Multimedia formats can improve older adult comprehension of clinical test results: Implications for Designing Patient Portals

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Learning is vital to health across the lifespan, in part because patients are responsible for self-care. This is especially so for older adults, who more likely have chronic illness yet fewer cognitive resources for self-care. Because learning is often mediated by technology, the success of self-care depends on whether technology is designed for older adults. Patient portals to Electronic Health Record systems ideally support self-care by ensuring patients continuous access to their health information and by supporting patient/provider collaboration. However, older adults, who stand to benefit the most, use portals less often partly because of cognitive constraints. We seek to improve older adults' ability to understand and use portal-based numeric information such as clinical test results. According to fuzzy trace theory, people must do more than remember specific numbers in order to understand test results. They must integrate cognitive and affective meaning of the information to extract 'the gist', or bottom-line for their health. Patients have trouble getting the gist of test results, which are usually presented as numbers with little context. Further, portals strip this information from patient/provider encounters in which providers use verbal and nonverbal cues to contextualize results. We are investigating how to present cholesterol results so that older adults better understand the gist, perceive implications of the results for risk of cardiovascular illness, and increase intention to perform self-care behaviors.

We compared typical portal numeric formats to enhanced formats that provide context for extracting gist representations and supporting risk perception. The graphic format situated test scores in a display highlighting the relation of the score to color-coded regions indicating higher or lower risk. In the video condition, a physician discussed the results displayed in the graphic. Nonverbal (e.g. facial expressions) and verbal cues helped convey affective as well as cognitive meaning to promote gist comprehension. The video was also a template for developing a portal-based conversational agent that emulates face-to-face patient/provider communication, which will be evaluated in later experiments. The impact of the standard, graphic, and video formats on gist comprehension, risk perception, and behavioral intentions were investigated in a scenario-based study in which participants read low, borderline and high risk test results and then answered questions.

Enhanced formats improved gist comprehension relative to the standard condition, primarily for low and borderline risk scenarios. Gist errors in the graphic condition suggested participants overestimated risk associated with the low risk test results compared to the video condition. Consistent with health behavior theories participants in the graphic condition also reported higher perceived risk and greater intent to perform self-care (e.g., change diet). The graphic format may inflate risk perception even for 'good news' (low risk) test results because this format (e.g., by emphasizing the range of risk values for a score) encourages risk avoidance (Schrillo & Stone, 2005). The physician commentary in the video may counter this effect by emphasizing how the test scores are associated with specific regions of the scale, suggesting the value of multimedia for conveying risk information to older adults in patient portals.