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Background :

The Cochrane Collaboration provides free online, plain language summaries of Cochrane systematic reviews for healthcare consumers. The readability of these summaries is unknown. We assessed if plain language summaries written by the Cochrane Breast Cancer Group (CBCG) met the recommended readability score of a grade six reading level. We also attempted to improve the readability of the plain language summaries using: simpler language, shorter sentences and active voice.

Method :

Two reviewers independently evaluated the readability of all published CBCG plain language summaries. Readability was assessed using Flesch Reading Ease and Flesch-Kincaid Grade Levels in Microsoft® Word 2010. Flesch Reading Ease is a score from 0 (unreadable) to 100 (very easy). Flesch-Kincaid Grade Levels indicate the academic grade level required to read a text. The same reviewers then rewrote each plain language summary using simpler language, shorter sentences and active voice to improve readability. Readability scores were then repeated.

Results :

- No individual plain language summary met the recommended readability level.
- Most plain language summaries (35/42 - 83%) were written at college level with mean Flesch-Kincaid Grade Levels of 15.0 (SD = 2.3, range = 10.9 - 20.0).
- Almost all plain language summaries (41/42 - 98%) were written at a scientific or academic level of publication with mean Flesch Reading Ease of 26.8 (SD = 11.3, range = 3.0 - 52.0).
- The re-writing techniques utilised significantly improved readability of the summaries ($p < 0.001$): improving mean Flesch Reading Ease to 52.5 (SD = 9.0, range = 34.1 - 72.5) and Flesch-Kincaid Grade Level to 8.9 (SD = 1.3, range = 6.4 - 11.0).

Flesch-Kincaid Grade Level of plain language summaries

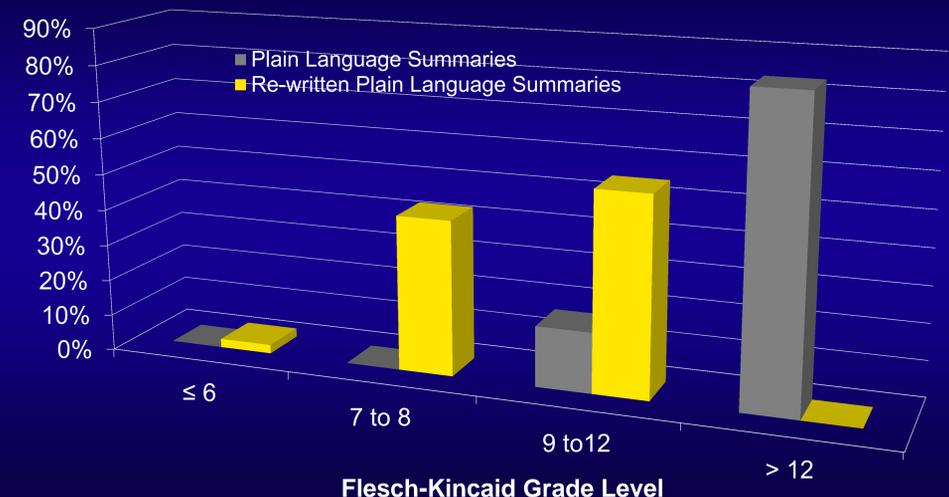


Table 1 : Flesch Reading Ease of plain language summaries[†]

Flesch Reading Ease †	Description of Style	Type of Publication	Plain Language Summaries (% of group)	Re-written Plain Language Summaries (% of group)
0-29	Very difficult	Scientific	25 (60%)	0 (0%)
30-49	Difficult	Academic	16 (38%)	15 (36%)
50-59	Fairly difficult	Quality	1 (2%)	17 (41%)
60-69	Standard	Digests	0 (0%)	9 (21%)
70-79	Fairly Easy	Slick-fiction	0 (0%)	1 (2%)

[†] Adapted from Flesch, R., A New Readability Yard Stick. Journal of Applied Psychology, 1948. 32(3): p. 221-233.

Example : Re-writing Techniques

Before utilising re-writing techniques:

"Breast cancer is a complex disease which has seen survival for women improve over the last 20 years. Many of these improvements are linked to treatment advances, improved screening and a multiprofessional approach to its management."

- Cruickshank S et al. Specialist breast care nurses for supportive care of women with breast cancer. Cochrane Database of Systematic Reviews 2008, Issue 1.

After utilising re-writing techniques :

"Breast cancer survival has increased over the last 20 years. This is due to better treatment, screening and team work."

Conclusions :

- **CBCG plain language summaries in our study did not meet recommended readability levels for healthcare consumers.**
- **Writing using simple language, short sentences and active voice are useful tools the Cochrane Collaboration could recommend to authors to improve readability.**
- **This may improve healthcare consumer understanding of the information in Cochrane systematic reviews.**