

Impact of artificial intelligence on Latin American criminal proceedings in the last five years



Review Article

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ABSTRACT

The integration of artificial intelligence into criminal justice systems represents a significant transformation that generates tensions between judicial modernization and the protection of fundamental guarantees. Thus, the objective of this research was to determine the impact of artificial intelligence on Latin American criminal proceedings over the last five years. A qualitative approach was employed through a systematic review of twenty-two scientific studies published in three databases: Scopus, SciELO, and Web of Science. The main results reveal that artificial intelligence was implemented in various applications, such as digital evidence management, judicial decision prediction, facial recognition, recidivism risk assessment and optimization of police patrols. However, recurring critical risks were identified, such as algorithmic discrimination, decision-making opacity shielded by trade secrets, the perpetuation of historical biases and potential violation of due process, the presumption of innocence and privacy. It is concluded that artificial intelligence should remain a complementary tool under continuous human oversight, requiring specific regulatory frameworks, algorithmic transparency, external audits, specialized training, and strengthened procedural safeguards to ensure that technological efficiency does not erode the democratic guarantees of the rule of law.

Keywords: artificial intelligence; criminal proceedings; due process; fundamental guarantees; Latin America.

Impacto de la inteligencia artificial en los procesos penales latinoamericanos en los últimos cinco años

RESUMEN

La integración de la inteligencia artificial en los sistemas de justicia penal representa una transformación significativa que genera tensiones entre modernización judicial y protección de garantías fundamentales. Así, el objetivo de esta investigación fue determinar el impacto de la inteligencia artificial en los procesos penales latinoamericanos en los últimos cinco años. Se empleó un enfoque cualitativo mediante la revisión sistemática de veintidós estudios científicos publicados en tres bases de datos: Scopus, SciELO y Web of Science. Los principales resultados revelan que la inteligencia artificial se implementó en diversas aplicaciones como gestión de pruebas digitales, predicción de decisiones judiciales, reconocimiento facial, evaluación de riesgo de reincidencia y optimización de patrullaje policial. Sin embargo, se identificaron riesgos críticos recurrentes, tales como discriminación algorítmica, opacidad decisional protegida por secretos comerciales, perpetuación de sesgos históricos y vulneración potencial del debido proceso, la presunción de inocencia y la intimidad. Se concluye que la inteligencia artificial debe mantenerse como herramienta complementaria con supervisión humana constante, requiriendo marcos regulatorios específicos, transparencia algorítmica, auditorías externas, capacitación especializada y garantías procesales reforzadas que aseguren que la eficiencia tecnológica no erosione las garantías democráticas del Estado de derecho.

Palabras clave: inteligencia artificial; proceso penal; debido proceso; garantías fundamentales; América Latina.

Cite as

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INTRODUCTION

In the last decades, the administration of criminal justice in Latin America has faced growing pressure to modernize judicial processes in response to persistent structural problems, such as procedural overload, delays in proceedings, limited availability of human and material resources, as well as public distrust in the effectiveness and transparency of the different judicial systems (Hurtado-Rodríguez & Borbor-Velíz, 2025; Bel & Pacheco, 2024).

Faced with this problematic, authors such as García Torres (2024) and González Fernández (2023) have expressed the need to implement artificial intelligence in Latin American legal systems in order to prevent the prolongation of proceedings, prioritize judicial cases, automate administrative tasks, etc. However, the situation described raises certain concerns regarding the compatibility of these technologies with fundamental principles of criminal proceedings, such as the presumption of innocence, due process, equality before the law, and the right to properly reasoned judicial decisions (Bechara et al., 2024).

Likewise, the technological gap between different Latin American countries, and even within the same judicial system, has led to unequal implementation of artificial intelligence, which may exacerbate asymmetries in access to justice and reproduce pre-existing structural biases (de Lara-García, 2022). This situation is particularly problematic in criminal justice systems characterized by high levels of social inequality, where the use of algorithmic tools may reproduce or deepen pre-existing discriminatory biases, disproportionately affecting vulnerable populations if such tools are not used appropriately (Filgueira, 2023).

In this context, the problematic of artificial intelligence in Latin American criminal proceedings lies not only in its technological incorporation, but also in the lack of structural conditions to ensure its responsible use and compatibility with fundamental rights (García Benítez & Ruvalcaba-Gómez, 2021). Thus, in recent years, the accelerated adoption of these tools has not, in many cases, been accompanied by rigorous assessments of their legal, ethical, and social impact, nor by effective mechanisms related to oversight, accountability, and the protection of fundamental rights (Corrales Castellano et al., 2025).

Based on the problem presented, the following research question was formulated: What is the impact of artificial intelligence on Latin American criminal proceedings over the last five years? This question arises because, in the Latin American context, the incorporation of artificial intelligence into criminal proceedings has advanced unevenly and with limited systematic assessment of its actual effects. Therefore, it is necessary to critically address this recent and relevant phenomenon (Segura, 2023).

