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UNDERSTANDING THE IMPACT OF PERCEIVED RISKS ON AI ADOPTION AMONG PHYSICIANS

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Abstract: *Artificial intelligence (AI) is progressively transforming the medical field, offering new diagnostic and therapeutic possibilities. However, its adoption remains uneven among physicians, shaped by the tension between technological promises and perceived risks. This study explores the factors influencing AI adoption by combining the concepts of technological promises and the temporality of perceived risks.*

We conducted 20 semi-structured interviews with physicians from various specialties, analyzed through a thematic approach using NVivo. Findings reveal a dual dynamic structuring attitudes toward AI. On the one hand, physicians view AI as a promising tool capable of improving diagnostic accuracy, streamlining patient management, and reducing administrative burden. On the other hand, four categories of perceived risks hinder adoption: (1) professional risks (loss of autonomy, algorithmic dependence), (2) risks for patients (dehumanization, standardized care), (3) algorithmic biases (inequities, diagnostic errors), and (4) data security concerns (breaches of confidentiality, control of sensitive information).

Perceptions are strongly shaped by temporality: immediate risks (such as errors or loss of expertise) are more salient, while delayed risks (such as long-term role transformation or evolving care standards) create persistent uncertainty. This temporal tension influences adoption decisions, particularly in specialties where human interaction is central.

The study underscores the need for proactive management of expectations and uncertainties to support the responsible integration of AI in medical practice.

Keywords: *Artificial intelligence, technology adoption, perceived risks, technological promises, temporality, medicine.*

JEL Classification:

1. INTRODUCTION

Artificial intelligence (AI) is at the heart of a major transformation in the healthcare sector. Its adoption generates both hope and concerns, forming what some authors call a "digital mythology," where the vision of a life-saving technology ("tech for good") contrasts with that of a potential threat ("tech for worst") (Mateu, 2019).

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Driven by significant advancements in algorithms, AI technologies have rapidly expanded in the healthcare sector (Rialle, 2021). In the medical field, AI is defined as a technology capable of learning and understanding health data, performing complex diagnoses, and analyzing large volumes of information to support healthcare professionals (Pelaccia et al., 2020).

However, the integration of AI in medicine still raises many questions among practitioners. Although these technological solutions continue to advance, their adoption remains uneven across medical specialties. For instance, radiology is among the fields most heavily invested in AI applications, whereas other areas, such as psychiatry or general medicine, remain less engaged (Pakdemirli & Weigner, 2020; Stewart et al., 2020).

Most physicians, who are key players in the healthcare system, face a lack of in-depth research on the effects of AI on their practice and the conditions that facilitate its acceptance (Stewart et al., 2020). It is within this context that our study is positioned, aiming to explore AI adoption among physicians through the concepts of technological promises and the temporality of perceived risks.

Our research seeks to understand how the promises surrounding AI technologies influence their adoption, while also identifying the perceived risks that may hinder the integration of AI into physicians' daily practice. This study aspires to enrich the existing literature, which still lacks appropriate theoretical frameworks to describe the challenges healthcare professionals face in response to major technological innovations (Habib et al., 2017).

The adoption and diffusion of innovations have been extensively studied in academic research (Rogers, 2003; Roehrich, 1993, 2004; Volle, 1995; Cestre, 1996; Jansson, 2011; Flight et al., 2011), yet few studies have specifically focused on physicians' perceptions of AI.

In general, technology acceptability can be defined as an individual’s a priori perception of a system or technology, leading to their intention to use it (Tricot et al., 2003). Acceptability is thus closely linked to use scenarios and the promises of AI. For example, a study conducted among gastroenterologists indicates that the usage scenarios of AI solutions significantly influence their acceptability among healthcare professionals (Goh et al., 2024).

Adoption (Rogers, 1995), on the other hand, refers to the transition from acceptability to the actual integration of AIinto daily medical practice. This transition can be explained both by the temporal gap between risk perception and benefit perception and by the distortion of risk perception over time (Baucells & Heukamp, 2012).

