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Research Paper

The attitude of the Polish medical community towards the use of artificial intelligence in medicine

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Abstract

Introduction: Artificial intelligence (AI) is increasingly used in medicine to support diagnosis, treatment and data management. However, its implementation raises significant ethical, legal and social concerns regarding the doctor–patient relationship.

Aim: This study examined the level of trust in medical AI among medical professionals and students. It focused on identifying factors influencing acceptance and concerns.

Material and methods: The survey targeted medical students, doctors, nurses, midwives, paramedics, dentists and academic teachers. The questionnaire contained 36 questions including 30 single choice and 6 multiple choice options. The survey was distributed in paper form at hospitals (20.0%), health centers (10.0%), universities (20.0%) and in electronic form (50.0%). All responses were collected anonymously. The results are presented descriptively and as pie charts. The survey was conducted from March to June 2025 among 682 individuals.

Results and discussion: Most respondents had only a theoretical knowledge of AI, which they had mainly acquired independently. Practical experience was rare, confirming the limited implementation of this technology. AI's potential was assessed positively, especially in radiology, oncology and medical administration. There was a preference for collaborative models supervised by doctors. Key concerns included the risk of errors, lack of legal responsibility and the impact on patient relationships. Respondents emphasized the need for algorithm transparency, legal-ethical regulations and formal education at every training stage.

Conclusions: The medical community accepts AI primarily as a supportive tool, provided physician oversight is maintained. Findings highlight the need for physician education and clear legal-ethical regulations.

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1. INTRODUCTION

Artificial intelligence (AI) is one of the fastest-developing technologies and is increasingly used in medicine.[1] In recent years, AI has evolved from an experimental tool to real support in clinical practice.[2] Advances in machine learning, data analysis and natural language processing have enabled the development of systems that assist physicians in diagnosis, treatment planning and medical decision-making.[3] AI is widely applied in multiple medical fields, particularly in diagnostics and clinical decision support.[4] It improves diagnostic accuracy and contributes to more efficient healthcare systems.[5] These technologies are becoming increasingly important due to growing healthcare demands and resource limitations.[6] Despite its benefits, the implementation of AI raises significant concerns regarding legal responsibility, transparency, clinical safety and its impact on the doctor–patient relationship.[7] Ethical and legal challenges remain key barriers to its broader adoption.[8] Attitudes toward AI vary depending on demographic and professional factors, while concerns about data security and over-automation persist.[9] AI also supports clinical workflows and administrative processes in healthcare systems.[10] As a result, it evokes both interest and uncertainty among clinicians. General overviews of AI development and its applications in medicine further emphasize its growing role in modern healthcare.[11,12] Given the increasing role of AI in medicine, this study aims to assess attitudes toward AI in the Polish medical community and identify factors influencing trust and acceptance.

2. AIM

The primary aim of this study was to assess trust in artificial intelligence in medicine among members of the Polish medical community. Secondary objectives included identifying factors influencing the acceptance of AI, concerns related to its use and perceptions of legal responsibility and the need for education.

3. MATERIAL AND METHODS

3.1. Study design and population

A cross-sectional survey was conducted between March and June 2025 among 682 members of the Polish medical community. The study population included medical students and healthcare professionals, including physicians, nurses, midwives, paramedics, dentists and academic teachers.

3.2. Research tool

Data were collected using an anonymous, structured questionnaire consisting of 36 questions (30 single-choice and 6 multiple-choice items). Selected questions were assessed using a five-point Likert scale. The questionnaire covered sociodemographic characteristics, experience with artificial intelligence, level of trust, perceived applications and ethical and legal concerns.

3.3. Data collection

The questionnaire was distributed both electronically and in paper form. Electronic distribution accounted for 50.0% of responses and was conducted via social media platforms. Paper questionnaires were distributed in hospitals (20.0%), universities (20.0%) and healthcare centers (10.0%). Participation in the study was voluntary and anonymous.

3.4. Statistical analysis

Descriptive statistics were calculated as frequencies and percentages. Differences between medical professionals and students were analyzed using the chi-square (χ^2) test. Statistical significance was set at $p < 0.05$. All analyses were performed using IBM SPSS Statistics version 29.

