



Evaluation of Online Education Materials for Bowel Preparation

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Objective

In this study, we have evaluated the readability, understandability, and actionability of online materials for bowel preparation prior to colonoscopy.

Introduction

- Insufficient bowel preparation is associated with higher risk of complications, missed pathology, prolonged procedures, and technical difficulties
- There are multiple effective formulations for colon preparation, and patients often use online materials to learn about the options

Methods

The top 75 hospitals in gastroenterology as ranked by 2021-22 US News and World Report were selected. These hospitals were entered into the search engine Google using the hospital's name followed by "bowel preparation."

Each hospital's bowel preparation information was evaluated independently by four reviewers using a total of 21 website criteria.

Readability evaluated by assessing the approximate reading grade level of the materials using the Flesch Kincaid Grade Level Calculator.

Understandability and actionability were measured with the Patient Education Materials Assessment Tool (PEMAT-P).

Understandability	
Agree = 1, Disagree = 0	
1.	The material makes its purpose completely evident.
2.	The material does not include information or content that distracts from its purpose.
3.	The material uses common, everyday language.
4.	Medical terms are used only to familiarize audience with the terms. When used, medical terms are defined.
5.	The material uses the active voice.
6.	Numbers appearing in the material are clear and easy to understand.
7.	The material does not expect the user to perform calculations.
8.	The material breaks or "chunks" information into short sections.
9.	The material's sections have informative headers.
10.	The material presents information in a logical sequence.
11.	The material provides a summary.
12.	The material uses visual cues (e.g., arrows, boxes, bullets, bold, larger font, highlighting) to draw attention to key points.
13.	The material uses visual aids whenever they could make content more easily understood (e.g., illustration of healthy portion size).
14.	The material's visual aids reinforce rather than distract from the content.
15.	The material's visual aids have clear titles or captions.
16.	The material uses illustrations and photographs that are clear and uncluttered.
17.	The material uses simple tables with short and clear row and column headings.

