



## Evaluating an Intervention to Lower Health Literacy Demand of Graduate Student Clinician Summary Cover Letters to Patients

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### Abstract

The American Speech-Language-Hearing Association encourages university programs to cultivate skills related to client health literacy among students. One means of doing so is to train students to write in a way that places lower health literacy demands on clients and their families. This study tested the effectiveness of a health literacy module for improving students' skills in writing client letters to accompany diagnostic reports. Students in two sections of an advanced graduate seminar in Speech Pathology course were assigned to write cover letters to be sent to a hypothetical client at the UCF Communication Disorders Clinic. Reading grade level calculators of the pretest indicated students wrote at a college level, and the Patient Education Materials Assessment Tool (PEMAT) revealed that students performed worst on literacy elements which are not regularly associated with letter writing, but which can dramatically assist with readability and comprehension: breaking information into chunks, using informative headers, and using visual cues like bullet points, bolding, and font size. Fewer than half of students regularly used plain language and active voice. After completing the module, grade level of student writing had lowered to high school, but no statistically significant differences were found in use of specific literacy elements.

### Keywords

health literacy, Patient Educational Materials Assessment Tool, graduate education

### Cover Page Footnote

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The integration of health literacy education within communication sciences and disorders (CSD) programs is increasingly recognized as crucial for preparing students to effectively communicate complex health information. The American Speech-Language-Hearing Association (ASHA, 2008) has emphasized the necessity for CSD programs to foster skills that enable students to enhance patient health literacy. This not only empowers patients to better advocate for their health but also aligns with broader healthcare objectives to improve patient outcomes and satisfaction. Responding to this educational imperative, our study investigates the impact of a specifically designed health literacy module within an advanced graduate seminar. The aim of this research was to determine whether such targeted training could enhance the ability of student clinicians to produce summary cover letters that facilitate reduced health literacy demands, thereby potentially improving patient understanding and engagement in their own care.

## Literature Review

Over one-third of adults in the United States (U.S.) have limited health literacy skills (Hogan et al., 2013; Kutner et al., 2003). That is, they have inadequate “ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others” (Santana et al., 2021, p. S258). Research indicates that low health literacy skills translate into poor health outcomes (Rudd, 2017). In fact, health literacy is a stronger predictor of a person’s health status than income, educational level, and race or ethnicity (Weiss, 2007). Individuals with speech, language, and hearing disorders are at special risk for low health literacy, especially when these disorders go unrecognized (ASHA, 2008).

Personal health literacy, however, is just one side of the picture. In recent years, scholars have increasingly acknowledged that the American healthcare environment places heavy literacy demands on individual patients (Arts et al., 2020; Bellon-Harn et al., 2020). According to the U.S. Department of Health and Human Services (Bauer, 2010), all health information should be understandable, accessible, and actionable regardless of the health literacy skills of the audience receiving the message. Thus, in addition to personal health literacy, experts now speak of “organizational health literacy,” or the degree to which organizations equitably enable patients to accomplish health informational tasks (Santana et al., 2021, p. S258).

One tool that all entities involved in organizational health literacy can use to mitigate low health literacy is the use of plain language. The simplest definition of plain language is “communication your audience understands the first time they read it or hear it” (Centers for Disease Control and Prevention, 2023, p. 1). The Federal Plain Language Guidelines released by the U.S. government in 2011 are considered the gold standard for converting complex writing into plain language. The guidelines include conventions such as avoiding jargon, technical terms, and complicated language. They also promote presenting information in a logical and structured order along with being concise and eliminating unnecessary words. Using “you” to address the reader more directly and active voice over passive voice are encouraged to improve clarity and succinctness (U.S. General Services Administration, 2011). These guidelines also describe proper organization of paragraphs for improved understanding and use of lists, tables, or visual illustrations to aid written text (U.S. General Services Administration, 2011). Use of plain language over standard language can result in better understanding and a higher probability of implementation by patients and the general public (Elliott et al., 2023). For speech and language pathologists, use of plain language is

especially critical; patients with communication disorders such as aphasia are at an inherent disadvantage and often report having difficulty keeping up with rushed clinician conversations, which can be exacerbated by lack of plain language use (Burns et al., 2012).

