THERAPEUTIC ADVANCES in
Gastroenterology

Original Research

Enhancing self-management of patients with inflammatory bowel disease: the role of autonomy support in health goal pursuit

Ther Adv Gastroenterol

2024, Vol. 17: 1–15

DOI: 10.1177/17562848241275315

Barbara Horvát, Kata Orbán, Anett Dávid, Viola Sallay, Beatrix Rafael, Sanela Njers, Tamás Molnár, Márta Csabai, Georgina Csordás and Tamás Martos

Abstract

Background: Inflammatory bowel disease (IBD) is a chronic condition that significantly affects patients' physical, mental, and social health, as well as their overall quality of life. Effective management of the disease demands self-management skills, enabling patients to navigate the daily challenges associated with IBD, such as unpredictable flare-ups, frequent hospitalization, severe symptoms, pain, and physical changes.

Objectives: This study examines the motivational aspects of self-management for patients with IBD and focuses on the role of autonomy and directive support from healthcare professionals in enhancing their self-concordance and self-efficacy.

Design: From November 2022 to February 2023, a cross-sectional questionnaire study was conducted at the IBD Center of Internal Medicine Clinic in Szeged, Hungary.

Methods: A total of 374 adult patients with IBD completed the paper–pencil questionnaire, of whom 241 patients (64.4%) had Crohn's disease, and 133 patients (35.6%) had ulcerative colitis.

Results: Based on the findings of the path analysis (χ^2 (8) = 18.914, p = 0.01, comparative fit index = 0.935, TLI = 0.837, root mean squared error of approximation = 0.06), autonomy support positively predicted self-concordance (β = 0.48) and self-efficacy (β = 0.02), particularly during disease relapse. In addition, self-concordance and self-efficacy predicted more positive (βs = 0.28 and 0.35) and fewer negative emotional experiences (βs = –0.09 and –0.20). The model's associations varied between the relapse and remission groups, indicating distinct impacts on different states of the disease.

Conclusion: Overall, autonomy support from healthcare professionals has been shown to enhance self-management in patients with IBD, particularly during disease relapse. Meanwhile, self-concordance and self-efficacy act as positive internal factors, thus reducing negative emotional experiences, especially during remission. In sum, this study underscores the need for further exploration of the motivational aspects of self-management and provides insights into developing interventions that promote the health behaviors of patients with IBD.

Plain language summary

Self-management of inflammatory bowel disease patients

Autonomy support from healthcare professionals has been shown to significantly improve the effectiveness of self-management in patients with inflammatory bowel disease (IBD) (especially during disease relapse), by enhancing their self-concordance and self-efficacy. In this case, the interplay between disease activity, positive and negative emotions, and self-regulatory mechanisms underscores the importance of examining the motivational aspects for developing interventions that promote health behaviors in patients with IBD.

Correspondence to:
Barbara Horvát
Doctoral School of Clinical Medicine, University of Szeged, Dugonics tér 13, Szeged 6725, Hungary
horvat.barbara@med.u-szeged.hu

Kata Orbán
Doctoral School of Clinical Medicine, University of Szeged, Szeged, Hungary

Anett Dávid
Tamás Molnár
Department of Internal Medicine, University of Szeged, Szeged, Hungary

Viola Sallay
Tamás Martos
Institute of Psychology, University of Szeged, Szeged, Hungary

Beatrix Rafael
Department of Preventive Medicine, University of Szeged, Szeged, Hungary

Sanela Njers
Department of Cognitive and Neuropsychology, University of Szeged, Szeged, Hungary

Márta Csabai
Department of Clinical Psychology, Károli Gáspár University of the Reformed Church, Budapest, Hungary

Georgina Csordás
Department of Developmental and Educational Psychology, Eszterházy Károly Catholic University, Budapest, Hungary

Keywords: autonomy and directive support, IBD, self-concordance, self-efficacy, self-management

Received: 27 March 2024; revised manuscript accepted: 26 July 2024.

Introduction

Inflammatory bowel disease (IBD) is a chronic condition that can have a significant impact on an individual's quality of life. This study explores the health goals of patients with IBD and their adaptation to the lifestyle modifications necessitated by the disease.

Supporting patients' autonomy in establishing health goals not only enables them to actively participate in disease management, but it also fosters long-term success in coping with the condition. Additionally, increased self-concordance and self-efficacy during health goal pursuit and self-management can contribute to more positive and fewer negative emotional experiences. A unique aspect of our study is to examine the role of autonomy and directive support from healthcare professionals in enhancing the self-concordance and self-efficacy of patients with IBD, taking into account whether the disease is in remission or relapse. In this regard, our study addresses a notable gap in the current understanding of the motivational and self-regulatory factors of IBD self-management. In the following, we summarize the main factors in our study.

Psychological aspects of IBD

IBD refers to a chronic gastrointestinal condition with unclear etiology,[1,2] encompassing two main clinical forms: Crohn's disease and ulcerative colitis. This disease primarily affects the gastrointestinal tract, causing various symptoms such as diarrhea, abdominal pain, bloody stools, bloating, and weight loss.[3-5] Since IBD is a lifelong condition, with the alternation of relapses and remissions, it can significantly impair patients' physical, mental, and social conditions, as well as their overall quality of life.[6] Meanwhile, the unpredictability of relapses, the need for frequent hospitalization, the nature of the symptoms, the severe pain, and the physical transformation caused by the disease can lead to loss of control and autonomy. This may underpin the development of anxiety and depression whose prevalence is higher among patients with IBD.[7-10]

In IBD, disease self-management is crucial for maintaining remission and preventing progression. This includes daily behaviors such as adhering to regular medical check-ups, medication, and smoking cessation, as well as following dietary recommendations, participating in sports activities, and reducing stress.[11,12] Effective self-management can also lead to positive health-related outcomes, including the reduction of inflammation, the alleviation of symptoms, better psychological/physical well-being, and improved quality of life.[13-15]

Despite the benefits of adapting to lifestyle changes required by the disease, previous research has found that 30%–45% of patients are nonadherent.[16,17] Hence, examining the psychological factors that influence the efficacy of patients' self-management is important. It can elevate patients' engagement and improve their adherence to treatment plans, fostering a more comprehensive and patient-centered approach to self-management support.

Autonomy and directive support

Since healthcare professionals play an important role in patients' social environments and self-management, it is important to address the nature of their support, especially for patients with chronic diseases.[18] Extensive studies have consistently demonstrated the positive impact of social support on self-management behaviors, including medication adherence, dietary modifications, and psychological symptom management.[19,20] For the IBD population, such support can effectively enhance self-management and alleviate various symptoms.[9,21] Thus, we applied the self-determination theory (SDT), according to which social support is categorized into two types: directive and autonomy support. Directive support involves providing reminders, advice, suggestions, and even compliments to potentially persuade individuals to make behavioral changes, whereas autonomy support includes acknowledging personal volition, recognizing negative feelings, and enhancing internal motivation.[22] Regarding

personal goals, autonomy support refers to the extent to which the social environment fosters an individual's sense of autonomy, allowing them to feel that their actions are self-chosen and aligned with their own values and interests. Autonomy supportive behavior has proven to be more beneficial, being linked to increased health goal self-concordance and self-efficacy, and contributing to long-term mental well-being.[23,24] Conversely, directive support neither correlates with improved goal internalization nor with better well-being.[21,25,26]

Health-related personal goals

Meanwhile, health-related personal goals are one of the motivational aspects of self-management and play an important role in behavioral changes, emotions, and commitment.[26-30] Specifically, such goals encompass aspirations related to an individual's appearance, health, and fitness. Hence, setting appropriate health goals can increase an individual's sense of autonomy and motivate them to become more active.[31,32]

Self-concordance

Self-concordance is a micro-theory of the SDT,[24,33] describing the consistency with an individual's core values, talents, and needs.[34-36] Self-concordant motivation is crucial for the success of health goal pursuit as it can predict greater efforts and more positive emotions, contributing to an individual's well-being.[35,37-39] In their study on the role of self-concordance in IBD self-management, Horvát et al.[40] indicated that this psychological factor signifies an internal capacity, leading to lower quality of life through positive and fewer negative emotions during health goal pursuit.

Self-efficacy

Self-efficacy is a psychological function that has been recognized to act as a crucial tool for individuals adjusting to the lifestyle changes brought about by chronic diseases, regardless of disease severity.[41-44] According to Bandura,[45] self-efficacy represents the belief that an individual can successfully perform certain tasks to achieve the desired outcomes itself. In the context of personal goals, greater self-efficacy can predict better goal progress and long-term commitment.[35,46] Among patients with IBD, previous studies have indicated that self-efficacy is a relevant component in disease management and coping.[47-49]

Disease activity and self-management

IBD is characterized by an unpredictable course that fluctuates between remission and relapse.[50] Specifically, remission indicates a period in which the symptoms of the disease significantly improve or disappear, while relapse is when the inflammatory process in the digestive tract intensifies, leading to the worsening of symptoms.[51] The impact of disease activity on the quality of life is also noteworthy, demonstrating reduced life satisfaction of 18% during relapse, compared to 6.6% during remission.[52]

The goal of IBD treatment is not only treating active inflammation but also maintaining remission and preventing relapses to improve patients' overall well-being. Moreover, previous research has mainly focused on the impact of self-management on disease activity, indicating that effective self-management is associated with shorter duration of treatment[18,53] and fewer disease relapses.[54] However, since it is important to recognize the challenges of patients with IBD, we determine how disease activity can predict self-management.[8]

The present study

In this cross-sectional study, we investigate how healthcare professionals can enhance the self-concordance and self-efficacy of patients with IBD in health goal pursuit by fostering their autonomy. Additionally, we examine the mediating role of positive and negative emotions in the relationship between self-concordance and IBD patients' quality of life, expanding the research of Horvát et al.,[40] who investigated the correlation between goal self-concordance, goal self-efficacy, and general anxiety among a sample of patients with IBD.

