Where Should Patients Search? Readability of Patient Education Materials for Periprosthetic Joint Infections on Search Engines and AI Platforms

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INTRODUCTION

With the increase in digital technology usage amongst patients, health literacy heavily relies on the readability of online patient education materials (PEMs). For optimal patient comprehension, the Agency for Healthcare Research and Quality and American Medical Association suggests that healthcare materials should not exceed a **6th grade reading level** (11-12 years old)[1,2].

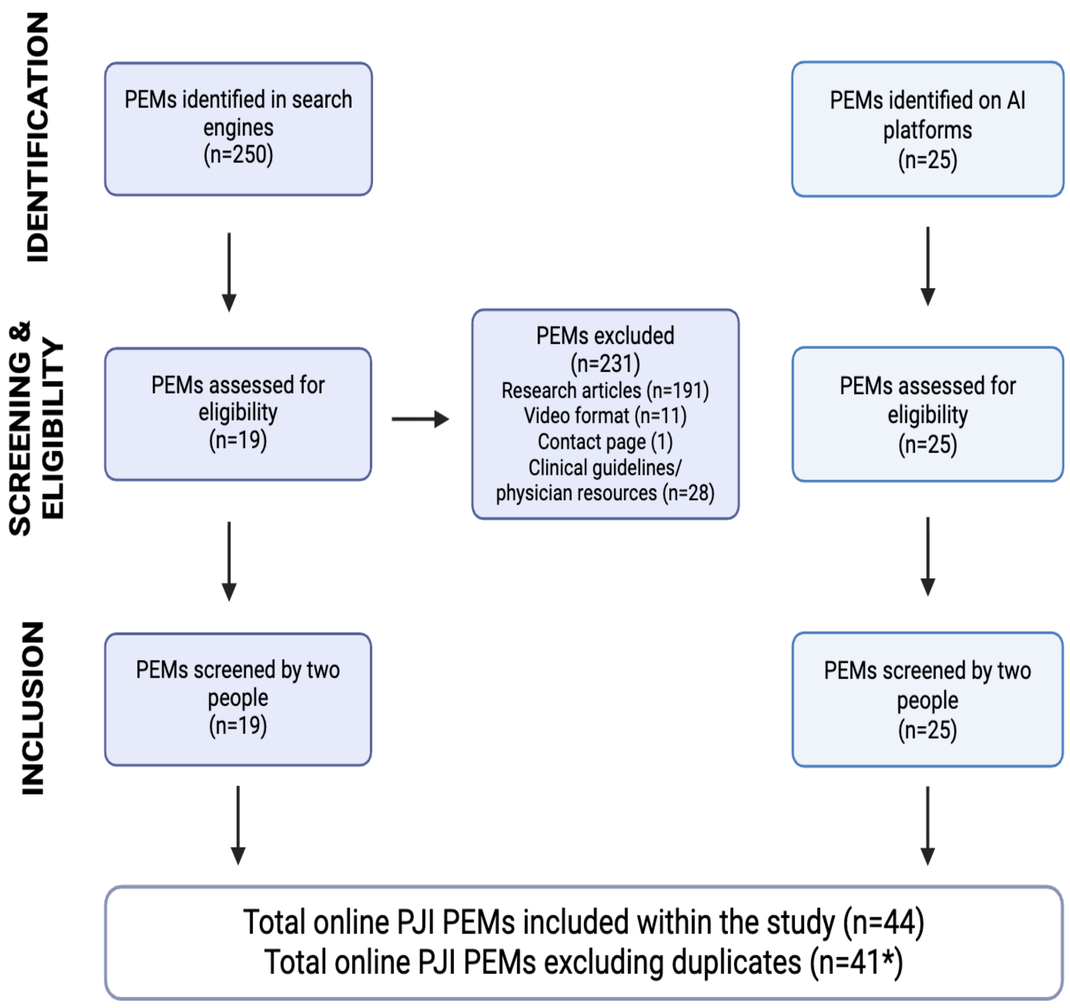
Periprosthetic joint infections (PJIs) are serious complications of arthroplasty, significantly impacting clinical and functional patient outcomes. Preventing PJIs is imperative to relieve healthcare burdens and optimize patient outcomes.

