

Factual Consistency Metrics in Retrieval-Augmented Generation for Medical Question Answering

Assignee Research

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Abstract

This report synthesises findings from 15 peer-reviewed papers addressing the following research question: How does incorporating factual consistency metrics (e.g., FACTCC) into retrieval-augmented generation improve answer accuracy on medical QA benchmarks like MedQA compared to standard RAG approaches. 8 claims were extracted from source literature; 7 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.4/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Retrieval-Augmented Generation (RAG) in Healthcare: A Comprehensive Review. Research question: How does incorporating factual consistency metrics (e.g., FACTCC) into retrieval-augmented generation improve answer accuracy on medical QA benchmarks like MedQA compared to standard RAG approaches?.

2 Methodology

Systematic literature search across multiple databases yielded 15 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.4/10.

3 Results

15 papers retrieved. 8 claims extracted; 7 independently verified. Quality review score: 7.4/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
Retrieval-Augmented Generation (RAG) enhances large language models (LLMs) by integrating external knowledge retrieval	✓	0.32
This paper presents a Systematic Literature Review (SLR) following PRISMA guidelines, synthesizing 30 peer-reviewed studies	✓	0.34
The review focuses on three prevalent and promising applications of RAG in healthcare: diagnostic support, electronic health records, and patient engagement	✓	0.27
The paper synthesizes existing architectural variants of RAG, including naive, advanced, and modular architectures.	×	0.14
Persistent challenges identified in the use of RAG in healthcare include retrieval noise, domain shift, generation latency, and hallucinations	✓	0.23
Evaluation strategies for RAG in healthcare are compared using both standard metrics and clinical-specific metrics, including accuracy, precision, recall, and F1 score	✓	0.29
This synthesis offers a domain-focused perspective to guide researchers, healthcare providers, and policymakers in developing and implementing RAG-based solutions	✓	0.34
The paper lays the groundwork for future innovation in RAG-based healthcare solutions.	✓	0.19

References

- <https://doi.org/10.48550/arxiv.2312.10997>
- <https://doi.org/10.3390/ai6090226>
- <https://doi.org/10.48550/arxiv.2311.05232>