Overall, the purpose of this study is threefold. First, we explore how autonomy and directive support from healthcare professionals shape self-concordance and self-efficacy during health goal pursuit. In this case, due to previous ambient results, we do not formulate a specific hypothesis on how directive support can predict self-concordance and self-efficacy. Second, we determine whether self-concordance and self-efficacy

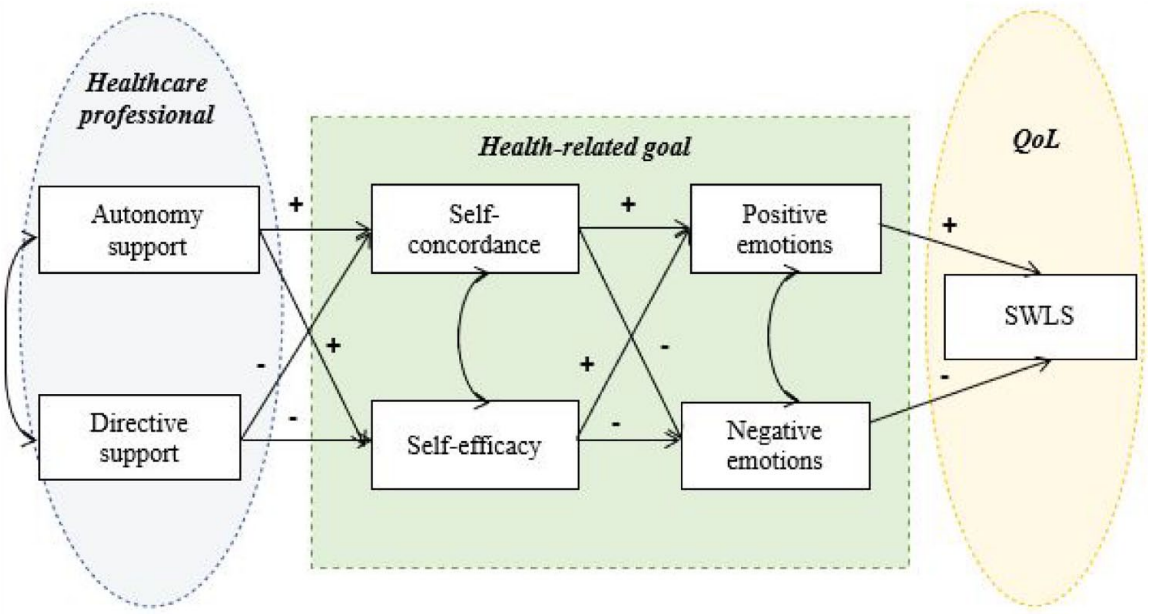

Figure 1. Model summary.
Both autonomy and directive goal support are related to the healthcare professional with whom the patient is in contact. QoL, quality of life; SWLS, Satisfaction With Life Scale.

are linked to positive and negative emotional experiences during health goal pursuit. Third, we assess whether positive and negative emotions during health goal pursuit can predict life satisfaction. All of the variables, except for life satisfaction, were evaluated in connection to health goal pursuit. Figure 1 summarizes the theoretical model. To test our model, we present the following hypotheses:

H1. Individuals with IBD who perceive higher levels of autonomy support from healthcare professionals will experience greater self-concordance and self-efficacy during health goal pursuit.
H2. Self-concordance and self-efficacy will predict positive and negative emotions during health goal pursuit.
H3. Positive emotions will predict greater life satisfaction, whereas negative emotions will predict lower life satisfaction among patients with IBD.

We also formulated the following research question:

Q1. Will individuals with IBD who perceive higher levels of directive support from healthcare professionals experience lower self-concordance and self-efficacy during health goal pursuit?

Moreover, we assess the influence of disease activity by comparing our theoretical model between two groups of patients: (1) those in remission and (2) those experiencing a relapse.

Materials and methods

Participants

This cross-sectional questionnaire study was conducted at the IBD Center of Internal Medicine Clinic in Szeged, Hungary. The participants were individually contacted during their regular check-ups at the center. Informed consent was collected before they completed the paper-and-pencil questionnaires. Their participation was voluntary; only the patients who agreed to participate, provided answers, and completed the questionnaire were included in the statistical analyses. The inclusion criteria were as follows: (1) aged 18 years or older; (2) an IBD diagnosis according to international criteria; and (3) a statement of consent. Those who are younger than 18 years of age or those currently receiving psychiatric treatment (or have received such treatment over the past year) were excluded from this study.

Ethical considerations

Ethical approval for this study was obtained from the Regional Research Ethics Committee of the Albert Szent-Györgyi Health Center at the University of Szeged. The date of ethics approval is November 11, 2023. This study was carried out according to the Code of Ethics of the World Medical Association (Declaration of Helsinki), and written informed consent was obtained from all the participants.

Procedure

Data collection for the study was conducted from November 2022 to February 2023. Patients were requested to complete a questionnaire, which took 30–40 min. Data collection was conducted with the assistance of psychology students trained in the procedure during their classes at the university. Training was necessary because patients might have raised clarifying questions during the completion of the questionnaires, and the students present were responsible for supervising the process and competently answering any questions. Participants did not receive any specific intervention in the study. The completion of the questionnaires took 30–40 min in average for the participants. Data entry, coding, cleaning, and analysis were performed by members of the research team.

Materials

The questionnaire consisted of three sections. In the first part, they were asked about socio-demographic factors, followed by information regarding their disease history and treatment (e.g. type of disease, treatment method, disease activity, year of diagnosis, surgery, medication, and presence of complications). The second part of the questionnaire covered questions on general health and life satisfaction, based on the Satisfaction with Life Scale. The third part of the questionnaire focused on personal health goals, based on the personal project analysis (PPA) method. In this case, such goals were assessed according to the following characteristics: autonomy and directive support from healthcare professionals, goal self-concordance, goal self-efficacy, and positive and negative emotions.

The questionnaires used in the study were administered in Hungarian and were adapted from previous studies conducted in Hungarian. Below, we refer to the original English and Hungarian publications, wherever it is appropriate. The exact Hungarian wording of the questions can be found in the Supplemental Materials under "Questionnaires."

IBD-specific questions

Self-reported questions about the disease, including diagnosis, type, and condition.

Health goal assessment

In this study, we applied the modified PPA method[32,55,56] to examine the participants' health-related goals. Specifically, the participants were asked to list their latest health-related goals, after being prompted by the statement "The health-related goals that you are actively pursuing." In this case, goals included weight management, sports participation, eating habits, smoking cessation, mental health, and sleeping. Then, they were asked to select the most relevant goal and rate it with respect to autonomy and directive support, self-concordance, self-efficacy, and positive and negative emotions, the details of which are as follows.

Autonomy and directive support. The questionnaire assessed the participants' perceptions of the support from the healthcare professionals for their health-related goals.[55] This assessment consisted of two subscales with three items each, namely: autonomy support (e.g. "My doctor understands how I see things with respect to this goal") and directive support (e.g. "My doctor repeatedly reminds me of this goal"). The responses were scored on a 7-point Likert-type scale ranging from 1 (not at all true) to 7 (very true). The internal consistency of the items for autonomy support demonstrated a Cronbach's α of 0.878, while that for directive support included a Cronbach's α of 0.910.

Goal self-concordance. The term "goal self-concordance" refers to the extent to which an individual has internalized the goal.[35,57] In this regard, we asked the participants to rate the extent to which they are pursuing their health-related goals based on four reasons, that is, external, introjected, identified, and intrinsic, representing a continuum of perceived locus of causality for action.[36] Additionally, an organismic integration variable was calculated from the subtraction of

two items of controlled (external) regulation (e.g. "You are pursuing this goal because someone else wants you to") and introjected regulation (e.g. "You are pursuing this goal because you would feel ashamed, guilty, or anxious if you did not"), and two items of autonomous motivation (identified) regulation (e.g. "You are pursuing this goal because you really believe that it is an important goal to have") and intrinsic regulation (e.g. "You are pursuing this goal because of the fun and enjoyment that the goal will provide"). Due to the composite nature of the index, the standard reliability estimate of alpha was not applicable.

Goal self-efficacy. The term "goal self-efficacy" refers to an individual's belief in his/her ability to achieve the goal.[58,59] This four-item questionnaire includes a 7-point Likert scale for each response (e.g. "I can usually handle the situations that come with achieving this goal"). Internal consistency of the four items was excellent, with a Cronbach's α of 0.846.

Positive and negative emotions. A total of six items were employed to assess emotional experiences during the goal implementation process.[56,57] To measure positive emotions, three items were utilized (e.g. "How often do you experience positive emotions, such as joy and happiness, about this goal"?). Conversely, three items were dedicated to measuring negative emotions (e.g. "How often do you experience negative emotions, such as stress, worry, and anxiety, about this goal"?). Both subscales utilized a 7-point Likert scale, ranging from 1 (Not at all true for me) to 7 (Very true for me). The internal consistency of the items for positive emotions demonstrated a Cronbach's α of 0.881, while that for negative emotions included a Cronbach's α of 0.869.