As is the case in most clinical disciplines, previous research about health literacy and plain language in the field of communication disorders has focused on websites, brochures, and fact sheets (La Scala et al., 2022; Nicholson et al., 2016; Steiner et al., 2022; Zraick et al., 2021). Only recently in some fields has organizational literacy research begun to address the content of summary cover letters. Since the adoption of electronic health records (EHR) in the United States (Drury et al., 2012), and especially since COVID-19, direct-to-patient communication—communication which bypasses intermediaries—has become more common. It has become standard practice in many clinics to provide patients with written summaries which often come directly from the patient’s EHR (Imoisili et al., 2017).

Patient letters can be used more broadly to provide a permanent record of the visit or more specifically, can provide patients with information about a new diagnosis and reiterating test results (Brown et al., 2016). Parents of pediatric patients have reported deriving a sense of autonomy and improved competence from well written letters, and often use the letter as a tool to communicate their child’s diagnosis with others (Brown et al., 2020). Although the ideal patient letter may perform these tasks effectively, in reality, patient letters often have shortcomings. Some researchers have suggested that using letters to convey a child’s diagnosis risks misinformation as contents are passed through long informational chains (Dheensa et al., 2018). Overuse of medical jargon in letters can be a significant barrier to patient understanding (Brown et al., 2016; Drury et al., 2021), and letters may lack information on continuity of care (Lin et al., 2014). At the same time, simplifying complex medical concepts, explaining implications of test results, and adequately addressing the uncertainty that comes with some diagnoses is a challenge in the one-directional messaging of patient letters (Lynch et al., 2020). Finally, striking a balance between comprehensibility for patients and maintaining sufficient information for colleagues to find the letter useful can also be difficult (Lin et al., 2014). Thus, training of clinicians is essential if patient letters are to be consistently effective.

**Measuring Health Literacy Demand.** The most common means of evaluating health literacy demand of print materials is by measuring readability. Readability is typically operationalized as the number of syllables, words, and sentences within the text, with U.S. school grade reading level as a reference (McLaughlin, 1969). Generally, Americans are assumed to read at an 8<sup>th</sup> grade level, and this is often used as a rule of thumb. Plain Language Guidelines (PLAIN, 2011), however, clarify that this depends on the audience and the type of information. In health information, medical terms can be confusing to patients and can skew readability scores to a higher level (Habeeb, 2021). The Joint Commission (2010) recommends that health-related materials be written in a manner equivalent to a 5<sup>th</sup> grade education level.

Research about readability of health information has been critiqued for relying too heavily on grade-level readability formulas that focus only on word and/or sentence length as indicators of difficulty in health-related texts (Rudd, 2017; Shoemaker et al., 2014). In fact, Osborne and Kunz (2011) found that scores on reading grade level alone of pharmaceutical information sheets had no association with consumer comprehension. In contrast, the Patient Education Materials

Assessment Tool (PEMAT) (Shoemaker et al., 2014) looks at multiple variables to determine how well information can be understood and the extent to which materials empower patients to take action. General categories include using common, everyday language, using active voice, presenting information in a logical sequence, and not expecting the user to perform calculations. The PEMAT also includes categories of document formatting like breaking or chunking information into short sections, providing informative headers for each section, having steps for the user to take action, and using visual cues such as bullets, bolding, or larger font. Research indicates that users pay more attention to nicely displayed information which they can find easily, and that graphics are an important tool for helping readers interpret health information (Abdel-Wahab et al., 2019; Bellon-Harn et al., 2020).

## Context of the Study

Given the variable health literacy levels of patients that they may work with, health literacy and plain language training for speech language pathology (SLP) graduate students is of great significance. The Communication Sciences and Disorders (CSD) master's program at the University of Central Florida (UCF) currently requires a minimum of 72 credit hours of which 38 credit hours are academic courses, 9 credit hours are electives, and 25 credit hours are for clinical practice (University of Central Florida, 2023). Students begin clinical work in the university clinic in their second semester. Recognizing the essential role of clear communication in patient care, the clinic director supported a novel initiative—integrating cover letters written by graduate students into the delivery of diagnostic evaluation reports to patients. These cover letters aim to explain complex diagnostic information following principles of plain language, thereby reducing the health literacy demands on patients and their families.

