



A Descriptive Study Evaluating the Readability of Consumer Medication

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Abstract

Introduction: One-third of American adults have basic health literacy and will need simple and plain consumer medication information to help them take medications appropriately. It is recommended for patient education materials to be written at the sixth-grade level, especially for individuals with limited health literacy. Unfortunately, consumer medication information from different resources can be written at different reading levels and may be written at levels above the recommended sixth-grade level. This study measured the readability of medication information from tertiary resources, private sectors, and consumer health websites.

Materials and Method: The SMOG readability formula was used to assess the readability of different samples of consumer medication information.

Results: Readability was assessed for a total of 56 individual leaflets or sets of medication information. Overall, the mean SMOG grade for all consumer medication information evaluated in this study was the 12th grade (range from grade 6 – 17). The most frequent grade calculated was the 12th grade.

Discussion: Results from our study demonstrate that most available consumer medication information from tertiary resources, private sectors, and consumer health websites are written well above the recommended reading level.

Conclusion: Future efforts should be taken to improve the readability of consumer medication information.

Keywords: Patient Education; Health Communication; Consumer Health; Health Literacy

Abbreviations: FDA: Food and Drug Administration; SMOG: Simple Measure of Gobbledygook

Introduction

The Institute of Medicine defines health literacy as, “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.” [1] Having proficient health literacy and being able to understand basic health information is very important for many individuals and can play a key role in encouraging patients to take medications appropriately. Unfortunately, 36% of American adults have basic and below basic

health literacy and thus will need simple and plain medication instructions and information to assist them [2].

Prescription drugs generally have instruction labels and accompanying consumer medication information for patients. Patients can reference this consumer medication information for additional instructions and information including side effects, medication storage, warnings, and more. They are intended to provide supplemental medication education for patients. Normally,

each retail pharmacy sources and provides its own medication information for its patients. However, health care providers including nurses, pharmacists, and physicians can also print out medication information for patients using tertiary resources like Lexicomp® and Clinical Pharmacology®.

Consumer medication information is also readily available to individuals through the internet. With increasing availability and usage of smartphones, tablets, and computers, access to medication related information is almost instant, and patients can research their own medication related information. There are numerous consumer health websites that provide consumer medication information, including WebMD and Mayo Clinic.

In 1996, the Food and Drug Administration (FDA) provided guidance on useful written consumer medication information and proposed specific criteria for useful consumer medication information. These criteria included: scientifically accurate, unbiased in content and tone, sufficiently specific and comprehensive, presented in an understandable and legible format that is readily comprehensible to consumers, timely and up-to-date, and useful, that is enables the consumer to use the medicine properly and appropriately, receive the maximum benefit, and avoid harm. Following this, a study released by the National Association of Boards of Pharmacy in 2002 found that although 89% of patients did receive consumer medication information, only 50% of the information was useful when evaluated against the FDA criteria [3]. With the usefulness of consumer medication information reported as low, it is important to consider the readability of the information. Although prior studies have looked at whether consumer medication information is in an understandable and legible format, they have not specifically measured the readability of the information [3]. Consumer medication information from different resources can vary in the level at which the language is written. Some may be written above the level for which many patients can understand, especially for individuals with basic and below basic health literacy. Hence, this study was designed to measure the readability of consumer medication information from different resources including medication information from tertiary resources, private sector, and consumer health websites.

Material and Methods

We reviewed three primary sources of medication related information that are commonly provided to patients with prescription medications. These included medication leaflets from local pharmacies in San Antonio, Texas, medication leaflets from tertiary resources, and medication information from consumer health websites. For local pharmacies, we included medication leaflets from five large chain pharmacies and twelve independent

pharmacies. For tertiary resources, we included medication leaflets from four well known resources, including the FDA, Micromedex®, Lexicomp®, and Clinical Pharmacology®. Consumer health websites that provide consumer medication information were also evaluated and included Merck Manual Consumer Version, WebMD, DailyMed, Safe Medication, MedlinePlus, Mayo Clinic and Cleveland Clinic Health Library.

Four commonly prescribed medications (lisinopril, warfarin, furosemide, apixaban) were chosen as reference points to determine the readability from the various health information sources. Warfarin was used to determine the readability of leaflets from FDA Medication Guides, Micromedex®, Lexicomp® and Clinical Pharmacology®. Warfarin, furosemide and apixaban were used to determine the readability from both chain and independently owned pharmacies in the San Antonio area. Lisinopril was used to determine the readability for consumer health websites.

The Simple Measure of Gobbledygook (SMOG) readability formula was used to measure the readability of the medication information. The SMOG formula is a validated tool and involves counting words that are three syllables or higher. Ten sentences are chosen in the beginning of the written information, the middle, and towards the end for a total of thirty sentences. A sentence for this test is considered any group of word ending with a period, exclamation point, or question mark. Numbers were read aloud to decide the number of syllables. Abbreviations were counted as the whole word they represent. When the words were counted for a total, they were applied to the SMOG conversion table that would convert the number of words to a grade level [4]. A grade level was assigned to each medication leaflet or set of medication information assessed.

