Generative artificial intelligence for plain language summary development: blinded assessment of preferences of the sickle cell disease community

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Conclusion

- There is a clear need for additional resources and education in sickle cell disease (SCD), which may be supported by the development of plain language summaries (PLS).
- Our study shows that generative artificial intelligence (GenAI) can generate PLS that are as informative as conventional, human-written PLS, achieving similar understandability scores as judged by people living with SCD in the UK (mean 4.1 for human-written, 4.0 for GenAI and 3.9 for AI-human hybrid).
- Twice as many participants (58%) preferred the video format over the written format (29%) of the PLS.
- We propose that GenAI may offer an alternative to conventional human-written PLS, providing a time- and resource-efficient solution to increase accessibility to educational resources.

Background

- SCD is an inherited condition that reduces life expectancy and has a profound impact on quality of life.[1]
- Assessment of social media conversations in the SCD community in the UK highlights many perceptions of health inequities, including issues with access to emergency care, low levels of healthcare professional (HCP) empathy, and racial bias/stigmatization.[2]
- This emphasizes the urgent unmet need for additional education, both for HCPs to increase disease awareness and empathy, and for patients and caregivers to empower them in conversations about their care with HCPs.
- Use of GenAI to facilitate the development of medical content, including PLS of research may increase efficiency, reduce resource cost and ultimately improve accessibility to educational information across a range of audiences.

Objective

- This study assessed the preferences of patients with SCD and caregivers for PLS format developed by humans or GenAI, based on our social media listening study.[2]

Methods

- We developed three written versions of a PLS:
  - Human-written by a professional medical writer
  - AI-generated, using Pfizer's GenAI tool, MAIA (Medical AI assistant)
  - Hybrid AI–human, where a person living with SCD edited the AI version for readability.
- Each written PLS was ~300–400 words, with a target reading age of 12 years.
- A video version of each written PLS was developed using the AI tool, *Synthesia*.

The written PLS and videos can be found in the mobile-friendly website version of this poster by scanning the QR code.

- People with SCD and their carers (≥18 years of age) were recruited via telephone to complete an online survey, as follows:
  1. Participants were presented with one of the three written PLS at random and asked to assess how easily they understood it on a 5-point scale (1=very difficult; 2=difficult; 3=neither difficult nor easy; 4=easy; 5=very easy).
  2. After reviewing their first PLS, each participant answered three multiple-choice questions to gauge their understanding.
  3. Participants were then shown the other two written PLS, graded the understandability of each and then ranked all three in order of most easily understood to least easily understood.
  4. Finally, participants watched the video version of their top-rated written PLS and stated which format they preferred.
- Participants were blinded to PLS source and were not told that any were generated by AI.

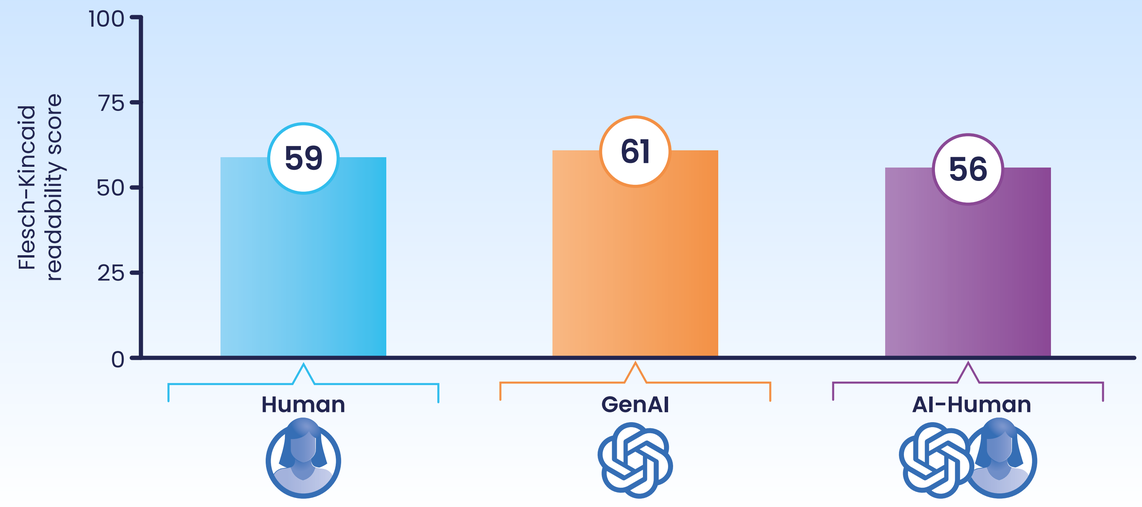
The survey questions can be found in the mobile-friendly website version of this poster.