The researchers could locate no literature that empirically investigated the best way to train clinicians to effectively write patient letters in any clinical specialty. In fact, no previous research in the field of communication disorders addresses the topic of patient letters at all was identified. Therefore, training in plain language and clear writing principles was developed for students in two sections of an advanced graduate seminar in speech pathology. The purpose of the present study was to do the following: (a) understand the extent student scores would improve in readability indices, PEMAT understandability, and PEMAT actionability after exposure to an online module about health literacy; and (b) determine best and worst adherence to plain language guidelines in letter writing, as indicated by the PEMAT for graduate student clinicians.

## Methods

The study used a pretest/posttest design. Research was judged exempt by the university institutional review board.

**Participants.** Seventy students in two sections of advanced graduate seminar of speech pathology at a large Southeastern university voluntarily participated in the study. Both sections of the course were taught by the same instructor, who was not part of the study.

**Procedure.** Near the beginning of the semester, students in the seminar classes were given a pretest assignment to write a cover letter for a hypothetical patient report. The assignment was evaluated

by the instructor as completed or not completed. Students who chose not to be involved in the research were given an alternate assignment with the same level of course credit and approximately the same length. All students in both sections of the course chose to participate in the study rather than undertake the alternate assignment. The assignment instructions are included in the Appendix. (A copy of the hypothetical report can be obtained from the first author.)

To preserve anonymity, all students were assigned a unique identifying number that was attached to their cover letters. A linking sheet with numbers and student names was created and maintained by the instructor in the course who had no access to study data.

Pretest letters were evaluated by the fifth and sixth authors, who were undergraduate pre-medical students in a different department and could, therefore, read the material from a roughly similar level of knowledge as a patient might. They were trained using the PEMAT Users Guide (Shoemaker et al., 2014) under the guidance of the first author. Given that the PEMAT was not specifically created for the print genre of letters, adjustments were made to the codebook during the meeting. However, these adjustments may impact the validity of the findings, as the PEMAT was not originally designed for patient letters. Future studies should consider developing or validating tools tailored specifically to assess the health literacy demand of patient letters. After coding three letters together, the two authors coded several additional letters separately and came back to determine inter-rater reliability. Ultimately, the researchers were unable to establish adequate interrater reliability, so they individually coded all letters. They then came together and resolved all disagreements by discussion or, in a few cases, by appealing to the first author for a final opinion.

Students then viewed a recorded presentation about health literacy and plain language created by one of the authors as a general introduction to the topic. The presentation included definitions of individual and organizational health literacy, statistics about health literacy in the U.S. population, at risk groups, and an introduction to principles of plain language. Examples were appropriate to the field of communication sciences and disorders.

Toward the end of the semester, students were given a posttest with the same instructions, but with a different hypothetical patient report. Posttest letters were evaluated by the same metrics as in the pretest, this time by the second and third authors (who were also undergraduate students in another department). The same process was used for training, coding, and resolving disagreements.

**Instrumentation.** Readability was measured with electronic calculations of five formulae regularly used to study health information: Flesch-Kincaid Grade Level (F-KGL), Gunning Fog reading formula, Flesch Reading Ease (FRE), the Coleman-Liau, and the Simple Measure of Gobbledygook (SMOG). All but the Flesch Reading Ease calculate a reading grade level based upon U.S. school grade as a reference. (See Reading Scoring System plus, n.d.)

Among formulae which present their results in terms of grade level, the Flesch-Kincaid Grade Level calculates readability via the number of words, sentences, and syllables within the text. The Gunning Fog (Gunning, 1968) uses the average number of words per sentence and the number of words with three or more syllables. Simple Measure of Gobbledygook (SMOG; McLaughlin, 1946) is based on the number of words with three or more syllables in a passage. The Coleman-

Liau formula (Coleman & Liau, 1975) uses letters per 100 words and sentences per 100 words as predictors of readability. The Flesch Reading Ease uses the average words per sentence and the average syllables per word to determine a readability score (Flesch, 1948). The range is 0 (very difficult to read) to 100 (very easy to read). Average documents should be within the 60-70 range, as this would indicate that 8th and 9th graders can easily understand the contents (Doak et al., 1996).