Regarding the general objective of this research, it was to determine the impact of artificial intelligence on Latin American criminal proceedings over the last five years. Additionally, the following specific objectives were considered relevant: to identify the applications of artificial intelligence used in Latin American criminal proceedings over the last five years; to evaluate the effects of artificial intelligence on fundamental safeguards in Latin American criminal proceedings over the last five years; and to examine the main risks and challenges associated with the use of artificial intelligence in Latin American criminal proceedings over the last five years.

From the perspective of the Sustainable Development Goals (SDGs), the incorporation of artificial intelligence into criminal proceedings is linked to SDG 16, insofar as it seeks to develop societies based on peaceful values and increasingly greater inclusion, with the purpose of ensuring effective, accountable, and transparent justice for their citizens through each of the institutions that make up the corresponding system. The incorporation of

technological tools into the administration of criminal justice can contribute to institutional strengthening and procedural efficiency (Brasil & de Araujo, 2025). However, their application without appropriate mechanisms suited to the legal system may weaken due process guarantees and public trust. Therefore, critically examining the implications of artificial intelligence in this context is essential to ensure that its use is aligned with the principles of SDG 16 and with the consolidation of a legitimate criminal justice system that respects fundamental rights (de Macêdo & Pila, 2024).

Now, regarding the conceptual framework of this research, artificial intelligence refers to the ability of computer systems to address highly complex problems through the execution of predefined algorithms (Sánchez Vásquez & Toro-Valencia, 2021). In the legal field, it has been implemented in processes such as the analysis of legal documents, the prediction of judicial outcomes, assistance in decision-making, and the automation of administrative processes (Maciel Nascimento et al., 2024). In this regard, its use is justified by the need to address procedural congestion and improve the efficiency of the justice system, particularly in contexts of high demand and limited resources, as is the case in most Latin American countries (Paredes Morales et al., 2025).

On another hand, the application of artificial intelligence in judicial proceedings is based on algorithmic models of machine learning and predictive analysis, which process historical data to generate estimates or recommendations (Díaz-Ramírez, 2021). These tools have been used at stages such as preliminary investigation, assessment of the risk of flight or recidivism, prioritization of procedural matters, and management of judicial case files (Aguilar, 2024). However, various authors, such as Samaniego Macas et al. (2024) and Villalta (2024), warn that these systems are not neutral, since they depend on the quality, representativeness, and context of the data used, which may give rise to structural biases that affect the impartiality and objectivity of criminal decisions.

In the framework of criminal procedural law, the introduction of artificial intelligence poses significant challenges regarding the validity of fundamental principles and safeguards. Thus, due process, the presumption of innocence, equality before the law, and the right to reasoned judicial decisions may be compromised when decisions rely on opaque algorithmic systems or systems that are difficult for legal practitioners and procedural parties to understand (Sangines Ordoñez & Avendaño Vera, 2025). From a guarantee-based theory perspective, it is argued that any decision affecting fundamental rights must be fully explainable and subject to oversight, a requirement that is difficult to meet when complex or proprietary automated models are used (Echeverría Justicia, 2024).

In this way, various artificial intelligence tools have been implemented in the judicial field in Latin America, such as Prometea in Argentina, developed to automate legal opinions and repetitive tasks within the Public Prosecutor's Office. Likewise, Pretoria exists in Colombia, used by the Constitutional Court to prioritize tutela actions in health-related matters. Meanwhile, in Brazil, systems such as Synapses, Victor, and Sócrates were developed and are used to manage repetitive proceedings, group appeals, and identify similar claims in federal and state courts (Segura, 2023).

METHOD

The research was framed within a qualitative approach, as it constitutes a way of interpreting and understanding social or human phenomena through the analysis of processes, contexts, meanings, and subjective experiences (Calle Mollo, 2023). Complementarily, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) strategy was employed, which constitutes a set of standards or guidelines for the transparent and

structured reporting of systematic reviews and meta-analyses, with the aim of ensuring methodological rigor, reproducibility, and transparency in the synthesis of the proposed topic (Espinoza-Freire, 2025).

In addition to the above, the hermeneutic method was incorporated into the present research, as it seeks to understand and explain the deeper meaning of texts, discourses, or social practices, taking into account their historical, cultural, and linguistic context (Guamán Chacha et al., 2021). Within the context of the present systematic review, it is particularly relevant because it allows for the examination not only of the legal content but also of the axiological, teleological, and social dimensions surrounding the proposed topic.

Regarding the search and collection of relevant articles for the corresponding systematic review, academic databases of recognized scientific rigor were consulted, such as Scopus, Web of Science, and SciELO, using the following search equation: “(Artificial intelligence AND criminal process) OR (Artificial intelligence AND criminal process).” Thus, for the selection of studies, the inclusion criteria established were articles from indexed journals published between 2021 and 2025 that examined the implications of artificial intelligence in Latin American criminal proceedings. In addition, only open-access studies with full-text availability and consistency with the proposed research objectives were considered. Conversely, duplicate articles, those without access to the full text, studies published more than five years ago, and those that did not clearly and directly address the topic of this systematic review were excluded.

