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(Can't get no) Patient satisfaction: The predictive power of demographic, GI, and psychological factors in IBS patients

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Abstract

Goals—To assess (1) the relative contribution of patient factors to satisfaction ratings in IBS patients and (2) the relationship between patient satisfaction and the number of diagnostic tests patients underwent prior to receiving IBS diagnosis.

Background—While patient satisfaction (PS) is regarded as an important indicator of quality of care, little is known about its determinants.

Study—448 Rome III-diagnosed patients (M age = 41 years; 79%, F) whose GI symptoms were at least moderate in severity completed patient reported outcome measures as part of pretreatment evaluation of an NIH-funded clinical trial. PS was measured with the 11-point HCAHPS global rating scale modified to assess for IBS treatments. A series of multiple regression analyses were conducted for demographic, IBS specific, general physical health, and psychological predictors before running a final model of significant predictors from each domain.

Results—The final regression model was significant, $F(6, 419) = 6.34$, $p < .001$, $R^2 = .08$, with race, insurance, number of diagnostic tests, and lower neuroticism predicting PS. Medical tests were rendered nonsignificant when history of seeking care from a gastroenterologist (GE) was introduced into the equation.

Conclusions—Contrary to hypotheses, neither the IBS symptom severity nor quality of life impairment predicted PS. Patient factors such as a neurotic personality style and sociodemographic profile had a significant but modest impact on patient satisfaction. Pattern of regression analyses suggests that patients may turn to their gastroenterologist for testing for reassurance which may in the long term fuel demand for more testing.

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Keywords

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The unsustainable cost of health care in the United States has led federal policy makers and insurers to emphasize value-based reform. Key to this movement is adoption of quality metrics and profiling designed to operationalize, incentivize, and reward delivery of patient-centered quality of care. To this end, the Centers for Medicare and Medicaid Services (CMS) initiated a reimbursement method that links performance to a set of quality indicators that includes both traditional clinical outcome measures as well as patient perception of care. Under this reimbursement model, providers have been reimbursed based on performance of CMS factors with 30% of the total quality (vs quantity) of care score based on patient experience factors through the end of 2016 with an increase to 50% by 2018. Practitioners who provide a higher quality of care than their peers will receive reimbursement incentive, while those providing a lower quality of care will be penalized. According to the US Department of Health and Human Services, the objective is “to move the ... health care system ...toward paying providers based on the quality, rather than the quantity of care they give patients.”(1)

A major, if not defining, indicator of quality of care is patient satisfaction which has been defined as an “individual's rating of important attributes of the process and outcomes of his/her treatment experience” (2, 3). Efforts to enhance patient satisfaction are believed to improve treatment outcomes. For example, satisfied patients are better able to recall medical information and physician recommendations(4) (5), have lower readmission rates, are more loyal to physicians, and are more compliant and cooperative with medical regimens (6-8). The link between patient satisfaction and reduced inpatient mortality has prompted some researchers to conclude that patients are “good discriminators of the type of care they receive” (9).

The emphasis on patient satisfaction, however, is not without its critics (10, 11). First, utilizing patient satisfaction to gauge quality of care has been criticized for compromising patient health by incentivizing medical care that is driven more by patient preference than empirical evidence (12). Second, prior research in patients with non GI complaints has found that beyond the actual quality of care that patients receive patient satisfaction is associated with multiple sociodemographic factors including age, sex, racial identify, education level, insurance and employment status (13-15) all of which are beyond the control of physicians or their available treatment options. Third, because patient satisfaction is an inherently subjective concept that reflects cognitive appraisal of, and emotional reaction to, health care experience (16), it is subject to the influence of psychological factors including emotions, personality style (e.g. neuroticism), and interpersonal dynamics between patient and medical team. These factors may introduce a non-trivial source of bias into patient satisfaction ratings that create a discrepancy between actual and perceived quality of care. This may disadvantage gastroenterologists whose practices includes a large proportion of GI disease with higher rates of comorbid psychological dysfunction. Because distressed patients may have a dispositional inclination to “be pessimistic and generally dissatisfied”

(17), low satisfaction ratings may be more reflective of dissatisfaction with life in general than the quality of care in specific. Physicians who specialize in difficult to treat disorders may also be handicapped under value-based reimbursement models that calibrate payments to patient satisfaction ratings. As an example, irritable bowel syndrome (IBS), one of the most common GI disorders seen by gastroenterologists, is in its more severe forms notoriously resistant to conventional medical treatments (18). Patients whose symptoms persist in the face of best available medical treatment may describe more negatively their patient experience because they “anchor” (19) satisfaction ratings to the severity of symptoms and their impact. In other words, patients may downgrade the quality of care not because of patient experience but the persistence of symptoms. However, the complexion of factors that influence patient satisfaction among IBS patients is not well known.

