

# Curriculum for Change: Medical Student Editing to Improve Readability of Health-Related Wikipedia Articles and Increase Health Literacy Awareness

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Study conducted at The Warren Alpert Medical School of Brown University, Providence, RI

## BACKGROUND

- Health literacy is a greater predictor of health outcomes than income, employment, or race<sup>1-3</sup>
- The National Institute of Health (NIH), American Medical Association (AMA), and other organizations recommend patient educational materials (PEM) be written at 4<sup>th</sup>-6<sup>th</sup> grade levels<sup>4</sup>
- The vast majority of PEM available is at or above 9<sup>th</sup> grade reading level<sup>5-11</sup>
- The most patients now rely on the Internet for healthcare information<sup>12</sup>
- Wikipedia is the most popular online resource<sup>12</sup>

## OBJECTIVE

- We propose a straightforward process to improve the quality and breadth of PEM:
  - Incorporate editing of online content into health literacy curricula at medical schools
  - Upload the revised content to websites devoted to patient-friendlier content

## METHODS

- Partnered with Dorcas International Institute, an adult learning center in Providence, RI
- Adult learners at Dorcas surveyed regarding where they received their care and what topics they would like to see revised
- 8 of the most popular topics were selected for revision
- All 144 first-year medical students at the Warren Alpert School of Medicine (AMS) were:
  - Assigned articles on health literacy and related outcomes
  - Provided guidelines on editing PEM to improve readability
  - Divided into four-member teams to revise one of the eight topics
  - Convened with other groups assigned the same topic to select their preferred revision
- Reading grade levels of original and revised articles were assessed with 5 reading grade indices

**Table 1: Reading Grade Levels of Original Wikipedia and Student-Revised Articles**

Topic	Flesch-Kinkaid Grade Level	Gunning Fox Index	Average Reading Grade Level	Standard Deviation	Pr ( T > t )
<b>Type II Diabetes</b>					
Original	11.5	14.4	12.8	1.6	0.008
Revision	6.0	7.7	7.2	1.8	
<b>Otitis Media</b>					
Original	11.7	14.8	12.6	1.8	0.0011
Revision	5.8	8.2	7.1	1.7	
<b>GERD</b>					
Original	11.3	13.3	12.4	1.4	0.0003
Revision	5.5	7.3	7.1	1.5	
<b>ADHD</b>					
Original	12.7	15.3	13.9	1.3	0.0003
Revision	6.2	8.0	7.9	1.7	
<b>Allergic Rhinitis</b>					
Original	12.0	14.6	13.1	1.5	0.0004
Revision	5.6	7.2	6.9	1.9	
<b>Glaucoma</b>					
Original	13.1	15.5	13.9	1.3	0.0003
Revision	5.9	8.4	7.4	2.0	
<b>Osteoarthritis</b>					
Original	11.8	14.5	13.1	1.4	0.0015
Revision	7.0	8.9	8.7	1.6	
<b>Hypertension</b>					
Original	13.1	14.8	14.2	1.1	0.0001
Revision	5.9	7.0	7.3	1.6	

Articles were also assessed using the Coleman-Liau, SMOG, and Automatic Readability Indices. These results were included in the average reading grade level, standard deviation, and p-value calculations but were not included in the table due to space constraints

**Table 2: Medical Student Survey, n=77**

<b>Do you feel that this experience improved your knowledge of health literacy?</b>	
Strongly Agree/Agree	85.7% (n=66)
Neutral	10.4% (n=8)
Strongly Disagree/Disagree	3.9% (n=3)
<b>Do you feel that you better understand the reading levels of patients of low health literacy?</b>	
Strongly Agree/Agree	79.2% (n=61)
Neutral	14.3% (n=11)
Strongly Disagree/Disagree	6.5% (n=5)
<b>Do you feel that this experience help prepare you to interact with patients of health literacy?</b>	
Strongly Agree/Agree	72.7% (n=56)
Neutral	18.2% (n=14)
Strongly Disagree/Disagree	9.1% (n=7)
<b>Do you feel that the editing process should remain a part of the AMS curriculum?</b>	
Strongly Agree	84.4% (n=65)
Neutral	11.7% (n=9)
Strongly Disagree/Disagree	3.9% (n=3)
<b>Do you feel that other medical schools should incorporate similar health literacy initiatives and editing processes into their curricula?</b>	
Strongly Agree/Agree	90.9% (n=70)
Neutral	6.5% (n=5)
Strongly Disagree/Disagree	2.6% (n=2)

## RESULTS

- Significant number of adult learners felt that PEM was not easy to read or understand
- Wikipedia articles had an average reading grade level of 13.3
- Student-revised articles had an average reading grade level of 7.4
- All articles displayed a statistically significant reduction in reading grade level after medical student revisions (range in reduction: 4.4 -7.1 grade levels)
- Of the medical students surveyed, >75% believed that the editing experience:
  - Improved their understanding of health literacy
  - Better prepared them to interact with patients of low health literacy
  - Should remain a part of the AMS curriculum
  - Should be incorporated at other medical schools

## CONCLUSIONS

- Medical student editing is an effective means to reduce reading grade levels of existing online PEM
- Future work will assess whether revised articles increase patient comprehension compared to original versions
- Medical schools and their students can be, and should be, at the forefront of improving health literacy
- Incorporating PEM editing into curricula allows for future physicians to learn about health literacy while producing high-quality, patient-friendlier content

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