Likewise, with the purpose of strengthening the rigor of the present study, the selected articles underwent a prior evaluation regarding the clarity of the research objectives, methodological coherence, relevance of the sources used, consistency of the results, and soundness of the conclusions. Thus, Figure 1 is presented below, showing the process of selecting the articles that met the filters mentioned in the previous paragraph, resulting in twenty-two articles relevant to the objectives proposed in the present study.

Figure 1
Selection of articles using the PRISMA procedure

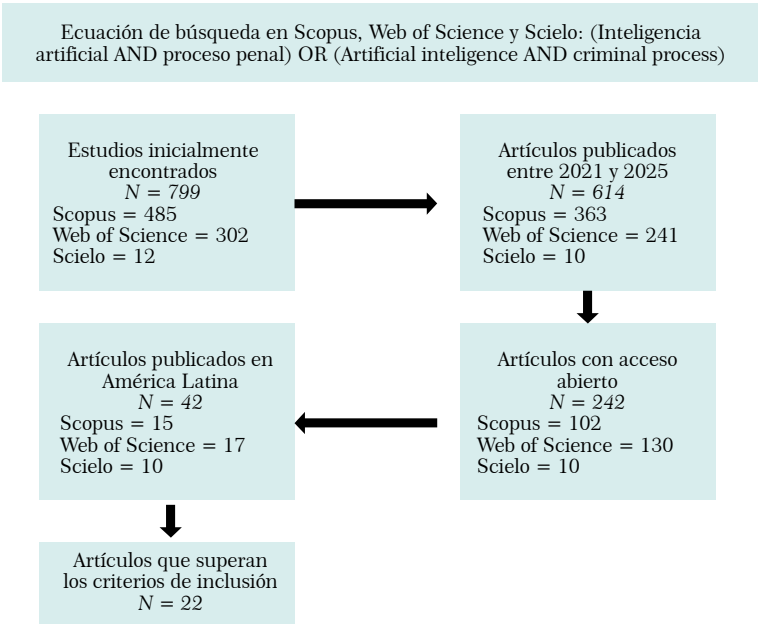
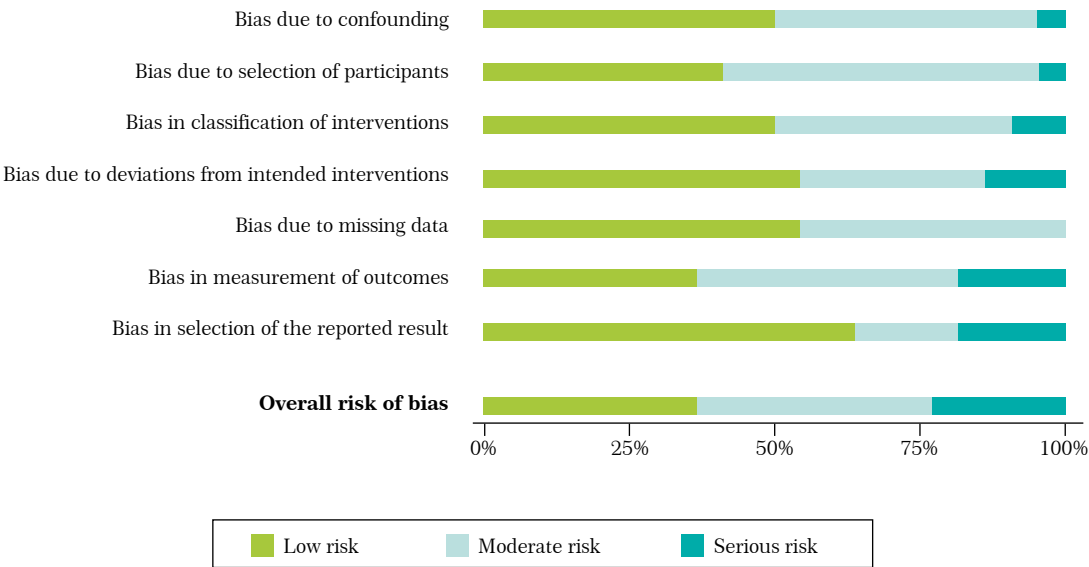


Figure 1 shows the selection of the studies based on their thematic relevance to the research objective, considering exclusively studies that directly analyzed the incorporation, applications, implications, risks, or challenges of artificial intelligence in the Latin American criminal justice field. Likewise, priority was given to research published in indexed and peer-reviewed journals, with full-text access and sufficient methodological and argumentative development to allow the identification of relevant findings. In this way, twenty-two articles were selected, which constituted the documentary corpus of this research.

On the other hand, in order to strengthen the methodological validity of the systematic review and ensure the reliability of the evidence analyzed, a risk-of-bias assessment of the included studies was conducted using the ROBINS-I tool (Risk Of Bias In Non-randomized Studies of Interventions). This instrument made it possible to systematically examine the methodological quality of the selected articles, considering potential sources of bias. The results of this assessment are presented in Figure 2.

