%), insufficient personalization of patient care (25.0%), and a limited capacity to respond to unforeseen situations (18.0%). Furthermore, 54.6% of participants considered that the responsibility for AI-assisted decisions lies with the attending physician (Table 4).

Association between Statistical Training, Teaching and Perception of AI

A statistically significant association was identified between the level of statistical knowledge and the use of AI ($\chi^2 = 70.05$; df = 2; $p < 0.001$), with a weak to moderate magnitude of association (Cramer's V = 0.260). Likewise, participation in university teaching was significantly associated with greater statistical knowledge ($\chi^2 = 68.655$; df = 2; $p < 0.001$; Cramer's V = 0.257). This relationship was corroborated by the Mann-Whitney U test (U = 82.729; Z = –7.623; $p < 0.001$), which showed significant differences in the levels of statistical knowledge between faculty and non-faculty members. On the other hand, a moderately strong inverse association was observed between statistical knowledge and the willingness to recommend the use of AI to colleagues ($\chi^2 = 83.678$; df = 8; $p < 0.001$; Gamma = –0.461), which suggests that the higher the level of statistical knowledge, the lower the tendency to recommend AI tools in professional practice (Table 5).

Table 2. Physicians classified by professional status, university teaching and participation in publications.

Professional status	**N**	**%**
Specialist	807	77.5%
General Practitioner	143	13.7%
Medical Student (Residents)	57	5.4%
Retired	34	3.3%
Total	1041	100%
University Teaching	**N**	**%**
No	515	49.5%
Yeah	526	50.5%
Total	1041	100%
Participation in Publications	**N**	**%**
No	257	24.7%
Yes, Main Author	435	41.8%
Yes, Co-author	349	33.5%
Total	1041	100%

Table 3. Distribution of the sample by knowledge of statistics and AI.

Knowledge of Statistics	**N**	**%**
No	190	18.2%
Yes, without a title	753	72.3%
Yes, with a title	98	9.4%
Total	1041	100.0%
Knowledge about AI		
I've heard of AI	221	21.2%
Basic AI knowledge	539	51.8%
Intermediate AI Knowledge	225	21.6%
Advanced AI Knowledge	39	3.7%
Active Research/Development with AI	11	1.1%
I've never heard of AI	6	0.5%
Total	1041	100.0%

Table 4. Analysis of Medical Judgment vs. AI, Ethical Concerns and Responsibility.

Knowledge of Statistics	**N**	**%**
Medical Judgment	895	86.0%
AI Opinion	27	2.6%
Patient Choice	69	6.6%
Don't know	50	4.8%
Total	1041	100.0%
Concerns about the use of AI in medicine		
It's difficult to apply it to controversial topics.	168	16.1%
It is not flexible enough to be applied to every patient	261	25.0%
It cannot be used to give opinions in unforeseen situations due to inadequate information	188	18.0%
The low capacity to empathize and consider the emotional well-being of the patient	292	28.0%
It was developed by a specialist with little clinical experience in medical practice.	45	4.3%
Don't know	88	8.4%
Total	1041	100.0%
Responsibility		
Doctor in charge	568	54.6%
Patient who consented to continue receiving artificial intelligence support	38	3.7%
The health center	17	1.6%
Public health policies in each country	154	14.8%
Company that created artificial intelligence	142	13.7%
Don't know	121	11.6%
Total	1041	100.0%

Table 5. Association between statistical knowledge, teaching and perceptions about the use of AI in medicine.

Relationship analyzed	**Test applied**	**Key statistician**	**p**	**Magnitude of association**	**Basic interpretation**
Knowledge of statistics vs. use of AI	Chi-square	$\chi^2 = 70.05$ (df = 2)	< 0.001	Cramer's V = 0.260	Significant association, weak to moderate
University teaching vs. level of statistical knowledge	Chi-square	$\chi^2 = 68.655$ (df = 2)	< 0.001	Cramer's V = 0.257	Significant association, weak to moderate
Teacher vs. non-teaching staff: differences in statistical knowledge	Mann-Whitney U	U = 82,729; Z = -7.623	< 0.001	—	Significant differences in ranks
Statistical knowledge vs. AI recommendation to colleagues	Chi-square and Gamma	$\chi^2 = 83.678$ (df = 8); Gamma = -0.461	< 0.001	Inverse association, moderately strong	Greater statistical knowledge, less AI recommendation

Association between personal experience and age.

