A handbook for health workers to use in evaluating health literature

Sylvia Morgan Dousman

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A HANDBOOK FOR HEALTH WORKERS TO USE IN 
EVALUATING HEALTH LITERATURE

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A Project
Presented to the
Faculty of
California State University,
San Bernardino

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In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education: Vocational Education

___

by
Sylvia Morgan Dousman
June 1997
A HANDBOOK FOR HEALTH WORKERS TO USE IN EVALUATING HEALTH LITERATURE

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California State University,
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June 1997
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Date
ABSTRACT

Over 150 publications currently in use by the Kern County Health Department and available from other agencies were evaluated to determine the appropriateness of use in patient education. Each piece of material was evaluated by the use of Flesch’s Readability Test and Flesch’s Human Interest Score. To facilitate the health educator in assessing the possible barriers to reading comprehension that patients may have because of different cultural views, lack of medical knowledge, or lack of interest in the subject matter, summaries of suggested methods, described in the literature review, were given. The information was placed in charts and brief descriptive paragraphs to form a handbook for easy access by health providers.
ACKNOWLEDGMENTS

To Jim, who encouraged and supported me all the way.

To Dr. Truell, who directed my efforts with patience and persistence.
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CHAPTER ONE

Introduction

The contents of Chapter One presents an overview of the project. The context of the problem is discussed, followed by the purpose and significance of the project. Next, the limitations and delimitations that apply to this project are reviewed. Finally, a definition of terms is presented.

Context of the Problem

Over 20 million United States citizens were unable to read daily papers and magazines, and were considered functionally illiterate in the 1980s. Limited reading skills restricted reading materials to signs and labels (Encyclopedia Americana, 1990). The total number of high school dropouts was 12.1% for white youths, 15.6% for black youths and 38.1% for Hispanic youths in the last census report from 1970 to 1992 (U. S. Department of Commerce, 1994). Personnel from the United States Office of Education are involved in programs that require teacher retraining, better and more appropriate literature, and special schools to promote reading for children and adults.

Medical personnel are morally and legally required to give accurate and timely instructions to patients and care givers. The people instructed are from diverse cultures and have attained varying levels of education. Medical personnel view education of patients, or care givers, as an important part of total medical care (Rubinson & Alles, 1984). Prevention of debilitating conditions leading to
hospitalization or prolonged recuperation is considered cost effective in the health care
industry (Pickett & Hanlon, 1990). One of the methods of instruction used in patient
education is the distribution of printed material. Patients are given instructions about
test preparation, side effects of medications, diets to be followed, and numerous
regulations involving medical regimens. Failure to conform is frequently viewed as
patient noncompliance (Green, Kreuter, Deeds & Partridge, 1980). The value of
printed health literature depends on the readability of the materials and the reading
ability of the recipient and the ability of the recipient to comprehend the written words
(Riche, Reed, Robinson & Kardash, 1995).

Purpose of the Project

The purpose of this project was to develop a handbook that provides health
workers with guidelines to follow while selecting health material appropriate for
individual patients, or care givers. Specifically, the handbook was designed to serve
health workers providing health instructions to clients in both clinic and home settings.

Significance of the Project

Health workers are not expected to be reading specialists. The educational
level of the person being counseled is usually unknown to the health care provider.
Instructions are given and procedures explained in environments that often are
crowded, noisy, and distracting. For these reasons, the materials handed out by the
health provider should serve as extensions of the in-house instructions. This project
was undertaken to review methods for determining the suitability of material for
targeted individuals and to develop a handbook, summarizing recognized methods of
evaluating health literature and evaluating possible patient comprehension. Easily accessible references facilitate the education of patients.

**Limitations and Delimitations**

A number of limitations and delimitations surfaced during the development of this project. These limitations and delimitations are presented in the next section.

**Limitations.** The following limitations apply to this project.

1. The scope of this project is limited to the materials currently available to health workers.
2. The project is further limited by the resources available to health workers working with patients or care givers.
3. Health care workers responsible for instructing clients are limited by the type of instruction designated in job descriptions.

**Delimitations.** The following delimitations apply to this project.

1. The project is designed specifically for Kern County, California health workers.
2. The project is delimited to the most frequently employed methods of ascertaining reading ability and readability of printed material. The Flesch formula was the most frequently used method to determine readability of health material in this handbook.
3. The target group receiving instructions is limited to clientele in clinic and home care situations.
4. Methods of determining reading level of material are limited to those easily and speedily utilized by health workers.
5. The use of reading ability testing on clients is to be done only with the knowledge and cooperation of Kern County Health Department supervisors.

Definition of Terms

The following terms are defined as they apply to this project.

Health literature, health material—Refers to printed material describing medical procedures and/or instructions.

Health worker, health provider—Refers to that person actively engaged in instructing a patient or care giver in health matters.

Home visits—Individual instruction by health worker in patient’s home.

Literacy—The ability to read.

Noncompliance—The failure of patients to follow the medical and dietary regimens prescribed by physicians.

Rapid Estimate of Adult Literacy in Medicine—A test consisting of three columns of increasingly difficult words that patients are asked to read.

Readability Formulas—Methods of determining the degree of difficulty of printed information. Each formula defines the number of syllables, words and lines to be counted in a given selection.

Organization of the Project

This project is divided into four chapters. Chapter One provides an introduction to the context of the problem, purpose of the project, significance of the project, limitations and delimitations, and the definition of terms. Chapter Two consists of a review of the literature. Chapter Three outlines the population to be
served and the project design. Chapter Four presents the conclusions and recommendations gleaned from the project. The project and references follow in Chapter Four.
CHAPTER TWO
Review of the Literature

Introduction

Chapter Two consists of a discussion of the relevant literature. Specifically, methods of assessing patient reading ability, methods of assessing readability of health material, and reader comprehension are discussed.