Figure 2
Risk-of-bias analysis of the selected articles



The ROBINS-I assessment showed that most of the studies presented a low to moderate risk of bias, which makes it possible to consider that the findings included in the present review have adequate methodological soundness. The main favorable aspects identified were the clarity of the research objectives, the consistency between the methods employed and the results obtained, as well as the adequate theoretical and legal foundation of the studies analyzed. Nevertheless, some studies showed a moderate risk due to limitations associated with the descriptive nature of the designs employed, the absence of standardized procedures for validating results, and the limited information on potential confounding factors.

RESULTS

This section presents the twenty-two articles that met the inclusion and exclusion criteria proposed in the previous section. They were organized as presented in Table 1, considering the following data identification elements: (1) author and year, (2) database, (3) country, and (4) main findings.

Table 1
Main conclusions of the selected articles

Author and year	Database	Country	Main findings
Aguilar Cabrera (2024)	Scopus	Peru	The integration of artificial intelligence into the judicial system represents a significant advancement that can optimize the efficiency, quality, and transparency of criminal proceedings. However, it is essential to establish clear protocols for the collection, preservation, and analysis of AI-generated digital evidence, ensuring the protection of fundamental rights, the integrity of the evidence, and respect for due process.
Alcántara Francia et al. (2022)	Web of Science	Peru	The use of artificial intelligence to predict judicial decisions has shown significant growth, achieving accuracy levels exceeding 60% in various areas of law.
de Alvarenga and Abi-Ackel (2024)	Web of Science	Brazil	Artificial intelligence in criminal proceedings offers important advantages in terms of efficiency, speed, and access to justice by streamlining repetitive tasks, optimizing data analysis, and reducing judicial overload.
Cavalcante Vieira and Rodrigues Santos (2025)	Scopus	Brazil	The use of predictive technologies, such as artificial intelligence and predictive policing, in public security entails significant risks of algorithmic discrimination and reproduction of historical biases, which may perpetuate social inequalities and violate fundamental rights.
Centeno Cardona et al. (2022)	Scopus	Colombia	The incorporation of information and communication technologies and artificial intelligence is essential for improving the processes of resocialization of punishment.
de Oliveira (2022)	Scopus	Brazil	The intersection between artificial intelligence and law requires a thorough review of fundamental legal concepts of the democratic rule of law, such as territoriality, legal personality, legality, and due process. In view of the autonomy and opacity of AI systems, the author argues that the law must adapt to preserve transparency, justice, and fundamental rights.
Díaz-Rincón et al. (2024)	Scopus	Colombia	Artificial intelligence brings greater speed to judicial proceedings in criminal law by optimizing the management of requests for precautionary measures in theft cases and reducing the perception of impunity.
Essahraoui et al. (2025)	Web of Science	Brazil	In the criminal field, the analysis of human behavior using artificial intelligence improves crime prediction, offense detection, and patrol optimization, but raises ethical risks such as algorithmic bias, lack of transparency, and threats to privacy. Therefore, its implementation requires regulatory frameworks and validation in real-world contexts to ensure justice and fundamental rights.
García and Barona (2024)	Web of Science	Ecuador	Artificial intelligence has the potential to revolutionize the criminal justice system by improving efficiency, optimizing decision-making, reducing human biases, and saving costs, with applications ranging from crime prediction and prevention to investigation, defense, and the post-conviction phase.
Julià Pijoan (2023)	SciELO	Chile	“Brain reading,” as a technique based on neurotechnology and artificial intelligence, is not currently in a position to be admitted as evidence in criminal proceedings. Although neurotechnology promises apparent objectivity, its use as criminal evidence would entail serious risks to procedural safeguards, the presumption of innocence, and the proper judicial assessment of evidence.
Navarro-Dolmestch (2025)	Web of Science	Chile	It is necessary to overcome the bipartite conceptual model of criminal law (subject/object) through the creation of an intermediate category called “actors,” which recognizes that intelligent machines, although they are not human subjects, possess autonomous capabilities that distinguish them from mere objects.
Padilla Sanabria (2025)	Web of Science	Mexico	The implementation of artificial intelligence in punitive law entails significant risks to the protection of human rights if AI systems are fed and trained with legal databases that do not respect the constitutional framework and international standards of procedural safeguards.
Pereira et al. (2022)	Scopus	Brazil	The use of artificial intelligence in judicial decision-making should be limited primarily to repetitive and low-complexity cases, while respecting the duty of analytical reasoning established in procedural legislation.
Perilla Granados (2024)	Scopus	Colombia	Artificial intelligence can be adopted as a viable strategy to reduce congestion in criminal courts, provided that it is integrated as a complement to human activity rather than as a substitute.
Roa Avella et al. (2022)	Web of Science	Colombia	The use of predictive risk algorithms such as COMPAS in the criminal justice system generates imminent risks to human rights, mainly due to the opacity of its architecture (“black box”) and the presence of algorithmic biases.