4. RESULTS

In terms of professional experience, 20.1% of respondents had 1–5 years of practice, 8.9% had 6–10 years, 6.1% had 11–20 years and 17.9% more than 20 years. Professional experience was not applicable to 47.0% of participants, primarily students (Q36).

Exposure to artificial intelligence in a medical context was most commonly limited to general awareness (40.0%) or self-directed learning through literature and personal interest (42.8%). Only 9.4% of respondents reported having completed structured training or obtained certificates, while 7.8% indicated no exposure at all. (Q3) Self-assessed experience with AI was rated as none by 32.8% of respondents, low by 29.4%, medium by 30.0% and very high – 2.8%, high – 5.0%. (Q15). In total, 29.5% of participants reported never using AI tools. The remaining respondents used them with varying frequency, most often several times a month – 34.4% or several times per week – 26.1% (Q16).

Support for independent use of artificial intelligence in medical diagnostics was expressed by 7.2% of respondents, while the majority opposed such use (Q7). Similarly, 24.6% stated that final clinical decisions should always remain the responsibility of the physician, 58.1% supported shared decision-making between physicians and AI systems and 6.7% indicated that AI could make clinical decisions; 10.6% had no opinion (Q25).

Radiology was the most frequently indicated area for AI application, followed by healthcare administration and general diagnostics (Table 1). Overall trust in AI was most often rated as neutral – 58.3%. Low trust was reported by 27.8% of respondents, while high or full trust was rare (Q8). The most commonly reported factors limiting trust were the risk of algorithmic errors and lack of legal responsibility. Ethical concerns were also frequently indicated (Q22).

Human empathy was considered irreplaceable by 78.4% of participants, 13.3% were more curious about the effectiveness of AI; 5.0% disagreed and 3.3% had no clear opinion (Q32). Looking ahead, 70.0% of respondents believed that within the next 10 years AI would support physicians without replacing them, 3.3% – anticipated partial replacement, 22.8%

predicted complete replacement and 3.9 % had no opinion (Q33). The majority of respondents indicated that artificial intelligence should support physicians in the diagnostic process but should not make independent clinical decisions. Opinions regarding legal liability for AI-related errors were divided, with respondents indicating both physician responsibility and responsibility of AI developers, while some had no clear opinion (Figure 2).

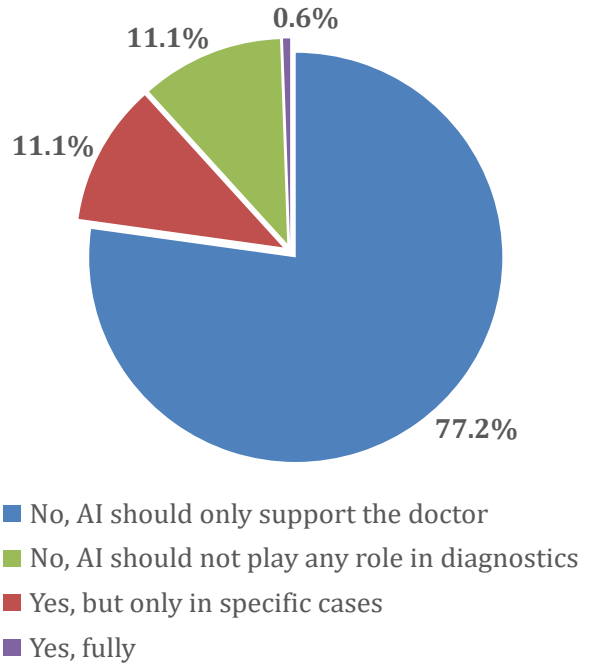

Figure 1. Can AI replace the physician in the diagnostic process?