Figure 1: PEMAT-P Understandability Rubric

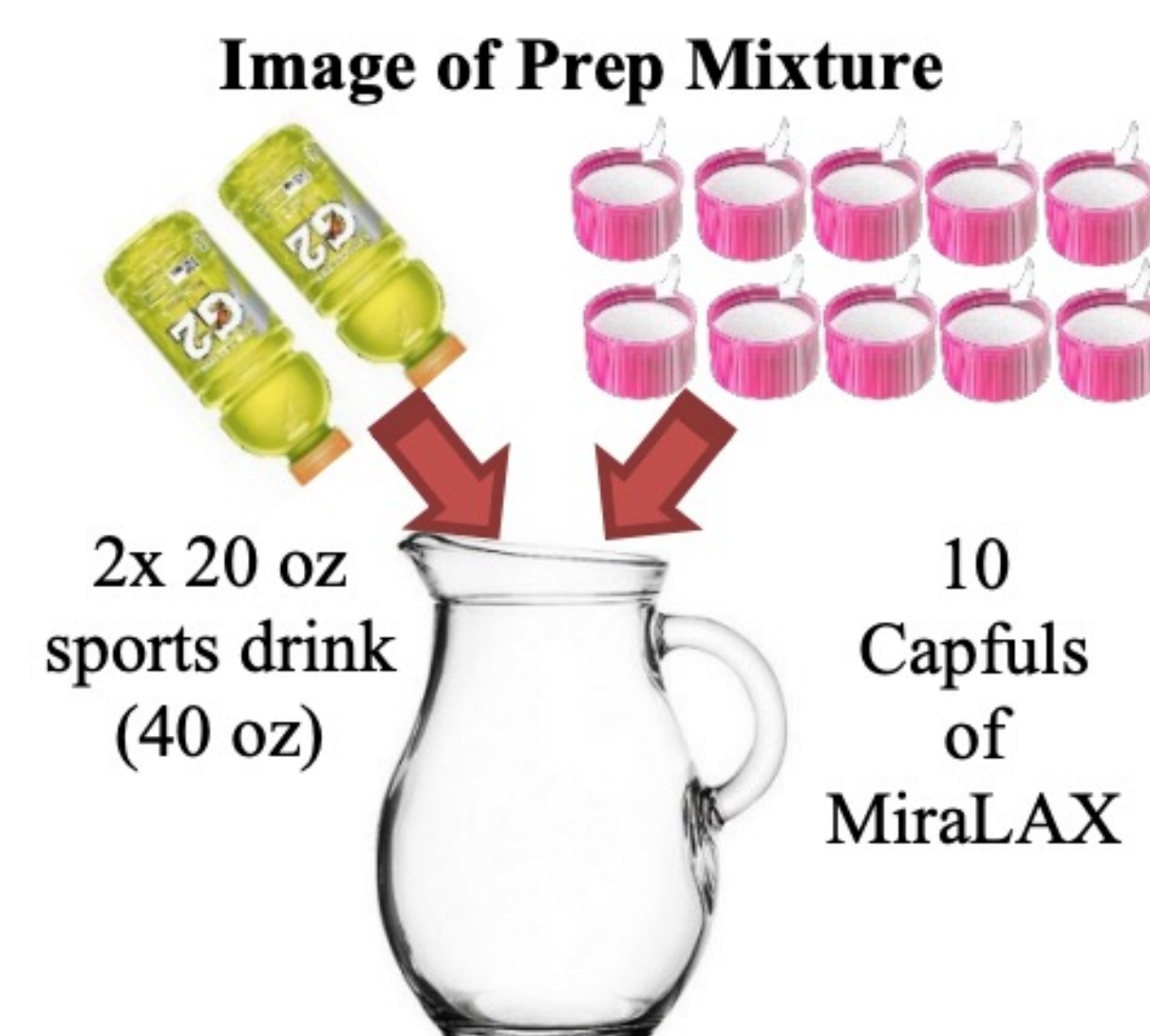