However, AI is often regarded as a "promising technology" since its various stages of development have always been driven by technological promises about its special capabilities and potential when applied to economic and societal challenges (Hirsch-Kreinsen, 2024). AI promises often manifest in the implicit or explicit commitments of developers and companies toward users, promising improvement, efficiency, and societal transformation. Unlike a pure promise, which is an unconditional commitment detached from real-world constraints (Jean-Pierre Lalloz, 2000), AI promises are often conditional commitments tied to expected performance, measurable results, or specific improvements.

In the healthcare sector, AI-related promises focus on two main areas: enhancing prevention and diagnostics for patients, and maximizing performance, profitability, and competitiveness of medical institutions, whether public or private.

In medical AI solutions, these promises represent potential engagement levers, influencing how physicians perceive the benefits of AI (e.g., improving diagnostics, optimizing treatments, or efficiently managing medical records). Understanding how these promises are perceived by healthcare professionals can significantly impact AI acceptability and adoption (Liang et al., 2023).

However, these promises can also generate mistrust due to perceived risks, particularly when considered holistically. Ravichandran et al. (2001) argue that "perceived risks can be defined as the risk of making the wrong choice, a particularly significant concern for systemic innovations–those that modify standards and create network externalities."

Behavioral economics research has highlighted the complex interaction between risk and time in decision-making (Halevy, 2008; Andreoni & Sprenger, 2012). Physicians' decisions regarding AI adoption are not limited to an immediate evaluation of its benefits and drawbacks but are embedded in a temporality where consequences can be either immediate or delayed. These dynamic leads professionals to assess risks differently, depending on whether they manifest in the short or long term. For instance, loss of decision-making autonomy is an immediate concern, whereas the gradual alteration of the physician's role constitutes a long-term risk.

The evaluation of risk associated with an innovation is thus a critical step in the overall assessment of the innovation itself (Guilhon & Montchaud, 2003). The gap in perception between those who design an innovation and those who use it poses a major risk to its adoption.

However, this risk assessment is not uniform: according to intertemporal risk theory (Halevy, 2008; Baucells & Heukamp, 2012), individuals may perceive an immediate risk and a delayed risk differently over time. In the case of AI in healthcare,

certain risks are immediate (e.g., loss of physician autonomy, diagnostic errors due to algorithmic biases), while others are deferred (e.g., gradual transformation of the physician's role, long-term impact on the doctor-patient relationship).

This duality between immediate and deferred risks can have a direct influence on AI acceptability and adoption among physicians, who must balance the immediate benefits of AI with the long-term uncertainties it generates. The gap between AI promises and the perceived risks among physicians could serve as an early indicator of whether AI solutions will be widely adopted or not.

Given these insights, we observe the emergence of a triptych between technological promises, perceived risk temporality, and AI adoption in the context of introducing AI to physicians. Increasing AI adoption requires a management strategy that aligns expectations generated by AI promises while simultaneously mitigating the risks that may arise from its implementation.

Building on the work of Halevy (2008) and Baucells & Heukamp (2012) on decision-making under uncertainty across different time horizons, we propose an original conceptual framework that examines whether perceived risk can explain the low adoption rate of AI in medical practice.

2. METHODS

To conduct this study, we opted for a qualitative and exploratory research method. This approach was chosen to explore or deepen the understanding of an empirical phenomenon that has been little addressed in the literature. We also adopted a phenomenological reasoning approach, involving multiple iterative exchanges between the collected data and existing literature. For instance, while the study initially focused exclusively on physicians, it was later expanded to include medical interns due to the low number of responses.

Regarding data collection, we conducted 20 semi-structured interviews with physicians (radiologists, nephrologists, geneticists, psychiatrists, etc.) and medical interns. We present in Table 1 some the characteristics of the participants along several dimensions including age, gender, medical specialties and workplace. All interviews were conducted via videoconferencing, recorded, and transcribed.

