The Evolution of Artificial Intelligence in Pediatric Medical Imaging and Diagnostics: A Bibliometric Analysis

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Abstract

This study presents a comprehensive bibliometric mapping of artificial intelligence (AI) in pediatric medical imaging and diagnostics, characterizing its thematic evolution, contributors, and gaps. Following PRESMA, Scopus-indexed English publications (2015–2025) were retrieved with pediatric, AI, imaging/diagnostics terms, screened to 1,245 records, and analyzed in VOSviewer for co-authorship, coupling/co-citation, and keyword co-occurrence. Three major clusters emerged: (1) modality-focused applications across X-ray, ultrasound, MRI, and CT/nuclear medicine; (2) technical advances (CNNs/transformers, self-/semi-supervised and generative methods, multimodal and NLP integration); and (3) governance and translation (explainable AI, reporting standards such as CLAIM, CONSORT-AI/DECIDE-AI). The United States and China lead output and collaboration, with Europe bridging networks; activity from South Korea, Taiwan, Turkey, and LMIC partners is accelerating. Influential institutions include Harvard Medical School, Cincinnati Children's, Great Ormond Street Hospital, Seoul National University, and the Chinese Academy of Sciences. Key outlets are Pediatric Radiology, Computers in Biology and Medicine, IEEE JBHI, and Frontiers in Digital Health. Trends show a shift from algorithm development to clinically integrated, explainable, and privacy-preserving systems, including federated learning and large foundation/LLM-enabled workflows. Persistent barriers are small, heterogeneous datasets; domain shift; single-center studies; limited pediatric-specific reporting; and ethical concerns around consent, privacy, bias, and trust. Opportunities include federated, standardized, multi-site pediatric datasets with rich metadata; uncertainty quantification and calibration; prospective, outcome-oriented trials; and participatory, equitable deployment that centers families and diverse health systems. Overall, pediatric AI imaging is rapidly maturing but requires coordinated, global, and ethically grounded research to deliver safe, fair, and generalizable benefits for children.

Image

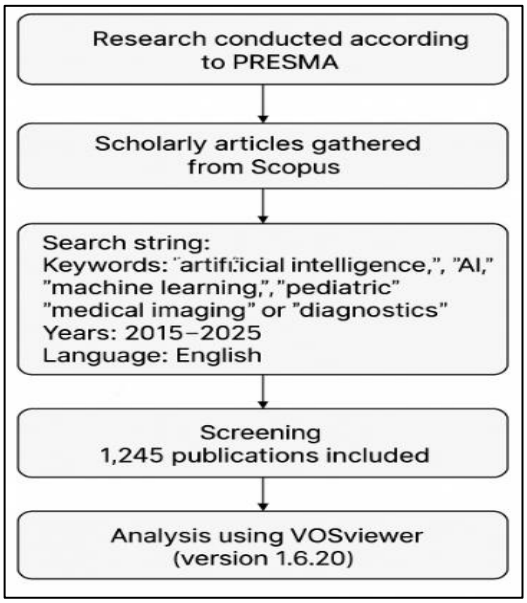


Figure 1. Methodology

Recent Publications (minimum 5)

1. Laboratory Markers vs. Ultrasound – Which is the More Reliable Additional Diagnostic Method in Pediatric Acute Appendicitis? under review in SCOPUS-indexed journal Q2.
2. The Evolution of Artificial Intelligence in Pediatric Medical Imaging and Diagnostics: A Bibliometric Analysis: under review in SCOPUS-indexed journal Q2.

Photograph



Biography

Dr Aya Safwan Al-Alwani is a sixth-year medical student at Novi Sad Medical University, expected to graduate in 2025 with a GPA of 91.8%. She has undertaken clinical training at Dr. Sulaiman Al Habib Hospital in Dubai and attended various surgical procedures in Novi Sad hospitals. Her research focuses on pediatric acute appendicitis, conducting a retrospective study comparing laboratory markers with ultrasound findings. Aya has actively engaged in academic development through participation in various conferences, including the Congress of Students of the Faculty of Medicine, University of Novi Sad 2025, the AAKH Surgery Conference (Dubai, 2025), and the International Medical Students Conference (Novi Sad, 2024), as well as multiple university workshops featuring visiting experts. She is fluent in English and proficient in Arabic, possessing strong interpersonal and teamwork skills, as well as research and analytical abilities. She is committed to lifelong learning, integrity, and patient-centered care.

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Notes/Comments