Satisfaction with Life Scale. A total of five items were employed to measure the patients' satisfaction with life (e.g. "In most respects, my life is almost ideal").[37,60] The responses were based on a 5-point Likert scale, ranging from 1 (totally agree) to 5 (I do not agree at all). The internal consistency of the items demonstrated a Cronbach's α of 0.837.

Statistical analyses

In this study, we used JASP software (Version 0.18.3, University of Amsterdam) to manage the data and calculate the statistics. We estimated the necessary sample size to detect an absolute value of 0.15 for correlation coefficients with at least 80% power (beta level = 0.2) and $p = 0.05$ alpha level. The correlation coefficient of $r = 0.15$ was considered a minimally interpretable effect size of a bivariate association. The calculation resulted in a minimum of 347 participants, which we considered the minimum sample size for the whole sample.

We tested path analytic models to estimate a system of equations that can specify possible causal linkages and identify the most significant pathways in predicting certain outcomes.[61] Meanwhile, we assessed the model's goodness of fit through multiple goodness-of-fit indices. Along with the χ^2 values test, we used the root mean squared error of approximation (RMSEA), the normed fit index (NFI), the comparative fit index (CFI), and the incremental fit index (IFI). In this case, the criteria were that the values for the NFI, CFI, and IFI should be greater than 0.90 and that the RMSEA should be 0.05–0.10, indicating a fair fit.[62] As for error estimation, it was conducted via the robust method, while the invariance between the two groups (i.e. those in remission and in relapse, respectively) was examined through multiple-group analyses. In this case, we used the CFI to define the invariance with a threshold of change below 0.01. Finally, we included more constrained models and individually assessed their model fit.

Results

Descriptive statistics

A total of 377 adult patients with IBD responded to our cross-sectional questionnaire study, of whom 241 patients (64.4%) had Crohn's disease and 133 patients (35.6%) had ulcerative colitis. In addition, 44.3% were men, the average age was 41.8 ± 12.1 years, and the average disease duration was 14.7 ± 9.34 years. Detailed descriptions of the demographic characteristics are presented in Table 1. Data from complete respondents were analyzed.

Bivariate associations

Since the sample size was large ($N = 370$), according to the central limit theory, we assumed that the sample distributions satisfy normal distribution assumptions and conducted parametric

Table 1. Demographic factors of IBD patients ($N = 377$).

Sociodemographic characteristics	*N*	Valid percentage (%)
Gender		
Male	167	44.3
Female	210	55.7
Education		
Elementary	12	4.1
High school	272	91.9
College or university studies	113	4.4
Marital status		
Single	67	17.8
In relationship	310	82.2
Economic activity		
Active	286	77.1
Inactive	72	19.4
Student	13	3.5
Disease type		
CD	241	61.6
UC	133	34.0
US	5	1.3
Disease activity		
Remission	289	77.9
Relapse	82	22.1
Intestinal complication		
Stenosis	137	56.2
Fistula	107	43.9
Operation		
Yes	159	42.2
No	218	57.8
Hospitalization within 1 year		
Yes	76	20.2
No	301	79.8

CD, Crohn's disease; IBD, inflammatory bowel disease; UC, Ulcerative Colitis; US, Unclassified type of IBD.

tests. To test our hypotheses, we ran a series of bivariate Pearson correlations for the study variables. The results of the correlation analyses and the average scores of the questionnaires are summarized in Table 2. Regarding autonomy support, it is significantly and positively linked to self-concordance, self-efficacy, positive emotions, and satisfaction with life, whereas it is negatively linked to negative emotions. As for directive support, it is only significantly and positively linked to self-efficacy. Meanwhile, the scores in the remission group remarkably differ from those in the relapse group. Specifically, the scores for self-concordance, self-efficacy, and satisfaction with life are significantly higher in the remission group, whereas the levels of negative emotions are significantly lower in this group.

Path model fit

In this study, the fit indices for the hypothesized model indicated an appropriate fit to the data: $\chi^2(8) = 18.914$, $p = 0.01$, CFI = 0.935, TLI = 0.837, RMSEA = 0.06. The results of the path analysis are presented on Figure 2.

Multigroup analysis

To examine the possible differences between the patients in different stages of the disease (i.e. remission or relapse), we tested the multiple-group path analytic models. To examine the model invariance between the patients in remission and relapse, the following steps were performed. First, the unconstrained model (i.e. the model in which the paths are free to vary between groups) was estimated, and the differences in significant pathways between the groups were analyzed: ($\chi^2 = 41.422$, df = 24, $p = 0.01$), NFI = 0.81, IFI = 0.91, CFI = 0.89, and RMSEA = 0.07, with a confidence interval CI = 0.03–0.12. Next, the model fit for the constrained model (i.e. the model in which the means are constrained to be equal across the groups) was assessed. In this case, the unconstrained and constrained models were compared using the CFI values. In addition, we tested additional constrained models (means and regression coefficients). We stopped testing when the model with restricted regression coefficients began to significantly deteriorate.

Overall, the fit indices for the constrained model were as follows: NFI = 0.68, IFI = 0.85, CFI = 0.83, and RMSEA = 0.07, CI = 0.04–0.12.

Table 2. Correlation matrix and the characteristics and average scores of the questionnaires ($N = 370$).

Variable		Disease activity												
		Remission		Relapse		*T* test								
		M	SD	*M*	SD	*p*	Range	1	2	3	4	5	6	7
1	Autonomy support	4.37	0.79	4.25	0.78	0.23	1–5	–						
2	Directive support	3.83	1.10	3.92	0.99	0.54	1–5	0.65***	–					
3	Self-concordance	1.92	1.28	1.37	1.23	<0.001	−2 to 4	0.07	0.01	–				
4	Self-efficacy	3.65	0.85	3.28	0.77	<0.001	1–5	0.23***	0.135**	0.235***	–			
5	Positive emotions	3.29	0.96	3.08	1.02	0.103	1–5	0.15**	0.04	0.31***	0.25***	–		
6	Negative emotions	1.71	0.93	2.40	1.14	<0.001	1–5	−0.12*	−0.04	−0.33***	−0.22***	−0.11*	–	
7	SWLS	3.69	0.74	3.43	0.82	0.007	1–5	0.13*	0.07	0.15**	0.28***	0.21***	−0.21***	–

$N_{remission} = 282$, $N_{relapse} = 82$.
*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$ denote significant values.

According to the CFI values, there is no difference between the groups according to the means, but there is a difference between the groups in regression coefficients. Thus, by separately testing the model in the remission and relapse groups, we found differences in the pathways. According to the results in Table 3, autonomy and directive support only predict self-concordance among the patients in relapse, while self-efficacy and self-concordance only significantly predict negative emotions among the patients in remission. Moreover, positive emotions only significantly predict satisfaction with life in the remission group. Results of the multiple-group analysis between patients with IBD in remission and relapse are presented in Table 4. The standardized estimates for the pathways in the remission and relapse groups are presented in Table 5.

Discussion

A novel aspect of this study was the examination of the motivational aspects of self-management for patients with IBD and focused on the role of autonomy and directive support from healthcare professionals in enhancing their self-concordance and self-efficacy of adopting lifestyle changes dictated by the disease. Additional strength of our approach was the inclusion of a multigroup analysis that considered disease activity as a crucial factor of IBD patients' self-management.

First, the autonomy-supportive behavior of the healthcare professionals had a positive impact on both self-concordance and self-efficacy during health goal pursuit. This indicates the potential to facilitate the internalization of self-management activities, which are essential for managing the disease. Conversely, the same impact was not observed for the directive-supportive behavior of the healthcare professionals. Meanwhile, emotions played a distinct mediating role among self-concordance, self-efficacy, and life satisfaction, varying with disease activity. These results highlight the need for further investigations into the motivational, self-regulatory, and emotional experiences linked to individual health goals within the IBD population since these factors have a significant impact on overall well-being.

As stated earlier, the purpose of this study was threefold. The first objective was to explore the roles of two types of social support (i.e. autonomy and directive) received from healthcare professionals during health-related activities. The significance of social support in enhancing self-management among individuals with chronic diseases, including IBD, has been

Table 3. Standardized parameter estimates of direct effects for the study model.

Predictor variable	Predicted variable	Estimate	*p*	*z*
AS	SC	0.22	0.001	3.28
DS	SC	0.002	0.97	0.04
AS	SE	0.13	0.05	1.90
DS	SE	−0.10	0.05	−1.38
SC	PE	0.25	<0.001	4.96
SC	NE	−0.29	<0.001	−5.23
SE	PE	0.26	<0.001	5.19
SE	NE	−0.17	<0.001	−3.28
PE	SWLS	0.23	<0.001	3.93
NE	SWLS	−0.19	<0.001	−3.71

The values in the table are the standardized coefficients.
AS, autonomy support; DS, directive support; NE, negative emotions; PE, positive emotions; SC, self-concordance; SE, self-efficacy; SWLS, Satisfaction with Life Scale.

Table 4. Results of the multiple-group analysis between patients with IBD in remission and relapse.

