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Artificial Intelligence Adoption Readiness among Pediatricians: A Cross-Sectional Assessment

Gaurav Gupta^{1*}, Pooja Arora² and Pramil Tiwari³

¹Senior Pediatrician and Director, Department of Pediatrics, Charak Clinics, S.A.S. Nagar (Mohali), Punjab, India.

²Scientist (Biostatistics), Department of Pharmacy Practice and Clinical Research, National Institute of Pharmaceutical Education and Research (NIPER), S.A.S. Nagar, Punjab, India.

³Professor, Department of Pharmacy Practice and Clinical Research, National Institute of Pharmaceutical Education and Research (NIPER), S.A.S. Nagar, Punjab, India.

***Correspondence:** Dr. Gaurav Gupta, MD, Senior Pediatrician and Director, Department of Pediatrics, Charak Clinics, S.A.S. Nagar (Mohali), Punjab, India.

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ABSTRACT

Objective: Artificial intelligence (AI) is increasingly being integrated into clinical practice, yet physician readiness to adopt these tools remains unclear. This study assessed the knowledge, attitudes, and adoption readiness of pediatricians regarding AI in clinical care.

Methods: A cross-sectional online survey was conducted among 238 pediatricians from private practice, teaching institutions, and government hospitals across India. The questionnaire assessed AI knowledge, confidence in using AI tools, perceptions of AI's future role, and willingness to adopt AI. Knowledge was scored on a 10-point scale and categorized into low (0–3), moderate (4–6), and high (7–10). Associations between key variables were evaluated using chi-square tests, and predictors of AI knowledge were analyzed using multinomial logistic regression.

Results: The mean AI knowledge score was low (3.9 ± 2.4). Overall, 40.8% of respondents demonstrated low AI knowledge. Male respondents and those working in teaching institutions had significantly higher odds of greater AI knowledge ($p < 0.01$). Despite limited knowledge, 91.5% of pediatricians expressed willingness to adopt AI tools, most commonly conditional on clinical validation (71.8%). Confidence in using AI and perceiving AI as a supportive clinical tool were the strongest predictors of willingness to adopt ($p < 0.01$). Major concerns included ethical and regulatory issues (65.5%), data privacy (63.4%), and clinical validity (61.3%).

Conclusions: Indian pediatricians demonstrate strong interest in adopting AI despite limited baseline knowledge. Expanding practical AI training and establishing clear ethical and regulatory frameworks will be essential for safe integration of AI into pediatric clinical practice.

Keywords: Artificial Intelligence, Pediatricians, Adoption Readiness, Cross-Sectional Study, Clinical Integration

Introduction

Artificial intelligence (AI) is rapidly transforming healthcare systems, offering great potential for better diagnosis, treatment planning, and clinic efficiency [1,2]. In pediatrics, AI tools are starting to

appear in many areas, from predicting serious conditions like neonatal sepsis to helping diagnose rare genetic problems [3,4]. However, for AI to be effectively integrated into clinical practice, it must be accepted and understood by the doctors who use it every day.

Understanding the current knowledge, attitudes, and practice (KAP) of pediatricians regarding AI is the first crucial step. Previous studies in other medical fields have found that doctors are interested in AI but often lack confidence in using it, and they worry about ethical and legal issues [5,6]. This study aimed to find out how ready Indian pediatricians are to adopt AI and what factors most influence their decision to use these new tools in their daily clinical work.

Methods

This was a cross-sectional survey conducted between Nov 2024 and Feb 2025. A total of 238 pediatricians from private clinics, teaching hospitals, and government institutions across India participated in an anonymous, online survey. The questionnaire was pilot-tested for clarity prior to dissemination.

The questionnaire covered four main areas:

- 1. Knowledge:** Assessed on a 10-point scale based on basic AI concepts and medical applications. Scores were grouped into Low (0-3), Medium (4-6), or High (7-10).
- 2. Confidence:** Measured how confident doctors felt about using and interpreting AI tools.
- 3. Attitude/Willingness:** Assessed the intention to adopt AI, categorized as “Yes, without hesitation,” “Yes, if clinically validated,” “Only if nothing else works,” and “No.”
- 4. Concerns:** Respondents rated their worries about barriers to adoption (e.g., ethics, privacy, clinical proof).