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Author and year	Database	Country	Main findings
Sanabria Moyano et al. (2022)	SciELO	Colombia	The implementation of facial recognition technology in criminal proceedings, particularly during the inquiry and investigation stages, presents significant risks to human rights and fundamental safeguards. Although these tools offer advantages such as speed and efficiency in identifying suspects and collecting evidence, they present high rates of inaccuracy (up to 81% in some cases) and algorithmic biases that disproportionately affect minority and vulnerable groups, such as people of African descent.
Serventich (2022)	Scopus	Argentina	The implementation of judicial artificial intelligence systems for risk assessment in decisions regarding pretrial detention may be a useful and complementary tool for judges, provided that procedural safeguards such as algorithmic transparency, bias avoidance, and the right to defense are respected.
Suárez Xavier (2024)	SciELO	Brazil	Artificial intelligence can be a valuable ally in modernizing the administration of justice, particularly in administrative and procedural support tasks; however, its implementation in judicial functions, especially in evidence assessment and appellate proceedings, must be subject to strict limitations.
Tavares (2024)	Scopus	Brazil	The use of digital technologies and artificial intelligence by the State in criminal prosecution is irreversible and entails significant benefits, particularly in decision-making. However, its implementation requires recognition of strengthened procedural safeguards to preserve fundamental rights.
Toledo and Pessoa (2023)	Web of Science	Brazil	Although artificial intelligence offers advantages in terms of speed and efficiency within the Brazilian Judiciary, its use for judicial decision-making presents significant risks, such as a lack of algorithmic transparency, the reproduction and amplification of cognitive biases, and a structural incompatibility between artificial intelligence data processing and the application of law, which prioritizes the uniqueness of the specific case.
Urzúa Urzúa (2024)	Web of Science	Chile	The incorporation of predictive recidivism-risk assessment tools based on artificial intelligence into oral trials presents serious risks to the fundamental rights to privacy and defense of the defendant, mainly arising from algorithmic opacity, discriminatory biases, and indiscriminate extraction of personal data.
Velasco (2022)	Scopus	Mexico	Although existing international instruments, such as the Budapest Convention, the Lanzarote Convention, and the Istanbul Convention, provide a relevant framework for addressing cybercrime, they are not sufficiently adapted to address the specific challenges posed by the malicious use of artificial intelligence systems.

In this regard, it was evidenced that twenty-two articles met the defined selection criteria and were developed during the period from 2021 to 2025. Thus, Figure 3 corresponds to the years of publication on the topic under study.

Figure 3
Publications on the implications of artificial intelligence in Latin American criminal proceedings according to year.

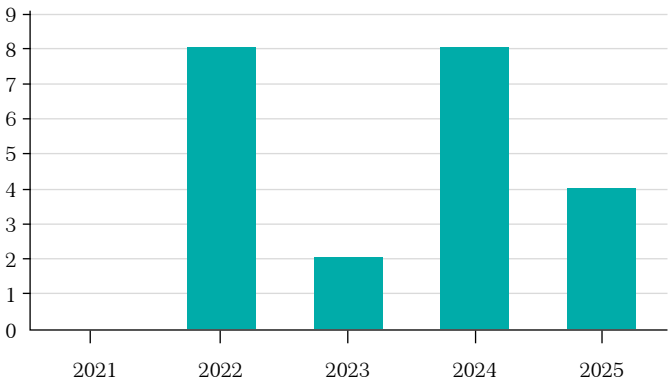


Figure 2 evidences a fluctuating evolution of scientific production related to the implications of artificial intelligence in Latin American criminal proceedings during the 2021–2025 period. Although no publications were identified in 2021, a significant increase in academic interest can be observed from 2022 onward, reaching eight studies. Subsequently, in 2023, a temporary decrease was recorded, with two publications, followed by a recovery in 2024, with eight publications again. While, in 2025, a total of four publications were identified. These results suggest that the analysis of artificial intelligence in the criminal justice field constitutes an emerging line of research in Latin America, whose development has been linked to the growth of debates on technological innovation, the protection of fundamental rights, and the modernization of criminal justice systems.

According to the criterion referring to databases, Figure 4 represents the number of articles corresponding to indexed journals hosted in databases recognized for their academic value at the international level: Scopus, Web of Science, and SciELO.

