Psychological Factors Associated With Adherence to Oral Treatment in Ulcerative Colitis

Sonya S. Dasharathy, MD,* Millie D. Long, MD, MPH,* Jeffrey M. Lackner, PsyD,* Dana Ben-Ami Shor, MD,§ Liu Yang, MD,* Nir Bar, MD,* Christina Ha, MD,* and Guy A. Weiss, MD*

From the *Vatche and Tamar Manoukian Division of Digestive Diseases, David Geffen School of Medicine at UCLA, Los Angeles, CA, USA
Division of Gastroenterology, University of North Carolina, Chapel Hill, NC, USA
‡Division of Behavioral Medicine, Department of Medicine, Jacobs School of Medicine, University at Buffalo, Buffalo, NY, USA
§Department of Gastroenterology, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel
Karsh Division of Gastroenterology and Hepatology, Cedars-Sinai Medical Center, Los Angeles, CA, USA

Address correspondence to: Guy A. Weiss, MD, 100 Medical Plaza, Suite #345, Los Angeles, California 90095, USA (GWeiss@mednet.ucla.edu).

Introduction: Medication nonadherence in patients with ulcerative colitis (UC) can result in frequent relapses, severe disease, and higher risk of colorectal cancer. Behavioral models relying on motivation and perceived competence, like the self-determination theory (SDT), have been implicated in nonadherence; however, the SDT has not been evaluated in the adult UC population. We sought to examine the association between adherence to oral medications in patients with UC and psychological distress, relationship with health care providers, motivation, and competence.

Methods: We performed a cross-sectional study within the Inflammatory Bowel Disease (IBD) Partners online registry in which participants completed a baseline survey including demographic information, IBD history, symptoms, medication adherence, and psychosocial factors. Members of the registry with a diagnosis of UC who received an online follow-up survey that included baseline questionnaires and assessment of competence, motivation, and patient-physician relationship. Logistic regression models were performed to determine the relationship between psychosocial factors, adherence modifiers, and medication adherence.

Results: Of the 410 UC patients included, 29% had low adherence to their medications, 36% had medium adherence, and 34% had high adherence. In the multivariable analysis, younger patients, those with a lower perceived competence, and those with worse relationship with their providers were more likely to have lower adherence to their medications.

Conclusions: Poor adherence to oral medications in UC was associated with lower perceived competence and worse relationship with providers. Further interventions based on the SDT can potentially improve adherence and optimize patient care.

Lay Summary
In a cross-sectional study within the Inflammatory Bowel Disease Partners online registry, poor adherence to oral medications in adult patients with ulcerative colitis was associated with lower perceived competence and worse relationship with providers.

Key Words: ulcerative colitis, self-determination theory, motivation, competence, adherence, inflammatory bowel disease

Introduction
Medication adherence poses a clinical challenge in inflammatory bowel disease (IBD), with nonadherence rates ranging from 30% to 45%. A wide range of modalities is used to assess adherence, including patient-reported outcomes, pharmacy refill records, and drug metabolite levels. Nonadherence to medications in ulcerative colitis (UC) may result in frequent relapses, a more severe disease course, and an increased risk for colorectal cancer. Previously established predictors of nonadherence to oral medications include younger age, higher education level, complex dosing schedule, limited knowledge of medications, unmarried status, and shorter disease duration. Comorbid depression is known to be a risk factor for poor adherence to medical therapy in other chronic conditions, and treatment has been shown to improve adherence to antiretroviral therapy among patients with human immunodeficiency virus (HIV). Similarly, multiple prior studies in patients with IBD have shown an association between depression and anxiety and medication nonadherence. Moreover, incomplete management of these psychological factors may lead to disease relapse.

