

The Use of Artificial Intelligence Tools in Nuclear Medicine to Promote Patient Communication, Education, and Compliance

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Introduction. Within the Nuclear Medicine (NM) Department at San Raffaele Hospital, strategies are being explored to improve patient education and adherence to radiometabolic therapies. Chatbots and large language models may support routine clinical workflows and deliver clearer, patient-centered information, but evidence specific to NM remains fragmented. This review aimed to examine AI-based chatbots for patient education and procedural communication and to inform the development of a chatbot for patients undergoing diagnostic and therapeutic NM procedures.

Methods. PubMed and CINAHL were searched for original English-language articles published up to January 15, 2026. Reference lists were also screened. Reviews, meta-analyses, editorials, and letters were excluded. Two authors independently screened titles and abstracts and resolved disagreements by consensus. Data on aims, designs, outcomes, AI tools, and assessment methods were extracted and synthesized narratively using descriptive statistics.

Results. Twenty-three records were identified and seven met the inclusion criteria. Studies were heterogeneous in design and outcomes, addressing the readability of online educational materials, AI-generated responses from ChatGPT-4, Gemini, and Google Bard, and chatbot-based information for NM procedures. Only 5% of 99 educational materials assessed by Hansberry et al. met the NIH/AMA-recommended reading level; the remaining materials averaged grade 11.8. Rogash et al. found that ChatGPT responses to 13 questions on [¹⁸F]FDG PET/CT were appropriate in 92% and useful in 96% of cases; inconsistencies occurred in 16%, while 83% of responses to sensitive questions were rated as empathetic. Other studies reported acceptable DISCERN reliability but consistently high reading levels. Human and AI-based ratings showed significant inter-rater correlations ($p < .01$).

Discussion. AI-based tools may support patient communication, education, and engagement in NM. Clinical implementation nevertheless requires rigorous validation, alignment with evidence-based guidance, and safeguards against misinformation and overreliance. Future studies should evaluate real-world feasibility, clinical impact, and patient outcomes.

Keywords: Digital Health, Patient Engagement, Nuclear Medicine, Patient Education, Digital Tools,

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