AIMS:

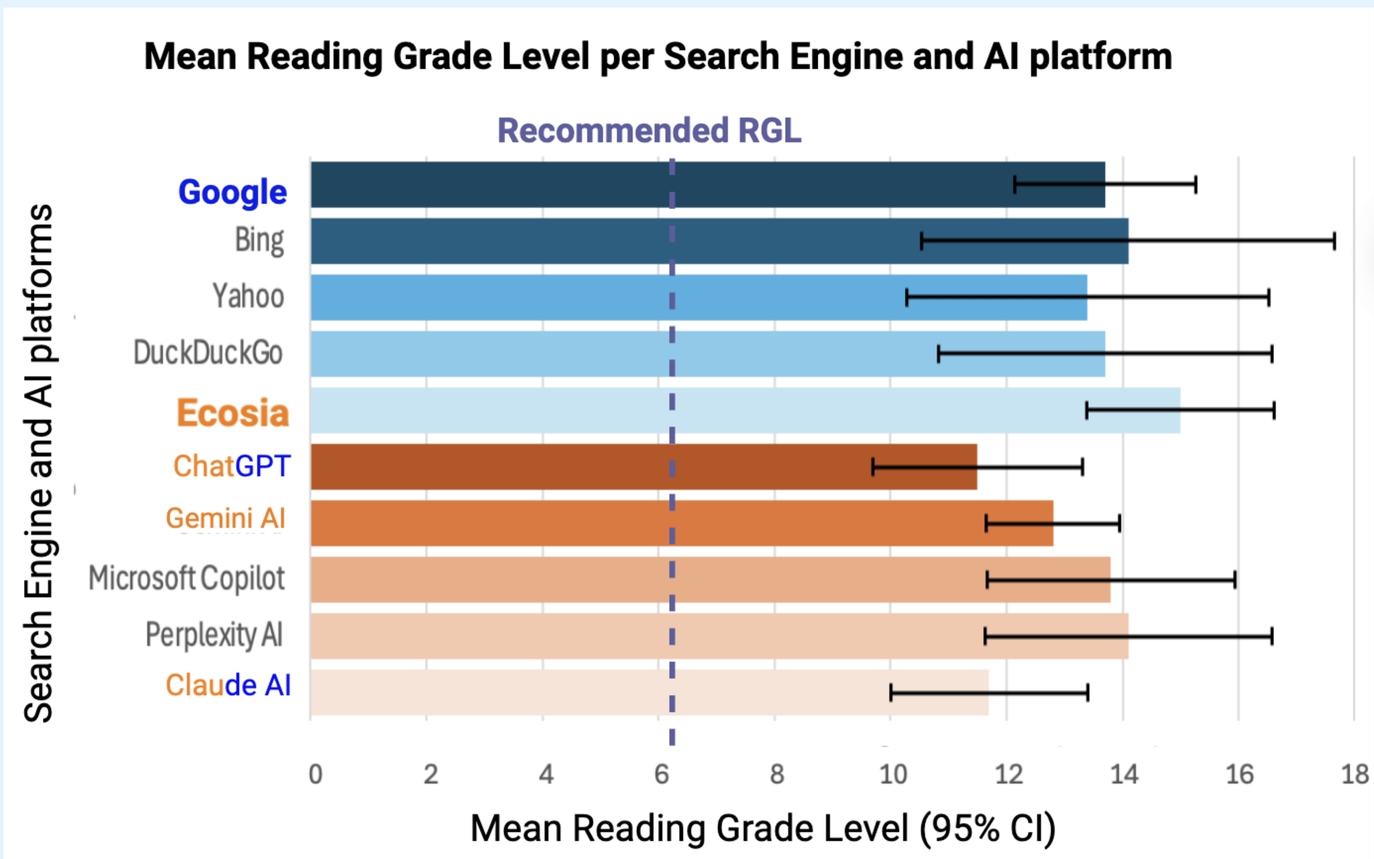
1. To assess the readability of online PJI PEMs sourced from frequently used online **search engines** and **AI chatbots** in the Republic of Ireland.
2. To compare the readability of PEMs against **best practice guidelines** and between each search engine and AI platform for any **significant differences**.
3. To analyse the **word and sentence complexity** used within the online PJI PEMs.

