AN ARTIFICIAL-INTELLIGENCE-POWERED INTERVENTION TO AID THE INFORMED CONSENT PROCESS FOR CATARACT SURGERY

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Introduction

Informed consent requires patients to understand the risks and benefits of their treatment, yet traditional written forms often fail to engage individuals with language barriers. Cataract surgery is a commonly performed procedure. In the 2022 NHS financial year, 624 458 cataract surgeries were performed in England and Wales.[1] Due to the sheer volume of surgeries, cataract surgery is responsible for the highest total pay-out in ophthalmic clinical negligence claims.[2] Hence, there is a need to enhance information delivery to patients undergoing cataract surgery.

This study compares an artificial intelligence–generated video-based consent process with conventional written consent, evaluating patient comprehension, satisfaction, and anxiety. The primary focus is on Bengali speakers, one of the largest linguistic minorities in East London. Outcomes are compared with those of English-speaking patients to assess the effectiveness of AI in improving engagement among Bengali speakers.

Methods

Participants were recruited between September 2024 and June 2025 from the Moorfields Eye Hospital cataract clinic in Stratford. Inclusion criteria were capacity to consent, scheduled for first cataract surgery, and fluency in English for Cohort A, or Bengali for Cohort B. Exclusion criteria included previous cataract surgery (self or partner) and age under 18. The primary outcome is information retention, one week after consultation. Secondary outcomes include baseline and day-of-surgery anxiety levels, satisfaction with the consent process, and surgery cancellation rates.

Following listing for surgery, participants were randomized to receive either both an AI-generated infographic video and the standard leaflet, or the leaflet alone. Baseline anxiety was assessed using a 6-item modified State-Trait Anxiety Inventory (STAI). One week later, participants completed a 5-question quiz to assess information retention and reported time spent engaging with the infographic. On the day of surgery, anxiety was reassessed, and participants completed a 6-question Likert-scale satisfaction questionnaire.

To ensure accessibility, materials (Infographic video, STAI, quiz, and satisfaction questionnaire) were made available in Bengali and proofread by a Bengali-proficient consultant on the team.

Results

A total of 161 participants were recruited so far, with 137 English-speaking and 24 Bengali-speaking. Of the 161 participants, 141 completed the information retention quiz.

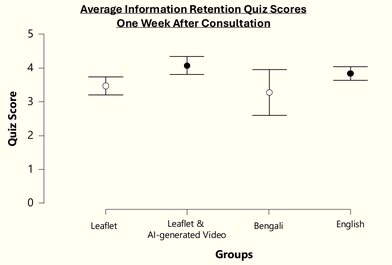


Figure 1 Quiz Scores of different groups with 95% confidence intervals shown. The leaflet group scored lower on average than the leaflet and video group, with non-overlapping confidence intervals. The Bengali group scored lower than the English group, however the confidence intervals overlap.

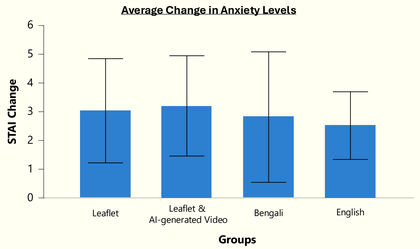


Figure 2 Average change in anxiety levels with 95% confidence intervals shown.
All four groups showed an increase in anxiety levels on the day of the surgery compared to baseline

Information Retention

Patients receiving the leaflet had an average of 3.47 (95% CI 3.21-3.74) while the leaflet & video group scored an average of 4.07 (95% CI 3.80-4.34). Bengali-speaking patients scored an average of 3.28 (95% CI 2.60-3.96) while English-speaking patients scored an average of 3.84 (95% CI 3.64-4.04). Independent samples t-tests were performed between the leaflet and the leaflet & video groups, and also between the English and Bengali-speaking groups. There is a statistically significant difference between the leaflet and leaflet & video groups, but not between the Bengali and English groups.

Anxiety Levels

There is also an overall increase in anxiety levels from baseline on the day of the surgery. Patients who received the leaflet only had an average change of +2.52 (95% CI +1.00-+4.03) while those who received an additional video averaged +2.633 (95% CI +1.20-+4.11). Bengali-speaking patients had an average change of +2.82 (95% CI +0.55-+5.08), while English-speaking patients had an average change of +2.53 (95% CI +1.35-+3.71).

Patient Satisfaction

Patients are generally satisfied with the information delivered regardless of randomization group or language.

Last-Minute Surgery Cancellation

There were 4 cancellations from the Bengali group, and 6 cancellations from the English group as of now.

	Satisfaction Score			
	Leaflet Only	Leaflet & Video	Bengali	English
Valid	39	35	11	63
Missing	41	46	13	74
Mean	27.05	28.49	26.27	27.98
Std. Deviation	3.09	2.33	2.90	2.76
Minimum	20.00	24.00	23.00	20.00
Maximum	30.00	30.00	30.00	30.00

Results (Cont')

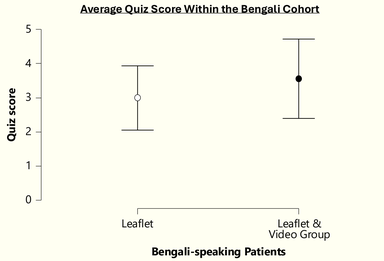


Figure 3 Average quiz score of Bengali-speaking patients in different randomization groups, with 95% confidence interval shown.

Bengali-speaking Population

The Bengali-speaking population was investigated in more depth. Bengali-speaking patients who received the leaflet only scored lower than their counterparts who received a supplementary AI-generated video. The leaflet only group averaged a score of 3.00 (95% CI 2.06-3.94), while the leaflet & video group had an average of 3.56 (95% CI 2.40-4.72). An independent samples t-test was performed, with p=0.404.

Discussion & Conclusion

The data showed that patients who received both the leaflet and the supplementary AI-generated video scored higher on the information retention quiz compared to patients who only received the leaflet, regardless of the language spoken. Regardless of the form of information provided, patients on average were more anxious on the day of the surgery. In general, patients were also satisfied with their respective consent processes.

This study showed promising results for the introduction of AI into the consenting process for cataract surgery in helping patients retain relevant information. However, whether this would be useful in reaching linguistic minorities would require further investigation. Future studies could focus solely on one linguistic group, but involve multiple centres to increase recruitment of minorities.

References

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2. Mathew RG, Ferguson V, Hingorani M. Clinical negligence in ophthalmology: fifteen years of national health service litigation authority data. Ophthalmology. 2013 Apr;120(4):859–64.