Results

A total of fifty-six individual SMOG Grades were calculated for leaflets or sets of medication information using the four commonly prescribed medications (Figure 1). Large chain pharmacies included CVS Pharmacy, Walgreens, H-E-B Pharmacy, Costco Pharmacy and Walmart Pharmacy. The mean grade for chain pharmacy leaflets was grade 12 with a range from 10-14. The pharmacy with the lowest mean grade was H-E-B, with all leaflets at grade 10, and the pharmacy with the highest mean grade was Walmart at grade 13. There were twelve independent pharmacies included in the analysis. The overall mean grade for independent pharmacies was grade 12, with a range from 9-14. The pharmacy with the lowest overall mean grade was Davila Pharmacy with a grade of 9. The highest were Village Oaks, Oakdell, Shavano Oaks, Mario's, Broadway, and Carvajal Pharmacies, each with a grade of 13.

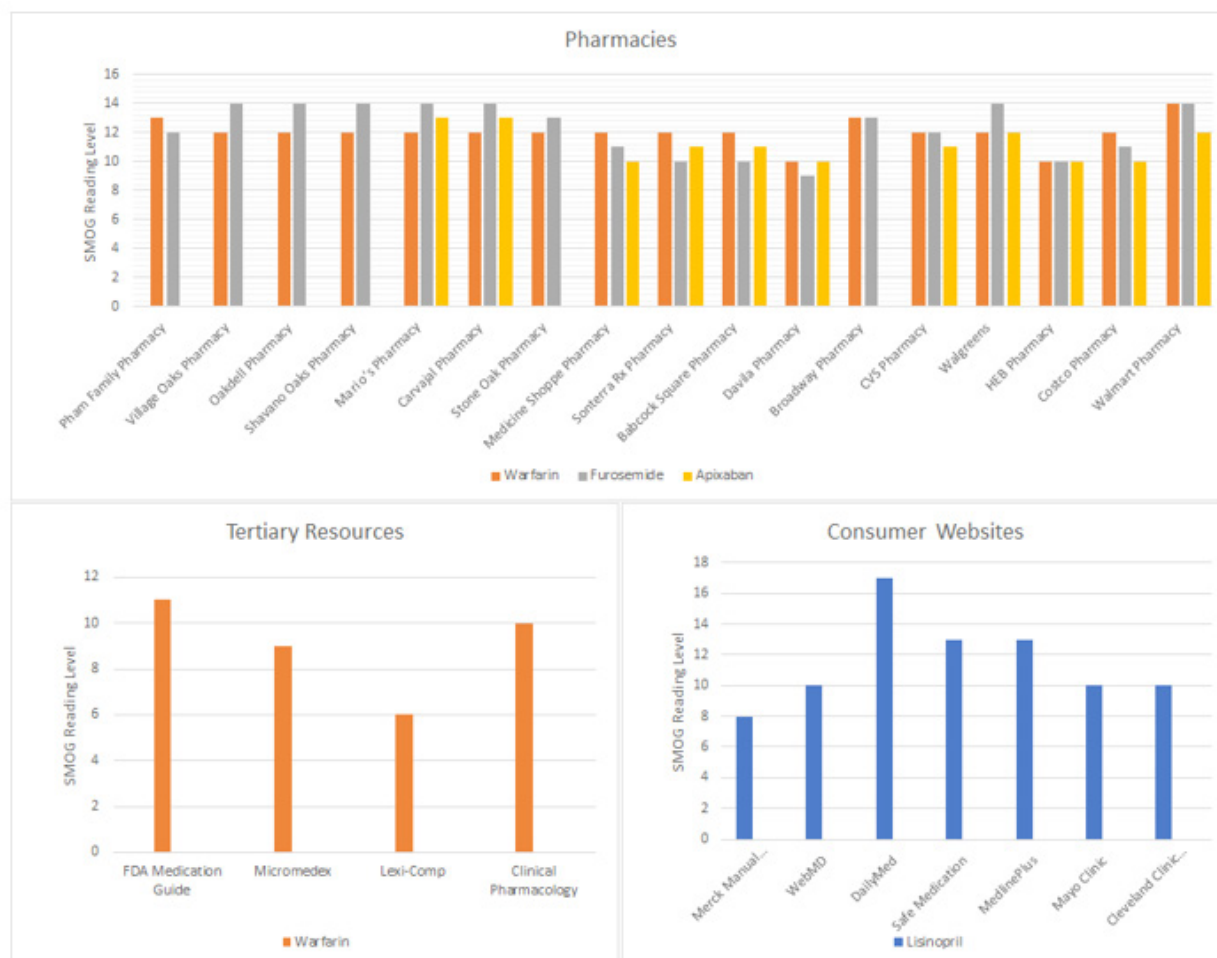


Figure 1: SMOG Reading Levels.