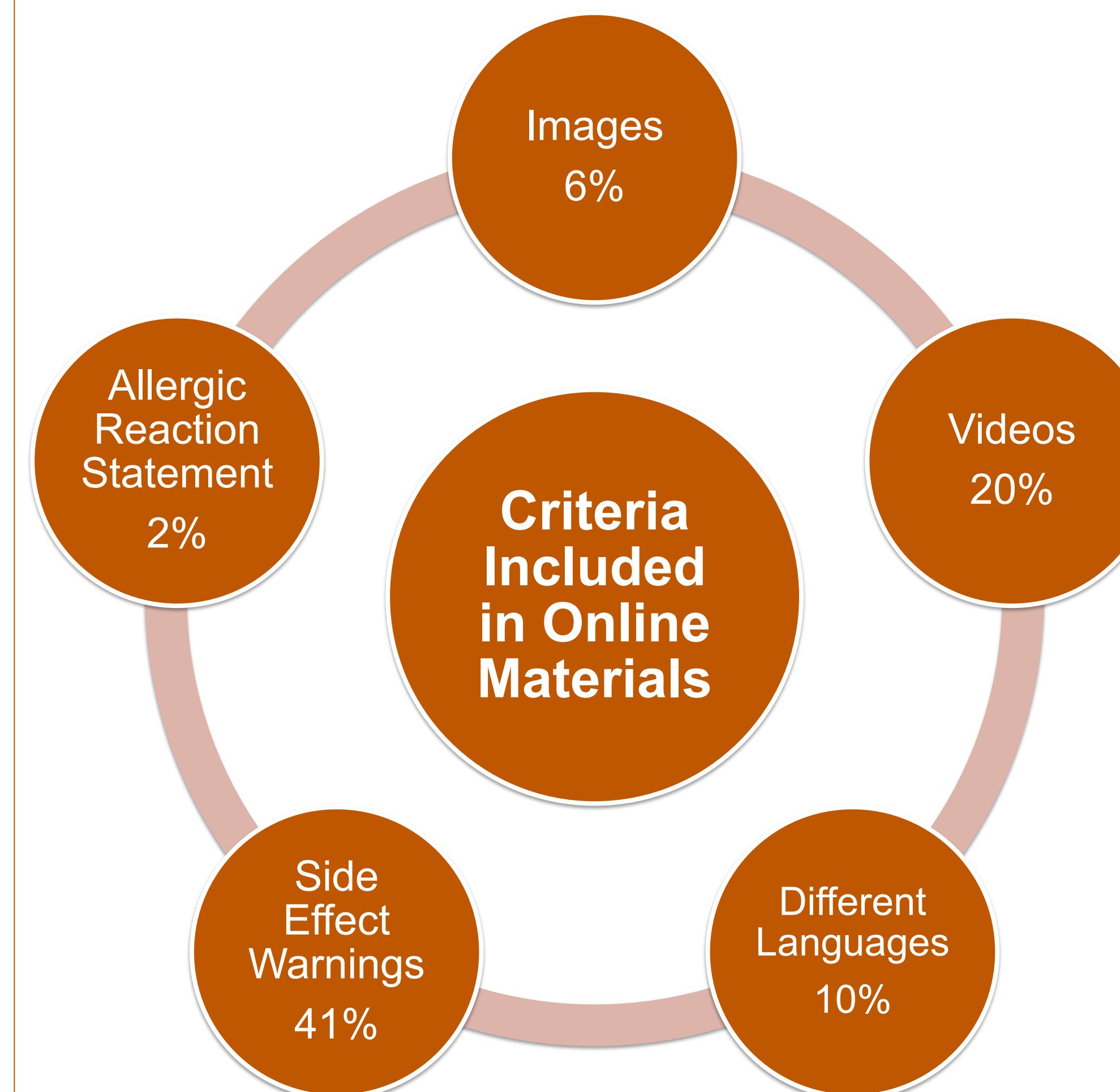
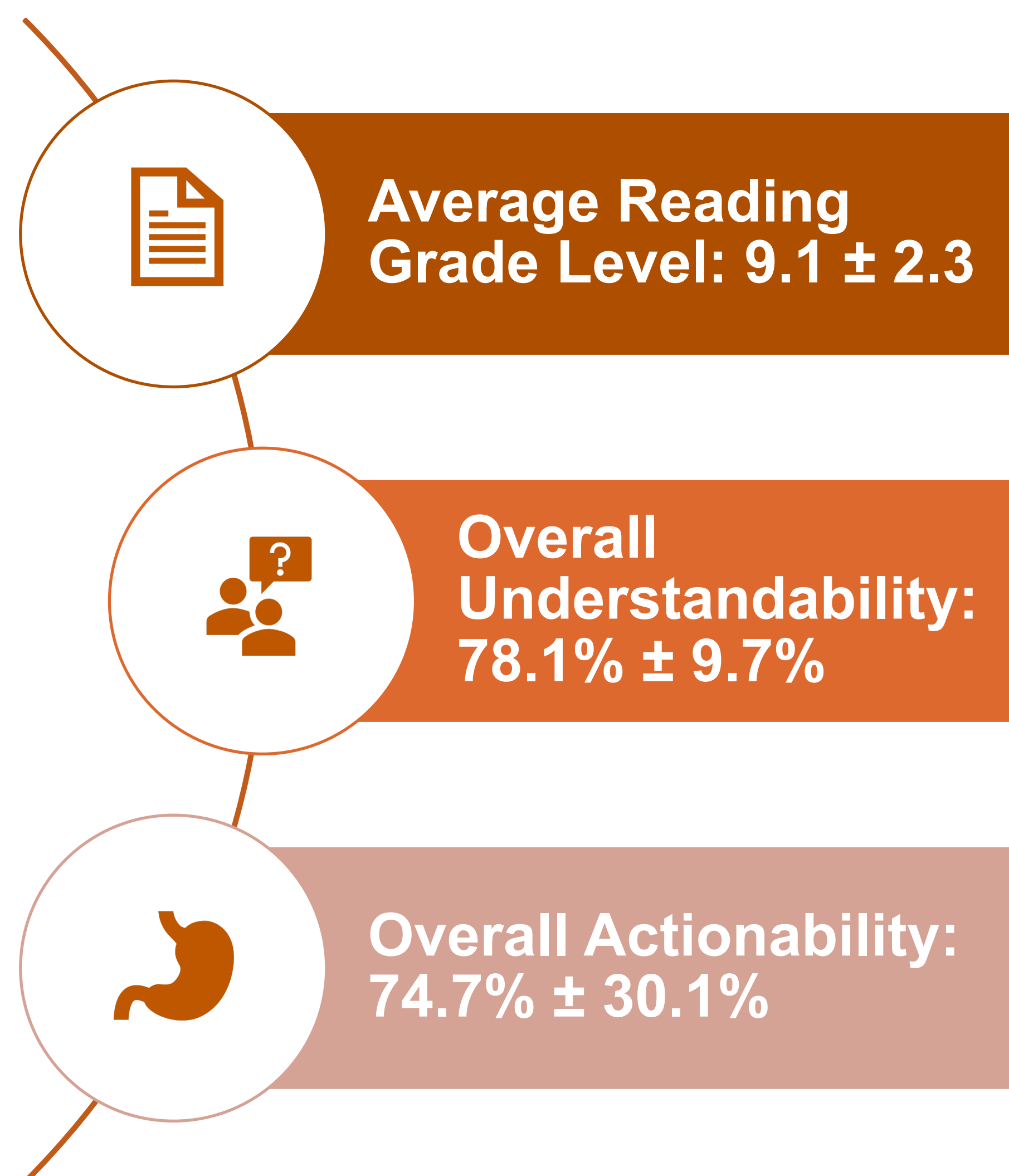


