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Health literacy and surgery expectations in total hip and knee arthroplasty patients

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ABSTRACT

Objectives: This study assessed patients' health literacy and expectations for total hip (THA) and total knee (TKA) replacement surgery, and compared health literacy levels of patients and their caregivers.

Methods: A convenience sample of 200 THA/TKA participants, patients and their caregivers, participated in this study.

Results: Results demonstrated no statistical difference in health literacy between patients and their caregivers. However, patients with lower health literacy had significantly lower expectations for walking after surgery.

Conclusions: Practices should be aware that caregivers may not be any better equipped to consume and use complicated patient education materials than the patient they are assisting. Additionally, lower health literacy, rather than or in addition to race or social factors, may contribute to disparities in opting for THA/TKA because of lower expectations for walking after surgery.

Practice implications: Healthcare practices should develop patient educational materials that are easy for all patients and caregivers to understand, especially those with low health literacy. Additional patient education and counseling may help patients with low health literacy realistically align their expectations and mitigate barriers to consenting to surgery due to low expectations.

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1. Introduction

Health literacy influences the ability to obtain, comprehend, and act on health information [1]. Nutbeam [2] describes "interactive health literacy" as a patient's capacity to derive meaning from different forms of communication and to apply it for individual benefit. Low health literacy affects about 90 million Americans [1] and is a barrier to self-care; patients and their caregivers may lack the skills to understand complicated instructions that deal with medications, wound care, self-monitoring, follow up schedules, and prevention behaviors. Adequate health literacy skills are important for understanding surgery procedures, providing informed consent, and adhering to

postsurgical treatment instructions [3,4]. Research studies that assessed the role of health literacy in perioperative surgical care found that patients with inadequate health literacy were less likely to understand surgery procedures and were more likely to have poor surgery outcomes [5,6]. Patients who undergo hip and knee replacement surgeries are often older adults, a population that struggles more than any other age group with health literacy skills [7].

Research has demonstrated that patients' expectations are often influenced by preoperative educational interventions [8]. In previous research studies, patients whose preoperative expectations were met were more likely to be satisfied with their surgery and had better surgery outcomes [9–11]; indeed, there is a strong correlation between patient expectations, patient satisfaction, and surgery outcomes [12–15].

Younger et al. [9] assessed the relationship between patient expectations and satisfaction and found that meeting postoperative expectations led to greater satisfaction and better surgery outcomes [9]. Becker et al. [10] reported that patient satisfaction correlated with improvements in limping and squatting in knee surgery patients. In addition, Hamilton et al.'s [11] analysis of

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preoperative patient expectations and patient satisfaction found that the degree to which expectations were met influenced satisfaction, pain, and overall hospital experience [11]. Other researchers assessing patient expectations and surgery outcomes in orthopaedics reported that higher expectations and fulfillment of patient expectations were associated with improved patient-reported outcome measures in hip and knee replacement patients [10,14,16]. For example, higher expectations for pain relief greatly predicted postoperative pain relief in orthopaedic patients [17].

While current research has explored many factors that contribute to patient expectations and subsequent satisfaction and outcomes [11,18,19], an important patient-level characteristic has been overlooked. Research to date has not included a focus on patient health literacy and the role it may play in patient expectations for surgery. While interventions to improve expectations often include patient education and information resources [19,20], these materials may be least understood by those patients who need them the most, contributing to disparities in expectations, satisfaction, and outcomes [21–23]. By identifying differences in expectations by health literacy level, clinicians and practices can improve the patient education and information on those expectations to improve understanding, satisfaction, and outcomes.

This study was designed to assess patients' preoperative expectations for surgery, prior to completion of an educational class, and explore the relationship between health literacy and these expectations. We hypothesized that patient expectations would be associated with health literacy; meaning, patients with lower health literacy would have lower expectations than those with higher health literacy who may have a better understanding of the benefits and documented outcomes of these surgeries. Another aim of this research was to examine differences between health literacy levels of patients and their caregivers/coaches who attend the patient education class with them. Because it is necessary for patients to rely on others' (caregivers, family members, "coaches") understanding of discharge and other information after surgery post-operatively, it is important to understand if patients with lower health literacy select others' with higher health literacy to compensate for skills they may lack. With a better understanding of this dynamic, interventions can better address the health literacy needs of both the patient and the caregiver to affect better postsurgical outcomes that are related to understanding.