Assessing Patients’ Reading Ability

Turner (1990) wrote in the Technology for Literacy Project report, that one of the unique problems in evaluating adults is that “standardized tests were developed for children and norming data was virtually nonexistent” (p. 195). The purpose of the Technology for Literacy Project was to develop ways to integrate technology into adult education. The need for evaluation was considered important for the adult to measure self progress and to compare progress with peers.

Lazar and Bean (1991) studied methods of assessing the reading capabilities of adults. Standardized testing was shown to be less reliable than other methods because of the lack of norming data. Suggestions included using other measures such as interviews, observation by the instructor, and collecting student writings. Instructor observation and feedback from the student were stressed. Lazar and Bean (1991) worked with a group of adult students on a daily basis. Each student was given the ALERT literacy screening test. The reading part of the test was described as a test with three choices of words given for deleted words that are arranged in a maze. Correct choices were scored and used as indications of the reading abilities of the
tested students. The test is used for assessing the progress of students over a period of time and would not be practical for health workers to use.

Other reading tests of interest to health workers are the Minnesota Reading Assessment, a test of comprehension, reading rate, and vocabulary (Raskinski, Padak & Logan, 1991). This survey test covers the curriculum and by adding raw scores that are converted to percentiles, a level of achievement is shown. Raskinski, et al. (1991) discussed the Nelson-Denny Reading Test and described it as consisting of a section of vocabulary and a section of comprehension tests. A screening test, the Nelson-Denny Reading Test is frequently given to college students to determine if additional reading help is indicated.

Educators continue to ask for better evaluation techniques to test literacy, but differ in definitions of literacy. Polizella (1994) defined literacy simply as the “ability to read” (p.2) Poissant (1994) describes low-literate individuals as those whose schooling is less than the fifth grade since the basics of reading and writing are given in those grades. The United Nations Educational, Scientific and Cultural Organization defines low-literacy as “can neither read nor write nor understand a short, simple presentation of facts that relate to everyday life” (Poissant, 1994, p. 2).

Educators usually consider grade completed as an indication of the reading ability of an adult, but Robinson (1995) described high school graduates as reading at the sixth grade to college level. Riche, Reid, Robinson and Kardash (1995) reported that “40% of adult patients who had completed ten years of school could not read at the eighth grade level” (p. 287). Material ranging from the fifth to just below the
eighth grade level was recommended following a study of health material used in North Carolina clinics (Johnson, 1994). Even though clients had completed an average of 11.1 grades in school, the reading ability was considered two to five grades below the average grade completed. Grade completed has been shown to be a poor estimate of an adult’s reading ability but may be the only information the health worker has about the educational qualifications of the person being instructed in health matters.

A test of reading skills that has been used by health personnel is the Rapid Estimate of Adult Literacy in Medicine (REALM) (Murphy, Davis, Long, Jackson & Decker, 1993). A simple test, the REALM is easy to administer and can be checked quickly. The patient, or care giver, is shown a list of words and asked to read them to the interviewer. There are three lists of increasingly difficult words. Some medical terms are included. The interviewer compares the number of correct words to a previously prepared scale and determines the approximate level of reading that the patient has demonstrated. In a clinic or hospital situation this test could be administered while the patient is in the waiting room or completing other medical forms. The score sheet would then be placed in the patient’s record and would be seen only by the authorized personnel with access to patients’ medical folders. Murphy et al. (1993) reported no complaints from clients after using the REALM on 1,000 patients a year at a preventive health clinic at Louisiana State University in Shreveport.

Harris (1989) questioned 160 Adult Basic Education students and found that the average student in the group had completed the ninth grade. Riche et al. (1995) reported that only 40% of the people in the United States of America over 65 years of
age have a high school education. The latest United States Statistical Report (1993) lists the number of persons in 1993 as having completed four years of high school or more as 80% of the total population. The same report shows a steady increase in the over 65 age group.

Assessing Readability of Health Material

All of the statistics and definitions point to the fact that the ability to read is a very personal, individualistic matter. Health workers cannot assume that any person is literate and capable of reading health literature. Poor readers are found in all ages and income groups. Some poor readers are very adept at concealing what may be perceived as a very embarrassing handicap. The health worker should rely on observations and interview techniques to determine the reading level of the patient if no other information is available. Printed material should be used that may require the better reader to read down since the poorer reader cannot be expected to read at a higher level (Robinson, 1988).

Readability formulas were developed to assist teachers in providing students with appropriate printed materials (Fry, 1989). The use of the formulas continued in the selection of textbooks. Jones (1993) used six readability formulas in an analysis of textbooks for special needs students and found the formulas valuable in determining the ease of reading of the texts. Readability formulas are now being used to determine the liability of written information (health included) to various clients (Fry, 1989). Dispensers of printed material have a legal obligation to supply well written, easily followed information to clients.
One of the most popular ways to determine readability of material was published by Rudolf Flesch in 1949. The Flesch formula consisted of counting syllables and lines per 100 words, on a reading scale that registers from easy to very difficult. This formula can be applied quickly to health literature. For longer selections, more groups of 100 words should be used and averaged.

Robinson (1988) recommended the use of the Flesch formula for shorter materials and for determining readability down to the fifth grade level. For longer selections, Robinson (1988) recommended the Fry formula. The Fry formula requires three, 100-word selections and is used to determine readability down to the first grade level. When using the Fry formula, proper nouns are included in the word count and the syllables in numbers and initials are counted in the syllable count (Custer, McKean, Meyers, Murphy, Olesen & Parker, 1990). In this test, the average number of sentences and the average number of syllables in the words are plotted on a Fry’s graph. The location of the information on the graph indicates the grade level of the material being tested.

Dixon (1990) used the Flesch formula and the Forecast formula to determine the readability of written hospital information. The Forecast formula was “designed specifically to assess technical writing” (Dixon, 1990, p. 280). Unlike the other formulas, the number of one syllable words in a selection containing 150 words is counted and then converted to school grade levels.