A very strong association was observed between personal use of AI and its recommendation to colleagues: those who have used it tend to recommend it almost universally, unlike those who have not (Phi and Cramer's V = 0.987). Likewise, the perception of job replacement by AI varied according to age ($\chi^2 = 27.843$; $p < 0.001$); younger physicians were more receptive to this idea, while older physicians showed greater skepticism (Gamma = –0.255).

Attitudes towards artificial intelligence and its influence on clinical decision-making

To assess physicians' general attitudes toward the use of artificial intelligence (AI), an AI Attitude Index was constructed, composed of six items related to its recommendation, familiarity, perceived usefulness, and willingness to integrate it into clinical practice. The index showed a mean of 11.02 points, with acceptable internal consistency (Cronbach's alpha = 0.613). Although the index distribution was not normal (Kolmogorov-Smirnov, $p < 0.001$), homoscedasticity was adequate (Levene's test, $p > 0.05$), allowing for analysis of variance (ANOVA). Statistically significant differences were observed between countries (F = 2.357; $p = 0.012$), most notably between Mexico, Argentina, and Colombia. Furthermore, a significant association was found between a positive attitude and the use of AI in medical practice ($\chi^2 = 81.914$; $p < 0.001$; Cramer's V = 0.281).

In simulated clinical scenarios where the judgment of the human physician and that of the AI differed, attitudes also showed a modulating role. Professionals with more favorable attitudes toward AI were more willing to follow its recommendation, even when faced with the physician's opinion ($\chi^2 = 75.204$; df = 6; $p < 0.001$; Cramer's V = 0.190). Likewise, those who valued AI more highly tended to consider options other than traditional clinical judgment ($\chi^2 = 16.764$; df = 2; $p < 0.001$; Cramer's V = 0.127). Finally, a moderate association was identified between a favorable judgment of AI and a generally positive attitude toward its use (Table 6) ($\chi^2 = 61.116$; df = 2; $p < 0.001$; Phi = 0.242; Cramer's V = 0.242).

Table 6. Relationship between attitude towards artificial intelligence and clinical decisions in hypothetical scenarios.

Dimension of analysis	Statistical	p	Association measure	Magnitude	Main interpretation
Attitude towards AI vs. decision in medical judgment vs. AI judgment	$\chi^2 = 75.204$ (df = 6)	< 0.001	Cramer's V = 0.190	Weak to moderate	Positive attitudes are associated with a greater willingness to follow the AI's judgment.
Attitude towards AI vs. preference for traditional clinical judgment	$\chi^2 = 16.764$ (df = 2)	< 0.001	Cramer's V = 0.127	Weak	Greater appreciation of AI is related to openness to judgments other than those of the traditional doctor.
Judgment towards AI vs. attitude index towards AI	$\chi^2 = 61.116$ (df = 2)	< 0.001	Phi = 0.242; Cramer's V = 0.242	Moderate	A positive judgment towards AI is associated with a better overall attitude towards its use

Multivariate analysis of predictors of AI use in medical practice.

Familiarity with artificial intelligence emerged as the strongest predictor of AI use, showing a positive and statistically significant association (OR = 4.59; 95% CI: 3.10–6.81). Consistently, perceived AI usefulness was also significantly associated with a higher likelihood of adoption (OR =

2.49; 95% CI: 1.07–5.81), although with a moderate effect size compared to familiarity. Conversely, neither skepticism regarding the diagnostic capacity of AI (OR = 0.95; 95% CI: 0.60–1.50) nor basic technical knowledge about AI (OR = 0.78; 95% CI: 0.50–1.20) showed statistically significant associations, presenting confidence intervals that cross unity (Figure 1).