Therefore, the purpose of this study was to assess patient-specific predictors of satisfaction with previous care in patients with IBS. We were particularly interested in the extent to which the severity of IBS symptoms, quality of life impairment due to IBS, psychological distress (anxiety, depression, somatization), and personality impacted satisfaction with the care they received for IBS. We predicted that patients with more severe IBS symptoms and greater psychological distress would describe the quality of care as low. A secondary goal was to explore whether number of diagnostic tests corresponded with patient satisfaction. Extensive diagnostic testing is regarded as painful, expensive, and largely unnecessary for a disorder that GE can confirm on the basis of symptom based criteria(20). As such, we predicted that patients who underwent more diagnostic tests would report lower satisfaction with quality of care than IBS patients who underwent less testing

Materials and Methods

Participants

Participants included 448 individuals (358 female, 90 male) between the ages of 18 and 70 years recruited to an NIH-funded clinical trial of three psychological treatments for IBS at two tertiary academic medical centers in Buffalo, NY (n= 290) and Chicago, IL (n=158). The majority of the sample (90%) across both performance sites self-identified as white. Participants were primarily recruited through local media coverage, community advertising and physician referral. Individuals who passed a brief telephone screening were scheduled for formal medical and psychological evaluations to determine their eligibility. Inclusion criteria included Rome III IBS diagnosis (21) confirmed during a medical examination performed by a board certified gastroenterologist and at least moderate IBS symptom severity (symptoms needed to occur an average of two or more days per week and cause life interference). Exclusion criteria included comorbid organic GI disease (e.g., inflammatory bowel disease), mental retardation, current or past diagnosis of psychotic disorders, current suicidal ideation, or current diagnosis of psychoactive substance abuse. Patients were classified on the basis of their predominant bowel habits after medical examination using Rome III guidelines (21): 42.7% were classified as diarrhea-predominant, 29.9% constipation-predominant, 22.8% mixed, and 4.6% unsubtyped. Institutional review board approval (University at Buffalo, 19 May 2009; Northwestern University, 19 December 2008)

and written, signed, informed consent were obtained before patient enrollment. The study was completed in full compliance with the Declaration of Helsinki.

Procedure

All measures in the present study were administered during pre-treatment screening period of an NIH trial. Informed consent was obtained from all participants before participation.

Measures

Patient Satisfaction—Patient satisfaction was assessed using a modified version of the global patient satisfaction scale from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey (22). The HCAHPS global scale asks patients to rate the quality of care using an 11-point numerical rating scale ranging from 0 (Worst possible care) to 10 (Best care possible). This single-item assessment of patient satisfaction is widely used (23-25) for rating care delivered in hospital settings. The scale was modified so that the patients rated quality of care for their IBS symptoms.

IBS Symptom Severity—IBS symptom severity was assessed using the UCLA Global Severity of Gastrointestinal Symptoms Scale (UCLA SS; (26)). The UCLA SS is a single item 21-point rating scale that measures severity of IBS symptoms. Participants rate symptoms from 0 (no symptoms) to 20 (most intense symptoms imaginable).

Bloating—Bloating was measured with the abdominal distension/tightness item of the IBS-Symptom Severity Scale (IBS-SSS, 27). Patients rated the severity of abdominal distension/tightness by marking a point on a continuous line ranging from 0 (no pain) to 100 (very severe).

Diagnostic Tests—Patients completed a 16 item checklist of diagnostic tests (stool sample tests, blood work, colonoscopy, sigmoidoscopy, GI endoscopy, barium enema, abdominal x ray, breath testing, etc.) they had undergone to assess their IBS symptoms since their onset.