Figure 4
Selected articles according to database

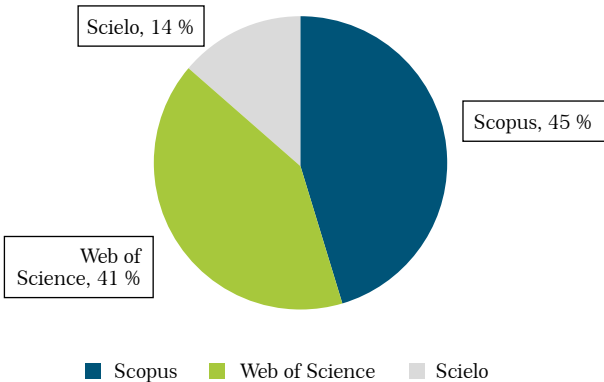


Figure 4 allows identify that most of the selected scientific evidence comes from Scopus (45%) and Web of Science (41%), databases recognized for their high indexing standards and academic quality control. Meanwhile, the SciELO database (14%) provides a relevant regional perspective and makes it possible to incorporate studies conducted in Latin American contexts that enrich the understanding of the legal and technological particularities present in the region.

On the other hand, Table 2 systematizes the countries belonging to the Latin American region in which the studies related to procedural legal systems, specifically criminal proceedings, were conducted, as presented below.

Table 2
Countries in which the included Latin American studies were

Country of study	No. of Articles	Percentage (%)
Argentina	1	4.55 %
Brazil	8	36.36 %
Chile	3	13.64 %
Colombia	5	22.73 %
Ecuador	1	4.55 %
Mexico	2	9.09 %
Peru	2	9.09 %

Table 2 evidences a significant concentration of article production in Brazil, the country that leads the region with eight articles, equivalent to 36.36% of the total sample. It is followed by Colombia with five publications (22.73%) and Chile with three studies (13.64%), consolidating these three countries as the main research foci on the incorporation of artificial intelligence tools into their judicial systems, as well as a greater academic interest in examining their legal and procedural implications. In contrast, Mexico and Peru present a moderate participation with two articles each (9.09%), while Argentina and Ecuador register the lowest incidence, with only one study per country (4.55%). This context demonstrates the need to strengthen regional scientific production on this topic, especially considering that the challenges related to the protection of fundamental rights and the regulation of emerging technologies affect Latin American criminal systems across the board.

DISCUSSION

This section discusses the findings obtained from the twenty-two articles selected between 2021 and 2025 on the implementation of artificial intelligence in Latin American criminal proceedings. Beyond describing the results reported in the literature, the aim is to contrast the different perspectives identified, examine their convergences and divergences, as well as reflect on the legal, ethical, and institutional implications arising from the incorporation of these technologies into the administration of justice. In this way, the study seeks to provide a critical interpretation of the available evidence and contribute to the academic debate on the scope, limitations, and challenges faced by artificial intelligence in the Latin American criminal context.

Regarding the general objective of this research, artificial intelligence has generated a multidimensional impact on Latin American criminal justice systems. For example, de Oliveira (2022) argues that this intersection between artificial intelligence and law requires an in-depth review of fundamental legal concepts such as territoriality, legal personality, legality, and due process, arguing that the law must adapt to preserve transparency and justice, preventing technical efficiency from replacing democratic safeguards. Meanwhile, de Alvarenga and Abi-Ackel (2024) identify that the implementation of artificial intelligence in Brazilian criminal proceedings offers significant advantages in terms of efficiency, speed, and access to justice, although they emphasize the imperative need to balance these advances with the preservation of fundamental rights such as due process of law, full defense, and the presumption of innocence.

In accordance with the above, García and Barona (2024) conclude that artificial intelligence has the potential to revolutionize the Ecuadorian criminal justice system by improving efficiency, optimizing decision-making, reducing human biases, and generating cost savings. However, Toledo and Pessoa (2023) point out a fundamental structural incompatibility between artificial intelligence data processing and the application of law, which prioritizes the uniqueness of the specific case. In this regard, Suárez Xavier (2024) synthesizes this tension by concluding that artificial intelligence can be a valuable ally in modernizing the administration of justice in administrative and procedural support tasks, but its implementation in judicial functions must be subject to strict limitations so as not to violate fundamental principles related to procedural equality, effective judicial protection, and legal certainty.

According to the first specific objective, it was identified that the applications of artificial intelligence in Latin American criminal proceedings encompass increasingly diverse areas. In this regard, Aguilar Cabrera (2024) points out that its use in the management of digital evidence contributes to improving the efficiency and transparency of criminal proceedings, while Alcántara Francia et al. (2022) demonstrate advances in the prediction of judicial

decisions with accuracy levels exceeding 60%. However, these results suggest that the usefulness of artificial intelligence should not be assessed solely by its ability to optimize procedures, but also by its compatibility with the principles and safeguards that characterize criminal proceedings. Therefore, its implementation must remain as a mechanism to support judicial work and not as a substitute for human legal reasoning.

For their part, Díaz-Rincón et al. (2024) provide evidence on a specific application by analyzing the PRISMA system in Colombia and conclude that this artificial intelligence tool brings greater speed to criminal judicial proceedings, optimizing the management of requests for precautionary measures in theft cases and reducing the perception of impunity. Likewise, Essahraui et al. (2025) broaden the panorama of applications in the police field, identifying that the analysis of human behavior using artificial intelligence improves crime prediction through models such as LSTM, XGBoost, or SARIMA. In addition, the proposal by Centeno Cardona et al. (2022) is noteworthy, as they concluded that artificial intelligence is important in the development of processes for the resocialization of punishment in Colombia, by facilitating access to education, employment, family contact, and judicial and penitentiary care.

