Patient Education Materials for the Medical Treatment of Glaucoma: How Readable are they?

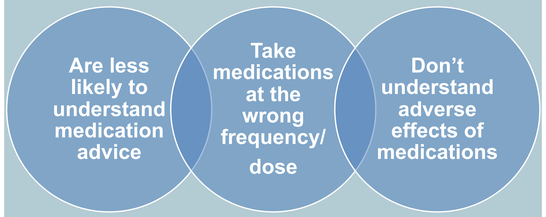
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Introduction

- Glaucoma is the second leading cause of irreversible vision loss worldwide (1)
- Patient adherence to glaucoma medications has been reported to be poor (2)
- A contributing factor for non-compliance to glaucoma medications is **poor health literacy** (3)

Patients with poor health literacy:



- Patient education materials (PEMs) relating to glaucoma treatment are readily available on the internet and should be written in a way which is accessible to patients with a range of health literacy levels
- It is advised that PEMs are written at a level which is understandable to the general population

Current guidelines

Health Education England → **PEMs should be written at an 11 year old level (4)**

American Medical Association → **PEMs should be written at an 11-12 year old level (US grade level ≤6) (5)**

Aims

The aim of this study is to assess the readability of online PEMs relating to the medical management of primary open angle glaucoma (POAG).

Average literacy level in the United Kingdom is equivalent to a **13 year old student**

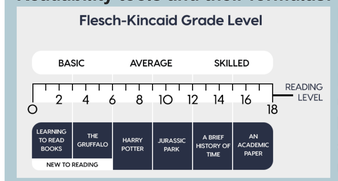
Methods

- Google searches were performed in November 2021
- The searches included either the medication name (trade and brand) or 3 generic searches
- Medications included were those recommended by NICE for the treatment of POAG
- The top ten PEMs for each search term were selected
- This yielded 111 PEMs
- PEMs were analysed using four readability scores
- PEMs were classified by source type
- Statistical significance was set at $p<0.05$, and mean values were compared using one-way ANOVA

Readability

Readability is a measure of the reading skills one must possess to understand material and has a significant impact on the comprehension of the material by the patient (6,7)

Readability tools and their formulas:

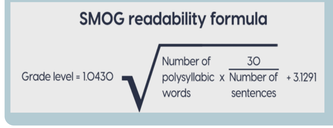


FRES
Ranges from 0-100



FKGL
Converts FRES into US grade level. Number of years of education required to understand the text

Gunning Fog
Ranges from 6-17



SMOG
Number of years of education required to understand the text

Results

- The readability tools and their ranges, average, standard deviations and 95% confidence intervals are set out in **Table 1**
- Websites were classified by source, the majority were from non-clinical health information sites. See **Figure 1**
- The readability scores did not differ significantly by website type, see **Table 2**

Table 1 Readability Tools

Readability Tool	Range	Average	Recommend Standard	Percentage Achieving the Recommended Standard
FRES	15.2-79	**55.5** (SD = 10.8; 95% CI 53.4 – 57.5).	**90-100**	**0%**
FKGL	5.3-17.3	**9.7** (SD = 2.1; 95% CI 9.3 – 10.0)	**≤6.9**	**15.3%**
Gunning Fog	7.7-18.5	**12** (SD = 2.1; 95% CI 11.6 - 12.4)	**6-6.9**	**1%**
SMOG	5.7-15.6	**9.3** (SD = 1.7; 95% CI 8.9 - 9.6)	**≤6.9**	**2.7%**

Figure 1 Websites classified by source

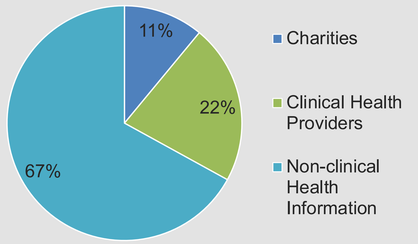


Table 2 Readability score by source type

Readability Tool	P Value
FRES	p=0.28
FKGL	p=0.08
Gunning-Fog	p=0.14
SMOG	p=0.14

The majority of online PEMs for the medical treatment of glaucoma are written at a level too difficult for the general population to understand

Discussion

- The results of this study are similar to other studies within ophthalmology and other surgical specialties
- Websites across all source types provide information that is above the recommended level and too difficult for most people to understand
- By improving health literacy it can empower patients to more effectively manage their health conditions

Limitations

- We chose three generic search terms patients may use, but this may not accurately reflect patient browsing behaviours
- Readability tools do not take into account context or meaning of words, or the layout or images included in the PEM

Recommendations for future research

- Future studies could focus on patient browsing behaviors to accurately reflect their choice of online PEMs

Conclusion

- PEMs relating to the medical treatment of glaucoma are written above the recommended reading level of 11 years old
- Organisations should consider health literacy when creating online content for patients
- Patients with poor health literacy less successfully manage their long term health conditions, therefore by improving health literacy it can empower patents to manage their health conditions.

References

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