Readability of Online Patient and Physician Education Materials for Blood Cancer Diagnoses

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Introduction

About 10% of all cancer diagnoses in the United States are blood cancers, including leukemia, lymphoma, myeloma. Additionally, blood cancer accounts for 25% of pediatric cancer diagnoses. As more people turn to the internet for healthcare related information, resources available should be at a reading level that most people can easily understand. Based on the National Institute of Health and American Medical Association recommendations, public patient education materials should be at or under the 6th to 7th grade reading level.

Methods

- We reviewed educational materials from 3 nationally recognized cancer organizations: Leukemia & Lymphoma Society, American Cancer Society, National Comprehensive Cancer Network
  - 50 leukemia & 42 lymphoma materials
  - 9 health professional education materials (HPEMs)
- We assessed readability with 5 readability methodologies: Flesch Reading Ease Formula (FREF), Flesch-Kincaid Grade Level (FKGL), Gunning Fog Index (GFI), Simple Measure of Gobbledygook Index (SMOG), Coleman-Liau Index (CLI)
- Images, tables, figures, glossaries, indexes, and references, if present in the materials, were excluded

Results

Leukemia vs. Lymphoma Average [SD]			**Leukemia vs. HPEM Average [SD]**			**Lymphoma vs. HPEM Average [SD]**		
Leukemia FKGL	Lymphoma FKGL	p-value	Leukemia FKGL	HPEM FKGL	p-value	Lymphoma FKGL	HPEM FKGL	p-value
9.60 [1.70]	9.60 [1.08]	0.9871	9.60 [1.70]	14.63 [5.76]	0.0002*	9.60 [1.08]	14.63 [5.76]	0.0002*
Leukemia SMOG	Lymphoma SMOG	p-value	Leukemia SMOG	HPEM SMOG	p-value	Lymphoma SMOG	HPEM SMOG	p-value
12.65 [1.46]	12.73 [2.10]	0.7753	12.65 [1.46]	16.10 [3.76]	0.0006*	12.73 [2.10]	16.10 [3.76]	0.0006*
Leukemia GFI	Lymphoma GFI	p-value	Leukemia GFI	HPEM GFI	p-value	Lymphoma GFI	HPEM GFI	p-value
12.69 [1.25]	12.74 [1.26]	0.8555	12.69 [1.25]	18.33 [7.61]	0.0003*	12.74 [1.26]	18.33 [7.61]	0.0002*
Leukemia CLI	Lymphoma CLI	p-value	Leukemia CLI	HPEM CLI	p-value	Lymphoma CLI	HPEM CLI	p-value
11.91 [1.80]	11.85 [1.95]	0.8203	11.91 [1.80]	15.75 [4.39]	0.0005*	11.85 [1.95]	15.75 [4.39]	0.0003*

Table 1: Average readability scores and standard deviations [SD] and T-Test p-values, * indicates statistically significant difference ($p<0.05$)

Conclusion

Of all the patient education materials, only 3.96% scored at or below the 7th grade reading level in any scoring modality. HPEMs were consistently appropriate at a graduate reading level, highlighting that medical communications are difficult to read due to the lengthy medical jargon. If the reading level is higher than patients can understand, patients may seek information from other sources that may have incorrect information or misinformation, which could influence the patient's understanding of their disease and the recommended treatment. Therefore, these materials should not replace physician counseling, and existing patient education materials should be revised so that patients will be well informed of their diagnosis and treatment options.

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