Perilla Granados (2024) agrees in proposing that artificial intelligence assume descriptive and procedural tasks, allowing legal practitioners to focus on more complex argumentative and strategic tasks, thus optimizing time and resources while maintaining the human essence of the criminal process. Likewise, Pereira et al. (2022) emphasize that the use of artificial intelligence in judicial decision-making should be limited primarily to repetitive and low-complexity cases, respecting the duty of analytical reasoning established in Brazilian procedural legislation, and highlight the need to ensure the explainability of algorithms to maintain trust and prevent violations of fundamental rights.

In contrast to these viable applications, Julià Pijoan (2023) concludes that *brain reading*, as a technique based on neurotechnology and artificial intelligence, is currently not in a position to be admitted as evidence in criminal proceedings, identifying significant conceptual, structural, and methodological obstacles. For this reason, there are contexts in which the application of artificial intelligence has represented major advances for the proper administration of justice, but in others it has not been highly relevant to its improvement, due to different factors that must be taken into account: technology, training, implementation policies, financial resources, etc.

The findings related to the first specific objective show that the incorporation of artificial intelligence in the criminal procedural field does not respond solely to a search for technological innovation, but also to the need to address structural problems of judicial congestion, procedural delays, and administrative limitations. However, the reviewed literature shows that the potential of these tools often exceeds the existing institutional capacity to adequately supervise their implementation. Consequently, the effectiveness of artificial intelligence does not depend exclusively on its technological development, but also on the existence of regulatory frameworks, institutional resources, and control mechanisms that make it possible to ensure use compatible with the fundamental principles of criminal proceedings.

As second specific objective, concerning the effects of the implementation of artificial intelligence on procedural safeguards, Roa Avella et al. (2022) conclude that the use of predictive risk algorithms such as COMPAS in the criminal justice system generates imminent risks to human rights due to the opacity of its architecture and the presence of algorithmic biases, violating fundamental safeguards such as due process, the presumption of innocence, equality, and the right to defense. Additionally, Cavalcante Vieira and Rodrigues Santos (2025) broaden this perspective by pointing out that the use of predictive

technologies and predictive policing in public security entails significant risks of algorithmic discrimination and the reproduction of historical biases, perpetuating social inequalities and violating fundamental rights.

The empirical evidence provided by Sanabria Moyano et al. (2022) result interesting about the recognition in Colombia is noteworthy, as they conclude that this technology presents significant risks to human rights, with high rates of inaccuracy (81% in some cases) and algorithmic biases that disproportionately affect minority groups, such as people of African descent. Likewise, Urzúa Urzúa (2024) delves deeper into the dimension of privacy by examining predictive recidivism risk assessment tools in Chile, identifying serious risks to the fundamental rights to privacy and defense arising from algorithmic opacity, discriminatory biases, and the indiscriminate extraction of personal data.

However, Serventich (2022) provides a balanced perspective from Argentina by concluding that judicial artificial intelligence systems for risk assessment can be useful and complementary tools in decisions regarding pretrial detention, provided that procedural safeguards are respected. Meanwhile, Tavares (2024) concludes that the use of artificial intelligence in criminal prosecution requires the recognition of strengthened procedural safeguards that include digital adversarial proceedings, auditability, transparency with counterfactual explanations, procedural consistency, and social oversight, constituting a contemporary dimension of due process of law designed to mitigate risks such as algorithmic opacity and discriminatory biases.

In this context, it is evident that the tension between technological efficiency and the protection of fundamental rights constitutes one of the main challenges of the digital transformation of Latin American criminal justice. Although some studies highlight benefits associated with the optimization of decisions and information management, the available evidence demonstrates that the risks associated with algorithmic opacity, discriminatory biases, and limitations in the explainability of systems continue to be insufficiently resolved aspects. Therefore, the adoption of these technologies must be understood as a process conditioned by legal and constitutional requirements that cannot be displaced by exclusively technical criteria.

Regarding the third specific objective, concerning the risks and challenges associated with the use of artificial intelligence in criminal proceedings, problems were identified that transcend technical issues to delve into philosophical, normative, and institutional dilemmas. Such is the case of Navarro-Dolmestch (2025), who recognizes a problem related to the compatibility of these technologies with constitutional and procedural safeguards, as well as the institutional-normative dimension, which encompasses the need for specific regulatory frameworks, training of legal practitioners, and the redefinition of traditional legal concepts.

From another point of view, Padilla Sanabria (2025) warns, from the Mexican context, that the incorporation of artificial intelligence in the punitive field entails significant risks to the protection of human rights if the systems are fed with legal databases that do not respect the constitutional block and international standards of procedural safeguards. Finally, Velasco (2022) highlights the need for specific regulatory frameworks, training of legal practitioners, and the redefinition of traditional legal concepts, since not only isolated technical or regulatory adjustments are required, but rather an integral reconfiguration that preserves the centrality of human dignity and fundamental rights in the administration of justice.