Statistical Analysis

We used descriptive statistics to summarize the data. Chi-square tests were used to check for associations between key factors (knowledge, confidence, future role perception, and age) and the willingness to adopt AI. We used Multinomial Logistic Regression (MNL) to find which demographic factors best predicted the level of AI knowledge. A p-value less than 0.05 was considered statistically significant.

Results

Demographics and Knowledge

A total of 238 pediatricians completed the survey. The majority were male (66.8%) and worked in private practice (64.3%). The largest age group was 30-45 years (42.0%).

The average AI knowledge score was low at 3.9 ± 2.4 out of 10 (median 4.5). A significant portion of doctors (40.8%) fell into the low knowledge category (score 0-3).

Our statistical analysis (MNL) showed that Gender and Type of Practice were the most important factors predicting AI knowledge. Specifically, male respondents had higher odds of having a high AI knowledge score (7-10) compared to female doctors ($p=0.002$). Doctors working in Teaching Institutions were also significantly more likely to have a Moderate Knowledge Score (3-6) compared to those in Private Practice (Odds Ratio: 2.636, $p=0.010$) (Table 1).

Attitudes and Concerns

An overwhelming majority of pediatricians (91.5%) expressed a willingness to adopt AI tools. Crucially, this willingness was mostly conditional: 71.8% said they would use AI “if clinically validated,” showing a strong evidence-based approach. Only 2.1% were completely unwilling to use AI.

The main barriers to adoption were related to safety and governance. The top three concerns were Ethical and Regulatory issues (65.5%), Data privacy and security (63.4%), and Clinical validity and workflow integration (61.3%). These concerns are visually represented in Figure 1 (Top Concerns Bar Chart).

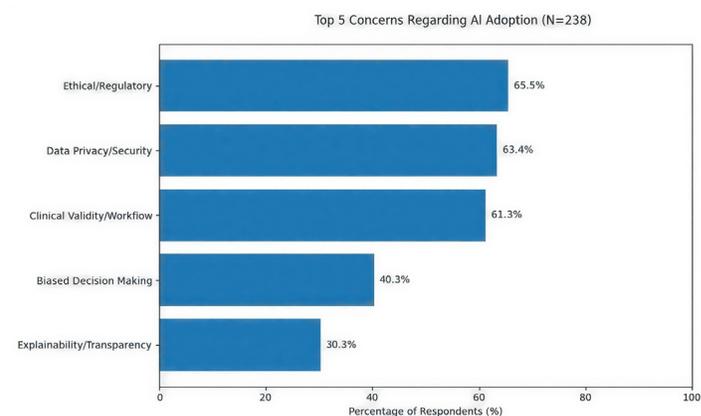


Figure 1: Top 5 Concerns Regarding AI Adoption. This bar chart illustrates the frequency of specific concerns regarding the integration of Artificial Intelligence identified by the surveyed pediatricians (N=238). The primary barriers to adoption were Ethical/Regulatory issues (65.5%) and Data Privacy/Security (63.4%), followed by Clinical Validity/Workflow integration (61.3%).

Table 1: Multinomial Logistic Regression Analysis of Predictors for AI Knowledge Category (Reference Category: Low Knowledge 0-3).

Predictor (Reference Categories: Female, <30, Private Practice)	Outcome Category (vs. 0-3)	Odds Ratio (OR)	p-value
Gender: Male (vs. Female)	High Knowledge (7-10)	4.56	0.002*
Type of practice: Teaching Institutions (vs. Private Practice)	Moderate Knowledge (3-6)	2.64	0.010*
Age group: 30-45 (vs. <30)	Moderate Knowledge (3-6)	0.26	0.440
Age group: 45-60 (vs. <30)	Moderate Knowledge (3-6)	0.13	0.323
Age group: >60 (vs. <30)	Moderate Knowledge (3-6)	0.18	0.351

Determinants of Willingness to Adopt

The chi-square analysis identified a strong link between willingness to adopt AI and three key factors: Future Role Perception, Confidence, and Training Sufficiency (Table 2).