Model	χ^2	df	χ^2/df	*p*	CFI (ΔCFI)
M0 (unconstrained)	41.422	24	1.73	0.01	0.89
M1 (means)	41.422	24	1.73	0.01	0.89 (0)
M2 (means and regression)	70.387	44	1.60	0.007	0.83 (0.07)

CFI, comparative fit index; IBD, inflammatory bowel disease.

well-established in the literature.[19,63] However, based on SDT, there is a notable gap in the literature regarding the examination of social support in IBD patients' self-management, with one research being an exception.[64]

In our study, within the IBD sample, autonomy support significantly and positively predicted both self-concordance and self-efficacy during health goal pursuit. Yet, distinctions emerged when we individually examined the remission and relapse groups, indicating the influence of disease activity on the efficacy of autonomy support from the healthcare professionals. Specifically, as disease symptoms intensify, autonomy support tends to function more as a positive resource, predicting higher self-concordance during relapse. Conversely, the negative impact of directive support becomes more pronounced during relapse, predicting lower self-concordance. In addition, autonomy support was beneficial for self-efficacy, in the relapse and remission groups, while directive support did not have a significant impact on self-efficacy in either group. These results underscore the significance of the supportive role of healthcare professionals in the health behavior change of patients with IBD. In sum, recognizing patients' autonomy and personal volition, and acknowledging negative emotions can boost their internal motivation and belief that the health behavior change will be carried out. On the contrary, providing reminders, guidance, and explicit recommendations can hinder the success of health behavior change.[55]

Table 5. Standardized estimates for defined pathways in remission and relapse group.

Predictor variable	Predicted variable	Disease remission		Disease relapse	
		Standardized estimate	*p*	Standardized estimate	*p*
AS	**SC**	0.03	**0.73**	0.48	**0.002**
DS	**SC**	−0.004	**0.96**	−0.47	**0.002**
AS	SE	0.18	0.02	0.35	0.02
DS	SE	−0.004	0.96	−0.05	0.75
SC	PE	0.27	<0.001	0.28	0.009
SC	**NE**	−0.28	**<0.001**	−0.09	**0.45**
SE	PE	0.21	<0.001	0.35	<0.001
SE	**NE**	−0.12	**0.04**	−0.20	**0.09**
PE	**SWLS**	0.23	**0.006**	0.10	**0.35**
NE	SWLS	−0.10	**0.12**	−0.40	**<0.001**

Values indicating a significant difference between the two groups are highlighted in bold.
AS, autonomy support; DS, directive support; NE, negative emotions; PE, positive emotions; SC, self-concordance; SE, self-efficacy; SWLS, Satisfaction with Life Scale.

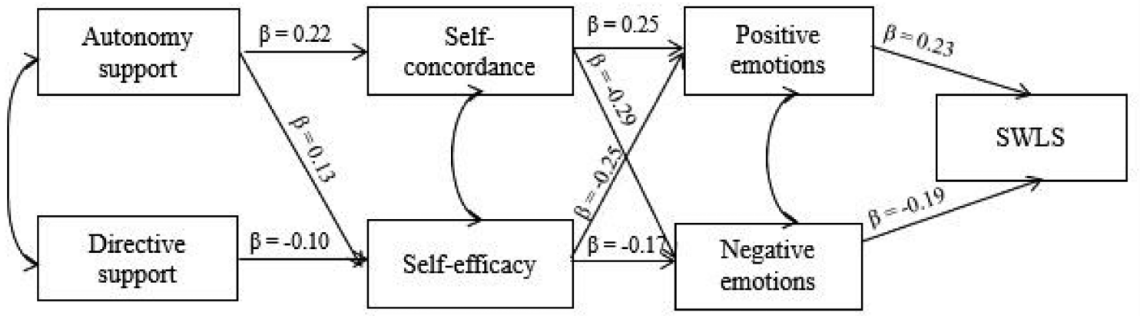

Figure 2. Path model.
Only significant paths ($p < 0.05$) are included.

The second objective of our study was to determine whether self-concordance and self-efficacy are linked to positive and negative emotional experiences during health goal pursuit. Based on the findings, autonomous motivation was identified as a core component of health behavior change.[65] In this regard, goal self-concordance represented an aspect of autonomous motivation, reflecting the extent of self-integration, encompassing internal interests and identity, and forming a connection with positive attitudes and behaviors.[35] Our path analysis also affirmed the influence of self-concordance on enhancing positive emotions and mitigating negative emotions during health goal pursuit. Previous research has shown that the level of self-concordance in health-related goals indicates the extent to which self-management activities are integrated into the self and internalized as intrinsic values.[34,35] Our findings align with a recent study on patients with IBD, which found that acceptance of the disease is associated with the activation of psychological resources and more effective disease management.[66] Moreover, in our IBD sample, self-concordance was a

predictor of reduced negative emotions. However, when considering disease activity, this association was only significant during remission. This implies that, during remission, self-concordance acts as a protective factor against negative emotions, reducing adverse experiences during health goal pursuit. Conversely, during relapse, this protective function appears to be overshadowed. A possible explanation is that during this period patients may prioritize efforts to manage physical symptoms, diverting attention from their motivation for health-promoting activities.

As for self-efficacy, it emerged as a predictor of positive emotions in both the relapse and remission groups. Similar to self-concordance, it forecasted fewer negative emotions, but this association was only observed during remission. According to related research, the role of self-efficacy in determining health outcomes for individuals with IBD is vital since it is a significant factor that influences the initiation and execution of health behaviors related to the disease.[45] Our observed positive impact of self-efficacy during health goal pursuit aligns with prior research, which found a positive correlation between self-efficacy and self-esteem, health-related quality of life, and improved mental well-being in patients with IBD.[41]

The third objective of our study was to investigate the relationship between emotional experiences during health goal pursuit and overall life satisfaction, by specifically determining whether emotions play a mediating role between self-concordance, self-efficacy, and life satisfaction in patients with IBD. The results of the path analysis indicated that, in our IBD sample, life satisfaction was influenced by both positive and negative emotions. However, upon considering disease activity, positive emotions only predicted higher life satisfaction in the remission group, while negative emotions only predicted lower life satisfaction in the relapse group.

Being the inaugural exploration into the role of health goal-related experiences in the life satisfaction of patients with IBD, these findings suggest that emotions during health behaviors linked to disease self-management can significantly influence patients' quality of life. Meanwhile, negative emotions have a more noticeable impact on psychological functioning, especially during relapse, whereas the protective effect of positive emotions is diminished. Conversely, during remission, the protective function of positive emotions is more evident, while the impact of negative emotions on patients' quality of life is attenuated.

In evaluating the results, a potentially valuable framework is the conservation resources theory,[67] which proposes that resources have psychological significance, serving as a safeguard against threatening situations. They also play an important role in enabling individuals to effectively manage stress and maintain positive self-esteem. In this regard, the primary objective is to conserve and enhance these resources. However, stressors, such as a chronic disease, can diminish the capacity to safeguard and generate resilience. It can also be inferred that the escalation of physical symptoms provides a modified context to protecting and generating resources, inhibiting self-regulatory mechanisms or the capacity for self-concordant and self-efficacious goal pursuit. This, in turn, can have an impact on emotional outcomes. Since this was the first study to comprehensively explore the complex interplay between disease activity and positive internal resources, including self-concordance and self-efficacy during health goal pursuit, and their associations with emotions and satisfaction with life, further research is essential for confirming the reliability of the results.

Limitations

In this study, we examined a linear model with a primary focus on autonomy support, as a predictor of self-concordance and self-efficacy. However, it is conceivable that autonomy support and internal resources may influence life satisfaction not only through emotional experiences but also through direct pathways. The intricate interplay of these factors in shaping the quality of life for individuals with IBD necessitates further research. The reliability of the data on disease status may have been compromised by relying only on self-reported data from patients instead of medical data. Additionally, due to the cross-sectional nature of this study, our models were not suitable for exploring causal relationships, highlighting the need for longitudinal research that focuses on causation.

Conclusion

Based on the findings of this study, if patients with IBD experience autonomy support from

healthcare professionals, then they can become more effective in self-management, through their enhanced capacity for self-concordant and self-efficacious health goal pursuit. This association is particularly pronounced during disease relapse. Moreover, self-concordance and self-efficacy can serve as positive psychological factors, mitigating the negative emotional experiences during health goal pursuit, especially during remission. However, the observed interplay among disease activity, emotions, and self-regulatory mechanisms underscores the need for further exploration of the motivational aspects of IBD self-management. Overall, these findings provide valuable insights into developing interventions that promote the health behaviors of patients with IBD.

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the Regional Research Ethics Committee (RKEB) of the University of Szeged, Albert Szent-Györgyi Health Centre. All participants provided written informed consent prior to study participation. The research was carried out according to the Code of Ethics of the World Medical Association (Declaration of Helsinki), and informed consent was obtained from the enrolled patients. Ethics approval number: 14/2022-SZTE RKEB.

Consent for publication

Participants acknowledged their consent for data processing and the potential publication of information obtained from the aggregated data.

Author contributions

Barbara Horvát: Conceptualization; Formal analysis; Investigation; Methodology; Writing – original draft.

Kata Orbán: Data curation; Investigation; Writing – review & editing.

Anett Dávid: Investigation; Supervision; Writing – review & editing.

Viola Sallay: Supervision; Writing – review & editing.

Beatrix Rafael: Supervision; Writing – review & editing.

Sanela Njers: Data curation; Investigation; Methodology; Project administration.

Tamás Molnár: Supervision.

Márta Csabai: Supervision; Writing – review & editing.

Georgina Csordás: Formal analysis; Methodology.

Tamás Martos: Conceptualization; Funding acquisition; Investigation; Resources; Supervision; Writing – review & editing.

Acknowledgements

We express gratitude to the research team for data collection and to patients with IBD who dedicated their time to completing the forms. Appreciation is also extended to colleagues who provided personal assistance, contributing to the realization of this study. The written support was financially supported by Klebelsberg Library, University of Szeged.

Funding

The authors disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The research was supported by research project no. K 138372, provided by the Ministry of Innovation and Technology of Hungary from the National Research, Development and Innovation Fund, and financed under the K_21 funding scheme.