Figure 2: Example image in online bowel preparation materials
Source: Massachusetts General Hospital Gastroenterology

Results



Discussion

The readability, understandability, and actionability of the written materials for bowel preparation among hospital websites are quite variable and often lack key information.

Online educational material content should be revised. Revisions should include writing that reflects lower reading grade levels, pictures and videos to support text, and options for resources in different languages.

More accessible materials could lead to improved quality of bowel preparation for CRC screening procedures.

References

1. Winawer SJ, Zauber AG, Ho MN, O'Brien MJ, Gottlieb LS, Sternberg SS, et al. Prevention of colorectal cancer by colonoscopic polypectomy. *N Engl J Med.* 1993;329(27):1977-81.
2. Yadlapati R, Johnston ER, Gregory DL, Ciolino JD, Cooper A, Keswani RN. Predictors of Inadequate Inpatient Colonoscopy Preparation and Its Association with Hospital Length of Stay and Costs. *Dig Dis Sci.* 2015 Nov;60(11):3482-90. doi: 10.1007/s10620-015-3761-2. Epub 2015 Jun 21. PMID: 26093612.
3. Leibold B, Kastrinos F, Glick M, Rosenbaum AJ, Wang T, Neugut AI. The impact of suboptimal bowel preparation on adenoma miss rates and the factors associated with early repeat colonoscopy. *Gastrointest Endosc.* 2011;73(6):1207-14.
4. Peery AF, Crockett SD, Barritt AS, Dellon ES, Eluri S, Gangarosa LM, et al. Burden of gastrointestinal, liver, and pancreatic diseases in the United States. *Gastroenterology.* 2015;149(7):1731-41.
5. Rex DK, Imperiale TF, Latinovich DR, Bratcher LL. Impact of bowel preparation on efficiency and cost of colonoscopy. *Am J Gastroenterol.* 2002;97(7):1696-700.