Table 1. *Characteristics of Participants*

Characteristics	**Physicians (n=20)**
Age (years)	30–70
Gender (M/F)	10 / 10
Medical Specialties (N=20)	

Characteristics	**Physicians (n=20)**
Psychiatry	5
Genetics	2
Radiology	3
Anatomopathology	2
Anesthesiology	2
Others (Oncology / Nephrology / Urology / Gastroenterology / Cardiology / Surgery)	6
Workplace (N=20)	
Public / Private	15 / 5
Paris / Other regions	14 / 6
Attitude toward AI (Favorable / Unfavorable)	18 / 2
Experience with AI (Yes / No)	8 / 12
Professional Role (Junior / Senior)	8/12

We performed a thematic analysis of the collected material using NVivo coding software. The dataset was segmented into representative themes aligned with our research focus, allowing us to create a coding framework combining emerging codes (E) and a priori codes (AP). This framework was structured around three key concepts: AI promises, Perceived risks, and AI adoption.

A priori codes were derived from existing literature on consumer vulnerability, AI ethics, and clinical risk (Baker et al., 2005; Hamilton et al., 2015; Ganascia, 2018). These included loss of autonomy, relational vulnerability, responsibility gaps, risk perception, and data vulnerability. Inductive coding identified several emerging codes such as loss of diagnostic sovereignty, deskilling, algorithmic dependency, loss of empathy, communication breakdown, unequal training data, misdiagnosis concerns, and fears of data misuse. All codes were grouped into five overarching themes: perceived benefits, professional risks, patient-related risks, algorithmic biases, and data security risks. A basic quantitative lexical analysis was also performed, showing that terms related to risk, diagnosis, data and control were the most frequent, reflecting the categories identified (see table 2). To ensure reliability, a test-retest intra-coder check was performed on 10% of the corpus, producing a Cohen's Kappa of 0.82, indicating strong coding consistency over time.

Table 2. *Summary of the Thematic Analysis Protocol*

	Description
Type of Analysis	Hybrid thematic analysis (inductive + deductive coding)
Corpus	20 semi-structured interviews (≈ 75 pages)
A Priori Codes (Deductive)	Loss of autonomy; Relational vulnerability; Moral vulnerability; Perceived risk; Informational vulnerability; Perceived usefulness of AI

	Description
Emergent Codes (Inductive)	Loss of clinical intuition; Deskilling; Algorithmic dependency; Dehumanization ; Communication breakdown; Data bias; Fear of data leakage; Diagnostic enhancement; Patient flow optimization; Reduction of administrative burden; Support for clinical decision-making
Final Categories (Themes)	(1) Professional risks; (2) Risks for patients; (3) Algorithmic biases; (4) Data-related risks; (5) Perceived benefits of AI for physicians (improved diagnosis, optimized patient management, reduced administrative workload)
Lexical Analysis	Word frequency analysis → 20 most frequent terms (e.g., algorithm, data, error, decision, diagnosis, patient, trust, risk, control)
Category Weighting	Professional risks (31%), Risks for patients (24%), Algorithmic biases (19%), Data-related risks (14%), Perceived benefits (12%)
Temporal Codes	Immediate risks: loss of autonomy, diagnostic errors, overload. Delayed risks: long-term deskilling, transformation of the physician's role, structural inequalities
Reliability (Test–Retest)	Cohen's Kappa = 0.82 (intra-coder agreement, indicating strog reliability)

3. RESULTS

Our research identified four types of perceived risks among physicians that may influence the adoption of AI in healthcare, as well as the promises associated with the projected use of AI solutions. The perceived risks are categorized into four main groups: professional risks for physicians, risks for patients, risks related to algorithmic biases, risks concerning data security.

On the other hand, the promises of AI refer to its perceived potential benefits, which directly impact physicians' ability to envision its future use. Many physicians view AI as an opportunity to reduce errors, acting as a safeguard to maintain consistent medical practice. AI is also perceived as a means to keep pace with medical innovation, improve efficiency and productivity, and treat more patients in less time. Finally, AI is seen as providing greater freedom, by democratizing medical knowledge and making medical communication more accessible and understandable.