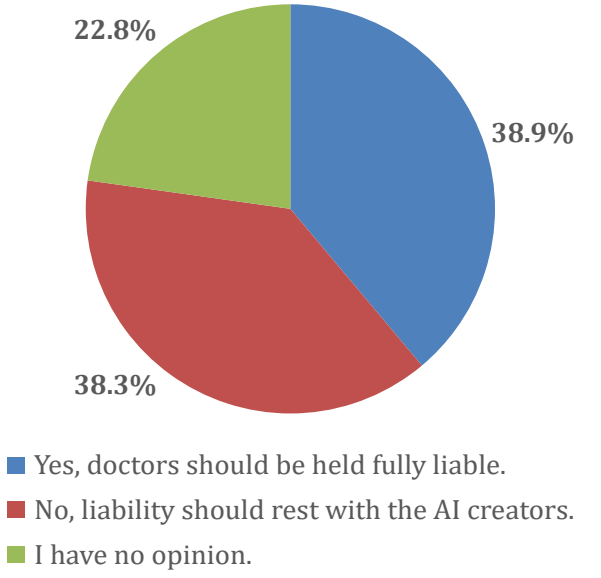

Figure 2. Should doctors be held legally liable for errors made by AI?

Oncology was the specialty most commonly perceived as benefiting from AI, followed by family medicine and neurology. The most frequently reported concerns related to AI use were the risk of incorrect diagnosis and unclear legal responsibility. According to respondents, the patients' main concerns included algorithmic errors and reduced direct contact with physicians (Table 1).

Table 1. Summary of selected multiple-choice questions.

Thematic area	Responses	Percentage (%)
Most useful areas for AI	Radiology	63.3%
	Administration	50.0%
	Diagnostics	46.7%
	Robotic surgery	31.7%
	Treatment personalization	26.1%
Medical specialities with the greatest AI potential	Oncology	50.8%
	Family medicine	30.7%
	Neurology	27.4%
	Dermatology	23.5%
	Cardiology	21.2%
Main concerns of respondents	Incorrect diagnosis	80.0%
	Responsibility	67.2%
	Lack of physician control	58.9%
	Dehumanization	42.2%
	Privacy	38.9%
Patient concerns according to respondents	Algorithm errors	82.8%
	Lack of contact with the doctor	63.3%
	Fear of replacing doctors	59.4%
	Lack of accountability	51.7%
Factors influencing trust	Algorithmic errors	61.1%
	Legal responsibility	60.6%
	Impact on doctor–patient relationship	31.1%
	Effectiveness and accuracy	26.1%
	Algorithm transparency	21.7%

4.1. Exposure to AI and level of experience

Medical students and students of other medical fields most frequently reported contact with AI through literature, self-directed learning, or general awareness. This indicates predominantly theoretical exposure. In contrast, doctors more often indicated professional contact with AI during clinical practice or through workplace-related experience. Nurses and midwives reported lower levels of both formal education and practical exposure to AI tools. These differences in exposure patterns between professional groups were observed descriptively.

4.2. Perceived role of AI in diagnostics

Across all groups, a supportive role for AI was favored. Doctors emphasized that AI should function primarily as a decision-support tool. Students were more open to independent decision-making by AI in selected diagnostic situations. Nurses and midwives expressed greater caution regarding any form of independence.

4.3. Trust in AI and response to diagnostic discrepancies

Students reported significantly higher levels of high trust in AI compared with medical professionals (12.5% vs. 5.4%, $p = 0.001$). In scenarios where AI-generated results conflicted with clinical judgment, doctors were more likely to rely on their own professional experience. Students and nurses more frequently sought additional diagnostic tests or consulted another specialist. These group-specific approaches to resolving diagnostic discrepancies differed descriptively between groups.

4.4. Responsibility for AI-related errors

Opinions on liability for AI-related errors varied among respondents. Some supported a shared-responsibility model involving both AI developers and users, while others assigned primary responsibility to AI developers.

4.5. Education and training in AI

The need for education in AI was recognized across all professional groups. Support for mandatory AI training was similarly high among students and medical professionals and did not differ significantly. These findings indicate that both groups acknowledge the importance of structured AI education in medical training.

4.6. Perceived impact of AI on the medical profession

Doctors were less likely to perceive AI as a threat to employment. They more frequently emphasized its supportive role in reducing workload and administrative burden. Students and nurses more often expressed concerns about potential long-term effects on certain medical specialties.

Table 2. Comparative analysis of survey results.

