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Summary

EFFICACY OF LARGE LANGUAGE MODELS IN PROVIDING EVIDENCE-BASED PATIENT EDUCATION FOR COELIAC DISEASE: A COMPARATIVE ANALYSIS

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A cross-sectional study comparing three large language models (ChatGPT 4.0, Claude 3.7, and Gemini 2.0) for coeliac disease patient education found all three demonstrated high accuracy and clarity, but Gemini 2.0 showed superior readability and substantially fewer instances of misinformation.

KEY POINTS

- All three LLMs demonstrated high scientific accuracy (mean scores 4.17-4.34 out of 5) and clarity (4.29-4.47 out of 5) with no statistically significant differences between models (p=0.076 for both metrics).
- Gemini 2.0 exhibited superior readability metrics (Flesch Reading Ease 51.2 vs. 34.6 and 35.1, p=0.0006; Flesch-Kincaid Grade Level 9.82 vs. 12.6 and 14.2, p<0.0001) and substantially fewer instances of misinformation (4 instances vs. 26 for ChatGPT and 31 for Claude, p<0.0001).
- All LLMs exceeded optimal health literacy targets (6th-8th grade reading level), with Gemini requiring 13.6 years of education for comprehension compared to 15.0 years for ChatGPT and 16.4 years for Claude.
- The study concluded that specific optimizations to improve accessibility and reduce misinformation remain necessary before widespread clinical implementation of LLMs for coeliac disease patient education.
- This evaluation is relevant for gastroenterologists, dietitians, and healthcare systems considering digital tools to address knowledge gaps contributing to poor dietary adherence in coeliac disease management.

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