The Flesch-Kincaid Index is required to be used by providers of printed information distributed by the Internal Revenue Service and the Social Security
Administration (Johnson, Saxon, Tyler, Matthis, Adams & Khalil, 1994). The formula consists of the addition of the average sentence length and the number of syllables per word less 15.59. The number given is the reading grade level. The Flesch formula alone does not indicate grade levels, only descriptive terms such as difficult or easy. Thus, an adjustment is made to assist the using agencies in selecting materials to distribute (Johnson et al., 1994).

The SMOG Readability Formula was used to demonstrate "effective and ineffective written communication" (Schinnow, 1990, p. 60). Using the formula, briefly described for short selections, entails counting the polysyllabic words in a 30-sentence paragraph, multiplying by the number of less than 30-sentence paragraphs, and adding the number to the total polysyllabic words. The number three is added to the square root of the sum obtained. The SMOG test also has a conversion table that allows quicker computations. The number of polysyllabic words in the 30 sentences is plotted on a grade level grid.

The Dale-Chall Formula utilizes a list of 3,000 words that are known to the average reader (Dixon, 1990). Reading material is compared to the list of words and a percentage using the number of unknown words is obtained. In some of the hospital material tested by Dixon (1990) one-third of the words would be unknown to the average reader. The use of this formula is important as word and sentence length alone should not be the only elements considered in finding clear printed material.
Reader Comprehension

Rice (1990) described reading comprehension as the process in which the printed text is assimilated into the reader's thinking. With assimilation health behavior and attitudes may be changed. Comprehension is more difficult if the reader finds the material too long, too detailed, or if it contains unfamiliar words.

A study by Botta (1993) compared the reading comprehension of readers of stories in two publications, *U. S. A. Today* and the *New York Times*. The stories were studied with the use of seven readability formulas and were found to be written at the college level of difficulty. The readers of the *New York Times* comprehended more than the readers of *U. S. A. Today* in spite of the fact that *U. S. A. Today* left out background information and used shorter sentences and articles. The researchers concluded that shorter sentences did not necessarily lead to better reader comprehension.

Other factors that contribute to the readability and thus the comprehension of printed materials are the selection of print no smaller than ten font and the use of paper that does not shine and is white. Frequently health literature is printed in all capital letters. Print in all capitals has been shown to make reading more difficult (Rice, 1990). To obtain patient compliance in following recommended medical regimes, the patient must be able to not only read printed material but also to comprehend the material. Comprehension of printed material is enhanced with interaction between the reader and the material (Riche et al., 1988). Interaction provides a way for ideas of confusion or doubt to be expressed and should be encouraged. An example of
interaction between readers and text was utilized in a workbook produced by HIV/AIDS health providers. Readers were encouraged to fill-in blanks related to the subject of the workbook (Hobbs, 1994). Students required to use information from the printed material were found to be more likely to comprehend the material (Dupuis, 1993).

Comprehension encompasses the patient’s knowledge of the subject, the degree of believability of the printed material, and the amount of interest the patient has in the information. To stimulate interest, health workers should be aware of many aspects of the population being provided information (Johnson, Saxon, Tyler, Matthis, Adams & Khalil, 1994). An awareness of the cultures being served in an area can be gained by an observation of clients and a caring, interested attitude that encourages the exchange of information. The health worker interacts with the patient by reading the material with or to the patient and by discussing the material with the patient to determine if comprehension has occurred.

In selecting textbooks it was found that the more suited reading material is to the varied abilities and needs of the students, “the more likely the students are to retain concepts necessary for classroom use and transfer this knowledge to the workplace and daily living skills” (Jones, 1993, p. 1). Cultural attitudes and beliefs need to be addressed to make printed information comprehensible to readers (Delgado & Rodriguez, 1990). Preventive materials targeting various groups, i.e. the Hispanic community, should not expound ideas contrary to the accepted beliefs of that group.
Flesch’s Human Interest Score was used to determine the interest level of college textbooks (O’Hear, Ramsey & Long, 1992). The results obtained from the Human Interest Score were compared to students’ replies in a survey that questioned the students’ level of interest. Many of the students did not agree with the Flesch findings. The researchers concluded that the textbooks were readable but found some uninteresting because the subjects, about service courses, were thought to be uninteresting. Health educators may find that patients are not receptive to literature simply because previous attempts to read it have been boring or too difficult.

Summary

The literature important to this project was presented in Chapter Two. Specifically, readability formulas were described and discussed as tools to use in determining the level of difficulty of printed material.
CHAPTER THREE

Methodology

Introduction

Chapter Three details the steps used in developing the project. Specifically, the populations served is discussed. Next, the handbook development process including the resources used and content validation process is presented. Lastly, the handbook design is outlined. The Chapter concludes with a summary.

Population Served

The handbook is intended for use by the health workers in Kern County, California working with patients and care givers from diverse cultures. Ultimately, the thousands of clients visited in homes or in clinics will benefit as implementation of the strategies outlined in this project result in appropriate health material dispersion.

Handbook Development

The next section of the project provides an overview of the handbook development process. Specifically, the resources employed in the handbook development process and the handbook design are reviewed.

Handbook Resources and Content Validation. This section describes the resources used to develop the handbook and the content validation process. The content for this handbook has been extracted from existing material. Specifically, the book How to Test Readability by Flesch (1949). The content and strategies outlined in this handbook were validated by Kern County, California Health Department personnel.
Handbook Design. The handbook was developed for employees responsible for instructing patients and caregivers in health matters. There are four sections in this handbook: (1) Introduction, (2) Evaluating Reading Material, (3) Evaluating Reader Ability, and (4) Evaluation of Material Available to Kern County, California Health Department.