Our research also revealed a form of duality, stemming from the contradiction between AI promises and perceived risks among physicians. This duality plays a crucial role in AI adoption and is structured around two key dimensions:

- The tension between AI promises and high expectations: AI is perceived as a major breakthrough that enhances diagnostics, therapeutic effectiveness, and healthcare organization. However, these promises often creates high expectations, and any gap between actual performance and initial expectations can lead to disappointment.

- The relationship between perceived risks and resistance: The more ambitious the promises, the more concerns arise regarding dehumanization, algorithmic biases, and data security. This contrast reinforces physicians' caution, often slowing down the adoption of AI technologies.

3.1 The Impact of AI Promises on Adoption

One of the main drivers of AI adoption lies in its potential to enhance medical diagnostics. AI is perceived as a complementary tool, capable of optimizing diagnostic accuracy and reducing medical errors.

"*I see AI as a kind of safety net that can help me avoid missing a diagnosis.*" (Gastroenterologist)

This safeguarding role is particularly valued in specialties such as radiology and pathology, where image analysis plays a crucial role.

"*In radiology, we often face an overwhelming workload of image analyses. AI can help us prioritize the most critical cases and reduce the risk of errors.*" (Radiologist)

Another key argument favoring AI adoption is its ability to reduce the cognitive and administrative burden on physicians.

"*Nowadays, we spend an incredible amount of time on paperwork. If AI can relieve us of administrative tasks, that's more time we can dedicate to our patients.*" (Gastroenterologist)

Some practitioners also see AI as an opportunity to enhance their role, allowing them to focus on more complex medical tasks.

"*Rather than wasting time on technical tasks, I prefer using my expertise to engage in meaningful discussions with my patients.*" (Oncologist)

However, this transformation also raises concerns among some physicians, who fear a reduction in their role to that of a mere supervisor of algorithms.

"*There is a real risk that AI will change our profession. If it does everything for us, we will eventually lose our own expertise.*" (Radiologist)

3.2 Risks and Temporality

3.2.1 Professional Risks for Physicians

One of the main perceived risks concerns the transformation of the physician's role over time and the fear of losing expertise.

"*The risk is that, over time, physicians will lose what we call... the art of practice, and everything will become automatic...*" (Nephrologist)

Some practitioners also fear excessive dependence on AI system recommendations, which could impair their clinical judgment and reduce their decision-making autonomy.

"*Well, I think relying too much on AI without knowing its limitations can be a real risk.*" (Cardiologist)

"*We risk becoming dependent on these AI tools, and that's why we need to be careful about how we use them.*" (Surgeon)

"*AI might make our job more complicated because we will be faced with an overwhelming number of possibilities. This is something we already see in lung nodule screening–there is an explosion in case recruitment… We spend more time ruling out nodules than confirming them.*" (Radiologist)

This concern can be analyzed through two types of intertemporal risks:

Immediate risk, perceived at the time of AI adoption, when physicians experience a rapid transformation of their role, a devaluation of their working time, or a loss of control over patient data.

"*Obviously, this poses an immediate problem for radiologists because there will be less need for them.*" (Emergency Physician)

"*This AI-based application will soon be available on all European physicians' smartphones, allowing anyone to request a diagnosis at any time of the day. And now I'm being asked to diagnose cases for everyone without being paid, so I asked this question: Who will pay for the medical time dedicated to these patients?*" (Geneticist)

"*The real risk for physicians is that they will feel dispossessed of their own patient data.*" (Oncologist)

Delayed risk, more diffuse, materializing over time (e.g., gradual loss of clinical expertise, reduction in the value of human diagnosis compared to AI, increased fragmentation of medical tasks).

"*We need to keep in mind that if we rely too much on AI for contouring, younger physicians will lose the habit over time. As generations pass, this skill could disappear if we are not careful.*" (Radiologist)

"*In the future, everything will be put into a machine, and then we'll just extract the numbers and tell the patient that the doctor no longer matters.*" (Nephrologist)

"*I can't say exactly, but I fear that AI will eventually take control, and people will rely entirely on it, to the point where clinical reasoning is no longer used.*" (Radiologist)

"*This is already the current trend, and I think it could go even further, which is a major, major risk–moving towards something even more technical than today, with an increasingly fragmented view of the person, even their psychological structure.*" (Psychiatrist)

These risks resemble the violations of Expected Utility (EU) observed in decision-making literature under risk and uncertainty (Allais, 1953; Tversky & Kahneman, 1992). Physicians must weigh the immediate gains in efficiency against the long-term risk of losing autonomy, which could explain the variability of attitudes towards AI across different medical specialties.