Competing interests

The authors declare that there is no conflict of interest.

Availability of data and materials

The data underlying this article will be shared on reasonable request to the corresponding author. The current manuscript, including related data and figures, has not been previously published and is not under consideration elsewhere.

ORCID iDs

Barbara Horvát https://orcid.org/0000-0002-2518-2096

Tamás Molnár https://orcid.org/0000-0002-4913-7599

Supplemental material

Supplemental material for this article is available online.

References

1. Podolsky DK. Inflammatory bowel disease. *N Engl J Med* 2002; 347(6): 417–429.
2. Sartor RB. Mechanisms of disease: pathogenesis of Crohn's disease and ulcerative colitis. *Nat Clin Pract Gastroenterol Hepatol* 2006; 3(7): 390–407.
3. Devlen J, Beusterien K, Yen L, et al. The burden of inflammatory bowel disease: a patient-reported qualitative analysis and development of a conceptual model. *Inflamm Bowel Dis* 2014; 20(3): 545–552.
4. Dibley L and Norton C. Experiences of fecal incontinence in people with inflammatory bowel disease: self-reported experiences among a community sample. *Inflamm Bowel Dis* 2013; 19(7): 1450–1462.
5. Park KT, Ehrlich OG, Allen JI, et al. The cost of inflammatory bowel disease: an initiative from the Crohn's & Colitis Foundation. *Inflamm Bowel Dis* 2020; 26(1): 1–10.
6. Knowles SR, Graff LA, Wilding H, et al. Quality of life in inflammatory bowel disease: a systematic review and meta-analyses—Part I. *Inflamm Bowel Dis* 2018; 24(4): 742–751.
7. Byrne G, Rosenfeld G, Leung Y, et al. Prevalence of anxiety and depression in patients with inflammatory bowel disease. *Can J Gastroenterol Hepatol* 2017; 2017: e6496727.
8. Graff LA, Walker JR, Lix L, et al. The relationship of inflammatory bowel disease type and activity to psychological functioning and quality of life. *Clin Gastroenterol Hepatol* 2006; 4(12): 1491–1501.
9. Kovács Z and Kovács F. Depressive and anxiety symptoms, dysfunctional attitudes and social aspects in irritable bowel syndrome and inflammatory bowel disease. *Int J Psychiatry Med* 2007; 37(3): 245–255.
10. Robertson DA, Ray J, Diamond I, et al. Personality profile and affective state of patients with inflammatory bowel disease. *Gut* 1989; 30(5): 623–626.
11. Grady PA and Gough LL. Self-management: a comprehensive approach to management of chronic conditions. *Am J Public Health* 2014; 104(8): e25–e31.
12. Plevinsky JM, Greenley RN and Fishman LN. Self-management in patients with inflammatory bowel disease: strategies, outcomes, and integration into clinical care.*Clin Exp Gastroenterol* 2016; 9: 259–267.
13. Kamat N, Pai CG, Rajan MS, et al. Cost of illness in inflammatory bowel disease. *Dig Dis Sci* 2017; 62(9): 2318–2326.
14. Lamers CR, Roos DNM, Heerink HH, et al. Lower impact of disease on daily life and less fatigue in patients with inflammatory bowel disease following a lifestyle intervention. *Inflamm Bowel Dis* 2022; 28(12): 1791–1799.
15. Schlee C, Uecker C, Bauer N, et al. Multimodal stress reduction and lifestyle modification program for patients with ulcerative colitis: a qualitative study. *BMC Complement Med Ther* 2022; 22(1): 60.
16. Chan W, Chen A, Tiao D, et al. Medication adherence in inflammatory bowel disease. *Intest Res* 2017; 15(4): 434–445.
17. Wagoner ST and Kavookjian J. The influence of motivational interviewing on patients with inflammatory bowel disease: a systematic review of the literature. *J Clin Med Res* 2017; 9(8): 659–666.
18. Elkjaer M, Shuhaibar M, Burisch J, et al. E-health empowers patients with ulcerative colitis: a randomised controlled trial of the web-guided "Constant-care" approach. *Gut* 2010; 59(12): 1652–1661.
19. DiMatteo MR. Social support and patient adherence to medical treatment: a meta-analysis. *Health Psychol* 2004; 23(2): 207–218.
20. Gariépy G, Honkaniemi H and Quesnel-Vallée A. Social support and protection from depression: systematic review of current findings in Western countries. *Br J Psychiatry* 2014; 209(4): 284–293.
21. Carbonneau N, Martos T, Sallay V, et al. Examining the associations of autonomy and directive support given and received with relationship satisfaction in the context of goals that romantic partners have for one another. *Motiv Emot* 2019; 43(6): 874–882.
22. Koestner R, Powers TA, Carbonneau N, et al. Distinguishing autonomous and directive forms of goal support: their effects on goal progress, relationship quality, and subjective well-being. *Pers Soc Psychol Bull* 2012; 38(12): 1609–1620.
23. Patrick H, Knee CR, Canevello A, et al. The role of need fulfillment in relationship functioning and well-being: a self-determination theory perspective. *J Pers Soc Psychol* 2007; 92(3): 434–457.
24. Ryan RM and Deci EL. *Self-determination theory: basic psychological needs in motivation, development, and wellness*. New York: Guilford Publications, 2017.

25. Csuka SI, Désfalvi J, Thege BK, et al. Relationship satisfaction and self-esteem in patients with breast cancer and healthy women: the role of expected and actual personal projects support from the partner. *BMC Womens Health* 2023; 23(1): 426.

26. Ryan RM and Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol* 2000; 55: 68–78.

27. Austin JT and Vancouver JB. Goal constructs in psychology: structure, process, and content. *Psychol Bull* 1996; 120(3): 338–375.

28. Liversage C, Wissing MP and Schutte L. Promotion of well-being in work and interpersonal relationships: a scoping review of goals and meaning interventions. *Int J Wellbeing* 2023; 13(3): 94–110.

29. Martos T, Konkolÿ Thege B and Kopp M. Csak az egészség meglegyen? Egészséggel kapcsolatos életcélok fontossága a „Hungarostudy Egészség Panel" 2006 felmérés alapján [All you need is health? The importance of health related life goals in the Hungarostudy Epidemiological Panel 2006 survey]. Pszichológia 2010; 30: 161–173.

30. Peterman AH and Lecci L. Personal projects in health and illness. In: Little BR, Salmela-Aro K and Phillips SD (eds) *Personal project pursuit: goals, action, and human flourishing*. Mahwah, NJ: Lawrence Erlbaum Associates, 2007, pp. 329–353.

31. Mann T, Ridder D and Fujita K. Self-regulation of health behavior: social psychological approaches to goal setting and goal striving. *Health Psychol* 2013; 32: 487–498.

32. Martos T, Sallay V, Désfalvi J, et al. Psychometric characteristics of the Hungarian version of the Satisfaction with Life Scale (SWLS-H). *Mentálhig Pszichoszomatika* 2014; 15(3): 289–303.

33. Ryan RM and Deci EL. Overview of self-determination theory: an organismic-dialectical perspective. In: Deci EL and Ryan RM (eds) *Handbook of self-determination research*. USA: University of Rochester Press, 2002, pp. 3–33.

34. Judge TA, Bono JE, Erez A, et al. Core self-evaluations and job and life satisfaction: the role of self-concordance and goal attainment. *J Appl Psychol* 2005; 90(2): 257–268.

35. Sheldon KM and Elliot AJ. Goal striving, need satisfaction, and longitudinal well-being: the self-concordance model. *J Pers Soc Psychol* 1999; 76: 482–497.

36. Sheldon KM and Kasser T. Pursuing personal goals: skills enable progress, but not all progress is beneficial. *Pers Soc Psychol Bull* 1998; 24: 1319–1331.

37. Bailis DS, Fleming JA and Segall A. Self-determination and functional persuasion to encourage physical activity. *Psychol Health* 2005; 20(6): 691–708.

38. Sheldon KM and Lyubomirsky S. How to increase and sustain positive emotion: the effects of expressing gratitude and visualizing best possible selves. *J Posit Psychol* 2006; 1(2): 73–82.

39. Smyth APJ, Werner KM, Milyavskaya M, et al. Do mindful people set better goals? Investigating the relation between trait mindfulness, self-concordance, and goal progress. *J Res Pers* 2020; 88: 104015.

40. Horvát B, Dávid A, Sallay V, et al. Improving disease management of patients with inflammatory bowel disease: the potential role of self-concordant health goals. *Front Psychol* 2023; 14: 1115160.

41. Izaguirre M and Keefer L. Development of a self-efficacy scale for adolescents and young adults with inflammatory bowel disease. *J Pediatr Gastroenterol Nutr* 2014; 59: 29–32.

42. Lorig KR, Sobel DS, Ritter PL, et al. Effect of a self-management program on patients with chronic disease. *Eff Clin Pract* 2001; 4(6): 256–262.

43. McAuley E. Self-efficacy and the maintenance of exercise participation in older adults. *J Behav Med* 1993; 16: 103–113.

44. Strecher VJ, DeVellis BM, Becker MH, et al. The role of self-efficacy in achieving health behavior change. *Health Educ Q* 1986; 13(1): 73–92.

45. Bandura A. Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev* 1977; 84(2): 191–215.

46. Koestner R. Reaching one's personal goals: a motivational perspective focused on autonomy. *Can Psychol* 2008; 49(1): 60–67

47. Eindor-Abarbanel A, Naftali T, Ruhimovich N, et al. Important relation between self-efficacy, sense of coherence, illness perceptions, depression and anxiety in patients with inflammatory bowel disease. *Frontline Gastroenterol* 2021; 12(7): 601–607.