Global Distress—Psychological distress was assessed using the 18-item version of the Brief Symptom Inventory(28). The BSI-18 requires respondents to indicate on a five-point scale (0 = not at all, 4 = extremely) their level of distress of 18 somatic and psychological symptoms for three types of problems (e.g., anxiety, somatization, depression). The average intensity of all items yields a composite index of psychological distress (Global Severity Index [GSI]). The GSI has been used extensively to measure psychological distress in patients with IBS(29).

Visceral Sensitivity—Fear of visceral sensations was assessed using the 15-item Visceral Sensitivity Index (VSI) (30). Items are rated on a 6-point scale, reverse scored, yielding a range of scores from 0 (no GI-specific anxiety) to 75 (severe GI-specific anxiety).

Anxiety Sensitivity—The Anxiety Sensitivity Index (ASI) (31) is a self-report measure that reflects fear of anxiety (e.g., “It scares me when I am anxious”), arousal related bodily

sensations (“It scares me when my heart beats rapidly”), and their consequences (e.g., “When I notice my heart is beating rapidly, I worry that I might have a heart attack”). Each of the 16 items of the ASI is rated on a six-point scale (0 =very little, 5 = very much).

Pain Catastrophizing—The two item version the Catastrophizing subscale of the Coping Strategies Questionnaire (CSQ) (32) asks patients to rate the frequency with which they engage in thoughts that index catastrophizing during pain episodes (e.g., “When I am in pain, I feel I can't stand it anymore). Respondents rate each item using a scale ranging from 0 (never do) to 7 (always do).

Neuroticism—Neuroticism was measured using the abbreviated Trait scale of the State Trait Anxiety Inventory (33). In responding to the 10 items of the Trait Anxiety scale, subjects indicate how they generally feel by rating the frequency of their feelings of anxiety on a 4-point scale ranging from 1 (almost never) to 4 (almost always).

Medical comorbidity—Medical comorbidity was assessed using a psychometrically validated (29) comorbidity checklist that covers 112 medical conditions organized around 12 body systems (musculoskeletal, digestive, kidney/genitourinary, endocrine, respiratory, circulatory, cardiovascular, oral, CNS, dermatological, Ear Nose, Throat, cancer). Respondents were asked whether a doctor had ever diagnosed them with a condition and, if so, whether the condition was present in the past 3 months. Persons were counted as current cases if the diagnosed condition was reported as present in the last 3 months. A total comorbidity score was based on the number of medical comorbidities a patient reported as present over the previous 3 months.

Psychiatric Comorbidity—Psychiatric comorbidity was assessed using the MINI International Neuropsychiatric Interview (MINI). The MINI (34) is a fully structured diagnostic interview that generates psychiatric diagnoses according to the fourth edition of the DSM. The version of the MINI developed for our research team included disorders covering 6 classes of conditions: anxiety disorders (panic, agoraphobia, generalized anxiety disorder, social phobia, obsessive-compulsive disorder, posttraumatic stress disorder), mood disorders (e.g., major depressive disorder, dysthymic disorder), substance use disorders (alcohol and drug abuse with or without dependence), somatization disorders (e.g. hypochondriasis, pain disorder), anxiety-depression, and antisocial personality disorder.

Data analysis plan

A series of multiple regression analyses were undertaken in order to determine the variables that best predict patient satisfaction (PS) among a sample of IBS patients. PS may be influenced by variables within several domains including demographic characteristics, overall health, IBS symptom severity, and psychological disorders. Data analysis involved a two-step process in which we first identified the strongest predictors of PS within each of these domains and then subsequently examined those predictors which best predicted PS within each domain together in a final comprehensive analysis. We chose to first examine predictors within each of these domains separately in order to identify the unique contributions of each domain to PS before comparing the variable in each domain to those in

the other domains. In each regression equation all predictor variables were entered in a single block. All significant predictors from the domain specific analyses were included in a final multiple regression equation predicting PS. Because these analyses were largely exploratory, we chose a liberal alpha level of $p < .10$ for variables in the domain specific regression analyses to be retained for the overall regression model. However, in the final overall regression model, we adhered to the traditional criteria for statistical significance of $p < .05$.