Understandability and actionability were measured with the Patient Education Materials Assessment Tool-print (PEMAT-P) (Shoemaker et al., 2014), which evaluates and compares the understandability (the extent to which consumers of diverse backgrounds and varying levels of health literacy can process and explain key messages) and actionability (the extent to which consumers of diverse backgrounds and varying levels of health literacy can identify what they can do based on the health information presented) of health-related print materials.

The PEMAT includes 19 items measuring understandability and 7 measuring actionability. Items are formatted as a checklist, which coders indicate as present or not present. Scores for understandability and actionability are calculated by obtaining the percentage of items of each that coders identify as present. The higher the percentage, the more understandable or actionable the material. The authors do not provide cut-offs for what is an acceptable score. A number of items were not applicable to the cover letter assignment in this study, however, so these were not evaluated. In total, 9 understandability items and 3 actionability items were used.

## Results

Means and standard deviations of readability indices and PEMAT understanding and actionability scores are presented in Table 1. All readability scores at pretest, except the SMOG, fell within college level range. At posttest, scores on the Flesch-Kincaid and SMOG, two of the most frequently used indices in health communication research, were both within high school range.

**Research questions.** The first research question asked to what extent student scores would improve in readability indices, PEMAT understandability, and PEMAT actionability after exposure to a module about health literacy. To answer this question, a series of paired samples t-tests were run. Results are presented in Table 1.

As indicated in the Table 1, scores on all grade level readability measures except the Gunning Fog showed statistically significant improvement at post-intervention testing. This means students simplified their language and reduced the complexity of their sentences after the health literacy training. It should be noted that all changes were small—less than one grade level. After adjustment for multiple tests, neither type of PEMAT scores showed statistically significant improvement. Thus, students did not take up practices beyond vocabulary and sentence structure that could have made their letters more readable. Students also did not improve on the actionability of the letters.

**Table 1***Comparison of Pre-intervention and Post-intervention Health Literacy Demand Scores*

Measure of Readability	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i> (one-sided)
Flesch Reading Ease scores			3.76	69	<.001
Pre-intervention	38.86	11.02			
Post-intervention	43.22	12.66			
Gunning Fog scores			-2.36	69	.071
Pre-intervention	15.35	2.55			
Post-intervention	14.74	2.61			
Flesch-Kincaid Grade Level scores			-3.24	69	.007
Pre-intervention	12.57	2.15			
Post-intervention	11.85	2.40			
Coleman-Liau Intext scores			-4.03	69	<.001
Pre-intervention	14.20	2.22			
Post-intervention	13.30	2.16			
SMOG Index scores			-3.30	69	.007
Pre-intervention	11.70	1.62			
Post-intervention	11.10	1.93			
PEMAT Understandability scores			1.65	69	.364
Pre-intervention	50.00%	.14			
Post-intervention	52.70%	.14			
PEMAT Actionability scores			2.22	69	.105
Pre-intervention	77.62%	.26			
Post-intervention	84.29%	.24			

Note: *p*-values multiplied by 7 to adjust for multiple tests.

The second research question explored best and worst adherence to plain language guidelines in letter writing per the PEMAT for graduate students. Percentage of students who utilized each element in the two assignments are presented in Table 2. The majority of students clearly stated their purpose, adhered to that purpose, used active voice, presented information in a logical sequence, identified at least one action users could take, and addressed the user directly about recommended actions. Scores were lower on using plain language. Students struggled with formatting guidelines such as breaking information into chunks, using informative headers, and using visual cues. Although these tools are often not typical of letters, they can make it much easier for recipients to process information contained therein. Some letters had difficult terminology, and also looked crowded and heavy with type.

## Discussion

Given that patient letters can serve a key role in providing patients with information about a new diagnosis, reiterating test results, and serving as a permanent record of the visit (Brown et al., 2016; Drury et al., 2012; Imoisili et al., 2017), this study investigated dimensions of graduate CSD student clinicians' ability to write patient letters in plain language and evaluated the effectiveness of a health literacy intervention in the form of a self-paced class module.