48. Graff LA, Walker JR, Lix L, et al. The relationship of inflammatory bowel disease type and activity to psychological functioning and quality of life. *Clin Gastroenterol Hepatol* 2006; 4(12): 1491–1501.

49. Sheehan JL, Greene-Higgs L, Swanson L, et al. Self-efficacy and the impact of inflammatory bowel disease on patients' daily lives. *Clin Transl Gastroenterol* 2023; 14(6): e00577.
50. Cosnes J, Gower-Rousseau C, Seksik P, et al. Epidemiology and natural history of inflammatory bowel diseases. *Gastroenterology* 2011; 140(6): 1785–1794.
51. Prantera C and Korelitz BI. Crohn's disease. Florida: CRC Press, 1996.
52. Rowse G, Hollobone S, Afhim S, et al. Factors associated with life satisfaction in people with Crohn's disease and ulcerative colitis: results from the national 2018 Crohn's and Colitis UK Inflammatory Bowel Disease Quality of Life Survey. *J Crohns Colitis* 2019; 13(Suppl. 1): S042–S043.
53. Robinson A, Thompson DG, Wilkin D, et al. Guided self-management and patient-directed follow-up of ulcerative colitis: a randomised trial. *Lancet* 2001; 358(9286): 976–981.
54. Kennedy AP, Nelson E, Reeves D, et al. A randomised controlled trial to assess the effectiveness and cost of a patient orientated self management approach to chronic inflammatory bowel disease. *Gut* 2004; 53(11): 1639–1645.
55. Koestner R, Powers TA, Carbonneau N, et al. Distinguishing autonomous and directive forms of goal support: their effects on goal progress, relationship quality, and subjective well-being. *Pers Soc Psychol Bull* 2012; 38(12): 1609–1620.
56. Little BR. Personal projects and the distributed self: aspects of a conative psychology. In: Suls JM (ed.) *The self in social perspective: psychological perspectives on the self*. Mahwah: Lawrence Erlbaum Associates, 1993, pp. 157–185.
57. Martos T, Kézdy A and Horváth-Szabó K. Religious motivations for everyday goals: their religious context and potential consequences. *Motiv Emot* 2011; 35: 75–88.
58. Rózsa S, Réthelyi J, Stauder A, et al. A Hungarostudy 2002 országos reprezentatív felmérés általános módszertana és a felhasznált tesztbattéria pszichometriai jellemzői. *Psychiatr Hung* 2003; 18: 83–94.
59. Schwarzer R and Jerusalem M. General self-efficacy scale [dataset]. APA PsycTests. https://doi.org/10.1037/t00393-000
60. Diener E, Emmons RA, Larsen RJ, et al. The satisfaction with life scale. *J Pers Assess* 1985; 49(1): 71–75.
61. Lleras C. Path analysis. In: Kempf-Leonard K (ed.) *Encyclopedia of social measurement*. *Elsevier*, 2005, pp. 25–30.
62. MacCallum RC, Browne MW and Sugawara HM. Power analysis and determination of sample size for covariance structure modeling. *Psychol Methods* 1996; 1(2): 130–149.
63. Katz L, Tripp DA, Ropeleski M, et al. Mechanisms of quality of life and social support in inflammatory bowel disease. *J Clin Psychol Med Settings* 2016; 23(1): 88–98.
64. Dasharathy SS, Long MD, Lackner JM, et al. Psychological factors associated with adherence to oral treatment in ulcerative colitis. *Inflamm Bowel Dis* 2023; 29(1): 97–102.
65. Knittle K, De Gucht V, Hurkmans E, et al. Targeting motivation and self-regulation to increase physical activity among patients with rheumatoid arthritis: a randomised controlled trial. *Clin Rheumatol* 2015; 34(2): 231–238.
66. Peters LA and Brown EM. The relationship between illness identity and the self-management of inflammatory bowel disease. *Br J Health Psychol* 2022; 27(3): 956–970.
67. Hobfoll SE, Halbesleben J, Neveu J-P, et al. Conservation of resources in the organizational context: the reality of resources and their consequences. *Annu Rev Organ Psychol Organ Behav* 2018; 5(1): 103–128.

frontiers | Frontiers in Psychology

TYPE Brief Research Report
PUBLISHED 03 July 2023
DOI 10.3389/fpsyg.2023.1115160

OPEN ACCESS

EDITED BY
Gianluca Castelnuovo,
Catholic University of the Sacred Heart, Italy

REVIEWED BY
Evgeny Osin,
Université Paris Nanterre, France
Pauline Rivière,
Universitéde Bordeaux, France

*CORRESPONDENCE
Barbara Horvát
✉ barbara@med.u-szeged.hu

RECEIVED 03 December 2022
ACCEPTED 13 June 2023
PUBLISHED 03 July 2023

CITATION
Horvát B, Dávid A, Sallay V, Rafael B, Njers S, Orbán K, Molnár T, Csabai M and Martos T (2023) Improving disease management of patients with inflammatory bowel disease: the potential role of self-concordant health goals. *Front. Psychol.* 14:1115160. doi: 10.3389/fpsyg.2023.1115160

Improving disease management of patients with inflammatory bowel disease: the potential role of self-concordant health goals

Barbara Horvát[1]*, Anett Dávid[2], Viola Sallay[3], Beatrix Rafael[4], Sanela Njers[5], Kata Orbán[1], Tamás Molnár[2], Márta Csabai[6] and Tamás Martos[3]

[1]Doctoral School of Clinical Medicine, University of Szeged, Szeged, Hungary, [2]Department of Medicine, University of Szeged, Szeged, Hungary, [3]Institute of Psychology, University of Szeged, Szeged, Hungary, [4]Department of Preventive Medicine, University of Szeged, Szeged, Hungary, [5]Department of Cognitive and Neuropsychology, University of Szeged, Szeged, Hungary, [6]Department of Clinical Psychology, Károli Gáspár University of the Reformed Church, Budapest, Hungary

Inflammatory bowel diseases (IBD) are chronic gastrointestinal conditions that significantly impact patients' quality of life. Previous research indicates that patients with IBD have a higher prevalence of anxiety compared to the general population and other chronic diseases. This pilot study aimed to investigate the relationships between goal integration, positive and negative emotions, goal self-efficacy, and trait anxiety as the outcome variable, focusing on patients' self-management strategies. Drawing from the Self-Concordance Model (SCM) of Self-Determination Theory (SDT), the study explored how goal integration is associated with more fulfilling and enjoyable experiences and fewer negative emotions, ultimately improving psychological well-being. Health-related goals were evaluated using the Personal Project Analysis technique, while the State–Trait Anxiety Inventory was utilized to measure general anxiety levels. Among the 141 participants with inflammatory bowel disease, 96 reported having health-related goals. Of these, 66 were female (68.75%), and 30 were male participants (31.25%). Path analysis revealed a moderate negative association between self-concordance (SC) and negative emotions, which, in turn, predicted higher levels of trait anxiety. Furthermore, the alternative model tested indicated that trait anxiety predicted a lower level of self-concordance. Setting well-integrated health goals involves an internal capacity, enabling patients to experience less negative emotions during self-management activities. Anxiety can hinder individuals from accessing their inner needs, resulting in less self-concordant aspirations and more negative emotions. These findings may contribute to developing prevention and intervention programs to enhance IBD patients' adherence to lifestyle changes, ultimately improving their overall well-being.

KEYWORDS

health-related goals, self-concordance, health behavior, chronic disease, inflammatory bowel disease, trait anxiety

1. Introduction

The global prevalence of inflammatory bowel diseases (IBDs) is rising, with these chronic conditions affecting multiple organs and primarily targeting the intestinal tissues (Podolsky, 2002; Sartor, 2006; Park et al., 2019). IBD patients often experience abdominal pain, bloody diarrhea, fatigue, and frequent bowel movements, significantly impacting their daily lives (Dibley and Norton, 2013; Devlen et al., 2014). Therapy aims to alleviate symptoms, achieve remission, and improve the overall quality of life for patients (Habibi et al., 2017). Given the physical burden of the disease and the heightened psychological vulnerability, empowering patients with self-management strategies, including emotion regulation and disease management skills, is crucial. This paper presents the findings of a cross-sectional pilot study conducted among inflammatory bowel disease patients. Our main objective was to explore the role of striving for health goals in disease management by examining the associations between three key elements of the health goal-striving process (goal-related self-concordance, goal self-efficacy, and positive and negative emotions) and their relationship with general anxiety.

1.1. Psychological aspects of living with IBD

The symptoms of IBD and its associated medications profoundly disrupt patients' daily activities and psychological well-being, affecting various aspects of their lives, such as work, school, family, relationships, and overall psychological health (Dibley and Norton, 2013; Devlen et al., 2014). Numerous studies have demonstrated that the prevalence of anxiety and depressive disorders is higher among IBD patients compared to the general population and other chronic diseases (Robertson et al., 1989; Addolorato et al., 1997; Katon and Ciechanowski, 2002; Katon et al., 2007; Kovács and Kovács, 2007; Scott et al., 2007; Graff et al., 2009; Byrne et al., 2017; Bhamre et al., 2018). These symptoms tend to worsen during disease relapses, and long-term anxiety levels have been associated with poorer IBD-related outcomes (Nahon et al., 2012; Selinger and Bannaga, 2015; Narula et al., 2019). Moreover, managing IBD requires specific self-management skills, including adhering to complex medication regimens, regular medical check-ups, cancer screenings, addressing medication side effects and extraintestinal symptoms, and making lifestyle adjustments (e.g., stress management, healthy eating, smoking cessation; von Wietersheim et al., 1992; Kane et al., 2001; Dudley-Brown, 2002). Effective disease management is crucial to minimize complications and prevent psychological distress (Dudley-Brown, 2002). While previous research has primarily focused on disease education interventions rather than self-management components (Barlow et al., 2010; Kemp, 2012), it is crucial to further investigate factors that can enhance self-management and improve patient adherence, especially considering the significant nonadherence rates and maladaptive coping strategies among IBD patients (Wagoner and Kavookjian, 2017).