- The Flesch-Kincaid readability score per Microsoft Office 365 Word was used to provide an objective measure of readability for each written PLS.

Results

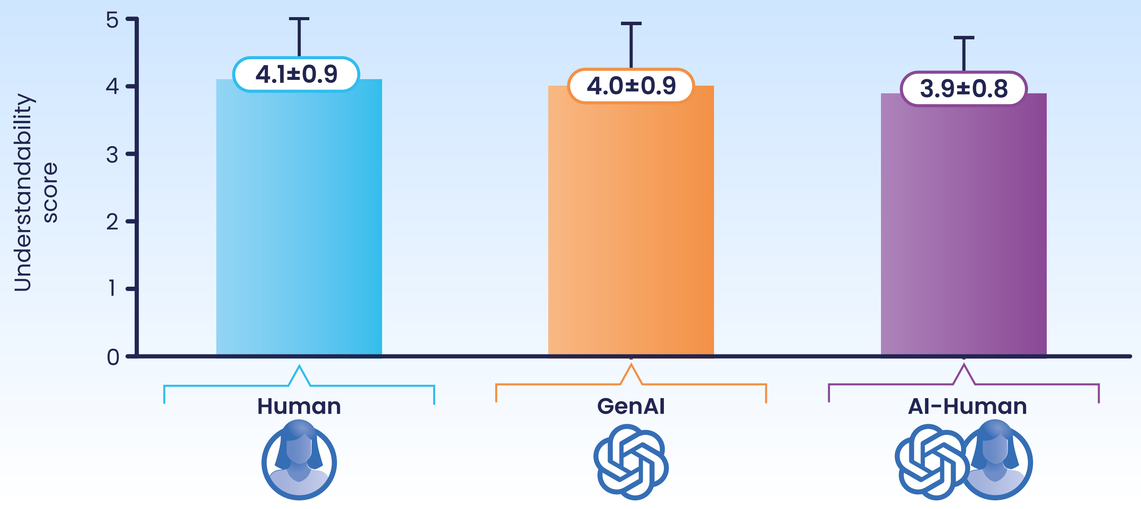
- Of 93 participants, there were 88 living with SCD and 5 caring for someone with SCD.
- Flesch-Kincaid readability scores were similar for the three written PLS (Figure 1).

Figure 1. Readability score according to Flesch-Kincaid



- The GenAI versions of the PLS were scored by the participants similarly for understandability to the human-written version (Figure 2).

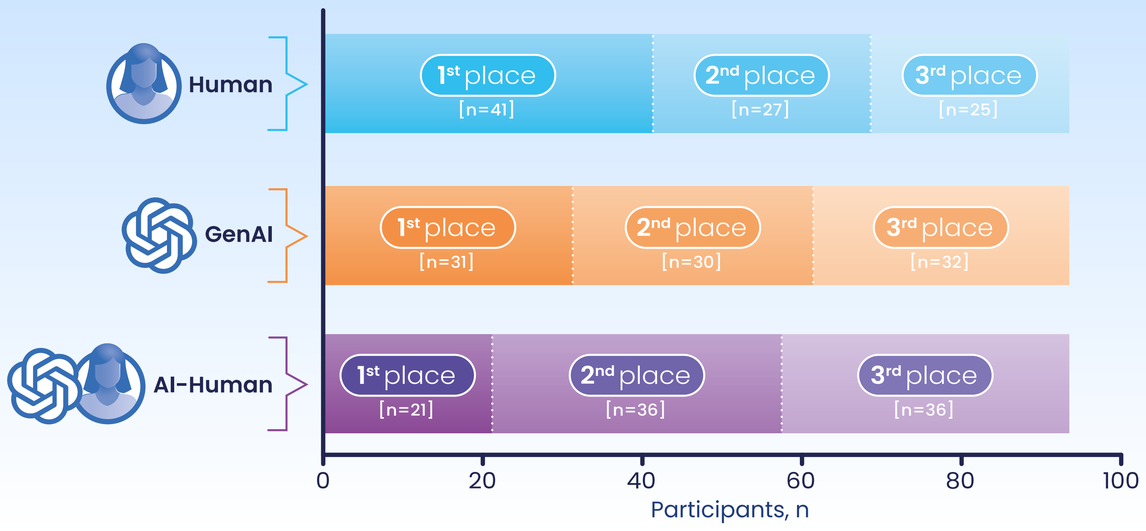
Figure 2. Participant-rated understandability score†