Section One Introduction presents an overall view of Kern County, California. Statistics and geographical descriptions are used to picture the vast area covered by the county and the diverse cultures of the people who inhabit the area. Statistics are also cited to demonstrate the educational and economical levels of Kern County, California population. The populousness of the Eastern section of Kern County is specifically noted since it is the area serviced by the Mojave Health Unit, the site used in this project. Section Two Evaluating Printed Health Literature is a description of the most easily applied tests of reading. The Flesch Readability Test is emphasized. Other reading formulas are described briefly. Section Three Evaluating Reader Ability includes the REALM test. The pros and cons of its use are discussed. Other methods of determining patients’ reading ability recommended by health educators are listed. Section Four Analysis of Health Material Available to Kern County is a summary of the levels of reading material determined by using readability formulas.

Summary

The steps used in the development of this project were outlined. Information given in each section was described. The population served was identified. Existing material used in compiling the handbook was named.
CHAPTER FOUR

Conclusions and Recommendations

Introduction

Included in Chapter Four is a presentation of the conclusions gleaned as a result of completing this project. Further, the recommendations extracted from this project are presented. Lastly, the Chapter concludes with a summary.

Conclusions

The conclusions extracted from this project follow.

1. It is concluded that addressing the reading needs of patients and care givers is of extreme importance to the mental and physical health of Kern County inhabitants.

2. It is concluded that health workers are a vital link in the education of patients and care givers.

3. It is concluded that interviewers have little or no information about patients’ reading ability.

4. It is concluded that the use of REALM may be found offensive by some clients.

5. It is concluded that health workers are unaware of the disparity between patients’ reading ability and the reading difficulty of health material.

Recommendations

The recommendations resulting from this project follow.

1. It is recommended that Kern County health workers use this handbook as a guide in determining appropriateness of health literature for patients or care givers.
2. It is recommended that the Kern County Health Department provide employees with this information.

3. It is recommended that Kern County, California Health Department provide employees with the time to implement this information.

4. It is recommended that the REALM test be utilized in a clinic and that the findings be made available to determine the worthiness of using the test in Kern County, California Health Department.

Summary

Chapter Four reviewed the conclusions derived from the project. Lastly, the recommendations extracted from this project were presented.
APPENDIX

A HANDBOOK FOR HEALTH WORKERS TO USE IN EVALUATING HEALTH LITERATURE
INTRODUCTION

Health workers routinely dispense printed materials to patients during clinic or home visits. Health literature is a powerful tool if the literature is read and comprehended by the recipient. When patients fail to change life styles or fail to follow instructions for preparation for procedures, the client’s noncompliance may be attributed to a lack of interest or an uncooperative attitude.

The premise of this handbook is that patients are inherently interested in their health and that health workers are dedicated to assisting them in reaching optimum well-being. This handbook was developed to assist health workers in gaining patient compliance by dispensing reading material appropriate for each patient’s reading ability. Subjects covered in the handbook include: the target group; assessing patients’ reading ability; determining printed material readability; and tables summarizing an evaluation of selected health literature.
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KERN COUNTY POPULATION
KERN COUNTY POPULATION

Reading comprehension is a process in which printed material is assimilated into the reader’s thinking. With assimilation, attitudes and behavior patterns may be altered. Some factors that influence the assimilation process are the reading material itself, i.e., the length of the sentences, the use of unfamiliar words, the interest the reader has for the material, and the size and type of print. The most overwhelming influencing factors are the abilities and attitude of the reader.

It behooves health workers to be aware of the cultural diversity of their clients. Language spoken at home is an indication of cultural differences. Most Kern County workers know that a large number of persons in the county, over 24,000, ages 18 to 65, speak Spanish and little or no English. Many, however, may not be aware of other potential clients, 14,000, ages 5 and over, who speak any one of 22 other languages in their homes in Kern County. The 1990 United States Census reveals that out of a total population of 543,477 in Kern County, 52,378 people over the age of 18 have completed less than the ninth grade of school. Another 72,287 people over the age of 18, in the county, attended school through the ninth to twelfth grades and have no high school diploma. Surprisingly, only 6,062 people in the county were reported to live below the poverty line. With two or more incomes in a home, industrious people survive. These statistics demonstrate the need for health workers to provide patients with reading materials that do not offend patients’ cultural beliefs and that are appropriate for patients’ reading ability.
DEFINITIONS OF TERMS

Care giver - the person in the home who is most intimately concerned with patient care.

Grade level - completed level of education, also used to describe needed level of education to comprehend a selection of literature.

Health worker, health provider - refers to that person actively engaged in instructing a patient or care-giver in health matters.

Health literature, health material - Refers to printed material describing medical procedures and/or instruction. Pamphlets are the most used type in this handbook.

Literacy - The ability to read.

Rapid Estimate of Adult Literacy in Medicine - A test consisting of three columns of increasingly difficult words that patients are asked to read.

Readability Formulas - Methods of determining the degree of difficulty of printed information. Each formula defines the number of syllables, words and lines to be counted in a specified selection.

Noncompliance - The failure of patients to follow the medical and dietary regimens prescribed by physicians.
ASSESSING PATIENTS' READING ABILITY
ASSESSING PATIENTS' READING ABILITY

Health workers have little or no information about patients' reading ability. Occasionally the educational grade level completed is noted on a patient's medical record. This is a good clue, but grade level completed has been demonstrated to be a poor indicator of reading ability. Studies have shown that reading ability is two to five grades below the grade completed.

A test of reading skills that has been used by health personnel is the Rapid Estimate of Adult Literacy in Medicine (REALM). This is a simple test that is easy to administer and can be checked quickly. The patient, or care-giver, is shown a list of increasingly difficult lay medical words. The interviewer asks the patient to identify the words and compares the number of correct words to a previously prepared scale and determines the approximate level of reading that the patient has demonstrated. The score sheet is then placed in the patient's record and is seen only by authorized personnel with access to patient's records. The test only requires one or two minutes to administer and score.

