Patient Factors That Affect Quality of Colonoscopy Preparation

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BACKGROUND & AIMS: Optimal colonoscopy preparation requires patients to adhere to written instructions and be activated to complete the task. Among patients with chronic disease, health literacy and patient activation have been associated with outcome, but these factors have not been studied for colonoscopy. We examined the association between health literacy, patient activation, and quality of bowel preparation.

METHODS: We analyzed outpatient colonoscopy results from 462 adults, 55–74 years old (mean, 62 ± 6 years), who previously completed extensive neurocognitive assessments as part of a prospective study (Health Literacy and Cognitive Function in Older Adults). We collected information on cecal intubation, polyp detection, bowel preparation quality, and histopathology.

RESULTS: One-third of the patients (n = 134) had suboptimal quality of bowel preparation; 15% (n = 62) had fair quality, and 17% (n = 72) had poor quality. Limited health literacy was associated with a lower level of education (P < .001), diabetes (P < .001), and a higher number of chronic conditions (P < .001), but not quality of colonoscopy preparation. No baseline characteristics were associated with patient activation. In multivariable analysis, after adjusting for demographics and clinical characteristics, diabetes (odds ratio [OR], 2.45; 95% confidence interval [CI], 1.14–5.25) and patient activation (OR, 2.12; 95% CI, 1.30–3.45) were independent predictors of suboptimal bowel preparation quality, but limited health literacy was not (OR, 0.76; 95% CI, 0.38–1.52).

CONCLUSIONS: We investigated the relationship between health literacy, patient activation, and colonoscopy preparation quality. Lower patient activation was an independent predictor of suboptimal bowel preparation quality. Interventions to improve colonoscopy preparation quality should consider the importance of patient activation within their design.

Keywords: LitCog; Procedure; Predictors; Endoscopy.

Colonoscopy is an effective screening tool for colorectal cancer and the only modality allowing for simultaneous polyp detection and removal.[1] Several studies have shown the benefit of screening colonoscopy with polypectomy at decreasing colorectal cancer mortality.[2–4] The effectiveness of colonoscopy in colorectal cancer screening relies on sufficient rates of adenoma detection and is dependent on both the endoscopist's skill and the quality of bowel preparation.[5–7] Multiple studies have shown that suboptimal bowel preparation quality is associated with missed adenomas, increased interval cancer rates, cost, procedure time, and unnecessary repeat exams.[8–12]

Although multiple studies have evaluated the role of specific bowel purgatives and optimal dosing regimens (single vs split dose), fewer have examined the patient's role in bowel preparation and colonoscopy quality.[13,14] Several reports have linked lower socioeconomic status, lack of social support, limited English language proficiency, failure to follow colonoscopy instructions, and medical regimen complexity to worse bowel preparation quality.[11,15–17] Smith et al[18] demonstrated that

low health literacy was associated with poor interpretation of common colonoscopy instructions; however, no published reports have examined how health literacy relates to actual colonoscopy quality in clinical practice. Complementary to health literacy barriers, no published studies to date have examined the role of patient activation on colonoscopy quality or outcomes.

Health literacy and patient activation have both been linked to multiple healthcare outcomes. Health literacy is defined by the Institute of Medicine as "the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions."[19] During the past 2 decades, multiple seminal reports have shown the association between low health literacy and increased hospitalizations, mortality, and cost in diverse patient populations.[20] Patient activation is defined as "an individual's knowledge, skill, and confidence for managing his/her own health and health care."[21] The Patient Activation Measure (PAM) is a validated scale developed by Hibbard et al[22] to measure this construct. Higher PAM scores are associated with multiple health behaviors and outcomes including higher medication adherence and use of preventive health services.[23] Both health literacy and patient activation may predict the knowledge, ability, and confidence to interpret and adhere to colonoscopy preparation instructions. As such, both are viable targets for intervention, although the nature of the clinical response would differ if the problem were with health literacy versus patient activation.

Because of the limited prior research examining patient factors in colonoscopy quality, our objective was to investigate the relationship between health literacy, patient activation, and bowel preparation quality among a cohort of screening-age adults previously recruited for a National Institute of Aging study, titled Health Literacy and Cognitive Function among Older Adults, referred to herein as LitCog (R01 AG03611, principal investigator: Wolf). We hypothesized that patients with low health literacy and low patient activation may have higher rates of suboptimal bowel preparation quality.

Methods

Study Sample

The study sample was obtained from the LitCog study, which has been previously described in detail.[24] Briefly, from August 2008 to October 2010, English-speaking adults ages 55–74 who received care at an academic general internal medicine practice or a federally qualified health center in Chicago were recruited to participate in structured, in-depth interviews. A total of 832 participants were recruited into the LitCog study; 614 of them were from the academic site with an electronic health record (EHR) with access to colonoscopy reports. Of the 614 individuals at the EHR-equipped site,

512 stated they had undergone a colonoscopy in the past; 466 of them had colonoscopy reports available for review (either from the study site or from an outside facility). Four patients were excluded on the basis of having inpatient colonoscopies, leaving 462 patients as the study sample; 455 of these participants had complete health literacy and patient activation assessments.

Data Collection

Study participants underwent 2 in-person structured interviews 7–10 days apart. A trained research assistant administered a series of assessments that included basic demographics, socioeconomic status, self-reported chronic conditions, and standardized measures of health literacy and patient activation. The following colonoscopy outcomes were obtained from the EHR: colonoscopy indication (screening, surveillance, anemia, heme-positive stool, other), outcomes (polyp size, cecal intubation, polyp detection, bowel preparation quality), and histopathology. The colonoscopy performed closest to the day of the in-person interview was used in the analysis. We also noted whether the patient had a colonoscopy before the index colonoscopy (referred to as previous colonoscopy). The protocol for this study was approved by Institutional Review Board at the study site.

Measures

Patient characteristics assessed for the LitCog study included age, gender, race, education, smoking status, and total number of self-reported chronic conditions (hypertension, diabetes, coronary artery disease, congestive heart failure, bronchitis, asthma, emphysema, arthritis, cancer, and depression). The self-reported chronic conditions were assessed in prior work by Wolf et al.[25]

Health literacy. Health literacy was assessed by the test of functional health literacy in adults (TOFHLA), a commonly used measure of literacy in healthcare research.[26] The TOFHLA is based on the use of materials patients likely encounter in healthcare and tests of both literacy and numeracy.[26] The TOFHLA is scored on a scale from 0–100; a score of 75–100 indicates adequate literacy, and a score <75 indicates limited literacy.[26]

Patient activation. Patient activation was evaluated with the shortened 13-item version of the original PAM. The PAM-13 includes items that assess patient-reported knowledge, skills, and confidence for self-management of chronic disease.[22] The scale categorizes individuals as being in 1 of 4 stages of activation. At level 1, patients do not possess the skills or knowledge to play an active role in managing their health, whereas at level 4, they have adopted many of the necessary behaviors to support their health but may be unable to maintain them under stress.[21] PAM scores were defined as low if participants scored at levels 1–3 and high if they scored at level 4.