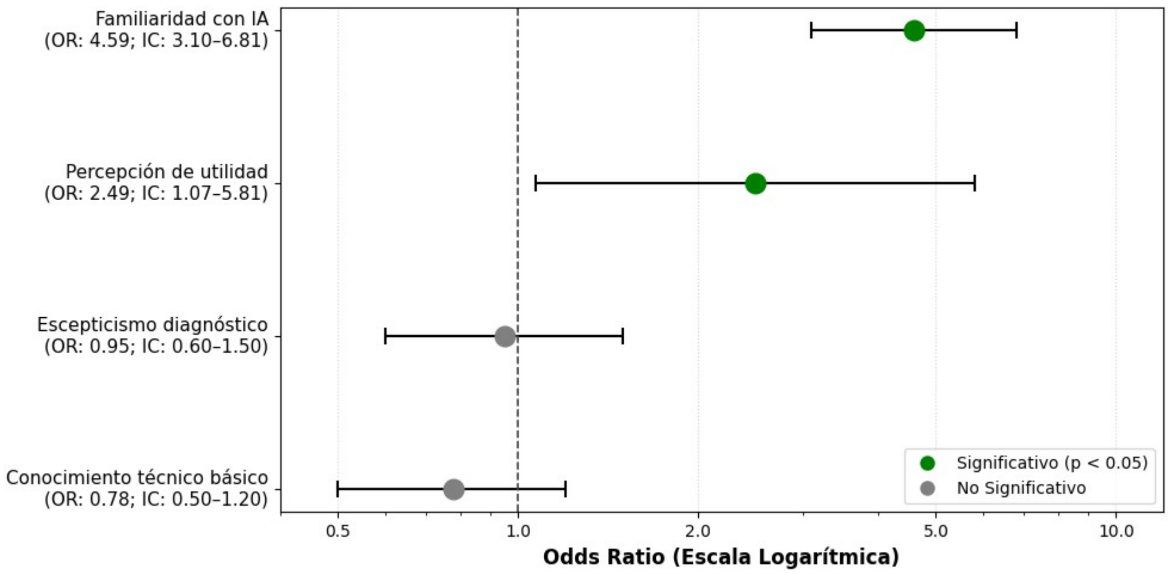

Figure 1. Multivariate predictors of artificial intelligence use in medical practice. Dots represent adjusted odds ratios (ORs), and horizontal lines indicate 95% confidence intervals (95% CIs). The X-axis scale is logarithmic. Green markers indicate significant associations (CI does not cross 1), while gray markers indicate no statistical significance.

4. Discussion

In this study, most Latin American physicians showed a basic level of familiarity with AI, which partially coincides with the meta-analysis by Abdulazeem et al., where around a third of primary care physicians presented limited knowledge about this technology (33%; 95% CI: 16–50%) (30). The high proportion of participants with teaching experience (50.5%) and scientific publications (75.3%) could have favored greater exposure to concepts related to AI, which would explain a somewhat higher familiarity than that reported in other populations.

Comparing these findings with the study conducted in Bahrain, it was observed that 71% of physicians self-assessed their knowledge as “average” or “above average,” although without using a standardized objective classification (31). In our case, a clearly defined operational categorization was used, allowing for more precise measurement and reducing the risk of overestimation. This suggests that, while in Bahrain the perception of familiarity may be overstated, in Latin America a more cautious self-assessment predominates, possibly more in line with the reality of technological skills. This contrast highlights the importance of using structured instruments to assess digital literacy in medicine, especially in emerging areas such as artificial intelligence.

In our study, the majority of physicians expressed a clear preference for human clinical judgment, reflecting greater confidence in professional expertise than in automated recommendations. This finding is consistent with the international literature. In Pakistan, for example, only 20.2% of physicians believed that AI could surpass the accuracy of clinical judgment, while 61% expressed concern about the possibility of relying entirely on automated decisions (32).

Likewise, the majority of participants considered that AI should have a complementary role and not replace the physician. Similar findings were reported in Jeddah, Saudi Arabia, where 56.6%

of physicians indicated that decision-making should continue to be led by the professional, assigning AI an auxiliary role, and only 2.9% accepted the possibility of it completely replacing the physician (6). These results confirm that, although AI is seen as a valuable tool, its acceptance depends on human clinical judgment remaining central to medical practice.

Our results show that more than half of the physicians surveyed believe that the legal responsibility for AI-assisted decisions lies with the treating physician. This perception reflects a clear preference for preserving clinical judgment and the human dimension as fundamental pillars in medical decision-making. However, this allocation of responsibility poses significant regulatory challenges, as the integration of AI systems into clinical practice introduces new layers of legal and ethical complexity. In line with this finding, a recent systematic review identified uncertainty regarding the allocation of legal responsibility as a critical barrier to the effective implementation of AI in healthcare. One of the main unresolved questions is precisely who should be held responsible for errors or incorrect decisions resulting from the use of these systems: the physician, the institution, the technology developer, or the patient themselves (9).