One way of understanding the role psychosocial factors have on adherence is by adopting a conceptual model that has informed research and clinical practice. Self-determination theory is an empirically based theory of motivation that presumes that humans have 3 basic psychological needs—autonomy, competence, and relatedness—each of which impact one's motivation to adhere to medical regimen. Perceived competence refers to the experience of mastery and being effective in one's activity. Autonomous or intrinsic motivation includes behaviors conducted because the patient considers them important and a personal choice, whereas controlled or extrinsic regulation results from external pressure (ie, from a physician or a spouse). Self-determination theory (SDT) health research and clinical trials have examined both patient motivation and provider autonomy support in a wide variety...
of health conditions including asthma, smoking cessation, and diabetes. Self-determination theory holds that when one’s social environment is more supportive of these needs, the quality of motivation is more autonomous. Researchers have found that patients who perceive their providers as more autonomous are more likely to adhere to diabetes medications, which in turn impacts patients sense of competence and achieves lower glucose levels and hemoglobin A1C. Similar pattern findings linking SDT constructs to health outcomes have been reported for behaviors such as dental hygiene, weight loss maintenance, and physical activity.

A study that examined motivation in an adolescent IBD population showed that lack of autonomous motivation indeed predicted nonadherence; however, the interrelationship among autonomous motivation and competence as they relate to medication adherence in adult IBD patients is unknown, and no studies to date have examined the SDT in the adult UC population. We therefore sought to examine the association between adherence to oral medications in patients with UC and psychological distress, quality of relationship with health care providers, motivation, and competence.

Materials and Methods

The IBD (Crohn’s and Colitis Foundation) Partners study is a longitudinal internet-based cohort of participants 18 years of age or older with a self-reported diagnosis of Crohn’s disease, UC, or indeterminate colitis. The development of this cohort has been described in detail previously. All participants completed a baseline survey including demographic information, questions about their IBD history, symptoms, medication use and adherence, and psychosocial factors, including anxiety and depression. Respondents then completed biannual surveys to update disease, demographic information, and psychosocial factors. We performed a cross-sectional analysis within this online registry. Existing members of the registry with a diagnosis of UC received an online follow-up survey that included baseline questionnaires, assessment of additional psychosocial factors (competence and motivation), and adherence-associated factors (patient-physician relationship). Only patients on oral UC treatment who reported follow-up with a gastroenterologist within the last year were eligible to participate. Patients who underwent surgery for IBD were excluded.

Psychosocial Factors

Depression and anxiety were assessed in the baseline and follow-up survey using the NIH Patient-Reported Outcomes Measurement Information System (PROMIS) surveys, which have been previously used to assess depression and anxiety in IBD. All scales were calibrated using an item response theory graded response model and scored on a t-score metric with a mean of 50 and standard deviation (SD) of 10 in the US general population. A higher score denotes more symptoms on that scale. Based on prior data in chronic diseases, a minimally important difference (MID) used for anxiety and depression was 4 and 3-4 points, respectively.

Stress, competence, and motivation were all measured in the follow-up survey. Stress was measured using the Perceived Stress Scale (PSS), which is a 4-item questionnaire that measures the stressfulness of situations over the past month. Items are rated on a 5-point Likert scale ranging from 0 (never) to 4 (very often). The PSS has been well-validated and widely used in many research settings, including in IBD. Competence for managing IBD was measured with the Perceived Competence Scale (PCS), which is a 4-item questionnaire that evaluates a subject’s confidence in maintaining their IBD treatment regimen. Lastly, motivation was evaluated using the Treatment Self-Regulation Questionnaire (TSRQ), a 15-item questionnaire that evaluates a subject’s motivation to maintain an adequate treatment regimen and defines this motivation as autonomous (intrinsic) or controlled (extrinsic).

Adherence-associated Factors

The relationship between patients and physicians was assessed in the follow-up survey using the Health Care Climate Questionnaire (HCCQ), a 6-item questionnaire that evaluates a subject’s perceptions of their physicians’ supportive-ness of autonomy. Disease activity was measured in the follow-up survey using the Simple Clinical Colitis Activity Index (SCCAI). Active disease was defined as a score ≥2.