Medication leaflets from tertiary resources had the lowest mean at a grade of nine, with a range of 6-11. The source with the lowest grade level was Lexicomp® at grade 6, and the resource with the highest level was the FDA Medication Guide at grade 11. Consumer medication information from consumer health websites had a mean grade of 12 with a range of 8-17. Merck Manual Consumer Version website was among the lowest of all with a grade of 8, and DailyMed had the highest with a grade of 17. Overall, the mean SMOG Grade for all consumer medication information evaluated in this study was 12th grade with all grades ranging from 6– 17. The most frequent grade calculated was the 12th grade. The highest graded patient leaflet was from DailyMed at grade 17, and the lowest was from Lexicomp® at grade 6.

Discussion

Survey results from the 2003 National Association of Adult Literacy found that 22 % of US adults have basic health literacy and 16% of US adults have below basic health literacy. Individuals with basic and below basic health literacy will likely need short and simple health related information and instructions to assist them in their health care needs [2]. Consumer medication information

is designed to be a useful educational reference for patients to assist them in taking their medications appropriately and provide additional useful information including contraindications, precautions, storage, etc. It is thus imperative to make sure consumer medication information is written at a reading level that most patients can understand. Most adults in the United States read at the eighth-grade reading level. The National Institutes of Health and the American Medical Association recommend that patient education materials be written at the sixth-grade level or lower [5]. Results from our evaluation demonstrate that most available consumer medication information from tertiary resources, the private sector, and consumer health websites are written at the twelfth-grade reading level, which is well above the recommended reading level. A significant number of consumer medication information evaluated was written at grades above the twelfth-grade, which corresponds to college level reading. Only one source, Lexicomp®, had leaflets written at the recommended sixth-grade reading level. With such high overall reading levels, many patients will not be able to read and understand most of the available consumer medication information.

Limited health literacy is associated with poor outcomes including greater risk for hospitalizations and use of emergency care, poorer health status, and lower ability to take medications appropriately [6]. Medication adherence, which encompasses patients taking medications and taking medications appropriately, is an important aspect of patient care. Although studies that have looked at the relationship between limited health literacy and medication adherence have been conflicting, it is still important to address limited health literacy when educating and communicating with patients about medications [7]. The ability to understand medication information is imperative for patients to take their medications appropriately. Patients with limited health literacy have difficulty understanding their medication indications, instructions, warnings, side effects and would benefit from simple and plainly written consumer medication information. Having good comprehension of medication information can encourage patients to take their medications, and it can help them take medications correctly. It can also help patients be familiar with side effects or warnings that may warrant attention. Hence, it is ideal for patients to have a better understanding of their medications to not only improve medication adherence but also to improve patient safety.

There are limitations to this study. First, we used the SMOG readability formula to assess the readability of consumer medication information. There are numerous readability formulas that can be used to measure readability, and they differ regarding technique and results. Our results are only reflective of the SMOG reading formula. Use of another readability formula could have resulted in different reading levels. However, the SMOG formula is a validated tool, easy to use, and appropriate for measuring readability. A second limitation is that we mostly assessed medication leaflets from pharmacies in the San Antonio area. Although we assessed medication information from five large chain pharmacies that generally use the same standardized medication leaflets for all their pharmacies, we did review medication leaflets from 12 local independent pharmacies. The twelve local independent pharmacies use their own unique leaflets and so these samples may not be representative of independent pharmacies in other parts of the United States. Thus, the readability of our medication leaflets may lack generalizability.

Conclusion

Consumer medication information is an important resource and can be a valuable educational reference for many patients. Consumer medication information can improve patient understanding and improve medication adherence and patient safety. This study demonstrates that current consumer medication information from tertiary resources, pharmacies, and consumer websites are written well above the recommended reading level for most Americans. Unfortunately, individuals with limited health literacy will struggle to read and understand this information,

limiting its utility. The findings of this study emphasize the need to improve the readability of currently available consumer medication information. This study reinforces how crucial it is to identify the literacy levels of one's audience and create patient education materials that are appropriate and effective for the target audience. Patients with limited health literacy will have difficulty understanding most educational materials. By improving the readability of consumer medication information, we can enhance communication and patient education, thus improving medication adherence and patient health outcomes.

Future efforts should be made to improve the readability of consumer medication information. Private sectors and consumer health websites should consider updating the readability of their written medication information so patients can find benefit and utility from these resources. Policy makers should encourage organizations and institutions to publish consumer medication information to improve the readability of their written product. Additionally, this points to the pivotal role for health care providers. It is important for health care providers to continue to take the time to communicate with patients and to use simple and plain language when educating and discussing medication information with their patients.

Acknowledgement

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Conflict of Interest

No Conflict of Interest.

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