1.2. Lifestyle change and health-related personal goals

Supporting lifestyle changes is a vital aspect of disease management for individuals with IBD. Various activities related to disease management, role adjustment, and emotional well-being can be framed as personal goals (Austin and Vancouver, 1996; Peterman and Lecci, 2007; Martos, 2009a). For IBD patients, these goals may include alleviating physical symptoms, maintaining disease remission, managing lifestyle changes (medication adherence, dietary modifications, smoking cessation, and regular physical activity), and improving mental health. Health goals serve as a tool for IBD patients to adapt to the necessary lifestyle changes imposed by the disease (Strecher et al., 1995; Mann et al., 2013). Although many studies have highlighted the impact of adopting a healthy lifestyle on the quality of life of IBD patients (Lo et al., 2021; Lamers et al., 2022; Schlee et al., 2022), the experiences of setting personal health goals have not yet been explored among this population.

1.3. Goal self-concordance

According to the Self-Determination Theory (SDT) of health behaviors (Ryan and Deci, 2000), intrinsic motivation is crucial in long-term adherence. SDT proposes a continuum of motivation, where autonomously regulated health goals are pursued out of intrinsic motives and are aligned with the individual's integrated sense of self (Sheldon and Elliot, 1999; Judge et al., 2005). The Self-Concordance Model (SCM; Ryan et al., 1996) addresses the extent to which goals are integrated into the self, indicating a lower degree of control, higher autonomy, and consistency with one's core values, talents, and needs (Sheldon and Elliot, 1998, 1999; Judge et al., 2005). According to SCM, higher self-integration leads to greater effort and improved goal implementation outcomes (Sheldon and Elliot, 1999). Individuals become more deeply engaged in their health management with more integrated goals, leading to more effective goal achievement (Vansteenkiste et al., 2005). Developing self-concordance regarding health goals can support lifestyle changes for people with IBD (Reed-Knight et al., 2011).

1.4. Goal self-efficacy

Self-efficacy (SE) is key to health behavior change (McAuley, 1993; Lorig and Holman, 2003; Fernández et al., 2009). SE refers to an individual's belief in their ability to perform the behaviors required to manage a situation (Bandura, 1977, 2001). This motivational factor has been shown to influence goal progress and long-term commitment (Bandura, 1977; Sheldon and Elliot, 1998; Koestner et al., 2008). Previous research among IBD patients has demonstrated that SE is a relevant component of disease management and coping (Graff et al., 2016). Moreover, SE has been found to have a positive association with self-esteem and health-related quality of life and a negative association with depression and anxiety (Izaguirre et al., 2017). IBD patients with high self-efficacy are more likely to visit gastroenterologists regularly and be open to psychological support (Keefer et al., 2011). Both self-efficacy and self-concordance are important determinants of successful lifestyle change. The question remains about how these factors interact and which is a stronger predictor of successful goal pursuit.

1.5. Positive and negative emotions

Self-concordant striving not only affects optimism about goal attainment but also influences emotions during the process (Sheldon and Elliot, 1999; Sheldon et al., 2004, 2022; Sheldon and Lyubomirsky, 2006; Wang, 2009; Gaudreau, 2012). Goals that align with inner values, talents, and needs have the potential to fulfill basic psychological needs, thereby contributing to enhanced psychological well-being (Sheldon and Elliot, 1999; Sheldon, 2002). In comparison, individuals with non-concordant goals tend to experience lower levels of happiness, even if they manage to accomplish those goals (Sheldon and Elliot, 1999). Furthermore, self-concordant goals are perceived as more attainable, facilitating more effective goal pursuit (Werner et al., 2016). Moreover, happiness-related exercises are more effective when self-concordant (Dickerhoof, 2007). Self-concordant future events are associated with more positive and intense emotions (Ernst et al., 2018).

1.6. The present study

This study proposes and examines a model (refer to Figure 1 for an overview and the hypothesized relationships between the variables). The level of self-integration of health goals reflects an individual's internal capacity, as well-integrated health goals are closely aligned with their inner values, talents, and needs. Pursuing well-integrated goals allows individuals to engage in activities that genuinely reflect their motivations, resulting in more self-rewarding experiences filled with joy, pleasure, and a sense of flow while minimizing negative emotions such as frustration, sadness, or distress. Consequently, experiencing more positive and fewer negative emotions during the process of goal pursuit can act as a mediator in enhancing overall functioning. We assumed that self-concordance (SC) and goal self-efficacy (SE) would predict lower levels of anxiety by experiencing more positive and less negative emotions during goal implementation. We acknowledge the interdependence between self-concordance, goal self-efficacy, and positive and negative emotions. However, we do not propose a specific hypothesis regarding the direct impact of self-concordance or goal self-efficacy on trait anxiety. As this is a pilot study and causal relationships cannot be established, we propose an alternative model that may also be plausible. Drawing on previous research, we hypothesize that trait anxiety could be associated with more negative and less positive emotions, and also undermine both self-efficacy and self-concordance.

2. Methods

2.1. Participants

Participants were recruited from the Internal Medicine Department of the University of Szeged. Our target group was patients living with any type of inflammatory bowel disease. In sum, 141 IBD patients' data were involved in the analysis. Data collection was carried out by filling in a paper-pencil questionnaire during patients' regular check-ups in the hospital, due at a 6–8 weeks pace. Before receiving the questionnaire, the participants were informed about the participation conditions and requested to provide informed written consent.

2.2. Measures

2.2.1. Personal project analysis

Patients were asked to list their health-related goals, select one of them and assess it according to the criteria provided. Sample personal health goals included domains such as sport (Example: *"I definitely need to start doing some form of exercise regularly."*), weight management (Example: *"I want to lose weight."*), eating habits (Example: *"Greater adherence to the diet"*), reduce smoking (Example: *"I want to quit smoking."*), mental health (Example: *"Find a better work-life balance."*), and sleeping (Example: *"Get 8 h of sleep every night."*). The health goals were rated according to the following criteria (Little, 1993; Martos, 2009b).

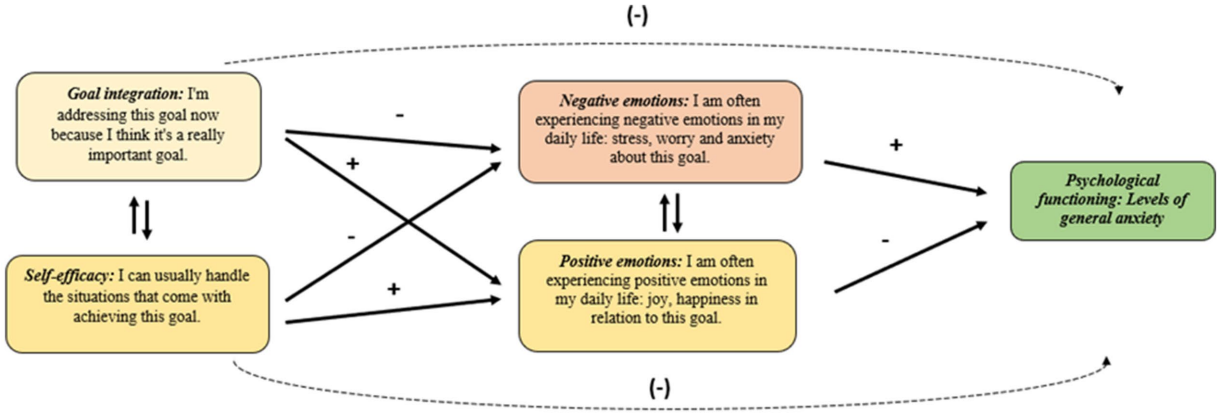

FIGURE 1
Goal integration's role in emotional experiences of lifestyle change and better psychological functioning. "+" stands for a positive, and "–" for a reversed association.

2.2.1.1. Goal self-concordance

Goal self-concordance refers to the extent to which the person has internalized the goal. It was calculated from the subtraction of two items of controlled motivation (External regulation: *"One of the reasons I am pursuing this goal is because somebody else wants me to."*) and (Introjected regulation: *"One of the reasons I am pursuing this goal is* because *I would feel ashamed, guilty, or anxious if I did not."*) and two items of autonomous motivation (Identified regulation: *"One of the reasons I am pursuing this goal is because I really believe that it is an important goal to have."*) and (Intrinsic regulation: *"One of the reasons I am pursuing this goal is because of the fun and enjoyment which the goal will provide."*; Sheldon and Elliot, 1999). The self-concordance score was rated on a seven-point Likert scale (ranging from "Not at all true for me" to "Very true for me"). Due to the composite nature of the index, the standard reliability estimate of alpha is not applicable (Sheldon and Elliot, 1999).