Primary Outcome

The primary outcome was adherence to oral UC medications, which was assessed in the baseline survey using the Morisky Medication Adherence Scale (MMAS-8), an 8-item measurement of medication adherence that was originally developed to examine the effect of adherence on hypertension control. The questionnaire was found to be reliable with good predictive validity and has been used in previous studies investigating IBD and nonadherence. Adherence scores ranged from 0-8, and low adherence was defined as a score of 5 or lower, medium adherence as a score of 6-7, and high adherence as a score of 8.

Statistical Analysis

The main hypothesis of the study was that there was a significant difference in motivation scores between adherent and nonadherent patients as defined by the MMAS-8 score. Univariate and multivariable ordinal logistic regression models were used to determine the relationship between adherence and psychosocial and adherence-associated factors. All variables with P < .1 in the univariate analysis were included in the multivariable model. The Wilcoxon Rank Sum test was used to compare continuous variables and χ² or Fisher exact test used to compare categorical variables. Analyses were conducted using SAS version 9.4.

Ethical Considerations

This study was approved by the institutional review boards of the University of California, Los Angeles and University of North Carolina.

Results

Six hundred twenty-one subjects were recruited to the study during a 3-month online recruitment period; 174 were excluded from the analysis due to missing data on adherence, and 37 were excluded because they previously underwent surgery for IBD. Four hundred ten subjects with UC were included in the analysis, with a median age of subjects of 49.5 years and age at diagnosis of 32 years. Of these subjects, 294
Psychological Factors Associated With Adherence to Oral Treatment in Ulcerative Colitis

(72%) were female, 368 (94%) were White, and 141 (34%) have been hospitalized for IBD.

Of the 410 subjects analyzed, 119 (29%) had low adherence to oral UC medications (MMAS-8 score <6), 149 (36.3%) had medium adherence (MMAS-8 score 6–7), and 142 (34.6%) had high adherence (MMAS-8 score >7) (Table 1). In the univariate model, younger patients and those diagnosed with UC at a younger age were significantly less adherent; however, no difference was identified in gender, number of medications, and other baseline characteristics. The percentage of subjects with active disease (SCAI >2) was significantly higher in the low and medium adherence groups compared with the high adherence group (28% vs 21% vs 17%, P = .0121). Patients with better adherence also had lower anxiety (P = .0038) and depression scores (P = .0138); although, this was not considered clinically significant, as the difference in mean scores was <3. Patients were more likely to have a better relationship with their providers (odds ratio [OR], 1.379; 95% CI, 1.209-1.574) with increased medication adherence. Perceived stress was also lower (OR, 0.909; 95% CI, 0.859-0.962), and perceived competence was higher (OR, 2.663; 95% CI, 1.910-3.713) as adherence increased.

In the multivariable analysis, older patients (adjusted OR [aOR] 1.035; 95% CI, 1.016-1.054) and those with a higher perceived competence (aOR, 2.228; 95% CI, 1.575-3.152) were more likely to have higher adherence (Table 2). Similarly, patients who had better relationships with their providers were more likely to have higher adherence to their medications (OR, 1.219; 95% CI, 1.054-1.411).