**Table 2***Scores on PEMAT Items*

	% pre-intervention	% post-intervention
Makes its purposes evident	90.0	87.1
Does NOT include content that distracts from purpose	87.1	94.3
Uses common, everyday language	60.0	70.0
Uses active voice	77.1	77.1
“Chunks” information into short sections	17.1	18.6
Sections have informative headers	1.4	4.3
Presents information in a logical sequence	98.6	100.0
Provides a summary	15.7	15.7
Uses visual cues (e.g. bullets, bold, etc.)	2.9	7.1
Clearly identifies at least one action user can take	94.3	94.3
Addresses user directly when describing actions	87.1	94.3
Provides specific steps	51.4	61.4

Results from this study demonstrated that exposure to an intervention about health literacy and health literacy demand raised awareness and led students to work toward simplifying their language. This is one means of reducing the health literacy burden placed on patients. Overall, however, students did not appear to have improved in their grasp of specific issues raised by scores on PEMAT understandability items. This limited improvement may reflect the scope and duration of the intervention, which consisted of a single online module. Longer-term interventions with opportunities for iterative feedback and writing practice might be more effective in fostering sustainable changes in writing practices. It might have been expected that if readability scores on grade-level indices improved, so would use of common everyday language. However, these results echo the point that everyday language can be more complicated than presence of polysyllabic words and sentence length (Osborne & Kuntz, 2011; Rudd, 2017; Shoemaker, 2014).

This study was limited by the fact that due to the relatively small number of students taking the course every semester, no control group was employed. Thus, it is possible that the small changes observed after the intervention are due to some other component of the course. Additionally, the dual role of the instructor as both researcher and course facilitator may have introduced unintended bias, despite measures to anonymize student submissions. Future studies could address this by employing independent instructors or researchers to ensure a complete separation between teaching and evaluation responsibilities. Additionally, while undergraduate evaluators were chosen to simulate the perspective of a patient with no advanced training in health literacy, their lack of expert knowledge could also be considered a limitation. Finally, the study’s findings are based on graduate students from a single institution, which limits generalizability. Expanding future research to include participants from multiple institutions and geographic locations would strengthen the external validity of these findings.

Our results provide support for the insertion of practical training material about organizational health literacy and plain language into graduate coursework in speech and language disorders. However, they also imply that the value of general information about health literacy and plain language is limited. To be maximally effective, training should strive to address specific issues that are non-intuitive in letter writing and perhaps other genres, such as visual cues, chunking, and headings. It should incorporate time to practice writing with understandable terminology, employing active voice, and providing summaries. Students who master these skills will be well positioned to communicate effectively with patients (Burns et al., 2012) and to empower them to better advocate for their own health.

Ideally, future studies should push this research further to determine functional outcomes of healthcare literacy for patients who receive plain language letters. Better understanding, higher self-efficacy, and more frequent actions taken might be expected in comparison to patients who receive letters in jargon- and type-heavy style. Future studies should also assess functional outcomes, such as patient comprehension, recall, and engagement with health information, to determine whether improvements in letter writing translate into tangible benefits for patients. These outcomes would provide a more comprehensive measure of the intervention's effectiveness in promoting health literacy. These outcomes are notoriously difficult to track, but they are ultimately the reason behind any health literacy effort.

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## **Appendix**

### **Health Literacy Assignment**

#### **Assignment Instructions**

For this assignment, imagine that you are working in the UCF Communication Disorders Clinic and you have just written the attached report about a client. The clinic has asked you to write a cover letter that summarizes the report and explains major issues in everyday language.

Your letter should fulfill the following criteria:

1. Meet expectations of a formal written letter. That is, it should include the client's address, the date, salutation, body, formal, complimentary closing, and signature.
2. Explain briefly what the report is. [Access the report here.](#)
3. Describe major issues in the report in everyday language.
4. Express the availability of clinic staff to answer any questions.

The letter should be single spaced and no more than one page total.

The client's name is Robert Jones. His address is 2622 Jackson Lane, Orlando Florida, 32828.

This assignment will be graded as full points for a completed, timely submission. However, you will receive feedback on your writing later in the term.