Developers of the REALM conducted field tests in public health clinics and primary care facilities in five states. Patients signed consent forms before the test was administered. A few declined, but the overall response was positive. While correctly pronouncing words does not insure that comprehension will occur, the inability to pronounce words can be interpreted as the inability to comprehend the words.

The REALM has been placed in the public domain. The address for ordering a kit is on the address sheet. If you would like to use it in your clinic, get permission
from your supervisor first. The completed test and a signed permission slip are to be placed in the patient's confidential permanent record. Remember, patients are embarrassed if they are poor readers. You want to be nonjudgmental and gain their cooperation.
Rapid Estimate of Adult Literacy in Medicine  
(REALM)©  
Terry Davis, Ph.D., Michael Crouch, MD, Sandy Long, Ph. D.  

<table>
<thead>
<tr>
<th>Patient Name/ Date</th>
<th>Date of Birth</th>
<th>Reading Level</th>
<th>Grade Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>List 1</td>
<td>List 2</td>
<td>List 3</td>
<td></td>
</tr>
</tbody>
</table>

fat       fatigue       allergic  
flu       pelvic        menstrual  
pill      jaundice      testicle  
dose      infection     colitis  
eye       exercise       emergency  
stress    behavior      medication  
smear     prescription  occupation  
nerves    notify        sexually  
germs      gallbladder  alcoholism  
meals     calories      irritation  
disease   depression    constipation  
cancer    miscarriage  gonorrhea  
caffeine  pregnancy    inflammatory  
attack    arthritis     diabetes  
kidney    nutrition    hepatitis  
hormones  menopause    antibiotics  
herpes    appendix      diagnosis  
seizure   abnormal      potassium  
bowel     syphilis      anemia  
asthma    hemorrhoids  obesity  
rectal    nausea        osteoporosis  
incest    directed      impetigo  

SCORE  
List 1  
List 2  
List 3  
Raw Score  

---

ASSESSING READABILITY OF HEALTH MATERIAL
ASSESSING READABILITY OF HEALTH MATERIALS

Readability formulas were developed to assist teachers in providing appropriate printed materials to students. Readability formulas are methods of determining the degree of difficulty of printed information. Each formula defines the number of syllables and the number of words in a given number of sentences. Some frequently used formulas are:

The Flesch Formula- Used for short materials. The level of difficulty scale measures from very difficult to easy. The level of interest scale measures from very interesting to uninteresting.

The Fry Formula- Used for longer pieces of material. Measures down to the first grade level by use of Fry’s graph.

The Forecast Formula- Used to assess technical writings like those in hospital settings.

The Flesch-Kincaid Index- The Flesch Formula does not give grade levels. Combined with Kincaid the levels of difficulty are converted to grade levels.

The SMOG Readability Formula- This formula is used for short selections. It entails counting the polysyllabic words in thirty sentence paragraphs, multiplying by the number of less than thirty sentence paragraphs, and adding the number to the total polysyllabic words. The square root is then found and the number three is added. The SMOG Formula requires more computations than the others.

The Dale-Chall Formula- Utilizes a list of 3,000 words that are known to the average reader. Reading material is compared to the list of words and a percentage
using the number of unknown words is obtained. One researcher used this formula in testing hospital material and found that one-third of the words would be unknown to the average reader.
THE FLESCH READABILITY FORMULA AND HUMAN INTEREST SCORE

The Flesch Readability Formula

The simplest and most frequently used formula for determining the readability of printed material is the Flesch Readability Formula. The Flesch formula requires counting the number of syllables in a 100-word sample and averaging the number of words in each sentence in the 100-word sample. A line connecting the two numbers is drawn from the number of syllables list to the average number of words in a sentence list. Where they cross on the difficulty list defines the difficulty of the printed material. A copy of the Flesch Readability Formula is shown on page 33. Difficulty is measured from easy to very difficult with corresponding grade levels applied ranging from fifth grade to college graduate level. The Flesch Readability Formula is used for short materials. This formula was used in this project because most health literature for patients is in pamphlets. For longer materials two or three 100-word passages should be selected and averaged.
How Easy?

HOW TO USE THIS CHART
Take a pencil or ruler and connect your "Words per Sentence" figure (left) with your "Syllables per 100 Words" figure (right). The intersection of the pencil or ruler with the center line shows your "Reading Ease" score.

READING EASE SCORE

100-100

Very Easy

Very Easy

95-95

90-90

Easy

Easy

85-85

80-80

Fairly Easy

Fairly Easy

75-75

70-70

Standard

Standard

65-65

60-60

Fairly Difficult

Fairly Difficult

55-55

50-50

Difficult

Difficult

45-45

40-40

Very Difficult

Very Difficult

35-35

30-30

25-25

20-20

15-15

10-10

5-5

0-0

SYLLABLES PER 100 WORDS

120-120

115-115

110-110

105-105

100-100

95-95

90-90

85-85

80-80

75-75

70-70

65-65

60-60

55-55

50-50

45-45

40-40

35-35

30-30

25-25

20-20

15-15

10-10

5-5

0-0

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The Flesch Human Interest Score

Flesch emphasized the need to personalize literature to make it interesting to the reader. The procedure for The Human Interest Score closely resembles the Readability Formula in that you count out a 100-word selection from a printed material. Instead of counting syllables, you should count the number of personal words in the selection. Then, you count the number of sentences containing personal words and draw a line connecting the percent of personal words and the percent of personal sentences. The line at which it crosses on the score chart is used as the human interest score. An easier method, the one used in this project, is to multiply the number of personal words in the 100 word selection by 3.635 and add it to the number of personal sentences multiplied by .314. The number obtained is the human interest score. Scores of “dull” indicate that the material is presented in a nonpersonal manner. Studies show that pamphlets like You and Your Baby, keep the attention and interest of readers better than information presented in a nonpersonal manner.
**How Interesting?**

**HOW TO USE THIS CHART**
Take a pencil or ruler and connect your "Personal Words" figure (left) with your "Personal Sentences" figure (right). The intersection of the pencil or ruler with the center line shows your "Human Interest" score.