### Table 1. Baseline demographics and medication adherence in UC.

<table>
<thead>
<tr>
<th></th>
<th>Low Adherence (MMAS-8 &lt; 6)</th>
<th>Medium Adherence (MMAS-8 = 6–7)</th>
<th>High Adherence (MMAS-8 &gt; 7)</th>
<th>OR (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>n (%)</td>
<td>119 (29)</td>
<td>149 (36.3)</td>
<td>142 (34.6)</td>
<td>1.04 (1.03–1.06)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Age, median (IQR)</td>
<td>41 (22)</td>
<td>50 (23)</td>
<td>55 (22)</td>
<td>1.07 (1.06–1.09)</td>
<td>0.094</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>93 (78.2)</td>
<td>104 (69.8)</td>
<td>97 (68.3)</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>26 (21.9)</td>
<td>45 (30.2)</td>
<td>45 (31.7)</td>
<td>0.71 (0.48–1.06)</td>
<td></td>
</tr>
<tr>
<td>Age at diagnosis, median (IQR)</td>
<td></td>
<td>29 (16)</td>
<td>32 (21)</td>
<td>36 (17)</td>
<td>1.03 (1.02–1.05)</td>
</tr>
<tr>
<td>Number of medications, median (IQR)</td>
<td></td>
<td>1 (1)</td>
<td>1 (1)</td>
<td>1 (0)</td>
<td>0.78 (0.54–1.13)</td>
</tr>
<tr>
<td>PROMIS anxiety, median (IQR)</td>
<td></td>
<td>51.2 (19.2)</td>
<td>48 (17.4)</td>
<td>48 (15.5)</td>
<td>0.97 (0.95–0.99)</td>
</tr>
<tr>
<td>PROMIS depression, median (IQR)</td>
<td></td>
<td>49 (28.4)</td>
<td>41 (12.9)</td>
<td>41 (10.8)</td>
<td>0.97 (0.95–1.00)</td>
</tr>
<tr>
<td>PSS, median (IQR)</td>
<td>5 (5)</td>
<td>4 (4)</td>
<td>4 (4)</td>
<td>0.91 (0.86–0.96)</td>
<td>0.0009</td>
</tr>
<tr>
<td>PCS, median (IQR)</td>
<td>7 (1)</td>
<td>7 (0)</td>
<td>7 (0)</td>
<td>2.66 (1.91–3.71)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>TSRQ, median (IQR)</td>
<td>1.5 (1.4)</td>
<td>2.1 (1.8)</td>
<td>1.9 (1.7)</td>
<td>1.09 (0.92–1.28)</td>
<td>0.324</td>
</tr>
<tr>
<td>HCCQ, median (IQR)</td>
<td>5.3 (2.3)</td>
<td>6.3 (1.8)</td>
<td>6.7 (1.3)</td>
<td>1.38 (1.21–1.57)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>SCCAI &gt; 2, n (%)</td>
<td>28 (23.5)</td>
<td>21 (14.3)</td>
<td>17 (12)</td>
<td>0.53 (0.33–0.87)</td>
<td>0.012</td>
</tr>
</tbody>
</table>

Use of the ©MMAS is protected by US copyright laws. Permission for use is required. Licensure agreement is available from: Donald E. Morisky, ScD, ScM, MSPH, Professor, Department of Community Health Sciences, UCLA School of Public Health, 650 Charles E. Young Drive South, Los Angeles, CA 90095-1772.

Abbreviations: IQR, interquartile range; MMAS-8, 8-item Morisky Medication Adherence Scale; OR, odds ratio; CI, confidence interval; PROMIS, Patient-Reported Outcomes Measurement Information System; PSS, Perceived Stress Scale; PCS, Perceived Competence Scale; TSRQ, Treatment Self-Regulation Questionnaire; HCCQ, Health Care Climate Questionnaire; SCCAI, Simple Clinical Colitis Activity Index

*Wilcoxon Rank Sum test used for continuous variables and χ² or Fisher’s Exact test used for categorical variables.*

#### Discussion

This study is the first to examine the impact of SDT and psychological distress on adherence to oral medications in adult patients with UC. Almost 30% of subjects had poor adherence, and younger patients and those diagnosed with UC at a young age reported lower rates of adherence. In addition, poor adherence to oral medications was associated with worse disease activity and increased stress. As expected, lower perceived competence and worse relationship with providers resulted in worse adherence to oral UC medications. Therefore, care providers need to be aware of the effect that psychological distress and sense of autonomy has on medication adherence.