Category / Variable	Medical professionals (N = 347)	Medical students (N = 335)	P-value
High trust in AI (4–5)	5.4%	12.5%	0.001
AI should only support physicians in diagnostics	78.3%	72.7%	0.09
Shared responsibility	37.0%	40.9%	0.28
AI can replace doctors	21.7%	23.9%	0.47
Support for mandatory AI training in medical education	90.2%	90.9%	0.78
Active use of AI (weekly/daily)	19.6%	53.4%	<0.001

5. DISCUSSION

The findings of this study highlight both the potential and the limitations of artificial intelligence in clinical practice. The growing role of AI requires the development of appropriate ethical and regulatory frameworks to ensure patient safety and transparency. International guidelines emphasize the importance of responsible AI implementation in healthcare systems.[13]

Similar concerns are reflected in national-level analyses, which underline the ethical implications of AI use, including issues related to trust, responsibility and decision-making processes.[14] At the same time, the practical implementation of AI in healthcare remains a significant challenge, particularly in terms of integration into existing clinical workflows and acceptance among medical professionals.[15]

Regulatory initiatives at the European level further stress the need for clear legal frameworks and standards for AI applications in medicine.[16] These aspects are crucial for building trust in AI systems and ensuring their safe and effective use in clinical settings.

Importantly, the perception of AI may also be influenced by broader patterns of health information-seeking behavior. Previous studies have indicated that patients often rely on online sources for health-related information, which may affect their attitudes toward emerging technologies such as artificial intelligence.[17,18]

5.1. Ethical and Legal Framework

The study highlights a critical gap between technological potential and legal readiness. This reflects the global discourse led by the European Commission in the 'White Paper on AI', which advocates for a risk-based approach. In Poland, there is an urgent need to develop standards for the use of AI in healthcare. Institutions such as the Supreme Medical Council should define whether an AI error constitutes a technical failure of the developer or a clinical error of the user. Most respondents – 58.0% – supported a model of shared responsibility. This aligns with the 'human-in-the-loop' approach, in which AI provides evidence-based suggestions, while the physician remains the final decision-maker. The need for clear legal and ethical standards for AI implementation in medicine has also been emphasized by national and international institutions. The World Health Organization and the European Commission advocate for a risk-based regulatory framework with mandatory human oversight. In Poland, similar discussions are ongoing among medical universities, professional chambers and regulatory bodies. This includes the Supreme Medical Council and highlights the need to define responsibility, transparency and accountability in AI-supported clinical decision-making.

5.2. Limitations

This study has several limitations. First, the questionnaire used in this study was author-designed and has not undergone formal validation. This includes reliability testing and assessment of internal consistency. Therefore, the results should be

interpreted with caution. Given the lack of widely validated tools to assess attitudes toward artificial intelligence among healthcare professionals, this study should be considered a pilot study. The questionnaire has been provided with the supplementary material to ensure transparency and reproducibility.

6. CONCLUSIONS

The findings of this study have indicated that attitudes toward artificial intelligence in medicine differ between students and healthcare professionals. Clinical experience appears to be a key factor influencing trust, perceived role and acceptance of AI technologies.

The Polish medical community has demonstrated a generally positive but cautious attitude toward AI with a clear preference for a collaborative model in which AI supports, but does not replace, physicians.

The results highlight the need for structured education in artificial intelligence, particularly at the undergraduate level, as well as the development of clear legal and ethical frameworks governing its use in clinical practice.

Artificial intelligence should be implemented as a supportive tool. It can enhance diagnostic efficiency while preserving physician responsibility and the doctor–patient relationship.

7. SUPPLEMENTARY MATERIAL

The following supplementary material is available for this article:

– **Supplement S1.** Survey Questionnaire.

Ethics approval
None declared.

Informed consent
Participation in the study was entirely voluntary. Before starting the questionnaire, participants were informed about the purpose of the study, the anonymity of responses, and the possibility of withdrawing at any stage. Proceeding to the questionnaire and completing it constituted informed consent to participate.

Conflict of interest
None declared.

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Author contributions
Study design: JFB, TM-K
Data collection: JFB, IS
Statistical analysis: JFB, IS, MK
Data interpretation: JFB
Manuscript preparation: JFB
Literature search: JFB

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