METHOD

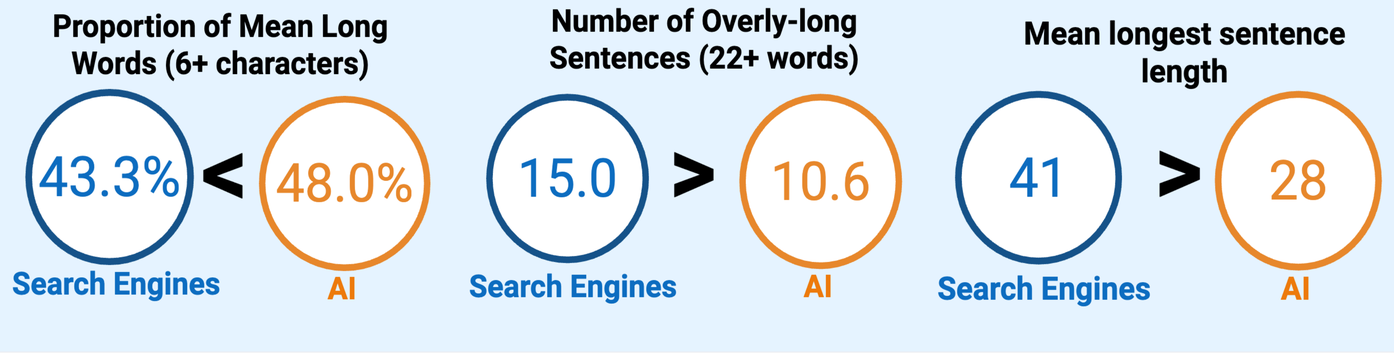
An online search for PJI PEMs was conducted amongst frequently used search engines and AI platforms in the Republic of Ireland. The readability of PEMs was examined using 8 well-established readability formulae via Readability Studio software. Mean RGLs between the online tools were compared against thresholds of the 6th and 8th RGLs.



RESULTS



Online PJI PEMs sourced from search engines had a significantly higher reading grade level (14.2, 95% CI 13.2-15.2) than AI platforms (12.8, 95% CI 11.9 - 13.8). Each PEM was significantly above the recommended 6th RGL. PEMs sourced from AI platforms had a significantly higher proportion of long (6+ characters) words compared to search engines.



CONCLUSION

- **Online PJI PEMs are not written at appropriate reading levels for the general population, hindering health literacy.**
- Patients underestimate the impact of PJI on their clinical and functional outcomes following total joint replacement. For those who are looking to inform themselves, the **volume** of suitable information online or through AI models is minimal, and it is effectively **"unreadable"** when encountered.
- As **clinicians**, we need to do better to counsel our patients preoperatively, but also to advocate on their behalf to ensure that:
  - A) there is **sufficient information** available to them outside of their consultation (leaflet, website, etc.). **Both clinical and functional outcomes** are explained to better convey the significance of the diagnosis and the implications of its management.
  - B) the **language** is appropriate so that patients and family members can digest and understand these resources. As it stands, we are failing patients on both fronts.
- **Urgent development and dissemination** of **more accessible, high-quality patient education resources on PJIs** is crucial. Improving the readability of PEMs through **plain language** and **communication strategies** can strengthen patient education, support informed decision-making, and improve patient outcomes.
- Future studies should explore the accuracy and quality of online PJI PEMs.

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