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READER COMPREHENSION
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Matching reader ability and readability of material does not ensure that patients will follow instructions or change life styles. Reader comprehension takes place only if information from the printed page is assimilated in the reader's mind. Only then can changes be observed.

Studies of readers' comprehension of materials have shown that short sentences do not make information easier to assimilate, nor do bare bones types of writing that give very little background information. Comprehension requires the readers' use of previous knowledge of the subject, the believability of the material and the interest the reader has in the subject. To facilitate patients' comprehension the health worker must know something about the background of the recipient. Interested, caring, dialog can help in determining cultural views about health matters. Listening and observing are always good ways to clarify others feelings and questions.

Health workers assume that patients are interested in written material concerning the disease or condition relative to the patients' situation. In Flesch's interest scoring system, the number of personal words and personal sentences are counted to determine the interest score ranging from dramatic to dull. Health workers need to personalize comments and select health material that addresses patients on a personal basis. Other factors that detract from the readability of printed health materials are selections in all capital letters and selections in italics. These as well as print smaller than 10 points have been found to be difficult for all readers.
EVALUATION OF HEALTH LITERATURE

FROM VARIOUS SOURCES
Materials Available From Center for Substance Abuse

Actions For Individuals

Grade Level: College
Interest Level: Dull

LSD (Lysergic Acid Diethlamine)

Grade Level: College
Interest Level: Dull

Cigarette Smoking

Grade Level: College
Interest Level: Dull

Anabolic Steroids

Grade Level: College
Interest Level: Dull

Inhalants

Grade Level: College Graduate
Interest Level: Dull
**Materials Available From Center for Substance Abuse**

**Ibogaine**
Grade Level: College Graduate
Interest Level: Dull

**Women and Drug Abuse**
Grade Level: 10-12
Interest Level: Dull

**Tips For Teens:**

**About AIDS**
Grade Level: College
Interest Level: Dull

**About Alcohol**
Grade Level: 10-12
Interest Level: Very Interesting

**About Inhalants**
Grade Level: College
Interest Level: Dull
Materials Available From Center for Substance Abuse

Alcohol and Other Drugs and Suicide
Grade Level: College,
Interest Level: Dull

Alcohol, Tobacco and Other Drugs in the Workplace
Grade Level: 10-12
Interest Level: Dull

Quick List: Ten Steps to Drug Freedom
Grade Level: College
Interest Level: Dull

Actions for Hispanics/Latinos
Grade Level: College
Interest Level: Dull

Heroin
Grade Level: College Graduate
Interest Level: Dull
Materials Available From Center for Substance Abuse

About Marijuana
Grade Level: College
Interest Level: Dull

About Smoking
Grade Level: 10-12
Interest Level: Mildly Interesting

About Steroids
Grade Level: College
Interest Level: Dull

Actions for Health Care Professionals
Grade Level: College
Interest Level: Dull

Actions for Older Americans
Grade Level: 8-9
Interest Level: Dull
Materials Available From Center for Substance Abuse

Alcohol, Tobacco, and Other Drugs and Women’s Health

Grade Level: College
Interest Level: Dull
Small Print

Alcohol, Tobacco, and Other Drugs and Pregnancy and Parenthood

Grade Level: 10-12
Interest Level: Dull

Sex Under the Influence of Alcohol and Other Drugs

Grade Level: College
Interest Level: Dull

Drug Abuse and AIDS

Grade Level: College
Interest Level: Dull

Designer Drugs

Grade Level: College Graduate, Interest Level: Dull
Materials Available From Center for Substance Abuse

Actions for Individuals
Grade Level: College
Interest Level: Dull

Turning Awareness Into Action
Grade Level: 10-12
Interest Level: Dull
Target Group: Community Workers

Actions for Family Members of People With Disabilities
Grade Level: 8.3
Interest Level: Mildly Interesting
Target Group: Hispanics

PCP
Grade Level: 10-12
Interest Level: Dull
Materials Available From Center for Substance Abuse

Making the Link Series:

Domestic Violence and Alcohol and Other Drugs
Grade Level: College Graduate
Interest Level: Dull

Violence and Crime and Alcohol and Other Drugs
Grade Level: College
Interest Level: Dull

Alcohol, Tobacco and Other Drugs and the College Experience
Grade Level: College
Interest Level: Dull

Impaired Driving, Injury and Trauma and Alcohol and Other Drugs
Grade Level: College
Interest Level: Dull
Materials Available From Kern County Health Department

Introduction to Substance Abuse
Grade Level: 10-12
Interest Level: Interesting

The Fetal Alcohol Syndrome
Grade Level: College
Interest Level: Dull

What Parents Should Know About SIDS
Grade Level: 10-12
Interest Level: Dull

Sexually Transmitted Diseases
Grade Level: College
Interest Level: Dull

Some Questions and Answers About HPV
Grade Level: 10-12
Interest Level: Dull
Materials Available From Kern County Health Department

Crab Lice
Grade Level: 7
Interest Level: Dull

Erythema Infectiosum
Grade Level: College
Interest Level: Dull

Facts About COCCI
Grade Level: 5
Interest Level: Interesting

Facts About Head Lice
Grade Level: 8-9
Interest Level: Dull

Facts About Lime Disease
Grade Level: 10-12
Interest Level: Dull
Materials Available From Kern County Health Department

Communicable Disease

Giardiasis

Grade Level: 10-12
Interest Level: Dull
Yellow Background

Hand, Foot and Mouth Disease

Grade Level: 6
Interest Level: Dull

Handling Food

Grade Level: 6
Interest Level: Dull
Background Green

Hansen’s Disease

Grade Level: 10-12
Interest Level: Dull
Materials Available From Available From Kern County