†Participants (n=93) ranked each PLS summary on how easy it was to understand on a 5-point scale, where 5 was very easy, 4 was easy, 3 was neither easy nor difficult, 2 was difficult and 1 was very difficult.

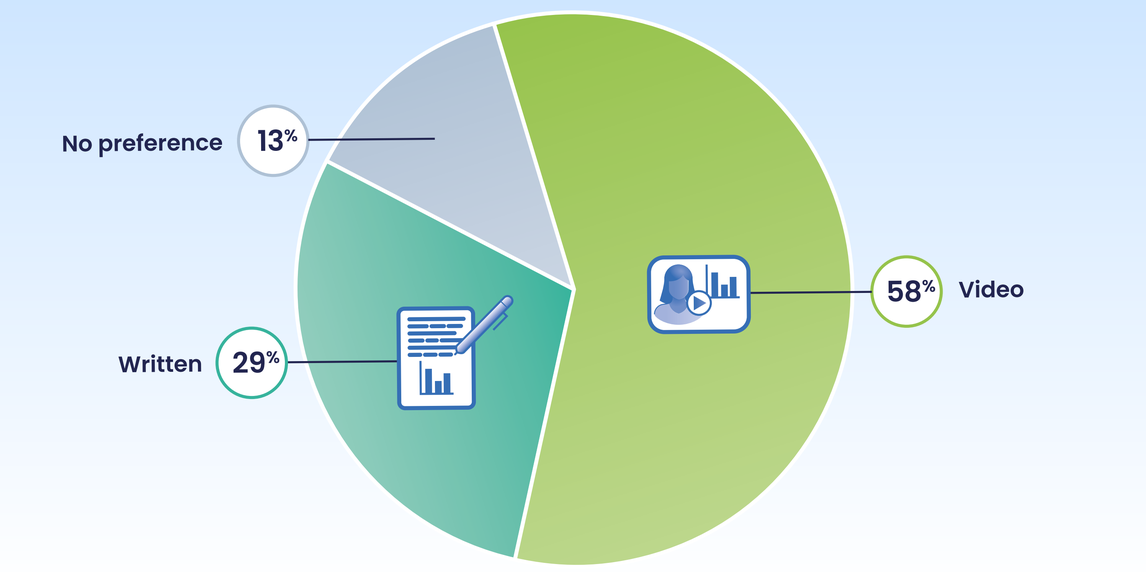
- Overall, 81% of participants identified the human PLS as easy or very easy to read, similar to 76% for the GenAI PLS, and 74% for the AI–human hybrid PLS.
- Forty-one participants (44%) ranked the human PLS in first place for understandability, 31 (33%) the AI PLS, and 21 (23%) the AI–human hybrid PLS (Figure 3).

Figure 3. Number of participants selecting each of the PLS in first, second or third place for ease of understanding



- For the multiple-choice questions, results were similar regardless of which PLS participants saw first. Across all three PLS:
  - 97% correctly identified the main findings of the study
  - 86% correctly identified the main conclusions of the authors
  - 63% incorrectly thought the data on which the PLS was based were obtained from interviewing people affected by SCD rather than social media listening.
- Fifty-four participants (58%) preferred the video PLS over the written PLS, 27 participants (29%) preferred the written PLS and 12 (13%) had no preference (Figure 4).

Figure 4. Participants' preferences for the format of the PLS



References: 1. Thomson AM, et al. *Lancet Haematol.* 2023;10:e585-e599. 2. Shastri O, et al. ASH 2023; abstract 1057.

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