Other studies confirm that, although many healthcare professionals accept that the physician must assume ultimate responsibility, they also report not being adequately prepared for this, or acknowledge that the attribution of such responsibility remains ambiguous and poorly defined in most current regulatory frameworks (33). This lack of clarity may contribute to skepticism and resistance to the adoption of AI, and highlights the need to establish specific regulatory guidelines that define roles, obligations, and frameworks for shared responsibility.

Comparing our results with those of the 2023 study conducted in Portugal reveals significant differences in physicians' perceptions of AI knowledge. In Portugal, 57% of physicians reported an intermediate level of knowledge, possibly reflecting earlier integration of AI into medical training and clinical practice (34). In contrast, basic levels predominated in our Latin American sample, with a lower proportion of physicians reporting intermediate or advanced knowledge. This gap can be explained by factors such as differences in healthcare systems, unequal access to emerging technologies, and the still limited integration of AI into Latin American medical curricula. Although most physicians have heard of the topic, functional technological literacy and formal AI training remain scarce. This finding aligns with a recent systematic review, in which professionals acknowledge a lack of practical experience and limited understanding of AI, even suggesting that its potential has been overstated by industry or the media (33). Taken together, these studies indicate that, despite increasing conceptual familiarity, deep and applicable knowledge of AI remains insufficient.

Regarding concerns about the dehumanization of medical practice, marked differences are observed between our Latin American sample and other international contexts. In Portugal, 82.7 % of doctors expressed concern about the lack of empathy in the use of AI, while 76.5 % pointed to the limited ability to improvise as a significant barrier (34).

In contrast, in our study, these concerns were mentioned by 28.0 % and 18.0 % of respondents, respectively. This disparity can be attributed to the greater presence of AI in Portuguese clinical practice, which gives professionals in that country more direct experience in identifying its functional and ethical limitations. Conversely, in Latin America, where the use of AI is still in its early stages, perceptions are based primarily on general expectations rather than concrete clinical experiences.

In terms of digital literacy, Portuguese physicians also appear to possess a higher level, which could facilitate a more critical assessment of the risks associated with the use of automated technologies in medical contexts. Meanwhile, studies conducted in Australia and New Zealand have identified distinct concerns, primarily focused on the delegation of decisions to technology companies, medical liability for errors, and the loss of clinical autonomy for specialists, reflecting a more structural and regulatory approach (35).

Additionally, a global survey of 791 psychiatrists, mostly from developed countries, revealed that 83 % considered it unlikely that future technologies could provide empathetic care, and only 3.8 % believed that AI could replace their job (36). These data reinforce the idea that, while AI is accepted as a support tool, there is an international consensus on the need to preserve the human dimension as the irreplaceable core of clinical practice.

Comparative analysis with international studies reveals significant differences in concerns regarding the adoption of AI in medicine. In our study, Latin American physicians primarily expressed humanistic concerns, such as a lack of empathy, insufficient personalization of care, and AI's limited capacity to respond to unforeseen clinical situations. These perceptions, assessed using a scale focused on relational aspects of medical practice, were accompanied by a marked preference for human clinical judgment. This pattern aligns with findings from Bahrain, where concerns about the dehumanization of care and the reliability of automated systems have also been reported (31). In both contexts, criticism of AI is not directed solely at its technical performance but also at its perceived inability to replace the interpersonal bond between doctor and patient. In contrast, research conducted in countries such as Italy and the United Kingdom reveals a different focus, centered on structural and regulatory obstacles. In these scenarios, attention is focused on the lack of clinical guidelines, implementation costs, and integration difficulties within existing hospital systems (37-38). This suggests greater maturity in technology adoption, where resistance is no longer so much focused on the conceptual acceptance of AI, but rather on its operational feasibility. Portugal, on the other hand, presents a more technical and ethical profile, with concerns related to the functional understanding of algorithms, data bias, legal liability, and insufficient training of healthcare personnel (34). This stance demonstrates a higher degree of digital literacy, but also a more critical view of the ethical implications of using AI in real-world clinical settings.