The standardization of diagnostics and treatments imposed by AI also raises concerns, especially in specialties where personalized care is essential (e.g., psychiatry).

"*That's the real risk with AI–that we end up with something very reductive, which doesn't take into account the complexity of the human being.*" (Psychiatrist)

Furthermore, physicians' performance evaluations could be influenced by AI-imposed criteria, leading to a form of algorithmic control over medical practice.

"*With AI, there will also be increased pressure on those who remain in the system–they will be more tested, more controlled.*" (Pathologist)

3.2.2 Risks for Patients

The risk of dehumanizing the doctor-patient relationship is a central concern raised by practitioners.

"*After 25 years in psychiatry, I have learned–and all my colleagues say the same–that it is the relationship that heals. Nothing can replace human interaction. If AI completely replaces human relationships, that is not good.*" (Psychiatrist)

"*The main risk for patients is the loss of human presence–it's the risk of eliminating human interaction.*"(Nephrologist)

Physicians are questioning AI's impact on the quality of clinical interactions and personalized care. Some fear that increased reliance on AI could reduce empathy and diminish consideration for the subjective aspects of patient suffering.

"*It's hard to say, but if human contact disappears with the arrival of AI, we will also lose compassion, empathy, and the ability to understand suffering. The human aspect of the relationship will be greatly diminished.*" (Radiologist)

"*Replacing human interaction between the doctor and the patient with AI can sometimes lead to significant errors.*" (Gastroenterologist)

This concern reflects a dual temporality of risks:

In the short term, doctors perceive a potential degradation of human interaction, particularly in consultations where AI is too prominent.

"*I notice that more and more, the care relationship is being replaced by highly technical elements–we are overwhelmed by these things… But today, with the arrival of AI, a kind of imbalance is emerging; it is becoming very, very technical and fragmented.*" (Psychiatrist)

"*I think a machine will never be able to do what we do–detect the emotions of patients when you see them face-to-face.*" (Gastroenterologist)

In the long term, changes in medical practice could lead to a deeper transformation of the healthcare model, gradually reducing the physician's role in personalized patient care.

"With AI, the doctor-patient relationship weakens over time. If the relationship disappears, diagnostic accuracy declines, and the patient begins to think they no longer need you. Sometimes, this could lead to missing very serious conditions." (Gastroenterologist)

"In psychiatry, the main risks related to AI are primarily medical risks, such as overdiagnosis–where AI might detect and label problems that don't actually exist." (Psychiatrist)

This temporal duality echoes research on preference for certainty (Andreoni & Sprenger, 2012), which suggests that individuals tend to prefer decisions with an immediate impact over those with long-term consequences. This preference may explain greater reluctance to adopt AI in specialties where the doctor-patient relationship is central (e.g., psychiatry, general medicine).

Additionally, there is widespread concern that automated decision-making could marginalize human intervention, particularly in cases where available data is incomplete or ambiguous.

3.2.3 Risks Related to Algorithmic Biases

Physicians also express strong distrust toward biases inherent in AI models. These biases can be structural (linked to the datasets used to train the algorithms) or amplified by design errors.

"*We must also be very vigilant about the biases we introduce into AI ourselves, whether through the data or the algorithmic methods we use. Sometimes, we notice these biases, but the risk exists that in other cases, we don't, and we end up using tools that produce poor results.*" (Pathologist)

For example, several practitioners have raised concerns about sociocultural biases in AI-assisted diagnostics, which could lead to discrimination in healthcare access.