2. Methods

Patients who were scheduled for either hip or knee replacements were eligible to participate in the study. Each patient is required to attend and bring a caregiver/coach to a preoperative Joint Academy education class, without specific instructions on how to select that individual. Patients' coaches who attended the class were also eligible to participate. All Joint Academy patients and coaches over the age of 18 were eligible to participate in the study. The sample included 200 participants, patients and coaches, enrolled in Joint Academy classes. All participants were consented by trained research assistants between the summer of 2016 and Spring of 2017 using an Institutional Review Board approved consent form (UAMS IRB Approval #205508). Consented patients and coaches completed a series of demographic questions using a secure online survey that was developed using LimeSurvey and interviewer-administered on an iPad. The survey included questions on the following: gender, age, race, level of education, and patient/coach status. Patients (not coaches) were also asked three questions regarding surgery expectations related to pain, running, and walking [24]. The Newest Vital Sign (NVS) [25] was also administered on the iPad with all participants. The

NVS measures health literacy for both words and numbers and has been validated with the Rapid Estimate of Literacy in Medicine (REALM) [26] and the Test of Functional Health Literacy in Adults (TOFHLA) [27]. All NVS questions were read aloud and responses recorded on the iPad by the researcher. For the coaches, the corresponding patients' medical record number followed by a "C" for "Coach" was recorded on the survey to identify all coaches and link them with the correct patient.

Descriptive statistics were used to describe the characteristics and health literacy levels of the sample population (Table 1). Statistical analyses were performed using SAS 9.4 with a level of significance $p < .05$. Chi Square analyses included patient expectation as the dependent variable and health literacy scores on the NVS as the independent variable. An Exact McNemar's test was used to determine differences between the health literacy level of patients and their coaches.

3. Results

The total sample included 200 participants: patients ($n = 108$) and coaches ($n = 92$) (see Table 1). Thirty-seven percent of the sample ($n = 73$) had inadequate health literacy as measured by the NVS. Because participation was voluntary, not all coaches agreed to participate with their patients and not all patients with their coaches, resulting in an uneven distribution. Among the 47 patient/coach pairs, sixteen patients with inadequate health literacy had coaches who also had inadequate health literacy, while 13 patients in the inadequate group had coaches with adequate health literacy. An Exact McNemar's test determined that there was not a statistically significant difference in the health literacy of patients and their coaches ($p = 0.68$).

The results of the chi square analyses are in Tables 2–4. There were no statistical differences between patient expectations for the patients with inadequate health literacy compared to those with adequate health literacy for the questions related to pain ($p = 0.37$) and running ($p = 0.91$). However, results indicated a significant difference between the expectation responses of patients according to their health literacy level ($p = 0.02$) regarding walking after surgery. Further exploration of these results revealed that patients in the inadequate health literacy group had "lower" overall expectations regarding walking after surgery, patients with adequate health literacy had "higher" expectations for walking after surgery for all responses except "short distances" (Fig. 1).

Table 1
 Demographics (N = 200).

Category	Response	n	%
Age, Years (M = 61.5)			
Gender	Male	79	39.5%
	Female	121	60.5%
Race	White	175	87.5%
	Black or African American	22	11.0%
	Other	3	1.5%
Education	Less than high school	10	5.0%
	High school graduate	104	52.0%
	College or professional degree	86	43.0%

Table 2
 Patient expectations for pain after surgery.

Health Literacy Screening	Patient Expectations				
	None	Some	Most	All	Total
Adequate	0 (0%)	20 (29%)	34 (49%)	15 (22%)	69 (100%)
Inadequate	1 (2%)	14 (37%)	14 (37%)	9 (24%)	38 (100%)
$\chi^2 (3) = 3.18, p = 0.37$					

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