In terms of psychological distress, our study identified an association between poor medication adherence and increased stress, which is consistent with previous studies. In a 2003 prospective study of 153 IBD patients, nonadherence to all IBD medications was assessed using the 4-item MMAS and was significantly related to perceived stress as measured by the PSS. Those who reported psychological distress did not have worse adherence, but this was not assessed using a validated questionnaire. Similarly in a cross-sectional study of 136 patients with IBD recruited from online support groups, higher perceived stress using the PSS was a predictor of lower adherence in both the CD and UC groups.

In our study, patients with better adherence also had lower anxiety and depression scores, but this was not considered statistically significant, as the difference in mean scores was considered clinically significant, as the difference in mean scores was <3. Patients were more likely to have a better relationship with their providers (odds ratio [OR], 1.379; 95% CI, 1.209-1.574) with increased medication adherence. Perceived stress was also lower (OR, 0.909; 95% CI, 0.859-0.962), and perceived competence was higher (OR, 2.663; 95% CI, 1.910-3.713) as adherence increased.

In the multivariable analysis, older patients (adjusted OR [aOR] 1.035; 95% CI, 1.016-1.054) and those with a higher perceived competence (aOR, 2.228; 95% CI, 1.575-3.152) were more likely to have higher adherence (Table 2). Similarly, patients who had better relationships with their providers were more likely to have higher adherence to their medications (OR, 1.219; 95% CI, 1.054-1.411).

**Table 1. Baseline demographics and medication adherence in UC.**

- **OR (95% CI)a**
- **P**
The same authors applied the self-determination theory (SDT) model of health behavior to predict medication adherence, quality of life (QOL), and physiological outcomes among patients with diabetes and concluded that health care providers’ support for patients’ autonomy and competence around medication use and diabetes self-management related positively to medication adherence, QOL, and improved HbA1c levels.23

To our knowledge, only 1 study has examined motivation in an IBD population.27 Reed-Knight et al assessed medication adherence using the Medical Adherence Measure (MAM) in 90 adolescent patients with IBD (26% with UC) and found that a lack of autonomous motivation predicted nonadherence. In our study, there was a trend towards worse relative autonomous motivation in the nonadherent group, but this was not statistically significant. This discrepancy in outcome may be attributed to pediatric vs adult population, smaller number of patients with UC in the pediatric group, and differing measurements of medication adherence.

Our study exhibited several strengths. Only psychometrically validated questionnaires were utilized to assess psychological distress, competence, motivation, relationship with providers, and medication adherence. In addition, we framed the hypothesis within an empirically rooted conceptual model (self-determination model) of human motivation, which has been applied to various domains, including education, health and medicine, physical activity, and religion.19–21 The concept of autonomous support of medical providers is also important, as a collaborative approach between the patient and provider leads to better outcomes.49,50

Despite the important results of our study, there are several limitations we would like to address. We recognize that volunteers for an online study are self-selected and may systematically differ from UC patients in general. Although at this stage of scientific discovery, we believe that the novelty and impact potential offsets methodological imperfections. Self-reported conditions may include overdiagnosis, although our cohort is on oral IBD therapy, which is prescribed by a health care provider and is unlikely to represent cases of self-diagnosis. Additionally, self-reported adherence remains susceptible to recall and social desirability biases and may lead to inaccuracies, yet the used tool has been widely validated. Multiple key publications have stemmed from this IBD Partners registry. In addition, several factors which may affect adherence were not included in the analysis, including additional patient-, disease-, and drug-related variables, though these have been previously studied (eg, daily medication dosing is associated with improved adherence compared with divided doses, concomitant medications are associated with lower adherence, and thiopurines are associated with better adherence compared with mesalamine).44,51,52 We relied upon voluntary participation among patients who belonged to the IBD Partners online cohort, a population more likely to be adherent to medications. However, our adherence rate was similar to previous studies.1 In addition, only associations related to adherence barriers can be noted in this type of study. Finally, the study sample was predominantly White with minimal disease activity and taking only 1 oral medication on average, which limits its generalizability. Therefore, the findings may not necessarily apply to different ethnicities and those with more severe forms of UC on combination or parenteral therapy.

