Utilising AI for Multilingual Patient Education: Enhancing Eye Drop Administration and Bridging Healthcare Inequalities

A Quality Improvement Project at Hillingdon Hospital

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Introduction

Eye drops are a fundamental part of treatment in ophthalmology, yet many patients—particularly those with limited English or low health literacy—struggle with correct administration. Misuse can compromise effectiveness, increase complications, and widen existing health disparities.
To improve understanding and promote equitable care, we developed multilingual educational videos using advanced digital tools. These videos were designed with voiceovers and subtitles in multiple languages, tailored to reflect the cultural and linguistic needs of our patient population.
This project explores how digitally delivered, language-accessible education can empower patients, improve technique, and help bridge gaps in healthcare access.





Analysis

The educational video improved patient confidence, adherence, and clarity—particularly among non-English speakers. The combination of voiceover and subtitles catered to diverse literacy needs, while cultural and linguistic tailoring increased trust and relevance.

However, broader analysis reveals a paradox: while digital tools can bridge communication gaps, they may also reinforce inequities if not inclusively designed. Most AI systems are built on English-centric datasets, limiting performance in underrepresented languages. This risks excluding minority populations from advancements in digital healthcare.

AI in patient education holds great promise—but only if implemented equitably. Our results show its value in supporting communication across language barriers, but they also raise questions about bias, accessibility, and who gets left behind. These findings highlight the urgent need for inclusive datasets, participatory design, and regulatory oversight to ensure AI tools genuinely serve all patient populations.

Objective

To improve patient understanding and administration of eye drops within 6 months using AI-generated, multilingual videos, measured via patient-reported confidence and technique improvement.

Methodology

- AI-generated instructional video created and translated into Arabic, Urdu, Mandarin
- Voice-over + subtitles included for accessibility
- Disseminated via QR codes and online
- Pre/post and 1-month follow-up surveys conducted
- Iteratively refined using patient feedback
- Data analysed on clarity, confidence, likelihood of technique change, and recommendation

Results

- 27 patients (age 27–91, 70% glaucoma)
- Clarity: 4.85/5
- Confidence: 3.96/5
- Likelihood to change technique: 3.41/5
- Would recommend: 4.94/5
- 92% of non-English speakers found the multilingual format very helpful

Conclusion

This project demonstrated that accessible, multilingual video education significantly improves patient understanding, confidence, and technique in administering eye drops. The combination of culturally tailored voiceovers and subtitles was especially effective in supporting patients with limited English proficiency or low health literacy.
The intervention was highly acceptable, low-cost, and scalable—offering a sustainable model for reducing communication barriers and promoting more equitable care. With potential applications across other treatments and specialties, this approach represents a meaningful step toward inclusive, patient-centred education in the NHS and beyond.