**Hepatitis A**

Grade Level: College

Interest Level: Dull

Good Pictures and Sub-Titles

**What You Should Know About Hepatitis A**

Grade Level: 7

Interest Level: Mildly Interesting

**Hepatitis B**

Grade Level: 8.9

Interest Level: Dull

Green Background

**Rubella**

Grade Level: 8.9

Interest Level: Dull
Materials Available From Kern County Health Department

Communicable Disease:

Herpes
Grade Level: 10-12
Interest Level: Dull

Herpes-Questions
Grade Level: 8.9
Interest Level: Dull

Letter to TB Associate or Contact
Grade Level: 7.5
Interest Level: Interesting

Psittacosis
Grade Level: 7.5
Interest Level: Dull

Shigellosis
Grade Level: 8.9
Interest Level: Dull
Materials Available From Kern County Health Department

Communicable Disease:

AIDS, What Every Woman Should Know
Grade Level: 5
Interest Level: Mildly Interesting

Acquired Immune Deficiency Syndrome
Grade Level: 5
Interest Level: Dull

Condoms and STD
Grade Level: 6
Interest Level: Dull

Nearly Every Woman Gets It
Grade Level: 7
Interest Level: Mildly Interesting
Materials Available From Kern County Health Department

Scabies
Grade Level: 5
Interest Level: Dull

Streptococcal Infections
Grade Level: 10-12
Interest Level: Dull

Immunizations:

Polio
Grade Level: 7
Interest Level: Dull

Diphtheria, Tetanus and Pertussis
Grade Level: 8-9
Interest Level: Dull

Haemophilus Influenza
Grade Level: College
Interest Level: Dull
Materials Available From Kern County Health Department

NGU
Grade Level: College
Interest Level: Dull

Plain Talk About Venereal Disease
Grade Level: 10-12
Interest Level: Dull
Small Print, Blue Paper

Hepatitis B Vaccine
Grade Level: 7
Interest Level: Dull

Measles, Mumps and Rubella
Grade Level: 7
Interest Level: Dull
Materials Available From Kern County Health Department

STD Facts

Grade Level: 7
Interest Level: Interesting

VD What Is It?

Grade Level: College
Interest Level: Dull

Prenatal and Family Planning:

Am I Parent Material?

Grade Level: 6
Interest Level: Very Interesting
Small Print

Breast Self-Examination

Grade Level: 7
Interest Level: Dull
Materials Available From Kern County Health Department

CA Alpha Fetoprotein Screening
Grade Level: 7
Interest Level: Dull
Attractive Booklet

Fetal Alcohol Effects
Grade Level: 7
Interest Level: Dull

Important Information About Toxic Shock Syndrome
Grade Level: 7
Interest Level: Interesting

Stop Smoking When You Go On the Pill
Grade Level: College
Interest Level: Mildly Interesting
Materials Available From Kern County Health Department

Prenatal and Family Planning:

Understanding Vasectomy

Grade Level: 8.9
Interest Level: Very Interesting

Will My Drinking Hurt My Baby?

Grade Level: 8
Interest Level: Mildly Interesting
Small Print

Your Guide to a Healthy Pregnancy

Grade Level: 7
Interest Level: Interesting
Attractive

Ways to Chart Your Fertility Pattern

Grade Level: 8.9
Interest Level: Dull
Small Print, Clear Charts
Materials Available From Kern County Health Department

Ways to Chart Your Fertility Pattern #2
Grade Level: 7.5
Interest Level: Dull

The IUD
Grade Level: 5-6
Interest Level: Dull

How to Examine Your Breasts
Grade Level: 7.5
Human Interest Level: Dull

When You Have Made Your Decision
Grade Level: 8.9
Interest Level: Mildly Interesting
Materials Available From Kern County Health Department

Buckling Up For Two
Grade Level: 5
Interest Level: Mildly Interesting

Keep Your Baby Smoke Free
Grade Level: 10-12
Interest Level: Dull

Pregnant?
Grade Level: 6
Interest Level: Interesting

Stop Smoking
Grade Level: 6
Interest Level: Interesting

The IUD
Grade Level: 5-6
Interest Level: Dull
Materials Available From Kern County Health Department

The Methods of Birth Control

Grade Level: 8.9
Interest Level: Dull

Very Small Print

Understanding Sterilization For A Woman

Grade Level: 8.9
Interest Level: Mildly Interesting

Be Lead Smart

Grade Level: 6
Interest Level: Mildly Interesting
Large Print

Breast Feeding

Grade Level: 5
Interest Level: Dull
Materials Available From Kern County Health Department

Factors Which Influence Health of the Fetus
Grade Level: College
Interest Level: Dull

Pregnancy, Nutrition and You
Grade Level: 8.9
Interest Level: Interesting

Relief From Common Problems
Grade Level: 7
Interest Level: Mildly Interesting

Words About Drinking While Pregnant
Grade Level: 5
Interest Level: Very Interesting

General:

About High Blood Pressure
Grade Level: 10-12
Interest Level: Dull
Materials Available From Kern County Health Department

Amblyopia
Grade Level: 8.9
Interest Level: Dull

Child Health Check-Ups
Grade Level: 6
Interest Level: Dull

Down Syndrome
Grade Level: 5
Interest Level: Dull

Eating To Lower Your Blood Pressure
Grade Level: 8.
Interest Level: Dull
Materials Available From Kern County Health Department

General:

**Hemophilia Council of CA**

Grade Level: College

Interest Level: Dull

**Letter To Alien Or Refugee**

Grade Level: 7.5

Interest Level: Mildly Interesting

**Medi-Cal Information**

Grade Level: 10-12

Interest Level: Dull

**Pep Up your Life**

Grade Level: 10-12

Interest Level: Dull

**Sickle Cell Anemia**

Grade Level: 8.9

Interest Level: Dull
Materials Available From Kern County Health Department

So You Have High Cholesterol
Grade Level: 5
Interest Level: Dull
Bright, Attractive