Table 2. Factors associated with medication adherence in the multivariable model.

<table>
<thead>
<tr>
<th></th>
<th>Adjusted OR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1.035</td>
<td>1.016–1.054</td>
<td>0.0002</td>
</tr>
<tr>
<td>Female sex</td>
<td>0.827</td>
<td>0.537–1.273</td>
<td>0.388</td>
</tr>
<tr>
<td>Age at diagnosis</td>
<td>1.008</td>
<td>0.989–1.026</td>
<td>0.417</td>
</tr>
<tr>
<td>PROMIS anxiety</td>
<td>1.003</td>
<td>0.972–1.036</td>
<td>0.836</td>
</tr>
<tr>
<td>PROMIS depression</td>
<td>0.999</td>
<td>0.963–1.037</td>
<td>0.972</td>
</tr>
<tr>
<td>PSS</td>
<td>0.979</td>
<td>0.901–1.065</td>
<td>0.627</td>
</tr>
<tr>
<td>PCS</td>
<td>2.228</td>
<td>1.575–3.152</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HCCQ</td>
<td>1.219</td>
<td>1.054–1.411</td>
<td>0.008</td>
</tr>
<tr>
<td>SCCAI &gt;2</td>
<td>0.709</td>
<td>0.348–1.442</td>
<td>0.342</td>
</tr>
</tbody>
</table>

Use of the ©MMAS is protected by US copyright laws. Permission for use is required. Licensure agreement is available from: Donald E. Morisky, ScD, ScM, MSPH, Professor, Department of Community Health Sciences, UCLA School of Public Health, 650 Charles E. Young Drive South, Los Angeles, CA 90095-1772.

Abbreviations: OR, odds ratio; CI, confidence interval; PROMIS, Patient-Reported Outcomes Measurement Information System; PSS, Perceived Stress Scale; PCS, Perceived Competence Scale; HCCQ, Health Care Climate Questionnaire; SCCAI, Simple Clinical Colitis Activity Index

*Adjusted for all variables with P < .1 in the univariate analysis.

low. A British study examined nonadherence to maintenance mesalazine therapy in 98 patients with UC by direct inquiry and analysis of urine samples for 5-aminosalicylic acid/N-acetyl-5-aminosalicylic acid.44 Complete failure to take medication was associated with depression as measured by the Hospital Anxiety and Depression Scale (HADS); however, a similar association was not found with anxiety.44 In a French study evaluating 1663 patients with IBD, 11% of patients were depressed, and 41% were anxious using the HADS.14

Both anxiety and depression were associated with an increase in disease flares; although, only anxiety was associated with nonadherence to treatment. In contrast to these studies, a 2013 study showed that nonadherence in IBD measured by the Medicine Adherence Report Scale was not associated with anxiety or depression.47 Overall, these studies yielded inconsistent results, which may be secondary to a significant heterogeneity in measurement of both medication adherence, anxiety, and depression.

Our findings also emphasize the importance of self-determination processes in maintaining adequate adherence to oral medications in UC, and our results are similar to previous studies of the SDT model and adherence in other chronic diseases. In a study by Kennedy et al assessing the utility of SDT in predicting adherence to antiviral therapy in 205 male patients with HIV, autonomy support from health care providers was predictive of autonomous motivation for adherence, which predicted perceived competence for adherence and ultimately resulted in greater adherence.48 In addition, adherence to HIV medications was associated with low psychological distress, similar to our study. Similar findings were identified in patients with type 2 diabetes mellitus.22,23 In a prospective cohort study of 128 patients with diabetes, patients’ perceptions of autonomy support related to a significant decrease in HbA1c values at 12 months.22 Moreover, perceived autonomy support from the staff related to significant increases in patient autonomous motivation, which in turn correlated with better perceived competence scores.22 The same authors applied the SDT model of health behavior to predict medication adherence, quality of life (QOL), and physiological outcomes among patients with diabetes and concluded that health care providers’ support for patients’ autonomy and competence around medication use and diabetes self-management related positively to medication adherence, QOL, and improved HbA1c levels.23