Results

Satisfaction Ratings

Past research studies on PS with the measure utilized in this project have usually scored the measure by dividing responses to the scale into three distinct groups, “Unsatisfied” (0-6), “Moderately Satisfied” (7-8), and “Very Satisfied” (9-10). Using this strategy, 73.3% were categorized as “Unsatisfied” ($n=321$), 19.5% as “Moderately Satisfied” ($n=86$), and 7.2% as “Very Satisfied” ($n=32$). The overall mean rating, 4.89 ($sd = 2.42$), fell between “Substandard” and “Average”. The most common rating was “Average” (22.3%) followed by “Inadequate” (14.8%) and “Good” (10.5%). As can be seen in Figure 1, although the mean was low but the distribution of scores was relatively normal (skewness = .04; Kurtosis = -.537). Based on these findings, we chose to treat PS scores as a continuous measure rather than using the traditional three group scoring. We did this because scoring the measure in the traditional way created an extremely skewed distribution with the majority of the patients categorized as unsatisfied. This did not adequately represent the actual distribution of the data. Additionally, breaking a continuous measure into a small number of categories has negative implications for both the validity and reliability of the measure and significantly reduces the statistical power of any tests conducted involving such a variable (see (35))

Predicting PS

Demographic Predictors—In the first multiple regression analysis examining demographic characteristics as predictors, PS regressed based on age, gender, minority status, relationship status, income, education, and whether the patient had health insurance. The regression model was significant, $F(7, 412) = 3.07$, $p = .01$, $R^2 = .04$. PS was predicted by race, $\beta = .09$, 95% CI [-0.01, .19], $t = 1.82$, $p = .063$, age, $\beta = -.13$, 95% CI [-0.03 / -.23], $t = -2.63$, $p = .009$, and having insurance, $\beta = .15$, 95% CI [.05, .25], $t = 3.06$, $p = .002$.

General Health Predictors—In the second multiple regression equation, we examined potential non-IBS health related issues as predictors. PS regressed based on the number of different medical tests patients had undergone in the previous 3 months, total number of non-IBS comorbid medical conditions reported, and the patient's Body Mass Index (BMI). The regression model was significant, $F(3, 429) = 5.67$, $p = .001$, $R^2 = .03$. PS was predicted only by number of medical disorders, $\beta = -.14$, 95% CI [-0.04 / -.24], $t = -2.71$, $p = .007$, and number of medical tests, $\beta = .17$, 95% CI [.07 / .26], $t = 3.46$, $p = .001$.

IBS Specific Predictors—Because our sample was drawn from treatment seeking IBS patients with residual GI symptoms, we examined possible predictors that reflected the

illness experience of IBS. PS was regressed on type of IBS (represented by three dummy coded variables)¹, duration of IBS symptoms (years), UCLA Symptom Severity, and bloating intensity. The regression model was not significant, $F(6, 420) = 1.40$, $p = .21$, $R^2 = .02$. No predictors from this model were retained for the comprehensive model.

Psychological Predictors—In the final preliminary regression analysis, we examined potential individual differences relating to general psychological traits and psychological disorders. When PS was regressed on neuroticism, BSI Global Severity (distress), total number of comorbid psychiatric disorders reported, visceral sensitivity, anxiety sensitivity, and catastrophizing, the model was significant, $F(6, 417) = 2.27$, $p = .036$, $R^2 = .03$. PS was only predicted by neuroticism, $\beta = -.14$, 95% CI $[-.01, -.28]$, $t = -1.99$, $p = .047$.

Comprehensive Model—All variables that were significant from the tests within each domain at $p < .10$ were retained for the final model. A correlation matrix of all the variables involved in the comprehensive analysis is presented in Table 2. PS was regressed on race, age, insurance, number of medical disorders, number of medical tests, and neuroticism (see Table 3). The regression model was significant, $F(6, 419) = 6.34$, $p < .001$, $R^2 = .08$. Results indicated that with the significant predictors from each domain included in the equation, race, $\beta = .10$, 95% CI $[-.01, .19]$, $t = 2.06$, $p = .04$, insurance, $\beta = .12$, 96% CI $[-.03, .22]$, $t = 2.61$, $p = .009$, number of medical tests, $\beta = .13$, 95% CI $[-.04, .23]$, $t = 2.75$, $p = .006$, and neuroticism, $\beta = -.13$, 95% CI $[-.03, -.22]$, $t = -2.58$, $p = .01$, all significantly predicted PS.