In this context, one of the most relevant findings of our study is the perception that AI tools are not yet sufficiently adapted to the individual needs of patients. This observation aligns with the international literature: Hassan, Kushniruk, and Borycki (2023) highlight that AI's limited ability to adapt to specific clinical contexts and the uniqueness of each patient constitutes one of the main barriers to its acceptance (39). This underscores the need to develop more personalized technological solutions that are sensitive to clinical reality. The study conducted in Australia and New Zealand showed that 47.6% of physicians considered their knowledge of AI to be "average," while only 5.5% rated their knowledge as "excellent" and 4.9% as "very poor" (35). In our study, by using defined operational categories, a more precise distribution was observed: a predominance of basic knowledge, a smaller proportion at an intermediate level, and a minimal percentage at an advanced level. Both studies agree that most physicians lack advanced AI skills; however, they differ in how they measure them. While the Oceanic study relied on subjective self-assessments compared to peers, our work used a standardized classification, which likely reduces overestimation and more realistically reflects training limitations. Furthermore, factors such as technological infrastructure, the integration of AI into clinical practice, and the training available in each country could influence these perceptions and actual exposure to these technologies.

Our findings align with those reported in a recent systematic review, which showed a generally favorable disposition toward the integration of AI in healthcare, both among healthcare professionals and among patients and citizens. In that review, 47 % of the included studies described predominantly positive attitudes towards AI, while only 19 % reported negative perceptions (33). However, this study does not simply describe attitudes, but rather analyzes how these are reflected in clinical practice. We observed that physicians with a favorable attitude toward

AI showed a greater willingness to incorporate it into their clinical decisions, even when its suggestions differed from traditional judgment. This suggests that some professionals are beginning to use AI as an active part of their clinical reasoning, which could indicate an early transition toward new models of medical decision-making. Thus, our results not only confirm the overall acceptance of AI, but also provide evidence of how this attitude translates into observable clinical behaviors.

Determinants of the clinical use of AI according to the multivariate and binary logistic model.

The logistic regression model demonstrated good overall performance and a clear structure, consistently differentiating between physicians who use and do not use artificial intelligence. Its strength lies in identifying a few key predictors that are practically relevant, giving it a parsimonious and easily interpretable character and avoiding artificial or inflated associations. Familiarity with AI and the perception of its usefulness provided the model's greatest explanatory power, while other variables, although conceptually important, did not maintain an independent effect after adjustment. This suggests that AI use depends less on extreme positions—such as skepticism or basic technical knowledge—than on progressive and significant exposure to the technology in real-world professional practice settings. Overall, the model is statistically stable, conceptually coherent, and closely reflects the reality of medical practice, providing confidence that the results reflect authentic patterns of AI adoption and offering a solid foundation for guiding training strategies and institutional decision-making.

Strengths and limitations

The study is distinguished by its multinational scope and large sample size, which provide a representative view of the use of artificial intelligence in Latin American medical practice. Key features include the application of a validated questionnaire, the use of statistical weighting by country based on WHO data, and the implementation of robust multivariate analyses with bootstrap validation, which lend methodological rigor and credibility to the results. Nevertheless, we acknowledge several limitations. The sampling was non-probabilistic due to the lack of standardized medical records in the participating countries, which may affect the representativeness of the sample. To mitigate this impact, a country weighting was applied based on official WHO data.

The use of self-administered surveys and convenience sampling can introduce selection and perception biases, favoring the participation of physicians with greater digital access. Furthermore, the study relies on self-reported perceptions and lacks methodological triangulation and qualitative approaches, limiting its interpretive depth and external validity. It also failed to consider institutional contextual variables—such as technological infrastructure or local policies—that could influence AI adoption. From an educational perspective, the findings underline the need to incorporate basic AI skills into medical training, such as digital literacy, critical thinking, and applied ethics, through curricular modules, clinical simulation, and teacher training.

5. Conclusions

- Artificial intelligence is now part of the professional landscape for Latin American physicians, but its integration into daily practice remains limited and cautious. Although there is interest and a generally favorable attitude, human judgment continues to be the primary reference point, reflecting a gradual and thoughtful adoption of these technologies.
- Our results show that AI use is driven primarily by practical familiarity, perceived usefulness, and the influence of the professional environment, rather than advanced technical knowledge. In fact, those with a better understanding of AI tend to adopt a more critical perspective, aware of its scope and limitations, suggesting a more responsible and less enthusiastic approach.

- In this context, the effective integration of artificial intelligence in medicine requires training oriented towards real experience, critical thinking and clear regulatory frameworks, which allow its potential to be harnessed without losing the human component that defines medical practice.

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