# Reading Grade Level and Readability of Printed Cancer Education Materials

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**Purpose/Objectives:** To analyze cancer brochures to estimate their reading level and assess their readability.

**Design:** Quantitative.

**Sample:** 10 cancer brochures published by various cancer organizations.

**Methods:** SMOG was used to estimate reading grade level of the brochures; the Readability Assessment Instrument (RAIN) was used to analyze the brochures in terms of 14 variables that affect comprehension. Interrater reliability was computed for reading grade level and readability level.

**Main Research Variables:** Reading grade level and readability.

**Findings:** Reading grade level of the brochures ranged from 9–15. The RAIN analysis showed that the number of variables incorporated across the 10 brochures ranged from 12–14, and the number of variables reaching readability criteria ranged from 6–8.

**Conclusions:** Cancer education materials are written at levels that may be too high for the average reader. These materials also may be difficult to understand because of the way they are written. Materials need to be written so that they match the reading levels of patients with cancer and the general public and incorporate more of the variables that affect comprehension so that readers can understand them easily.

**Implications for Nursing:** Nurses use written education materials to inform patients about their cancer diagnoses. They can conduct a comprehensive analysis of cancer brochures using SMOG and RAIN and then, if needed, use this information to revise the brochures so that they can be understood easily. If possible, patients who are going to be using the materials should be involved in the revision process.

## Key Points . . .

- Cancer education materials are written at a level that is too difficult for the general population, and they do not incorporate all of the variables that facilitate comprehension.
- Information from a comprehensive analysis with SMOG and the Readability Assessment Instrument (RAIN) can be used to revise printed cancer education materials.
- Writers can use RAIN variables to guide preparation of new materials in collaboration with target audiences.

Cancer education materials often are written by healthcare professionals who work closely with patients with cancer and are aware of their information needs. In some instances, after writing a brochure or pamphlet, writers use one of the readability formulas, such as Flesch's (1948), Fry's (1968), or the Simple Measure of Gobbledygook (SMOG) (McLaughlin, 1969), to assess their work. They then print and disseminate the materials and assume that the target audience will be able to read and understand them. Results from research studies show that this assumption often is incorrect because the materials are too difficult for patients with low literacy skills to read and comprehend (Cooley et al., 1995; Glazer, Kirk, & Bosler, 1996). Some researchers have suggested that appropriate reading levels can be obtained by using shorter sentences and simpler words (Davis, Crouch, Wills, Miller, & Abdehou, 1990; Estey, Musseau, & Keehn, 1994). Materials prepared using this approach most likely would have a lower reading grade level when assessed by one of the previous formulas that use sentence and word length to determine reading level. However, lowering the reading level does not necessarily ensure that the materials will be readable. These formulas provide a reading grade level estimate for the material but they do not assess readability. Readability and reading level are equally important but entirely different concepts. Readability is the ease with which readers are able to understand the text. Thus, a person reading at the eighth-grade level may be able to recognize all the words in a brochure written at his or her level but may have difficulty understanding the content because of the way it is written.

Although formulas may be useful in providing an estimate of the reading grade level of written material, they do not incorporate the variables needed to assess readability. The Readability Assessment Instrument (RAIN) (Singh, 2003) was developed to determine the readability of texts in terms of 14 variables that affect comprehension. A number of studies have used RAIN to evaluate health education brochures about attention-deficit hyperactivity disorder (Singh, 1995), HIV and AIDS (Singh, 2000), patient medication leaflets (Kirkpatrick & Mohler, 1999), and behavioral treatment programs in mental health (Adkins & Singh, 2001; Adkins, Singh, McKeegan, Lanier, & Oswald, 2002). These studies found that many of the materials were unacceptable in terms of readability.

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