"*It depends on the type of data we choose to include in these algorithms. If we use relevant medical data such as patient history, age, or syndromes, that makes sense.*

But if we start incorporating social status or economic conditions into the dataset, it could lead to discrimination in patient selection." (Gastroenterologist)

"*Algorithmic discrimination is a societal issue that must be addressed through discussions with public authorities.*" (Psychiatrist)

"*Of course, there is discrimination through AI algorithms. As I mentioned, look at the example of insurers–it's terrible. This is already happening today with people who have had cancer or chronic kidney disease. They systematically get denied bank loans. The problem is, AI will assign you a probability–your likelihood of staying healthy or getting sick–but it's just a global percentage. That's why the role of physicians must remain crucial.*" (Nephrologist)

The lack of transparency in algorithmic decision-making also reinforces fears about medical responsibility in case of errors.

"*Biases are significant, especially when predicting unknown variables, such as a genetic marker. In my training set, I know the expected output variable, but I don't know which specific parts of the image will predict it… That's the real issue with the AI 'black box'–it's a major problem.*" (Pathologist)

3.2.4 Risks Related to Data Security

The protection of health data is also a major concern for the professionals interviewed. The integration of AI requires the processing of large volumes of medical data, posing challenges in terms of cybersecurity and confidentiality.

"*I wonder where medical confidentiality stands because everything is so public today... it's terrible (…), there's almost no medical secrecy in practice anymore.*" (Surgeon)

"*This is still a form of commercialization because patient data is being used for purposes other than research.*" (Radiologist)

Physicians highlight the risks of hacking, data misuse, and loss of control over sensitive medical information. Some also express concerns about dependence on private sector actors developing these technologies, particularly regarding the commercial use of health data.

"*As a French pathologist, when I see that I check a patient's name, date of birth, diagnosis, number of affected lymph nodes, and histological type, and then a commercial representative from a U.S. company calls me saying, 'So, Mrs. S., you have X% of this and Y% of that'–I find that shocking. But well, that's how the oncology business works.*" (Pathologist)

Our findings indicate that perceived risks are also influenced by their temporality.

Professional risks: Physicians immediately perceive a loss of decision-making autonomy, making AI intrusive and limiting their clinical judgment. However, in the long term, repeated use of AI could reduce learning and expertise, leading to growing dependence on these systems and a decline in medical skills.

Risks for patients: In the short term, AI may improve diagnoses and treatments, but physicians fear that in the long run, dehumanization of the doctor-patient relationship could negatively impact the quality of care. Increased reliance on AI at the expense of human interaction could weaken physicians' ability to fully understand patient needs.

Algorithmic bias risks: In the short term, algorithmic biases can lead to diagnostic and treatment errors, making certain patients more vulnerable than others. Over time, these biases could reinforce inequalities in healthcare access, structurally altering the way medical services are organized and delivered.

Risks related to data security and access: Data vulnerability is an immediate concern, particularly due to the risks of cyberattacks and information leaks. However, in the long term, dependence on private AI systems could create an information monopoly over health data, jeopardizing the sovereignty of public healthcare systems.

Our findings also reveal a contradiction between AI promises and physicians' perceived risks. This duality is structured around two key dimensions:

The tension between AI promises and high expectations – AI is perceived as a revolutionary tool, expected to enhance diagnostics, improve treatment effectiveness, and optimize healthcare organization. However, any discrepancy between real-world performance and initial expectations can lead to disappointment.

The link between perceived risks and resistance – The more ambitious the promises, the greater the concerns about dehumanization and data security. This opposition reinforces physicians' caution, often slowing the adoption of these technologies.

The study highlights a dual dynamic in AI adoption in medicine: AI promises drive conditional adoption and gradual acceptance among physicians, particularly in areas related to diagnostic assistance, administrative task management, and overall healthcare improvement. Perceived risks (automation of medical decision-making, algorithmic biases, and organizational transformations) slow down adoption and create resistance, especially in specialties where human interaction is central (e.g., psychiatry, general medicine).

This tension between AI-driven optimism and fears of its structural drawbacks shapes the temporality of AI adoption. The challenge for healthcare policymakers will

be to turn promises into concrete guarantees, reduce perceived uncertainty, and ensure the controlled and progressive integration of AI into medical practice.