Number of Medical Tests and Gastroenterologist Consults As Predictors

Because we recruited subjects from a variety of sources (e.g. community, physician offices), not all participants had consulted a gastroenterologist at baseline screening. Out of the 448 patients in the sample, 305 (70%) had consulted a gastroenterologist. Whether patients consulted a gastroenterologist corresponded with the number of medical test they had undergone, $t(448) = -13.94$, $p < .001$. In the 133 patients who had not yet seen a gastroenterologist the mean number of medical tests was 1.67 ($sd = 2.48$). The distribution was abnormal, skewness = 1.57, kurtosis = 1.94, with the majority of the sample reporting no prior medical testing ($n = 78$, 54.5%). In the 305 patients who had seen a gastroenterologist, the mean number of medical tests was 5.47 ($sd = 2.78$). The distribution was more normal, skewness = 0.29, kurtosis = -0.52, with the majority of the sample reporting at least 4 or more medical tests ($n = 186$, 60.3%). Prior GI assessment also related to neuroticism, $t(435) = 2.03$, $p = .043$, with those receiving GI consultation being slightly more neurotic ($M = 20.97$, $sd = 5.85$) than those who had not seen a gastroenterologist ($M = 19.75$, $sd = 5.93$). $d = .21$. Having health insurance was also related to having visited a gastroenterologist, $\chi^2(df=1, n=448) = 4.25$, $p = .039$, with 47.6% of those without insurance versus 69.1% of those with insurance having visited a gastroenterologist.

¹IBS diagnosis is recorded as a four category variable consisting of diarrhea-predominant (IBS-D), constipation-predominant (IBS-C), mixed (IBS-M), and untyped (IBS-U). In order to use this information in the regression analyses, this nominal categorical variable was converted in to three dichotomous variables using dummy coding. The first variable created indicated IBS-D or not, the second indicated IBS-M or not, and the third indicated IBS-U or not. IBS-C was considered the reference category because the presence of with IBS-C would be indicated by null scores on all three dummy coded IBS diagnosis variables.

When the decision to consult a gastroenterologist (coded 1 = yes, 0 = no) was included in the full equation, the model was again significant, $F(7, 418) = 7.02$, $p < .001$, $R^2 = .11$. Insurance, $\beta = .11$, 95% CI [.02, .20], $t = 2.28$, $p = .023$, neuroticism, $\beta = -.12$, 95% CI [-.03, -.21], $t = -2.49$, $p = .013$, and having seen a gastroenterologist, $\beta = .18$, 95% CI [.07, .30], $t = 3.20$, $p = .001$, were the significant predictors. Medical testing was no longer significant, $\beta = .03$, 95% CI [-.08, .15], $t = 0.55$, $p = .582$.

To gain more perspective on the relationship between the decision to consult a gastroenterologist and the number of medical tests, we examined the distribution of the medical tests variable in both groups. Regression analyses were then conducted within each of the groups delineated by the having visited a gastroenterologist. In the group of patients who had not seen a gastroenterologist, the overall regression model was not significant, $F(6, 127) = 1.54$, $p = .17$, $R^2 = .07$, although the number of comorbid medical disorders was a significant predictor, $\beta = -.21$, 95% CI [-.01, -.38], $t = -2.05$, $p = .043$ (see Table 2, column 2). Because of the lack of statistical significance for the overall model and likely low statistical power due to the small sample size in this group these results should be viewed with caution. In the group of patients who had seen a gastroenterologist (see Table 2, column 3), the regression model was significant, $F(6, 285) = 4.07$, $p = .001$, $R^2 = .08$. Age, $\beta = -.17$, 95% CI [-.04, -.28], $t = -2.57$, $p = .011$, insurance, $\beta = .16$, 95% CI [.05, .30], $t = 2.73$, $p = .007$, and neuroticism, $\beta = -.16$, 95% CI [-.04, -.26], $t = -2.68$, $p = .008$, were significant predictors, however, number of medical tests was not a significant predictor, $\beta = .01$, 95% CI [-.13, .13], $t = 0.16$, $p = .873$.