This Is You
Grade Level: 8
Interest Level: Dull

Why Risk Your Teeth
Grade Level: 10-12
Interest Level: Dull

Wellness Walking
Grade Level: 7
Interest Level: Mildly Interesting
Materials Available From Kern County Health Department

General:

Cal City Clinic
Grade Level: College
Interest Level: Dull

Facts About Blood Cholesterol
Grade Level: College
Interest Level: Dull

Red Print

Hearing Conservation
Grade Level: 8.9
Interest Level: Dull

High Blood Cholesterol
Grade Level: 7.5
Interest Level: Interesting

Melanoma
Grade Level: 10-12, Interest Level: Dull
Materials Available From Kern County Health Department

Noise and You
Grade Level: 7
Interest Level: Dull

Pain Free Payment Plan
Grade Level: 7
Interest Level: Interesting

You and Your Blood Pressure
Grade Level: 6-7
Interest Level: Dull

What You Should Know About Heart Attacks
Grade Level: 7
Interest Level: Dull

First Step In Eating Right
Grade Level: 6-7,
Interest Level: Dull
Materials Available From Administration on Aging

A Profile of Older Americans 1995
Grade Level: College
Interest Level: Dull

A Profile of Older Americans 1996
Grade Level: College
Interest Level: Dull

Healthy Aging-What Is It?
Grade Level: 7.5
Interest Level: Dull

Hospice Benefits
Grade Level: 10-12
Interest Level: Dull

Medicare-M. C. P.
Grade Level: College
Interest Level: Very Interesting
Materials Available From Administration on Aging

Prescription Medicines and You

Grade Level: 6
Interest Level: Very Interesting

Searching For Information About Services For Seniors?

Grade Level: 10-12
Interest Level: Mildly Interesting

Social Security-An Employer’s Investment

Grade Level: College
Interest Level: Mildly Interesting

Social Security-Understanding Benefits

Grade Level: College
Interest Level: Mildly Interesting
Materials Available From Administration On Aging

Association of Aging Update
Grade Level: 8.9
Interest Level: Dull
Small Print

Guide To Choosing A Nursing Home
Grade Level: 8.9
Interest Level: Mildly Interesting

Healthy Living-It’s Never Too Late
Grade Level: 10-12
Interest Level: Mildly Interesting

Long-Term Care Insurance
Grade Level: 7
Interest Level: Mildly Interesting

Medicare Beneficiary
Grade Level: College
Interest Level: Very Interesting
Materials Available From Administration on Aging

Minority Aging
Grade Level: 10-12
Human Interest Level: Dull

Parenting Grandchildren
Grade Level: 8.9
Interest Level: Dull
Yellow Background

Spread The Word-Eldercare
Grade Level: College
Interest Level: Mildly Interesting

The Impact of Domestic Violence
Grade Level: 8.9
Target: Lawyers
Materials Available From U. S. Public Health Service

Adults Need Tetanus Shots Too
Grade Level: 10-12
Interest Level: Dull

An FDA Guide To Choosing Medical Treatment
Grade Level: 8.9
Interest Level: Interesting

Can Your Kitchen Pass The Food Safety Test?
Grade Level: 5
Interest Level: Interesting

Eating For A Healthy Heart
Grade Level: 5
Interest Level: Interesting

Healthful Snacks
Grade Level: 5

Mercury In Fish
Grade Level: 7, Interest Level: Dull
Materials Available From U. S. Public Health Service

New Hope For People With Sickle Cell Anemia

Grade Level: 7.5
Interest Level: Dull

Progress In Blood Supply Safety

Grade Level: 10-12
Interest Level: Dull

Taking The Fat Out of Food

Grade Level: 10-12
Interest Level: Dull

Use Medicine Safely

Grade Level: 6
Interest Level: Dramatic
Material Available From American Heart Association

An Eating Plan For Healthy Americans
Grade Level: 5
Interest Level: Mildly Interesting

Exercise and Your Heart
Grade Level: College
Interest Level: Mildly Interesting
Good Illustrations

Heart and Stroke Facts
Grade Level: College
Interest Level: Dull

Heart and Stroke Facts, Supplement
Grade Level: College
Interest Level: Dull
Materials Available From Health Net

Living Healthy With Diabetes
Grade Level: 5
Interest Level: Dull

Managing Your Cholesterol
Grade Level: 8.9
Interest Level: Mildly Interesting

Save Food Dollars and Help Your Heart
Grade Level: 7.5
Interest Level: Dull

Six Tips To Lower Your Cholesterol
Grade Level: College
Interest Level: Interesting
Material Available From March of Dimes

About The March Of Dimes

Grade Level: 8.9
Interest Level: Dull

All in italics

Birth Defects

Grade Level: 7.5
Interest Level: Interesting

Genetic Counseling

Grade Level: 8.9
Interest Level: Very Interesting
SOURCES OF HEALTH LITERATURE

American Heart Association
National Center
7272 Greenville Avenue
Dallas, TX 75231-4596

Center for Substance Abuse Prevention
CSAP's National Clearinghouse
7079 Oakland Mills Road
Columbia, MD 21046

Health Net
High Desert Medical Group
44424 N 10th St. West
Lancaster, CA 93534

Kern County Health Department
1700 Flower St.
Mojave, CA 93501

March of Dimes Birth Defects Foundation
1275 Mamaroneck Avenue
White Plains, New York 10605

NHLBI Information Center
P. O. Box 30105
Bethesda, MD 20824-0105

School of Medicine in Shreveport
Louisiana State University Medical Center
P. O. Box 33932
Shreveport, LA 71130-3932

U. S. Department of Health and Human Services
CDC
Atlanta, GA 30333

U. S. Department of Health and Human Services
National Center on Child Abuse and Neglect
P. O. Box 1182
Washington, D. C. 20013
REFERENCES


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