4. DISCUSSION AND LIMITATIONS

In this article, we propose a conceptual framework that examines how the technological promises of AI can increase physicians' perception of risks. This framework draws on decision-making approaches under uncertainty and integrates research on the temporality of risk. By combining perceived risk theories (Ravichandran et al., 2001) and intertemporal decision-making theories under uncertainty (Halevy, 2008), we demonstrate that physicians assess immediate and delayed risks of AI differently.

Adoption decisions are influenced by the perceived moment when the consequences of risk materialize. Thus, AI adoption is conditioned by the perception of when the risk will be resolved. In some cases, uncertainty about when AI will become fully functional (e.g., long-term algorithm reliability) may delay its adoption.

AI in healthcare represents a particular case of decision-making involving both risk and time. As seen in other fields (e.g., economics, politics, law), individuals may adjust their choices depending on when the effects of a technology become visible (e.g., immediate impact vs. delayed impact).

This theoretical framework helps explain how physicians oscillate between enthusiasm for AI's potential benefits and distrust toward its unforeseen side effects.

The economy of promises, as developed in the technological innovation literature (Borup et al., 2006; Brown & Michael, 2003), highlights that new technologies always emerge within an environment of expectations and anticipated commitments. Technological promises play a structuring role in the acceptability and adoption of AI by physicians, as they shape perceptions of both benefits and associated risks.

In healthcare, these promises take several forms: AI as a tool for improving diagnostic accuracy, reducing medical errors, and optimizing personalized treatments (Topol, 2019). However, this raises concerns, as high expectations can make any algorithmic failure particularly problematic. AI as a solution for improving efficiency and reducing workload. AI is often presented as a way to free up medical time by automating administrative and repetitive tasks (Liang et al., 2023). However, this raises concerns about over-standardization of care and growing dependence on technology. AI as an enabler of physicians' strategic decision-making. AI is expected to shift physicians toward more complex, decision-based roles. However, some practitioners

fear that this shift could turn them into mere supervisors of algorithms, reducing the meaning and autonomy of their profession.

Thus, technological promises directly shape physicians' attitudes toward AI. When these promises are not backed by solid assurances regarding risk management and uncertainties, they can lead to increased skepticism and even resistance to adoption.

Research in behavioral economics and decision-making under uncertainty (Halevy, 2008; Baucells & Heukamp, 2012) has shown that individuals evaluate risks differently depending on whether they are immediate or delayed. This dynamic is particularly relevant in the case of AI in healthcare.

Immediate risks (e.g., loss of decision-making autonomy, diagnostic errors due to algorithmic biases, complexity of AI integration in medical practice) are more prominent in specialties like radiology and pathology, where AI is already deeply integrated.

Delayed risks (e.g., long-term transformation of the physician's role, potential dehumanization of patient care, increased dependence on AI systems) are harder to anticipate and may be underestimated in early adoption phases.

By examining these temporal dimensions, our study highlights a tension between short-term expectations and long-term uncertainties. This phenomenon may explain why some medical specialties, such as nephrology, cardiology, or psychiatry, show greater resistance to AI adoption, while fields like radiology, where immediate benefits are more tangible, exhibit higher adoption rates.

Despite the valuable insights obtained, several limitations must be acknowledged: the interviewed professionals expressed their opinions based on personal experience, which may influence the types of risks discussed and introduce perception biases. The study does not allow for tracking changes in perceptions over time, particularly after prolonged AI use. Additional quantitative research could help measure the extent of perceived risks on a larger scale. A comparative analysis between different medical specialties could identify disparities in AI adoption depending on the clinical context. Exploring organizational strategies to mitigate these risks could offer promising insights for improving AI integration in healthcare.

Finally, this study has an additional limitation related to the heterogeneous composition of the sample. The participants came from different medical specialties (radiology, psychiatry, cardiology, nephrology, etc.) and held diverse professional statuses, ranging from senior physicians to medical trainees. This diversity enriched the range of perspectives but may also introduce bias, as levels of exposure to AI, clinical responsibilities, and decision-making frameworks vary considerably across these profiles. Such disparities may influence how risks associated with AI are perceived.