Discussion

This study sought to determine predictors of satisfaction in a cohort of individuals with moderate to severe IBS symptoms. Understanding the predictors of satisfaction can help physicians optimize the quality of care and their reimbursement potential in a value-based health care environment. Contrary to our hypothesis, our analysis did not support the notion that patient satisfaction corresponds with IBS symptom severity. Furthermore, we did not identify a link between PS and other aspects of IBS such as duration of illness, quality of life impairment due to IBS symptoms, predominant bowel type, etc. Our findings suggest that at some level patients do not use the severity of their symptoms as a basis for gauging quality of care. These data should allay gastroenterologists who worry that they may be disadvantaged in reimbursement models by virtue of the chronicity and refractory nature of GI symptoms. That said, a significant proportion of IBS patients reported lower ratings of quality of care. It is possible that what drives these ratings is not so much the severity of symptoms or their impact on quality of life but the “hassle factor” of being treated for a chronic condition (cost of copays or deductibles, inconvenience, the need to take time off work and arrange childcare, wait time for appointments, etc.). Future research is needed to determine their contribution, if any, to patient satisfaction.

Echoing previous patient satisfaction research (36) more neurotic patients reported greater dissatisfaction with the care they received for IBS symptoms. Neuroticism reflects a broad and pervasive personality style that is prone to experience negative emotions. Neuroticism differs from state anxiety that is time limited and arises in specific situations (e.g. roller

coaster ride, public speaking). Physiologically, elevated neuroticism is associated with increased autonomic and neural responses to negative stimuli (37-39). Cognitively, persons with high scores on neuroticism scales tend to have an internal self-focus (i.e. somatically focused) and a propensity to interpret noxious bodily sensations in a negative manner. On self-report measure, high neurotic individuals report more bothersome symptoms, interpret their symptoms as more severe and expressed more general emotional distress than low neuroticism individuals. Neuroticism may influence the IBS experience by lowering the sensitivity threshold at which noxious symptoms (e.g., pain) are perceived as threatening, intolerable, and requiring medical intervention. If personality variables like neuroticism influences perceptions of clinical care, then it raises questions as to whether patient satisfaction reporting is a wholly accurate reflection of treatment delivery. If not, then reimbursement models based on quality indicators may work against physicians whose patients have a notable perceptual abnormality that distort their appraisal of patient reported outcome indices like patient satisfaction. While statistically significant, neuroticism accounted for a limited amount of variance in satisfaction. However, this does not necessarily render this relationship clinically irrelevant. A small effect can often have important implications when multiplied over a large population. For example, the variance accounted for in heart attacks by the prescription of a daily aspirin is less than 1% but this translates a large number of lives saved each year(40)). While patient satisfaction may not be as life threatening as heart disease, understanding the psychological factors that influence how patients relate to their physicians may help physicians better serve patients and ultimately lead to an increase in treatment adherence and improved treatment outcomes. In an era of value-based medicine it is important for physician and patient to understand each other and what is expected of each in order to for the patient to receive the best care possible. At the least, our data argue for moving from intrapersonal to interpersonal and organizational factors that drive patient satisfaction.

Contrary to predictions, number of diagnostic tests was associated with greater, not less, patient satisfaction. The finding raises concerns expressed elsewhere (41) that quality of care measured by what patients want may under certain circumstances conflict with the principles and practice of evidence based medicine that emphasizes what they need (42). The potential upshot is that providers and payers find themselves pressed to provide a positive patient experience at the expense of delivering quality evidence-based care. Clinical guidelines for IBS encourage physicians to make a positive diagnosis using symptom based diagnostic criteria, while limiting testing in patients without clinical “red flags” suggestive of more serious organic disease. This recommendation is based on extensive evidence that satisfying Rome criteria for IBS portends a 98% probability that the symptoms are due to IBS (43). Further, as Longstreth (20) has written, “unnecessary testing in patients with severe IBS can contribute to an unfortunate cycle that includes increasing anxiety, pain, disability, expectation of cure, and more visits, drugs, tests”. This would suggest that the number of diagnostic tests would be inversely associated with satisfaction, with more satisfied patients reporting fewer tests. In fact, we found the opposite: Patients who underwent more tests described their care in more positive terms. This is notable for two reasons. First, because IBS lacks a reliable biomarker, testing would appear to have limited value in identifying structural pathology that would guide clinical decision making for

patients who as in our sample lacked organic GI disease. Second, because the predictive power of testing was rendered not significant when history of consulting a gastroenterologist was introduced into regression equation, it is possible that testing derives its value from the reassurance there is “nothing seriously wrong”