To our knowledge, only 1 study has examined motivation in an IBD population.27 Reed-Knight et al assessed medication adherence using the Medical Adherence Measure (MAM) in 90 adolescent patients with IBD (26% with UC) and found that a lack of autonomous motivation predicted nonadherence. In our study, there was a trend towards worse relative autonomous motivation in the nonadherent group, but this was not statistically significant. This discrepancy in outcome may be attributed to pediatric vs adult population, smaller number of patients with UC in the pediatric group, and differing measurements of medication adherence.

Our study exhibited several strengths. Only psychometrically validated questionnaires were utilized to assess psychological distress, competence, motivation, relationship with providers, and medication adherence. In addition, we framed the hypothesis within an empirically rooted conceptual model (self-determination model) of human motivation, which has been applied to various domains, including education, health and medicine, physical activity, and religion.19–21 The concept of autonomous support of medical providers is also important, as a collaborative approach between the patient and provider leads to better outcomes.49,50

Despite the important results of our study, there are several limitations we would like to address. We recognize that volunteers for an online study are self-selected and may systematically differ from UC patients in general. Although at this stage of scientific discovery, we believe that the novelty and impact potential offsets methodological imperfections. Self-reported conditions may include overdiagnosis, although our cohort is on oral IBD therapy, which is prescribed by a health care provider and is unlikely to represent cases of self-diagnosis. Additionally, self-reported adherence remains susceptible to recall and social desirability biases and may lead to inaccuracies, yet the used tool has been widely validated. Multiple key publications have stemmed from this IBD Partners registry. In addition, several factors which may affect adherence were not included in the analysis, including additional patient-, disease-, and drug-related variables, though these have been previously studied (eg, daily medication dosing is associated with improved adherence compared with divided doses, concomitant medications are associated with lower adherence, and thiopurines are associated with better adherence compared with mesalamine).44,51,52 We relied upon voluntary participation among patients who belonged to the IBD Partners online cohort, a population more likely to be adherent to medications. However, our adherence rate was similar to previous studies.1 In addition, only associations related to adherence barriers can be noted in this type of study. Finally, the study sample was predominantly White with minimal disease activity and taking only 1 oral medication on average, which limits its generalizability. Therefore, the findings may not necessarily apply to different ethnicities and those with more severe forms of UC on combination or parenteral therapy.
Conclusion

Our findings present an important relationship between components of the SDT and medication adherence in the adult UC population, which has not been evaluated in the past. Poor adherence to oral medications in adult patients with UC is common and associated with worse disease activity, increased stress, lower perceived competence, and worse relationships with providers. This study highlights the important but largely overlooked role that cognitive-affective processes bear on IBD patients whose optimal medical management depends not simply on prescriptive treatments but also the ability to comply with them and regulate negative emotions. Future studies should focus on developing strategies to support patients’ autonomous self-regulation, perceived competence, and psychological well-being in IBD, which could potentially improve adherence and subsequently remission rates, improve quality of life, and reduce health care costs.

Acknowledgments

This research was supported in part by grants from the Crohn’s & Colitis Foundation and the Patient Centered Outcomes Research Institute (PCORI).

Conflicts of Interest

There are no financial disclosures or conflicts of interest.

References


34. Kroenke K, Stump TE, Chen CX, et al. Minimally important differences and severity thresholds are estimated for the PROMIS depression scales from 3 randomized clinical trials. *J Affect Disord.* 2020;266:100–108.