Based on the findings, another of the main challenges identified lies in the fact that the speed of development of artificial intelligence-based technologies currently exceeds the capacity of Latin American legal systems to adapt. This situation generates regulatory gaps that may affect legal certainty and hinder the effective protection of fundamental rights.

For this reason, the discussion should not focus solely on determining whether these technologies should be incorporated into criminal proceedings, but rather on establishing under what institutional, regulatory, and ethical conditions their use is legitimate.

On the other hand, the comparative analysis of the included studies makes it possible to examine the relevant differences among Latin American countries, as is the case of Brazil, which concentrates the highest academic production and presents more advanced experiences in the incorporation of digital technologies into the justice system. This situation can be explained by greater investment in judicial innovation and by the development of institutional initiatives aimed at digital transformation. For its part, Colombia and Chile present significant academic production focused mainly on the protection of fundamental rights, the regulation of predictive algorithms, and the risks associated with facial recognition.

In contrast, countries such as Peru, Ecuador, and Argentina show more limited scientific production, oriented mainly toward doctrinal and normative analysis. These differences suggest that the development of artificial intelligence in Latin American criminal justice does not occur homogeneously, but rather responds to different levels of technological maturity, institutional capacity, regulatory development, and availability of resources allocated to judicial modernization. Despite these differences, a common concern was evidenced in all countries regarding the need to reconcile the benefits derived from artificial intelligence with the protection of procedural safeguards and fundamental rights.

Nevertheless, it should be highlighted that the present systematic review presented limitations, such as the temporal restriction to the last five years. Although this makes it possible to capture recent developments, it excludes historical background that could better contextualize the evolution of these technologies in the region. Another aspect was the databases consulted. Although appropriate for the Latin American context, they potentially exclude other relevant studies that address comparative experiences or theoretical frameworks applicable to the region. A final relevant criterion was the interdisciplinary nature of the topic, which requires knowledge of both legal and technological aspects and represents a methodological challenge for the comprehensive interpretation of findings..

Finally, it should be mentioned that the results presented in this section reveal that the Latin American region is at a crucial crossroads regarding the incorporation of artificial intelligence into its criminal systems. On the one hand, there is widespread recognition that these technologies offer genuine opportunities to modernize historically overloaded judicial structures, streamline procedures that for decades have been criticized for their slowness, and potentially reduce certain biases inherent in human decision-making. However, it is paradoxical that the same tools designed to increase procedural objectivity may simultaneously become mechanisms for perpetuating structural inequalities if they are not implemented with rigorous safeguards. The evidence analyzed suggests that the region faces the risk of uncritically adopting technologies developed in different social, legal, and cultural contexts, without proper adaptation to the particularities of Latin American justice systems and without considering that the limited Spanish-American scientific production in this field restricts our ability to develop contextualized solutions.

CONCLUSIONS

Starting from the systematic review, it is concluded that artificial intelligence has begun to be progressively integrated into Latin American criminal systems, manifesting itself in diverse applications that encompass digital evidence management, the prediction of judicial decisions, facial recognition, recidivism risk assessment, optimization of police patrols, and penitentiary resocialization processes. These technologies have demonstrated, in different

Latin American countries, their capacity to improve procedural efficiency, reduce judicial congestion, streamline repetitive administrative tasks, and potentially optimize decision-making through the analysis of large volumes of data.

However, it is worth specifying that their implementation is marked by fundamental tensions between the pursuit of efficiency and the preservation of fundamental safeguards regulated at the level of each country, as well as international standards. Thus, critical risks are evidenced, such as algorithmic discrimination that disproportionately affects vulnerable groups, opacity in decision-making processes that hinders the exercise of the right to defense, the perpetuation of historical social biases, high rates of inaccuracy in facial recognition systems, and the potential violation of due process, the presumption of innocence, procedural equality, and the right to privacy.

The identified challenges require comprehensive responses that go beyond isolated technical or regulatory adjustments, because the implementation of artificial intelligence in Latin American criminal proceedings requires the development of specific regulatory frameworks adapted to local contexts, constant human oversight that preserves judicial judgment in complex decisions, specialized training for legal practitioners, and public policies that promote digital transformation strategies incorporating ethical standards, institutional control mechanisms, and periodic impact assessments. For this reason, artificial intelligence must remain a complementary support tool and not a substitute for human judgment, especially in decisions affecting fundamental legal interests such as liberty, ensuring that technological efficiency does not erode the democratic safeguards of the rule of law or compromise the centrality of human dignity in the administration of justice.

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GDCE: All the stages, data curation, formal analysis, funding acquisition, investigation, methodology, project administration, resources, software, supervision, validation, visualization, writing – original draft, writing, review & editing.

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Conflict of interest

The author declares that he has no conflicts of interest.

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