Of course, a normative amount of reassurance plays an important role in clinical encounters by providing patients an alternative (less threatening) explanatory model for making sense of symptoms. The problem is that excessive reassurance may inadvertently perpetuate some patients' anxiety via the conditioning principle of negative reinforcement. This is because any immediate anxiety relief that temporarily follows reassurance has the potential to reinforce anxiety in the long term, fueling the demand for more reassurance as a way of managing anxiety (44). This process is represented in Figure 2. Because of their propensity toward neuroticism and a rigid coping style geared toward solving problems regardless of their controllability (45, 46), IBS patients may be particularly drawn into this vicious cycle. The unintended negative consequences of reassurance has prompted some medical researchers to argue that ‘medical reassurance [through testing and simple statements like “don't worry about it”] as currently practiced is both ineffective and theoretically contraindicated’ (47). The work of Spiegel et al (48) and others (49) suggest that this conclusion extends to GI patients including those with IBS. To the extent that testing provides little if any reassurance (50) and can actually escalate the very anxiety it aims to relieve (51) then patients may benefit by learning more adaptive symptom self-management skills (52) that help shift their focus from what disease they may (or may not) have to what specific behaviors they need to learn to more effectively manage the daily burden of IBS. Gastroenterologists may be well served by accessing resources to help their patients understand and face their fears (53) without acquiescing to the incessant drum beat for additional tests as an anxiety management strategy with questionable clinical importance. This need not be burdensome. A clear explanation of what the symptoms mean and watchful waiting can render excessive testing unnecessary for patients without signs of more serious disease (50) and empower patients to take charge of residual symptoms. As Deyo wrote of the problem of excessive testing in patients with low back pain, the “task is to convince our patients that more is not always better” (12). If conveyed in a firm, patient and compassionate manner, this approach can go a long way in validating the genuineness of their symptoms without relying on tests to do so, and even, enhance patient satisfaction (54).

Our study has several limitations. First, because our data are cross-sectional, we do not intend to suggest that the findings demonstrate causal relationships between variables. At best, our data can be construed as suggestive of a possible causal relationship between predictors and patient satisfaction that could be confirmed through longitudinal analyses with a larger sample. Furthermore, because of the relative demographic homogeneity of our sample, our results may not generalize to a broader, more diverse population. Our sample included subjects who volunteered for a behavioral treatment for a medical problem. It is possible that our subjects were more severe and complex than those who did not seek psychological treatment for their IBS. Lacking a control group, we cannot determine whether the association between significant behavioral factors and patient satisfaction is specific to IBS or a nonspecific finding characteristic of patients with other GI diseases (eg IBD). We relied on a single item measure of patient satisfaction. While the measure was

drawn from the Hospital Consumer Assessment of Healthcare Providers and Systems survey used by the CMS to gauge quality of care, single item measures are less reliable and less valid than multiple item measures (4). Notwithstanding their psychometric limitations, single item measures of patient satisfaction have both empirical and practical advantages. Because they are easy to administer and interpret, they are used extensively by both patients and hospitals on social media outlets such as Vitals, Yelp, Healthgrades, and RateMDs to gauge patient satisfaction. Patients rely on single item measures to make decisions about health care plans and physicians (56). Hospitals use single item measures to interact with prospective patients and gauge satisfaction of treated ones (57). Single item measures are descriptively similar to what information patients exchange with others about health care options. Beyond their logistical advantages, single item measures are not wholly devoid of psychometric soundness. Dorn et al (4) found good correspondence between single and multi-item measure of satisfaction for IBS patients. Single item patient ratings predict objective quality of care indices such as hospital readmission rates and malpractice claims (58, 59).

