



Assessing and Optimizing Readability of Dermatology Patient Education Materials (PEMs)



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INTRODUCTION

Inadequate health literacy is a well-established barrier to optimal health outcomes. PEMs are a powerful tool to improve patient comprehension and disease self-management. The average American reads at an 8th grade level, however the National Institute of Health (NIH) recommendation for PEMs is the 6th grade level. It is plausible that higher reading levels of PEMs may result in confusion and suboptimal outcomes.

Objective: To assess and optimize PEMs to identify changes that are most effective at lowering reading level without diluting its critical content.

METHODS

This study assessed the readability of 39 PEMs provided by *The Society for Pediatric Dermatology*. Reading levels were determined using www.readabilityformulas.com. Numerical data collected included: number of words, average words per sentence, average syllables per word, percent of words that are ≥ 3 syllables, number of words with ≥ 3 syllables. The critical content of PEMs often contains medical terminology. This is often necessary for the purpose of the PEM (i.e., use of "melanoma" in a PEM about concerning moles) but increases reading level. For each of the 39 PEMs, reading level and numerical data were collected twice. Once for the original PEMs and a second time for the PEMs without medical terminology (names of diseases, medications, microbes, etc.). PEMs were identified as having potential for improving readability if the reading level remained high without medical terminology. Of the 39 PEMs, seven had high reading levels that were unchanged by exclusion of medical terminology. These seven PEMs were subjected to revisions until reading level reached the 6th grade. Numerical data for the seven revised PEMs was then collected a third time.

RESULTS

Table 1. Reading level of Original PEMs vs. PEMs without Medical Terminology

	Original PEMs (n=39)	PEMs without Medical Terminology (n=39)
Mean (Grade Level)	9 th grade	8 th grade
Variance	1.26	1.31
Pearson Correlation	0.68	
Hypothesized Mean Difference	0	
Degrees of Freedom	38	38
P-Value Two Tail Distribution	2.4×10^{-10}	

PEMs, Patient Education Materials

Table 2. Characteristics Pre- and Post-Edits

Characteristics	Pre-Edits (n=7)	Post-Edits (n=7)	P Value
Mean (Grade Level)	9 th grade	6 th grade	
Total Word Count	996	955	0.01^a
Average Number of Words per Sentence	14	13.3	0.008^a
Average Number of Syllables per Word	1.9	1	9.6×10^{-4} ^a
Percentage of Total Words with ≥ 3 Syllables	13.7%	7%	1.06×10^{-4} ^a
Total Words with ≥ 3 Syllables	134.7	66.7	5.2×10^{-5} ^a

^a Indicates statistical significance

Table 1: A Paired Samples t Test was conducted to see if there was relationship between reading levels of the original PEMs and reading level of the PEMs without medical terminology. The reading levels differed significantly between the 39 original PEMs (M = 9.05, SD = 1.12) and PEMs without medical terminology (M = 7.82, SD = 1.14), P < 0.005.

Table 2: Five Paired Samples t Tests were conducted. All numerical data compared between the seven original PEMs and revised 6th grade level PEMs were statistically significant. For number of words and average words per sentence, P < 0.05. Average syllables per word, percent of words that are ≥ 3 syllables, and number of words with ≥ 3 syllables were significant to a level of P < 0.005.

CONCLUSIONS

- Dermatology patient education materials (PEMs) are consistently well above the national recommended reading level of 6th grade.
- Decreasing total word count, average number of words per sentence, average syllables per word, percent of words with ≥ 3 syllable, and total number of words with ≥ 3 syllables were effective ways to improve readability to at or below the 6th grade level without diluting critical content.

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