Discussion

This study provides important insights into AI readiness among Indian pediatricians, showing a key finding: doctors are very willing to adopt AI (91.5%), but their basic knowledge is low (average score 3.9/10). This suggests that pediatricians are practical and open to new technology, provided it is proven to work and is safe [13,14].

The fact that willingness is overwhelmingly conditional on clinical validation (71.8%) is a powerful message. It confirms that pediatricians are evidence-driven and prioritize patient safety. This is a positive sign, meaning that as AI tools pass rigorous clinical trials and get regulatory approval, adoption will naturally increase [7,8].

Our analysis clearly shows that Future Role Perception and Confidence are the strongest drivers of adoption. This means that AI education should focus less on complex coding and more on practical, hands-on training that shows how AI can be a helpful clinical co-pilot [9]. The link between Training Sufficiency and willingness further supports the need for practical AI literacy programs in medical training and continuing education [10].

The high level of concern about Ethics, Regulation, and Data Privacy (over 63% for both) is a serious warning. Pediatric data is extremely sensitive, and a strong governance framework is needed in India before AI is widely used [11]. Clear guidelines and transparent processes are essential to turn this high willingness into safe clinical practice [12].

A limitation is that this was a survey, reflecting intentions rather than actual usage. Future studies should track how doctors actually use AI tools in their clinics.

These findings have important implications for medical education and digital health policy. As AI tools become increasingly integrated into clinical workflows, structured AI literacy programs for practicing physicians and trainees will become essential. National pediatric societies and academic institutions may play a critical role in developing training frameworks that focus on clinical interpretation of AI outputs, ethical considerations, and safe implementation strategies.

Conclusion

Pediatricians in this study are highly receptive to AI, driven by a demand for evidence-based tools. Addressing this gap will require two key actions: focused, practical training to improve confidence, and the fast development of clear ethical and regulatory guidelines to address concerns about safety and privacy.

What this Study Adds?

This study reveals that while pediatricians in India have low basic knowledge of AI, their willingness to adopt it is very high (91.5%), but critically dependent on clinical proof. The strongest predictors of AI adoption are seeing AI as a helpful tool, rather than a replacement, and having confidence in using it. Our analysis also shows that male doctors and those in teaching hospitals have higher AI knowledge. Overall, it suggests that the best strategy for AI integration for Indian Pediatricians is to focus on providing proven tools and hands-on training, rather than just increasing theoretical knowledge.

Author Contributions

- » **Dr Gaurav Gupta:** Conceptualization, study design, questionnaire development, data collection, manuscript drafting, final approval, and corresponding author responsibilities.
- » **Dr Pooja Arora:** Statistical analysis, data interpretation, results validation, and manuscript review.
- » **Dr Pramil Tiwari:** Methodological guidance, critical manuscript revision, academic supervision, and final approval.

Table 2: Association of Key Predictors with Willingness to Adopt AI (N=238).

Predictor Variable	Overall Chi-square	p-value	Effect Size (Cramér's V)	Key Finding
Future Role Perception	27.07	< 0.001	0.21 (Moderate)	Doctors who see AI as a helpful tool are significantly more willing to adopt.
Confidence in using AI	14.53	< 0.001	0.14 (Small)	“Very confident” doctors are more likely to adopt AI without hesitation.
Training Sufficiency	14.37	< 0.001	0.14 (Small)	Adequate training is linked to increased willingness to adopt AI.
Prior AI Use	5.22	< 0.05	0.15 (Small)	Association did not remain significant after correction.
Age Group	8.22	< 0.05	0.13 (Small)	Association did not remain significant after correction.

Post-hoc analysis confirmed that doctors who viewed AI as an integral or supportive tool were significantly more willing to adopt. Similarly, those who reported being “Very confident” were more likely to adopt AI without hesitation.

Conflicts of Interest

The authors declare no conflict of interest and received no specific funding for this work.

Declaration of Artificial Intelligence (AI) in Scientific Writing

Artificial Intelligence tools were used for language refinement and formatting support only. The scientific content, data interpretation, and conclusions are entirely the responsibility of the authors.

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