Because patient satisfaction is a multidimensional judgement of various aspects of health care, single item scales have less explanatory value than ones with subscales that tap its different aspects such as provider communication style, organizational efficiency, etc. (60). Our study was not designed to address the question of what aspects of health care drive (dis)satisfaction. Also unanswered from this cross-sectional study is the causal relationship between study variables. The patient satisfaction data have inferred causality from associations between patient satisfaction and health outcomes. Indeed, an assumption of causality lies at the core of value-based reimbursement schemes. The design of these studies does not rule out the notion that patient satisfaction is a consequence not cause of health outcomes. Patients may describe themselves as more satisfied because their symptoms improve, not because of the courtesy of staff, accessibility, cleanliness of office, physician bedside manner or other quality of care dimensions. If this is the case, patient satisfaction may simply be a proxy for more traditional outcome metrics which would mean that they are given extra and undue weight in value-based reimbursement models. Ironically, gastroenterologists seeing difficult to treat GI patients may be disadvantaged because reimbursement models may not adequately assess quality metrics that should be independent of outcome of treatment delivered. Disentangling the casual relationship between patient satisfaction and symptom persistence or relief requires a more sophisticated methodological approach than has been applied to the data. Also unknown is the role of distress variables in shaping quality of care indices. Previous research (61) has shown that patients' emotional and psychological makeup can influence their responses to physician behaviors (e.g. interactional style) that define quality of care metrics. It is also possible that psychologically distressed patients "may lead physicians to respond with anger, avoidance and frustration and to refer negatively to them as "crocks" and "hypochondriacs" (17). This response may trigger a vicious cycle that engenders low patient satisfaction, poor compliance to prescribed medical regimens, and increased hostility, further compromising quality of care. There is clearly much to learn about quality of care indices and their determinants. In the meantime, it is hoped that this study will foster other research that clarify just what patient satisfaction

means to provider, patient, and payers as they traverse the changing landscape of value-based healthcare.

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Fig 1. Percent of Sample Responding to Each Scale Point on PS Measure

Fig 2.
The role of reassurance seeking in the maintenance of health anxiety. GI, Gastrointestinal.

Table 1**Patient Characteristics**

	Mean (sd)	Min	Max
Age	41.37 (14.80)	18	70
Medical Comorbidities	9.47 (6.59)	0	24
Psychiatric Comorbidities	1.21 (1.61)	0	12
Medical Tests	4.26 (3.22)	0	14
BMI	26.51 (6.52)	16.50	79.30
Duration IBS Symptoms (Years)	16.81 (14.29)	0	70
Bloating	42.72 (27.85)	0	100
BSI-GSI	12.96 (11.29)	0	60
Catastrophizing	2.63 (1.66)	0	6
VSI	44.69 (13.99)	6	73
ASI	23.61 (11.84)	0	62
Neuroticism	20.13 (5.93)	10	40

Table 2

Correlations Among All Variables in Final Models

	1	2	3	4	5	6	7	8
1. PS	1.00							
2. Race	.11*	1.00						
3. Age	-.11*	.00	1.00					
4. Insurance	.12*	.00	.01	1.00				
5. Med Comorbidities	-.12*	-.02	.45**	.03	1.00			
6. Medical Tests	.14*	.08	.06	.01	.16**	1.00		
7. Neuroticism	-.15**	.01	-.06	-.07	.17**	-.09	1.00	
8. Visit to Gastroenterologist	.24**	.09	-.10*	.10*	-.07	.55**	-.10*	1.00

Table 3

Full Regression Model for Complete Sample and for Subsample of Patients Having Visited a Gastroenterologist.

	Full Sample	No Visit to GE	Visit to GE
	b(se)	b(se)	b(se)
Race	0.80 (0.39) *	0.75 (0.61)	0.65 (0.51)
Age	-0.01 (0.01)	0.03 (0.02)	-0.03 (0.01) *
Insurance	1.41 (0.54) **	0.55 (0.78)	2.01 (0.74) **
Medical Comorbidities	-0.03 (0.02)	-0.07 (0.04) *	0.00 (0.02)
Medical Tests	0.10 (0.04) **	0.08 (0.08)	0.01 (0.05)
Neuroticism	-0.05 (0.02) *	-0.01 (0.04)	-0.06 (0.02) **
<i>Constant</i>	4.31 (0.85)	2.32 (1.50)	4.97 (1.08)

*
p < .05,

**
p < .01