2.2.1.2. Goal self-efficacy

Goal self-efficacy refers to the person's belief in his/her ability to achieve the goal. This four-item questionnaire provides a seven-point Likert scale for each response. Example item: *"I can handle the situations that come with achieving this goal."* The self-efficacy score was rated on a seven-point Likert scale (ranging from "Not at all true for me" to "Very true for me"). Internal consistency of the four items was excellent: Cronbach's α =0.805 (Rózsa et al., 2003).

2.2.1.3. Positive and negative emotions

Six items referred to the emotional experiences during the goal implementation process. Three items were used for measuring negative (Example item: *"How often do you experience negative emotions on a daily basis: stress, worry, and anxiety about this goal?"*) and three items for positive emotions (Example item: *"How often do you experience positive emotions on a daily basis: joy and happiness about this goal?"*). Both subscales used a seven-point Likert scale (ranging from "Not at all true for me" to "Very true for me"). Internal consistency of the items for positive emotions was Cronbach's α =0.806, and for the negative emotions, Cronbach's α =0.890 (Martos et al., 2013).

2.2.2. State–trait anxiety inventory

The Trait Anxiety Subscale was used to measure the general levels of anxiety. The trait anxiety score was calculated from 20 items, rated on a four-point Likert scale (ranging from "Almost Never" to "Almost Always"). Example items: *"I worry too much over something that really does not matter"* and *"I am content; I am a steady person."* The scale had an internal consistency of 0.925 in our sample (Sipos, 1978; Spielberger, 1983).

2.3. Procedure

Our research was the pilot phase of a broader longitudinal study. The presented data were collected from April to May 2022 as a pilot study to test the self-concordance-based model's reliability. Future phases of the research project, started in November 2022, will extend to three waves of longitudinal data collection. The paper-pencil questionnaire package, consisting of several other scales not discussed here, took approximately 30–40 min to complete. Only the Personal project analysis questionnaire is attached in Supplementary Material. The ethics approval was provided by the Regional Research Ethics Committee (RKEB) of the University of Szeged, Albert Szent-Györgyi Health Centre, under Nr. 14/2022-SZTE RKEB. The study was conducted following the Declaration of Helsinki.

2.4. Statistical analyses

JASP 0.14.6.0 was used for the statistical analyses of the data. Patients' scores for the inventories were summarized using descriptive statistics, and Pearson's correlation coefficients were used to quantify associations between variables (0.10 is small, 0.30 is moderate, and 0.50 is large; Cohen, 1988). Path analysis was used to examine the relationships between variables. To further examine the relationship between variables, standardized regression coefficients (β) were used to quantify the strength of association (0.10 is small, 0.30 is moderate, and 0.50 is large).

3. Results

3.1. Descriptive statistics of the sample

According to the type of IBD, 79 patients (56.02%) had Crohn's disease (CD), 56 patients (39.71%) had a diagnosis of ulcerative colitis (UC), five patients (3.54%) reported having an unspecified type (UT) of IBD, and one patient (0.7%) did not know the type of the disease. Concerning the status of IBD, 95 patients' disease was in remission (46.0%), and 44 patients' disease was in the relapse phase (31.2%) at the time of the data collection, with two missing data (1.41%). The mean age of IBD subsamples for CD was 38.4 years ($SD = 11.9$), for UC, 39.70 years ($SD = 13.3$), and for UT, 54.0 years ($SD = 18.7$). Of CD patients, there were 46 female (58.22%), 31 male (39.24%) participants, and two persons with missing data (2.53%). UC patients involved 39 female (69.64%) and 14 male participants (25.0%), with three missing data (5.35%). From UT of IBD patients, there were three female and two male participants. Of the total sample, 101 patients (71.63%) reported having a health-related goal, and 40 patients (28.37%) reported not having a health-related goal. Of those with a health-related goal, 66 were female (68.75%) and 30 were male participants (31.25%), with five missing data. The IBD subsamples' demographic information and other characteristics are summarized in Table 1.

3.2. Correlations between goal characteristics and trait anxiety

We run a series of bivariate Pearson correlations for the study variables. According to the results, positive emotions, higher self-efficacy, and goal-self-concordance have a significant, weak to medium-strong negative association with the levels of trait anxiety (p was everywhere <0.001, $n = 91–105$): $r_{PE} = -0.37$, $r_{SC} = -0.46$, $r_{SE} = -0.36$. Negative emotions had a significant, moderate positive association with trait anxiety ($r_{NE} = 0.43$, $p < 0.001$). There was a significant positive association between SC and SE ($r = 0.33$, $p < 0.001$), and a significant negative association between PE and NE ($r = -0.38$,

TABLE 1 Demographic information and IBD characteristics.

Variable name	Type of IBD		
	UC	CD	UT
N	56	79	5
Age (*M, SD*)	38.65 (12.17)	39.00 (7.07)	37.35 (11.27)
Gender			
Male	8	19	2
Female	28	34	2
Missing	6		
Level of education			
Primary school	4	11	2
High school	18	16	1
College and higher	14	21	1
Missing	4		
State of disease			
Remission	19	38	1
Relapse	17	17	3
Missing	3		
Psychological functioning (M, SD)			
Trait Anxiety	44.64 (9.78)	40.98 (11.88)	49.25 (10.69)
State Anxiety	40. (9.61)	38.91 (11.80)	47.25 (14.25)
Health-related goal			
One or more	101 (%)		
None	40 (%)		

$p < 0.001$). Descriptive statistics and correlations are presented in Table 2.

3.3. Path analysis

3.3.1. Model I

For path analysis, data were examined from individuals who reported having a health goal and completed all questions. Since our self-concordance-based model is saturated, the fit indices indicate a perfect fit to the data: X^2 (0) = 0.00, p = 1.00, CFI = 1.00, TLI = 1.00, RMSE = 0.00, SRMR <0.001. Self-efficacy has a significant positive effect on positive emotions ($\beta = 0.45$ $p < 0.001$), and a significant negative effect on negative emotions ($\beta = -0.19$, $p = 0.05$). Self-concordance has a positive effect on positive emotions ($\beta = 0.19$, $p = 0.06$), and a significant negative effect on negative emotions ($\beta = -0.27$, $p = 0.01$). Positive emotions have no significant effect on trait anxiety ($\beta = -0.13$, $p = 0.23$), but negative emotions have a significant negative effect on trait anxiety ($\beta = 0.21$, $p = 0.03$). Self-concordance has a significant negative effect on trait anxiety ($\beta = -0.28$, $p = 0.004$). Self-efficacy has no significant effect on trait anxiety ($\beta = -0.15$, $p = 0.16$). Self-efficacy has a significant moderate positive association with self-concordance ($\beta = 0.34$, $p = 0.002$). Positive and negative emotions have a significant small negative association ($\beta = -0.32$, $p = 0.002$). Figure 2 shows defined paths.

3.3.2. Model II

In the absence of longitudinal data, we tested an alternative model for the pilot study to explore the effect of trait anxiety on self-efficacy and self-concordance. Since the alternative model is also saturated, the fit indices indicate a perfect fit to the data: X^2 (0) = 0.00, p = 1.00, CFI = 1.00, TLI = 1.00, RMSE = 0.00, SRMR <0.001. Self-efficacy has a significant positive effect on positive emotions ($\beta = 0.42^*$, $p < 0.001$), no significant effect on negative emotions ($\beta = -0.15$, $p = 0.16$), and no significant effect on self-concordance ($\beta = 0.19$, $p = 0.08$). Trait anxiety has a significant positive effect on negative emotions ($\beta = 0.35$, $p < 0.001$), a significant negative effect on positive emotions ($\beta = -0.25$, $p = 0.01$), a significant negative effect on self-concordance ($\beta = -0.29$, $p = 0.005$) and a significant negative effect on self-efficacy ($\beta = -0.38$, $p < 0.001$). Neither positive emotions ($\beta = 0.11$, $p = 0.36$) nor negative emotions significantly predict self-concordance ($\beta = -0.12$, $p = 0.24$). Positive and negative emotions have a significant small negative association ($\beta = -0.31$, $p = 0.005$). Figure 3 shows defined paths.

4. Discussion

Inflammatory bowel diseases (IBDs) are chronic conditions increasingly affecting a larger population worldwide (Goodhand et al., 2012). Patients with IBD have a higher prevalence of anxiety disorders compared to other chronic disorders, but the underlying factors require further investigation (Kovács and Kovács, 2007; Mikocka-Walus et al., 2016; Navabi et al., 2018). Effective self-management and adaptation to disease-specific lifestyle changes are crucial for maintaining and improving the health of IBD patients. This study examined a model based on goal self-concordance theory (Sheldon and Elliot, 1999) and found that more integrated goals are associated with increased positive affect and reduced negative affect, which, in turn, may contribute to better psychological functioning. By assessing patients' autonomous motivation toward personal health goals, we provide evidence of how individuals with IBD can enhance their ability to manage their disease effectively.

The current results partially support our assumption that self-concordance represents an internal capacity leading to better self-management of IBD patients. Self-concordance significantly predicted lower levels of negative emotions and higher levels of positive emotions. Consistent with previous research, internally regulated goals are more likely to lead to activities that satisfy basic psychological needs and promote overall well-being (Ryan and Deci, 2000, 2017; Sheldon et al., 2004). The unidirectional relationship between positive and negative emotions and self-concordance reinforces the role of goal integration in enhancing positive emotions, as supported by the multivariate analysis.

A high level of goal self-concordance predicts reduced negative emotions, which, in turn, is associated with lower levels of trait anxiety. However, positive emotions do not significantly predict trait anxiety. This suggests a dynamic interaction between self-concordance and psychological functioning. Since goals are expressed through individual language, they reflect an individual's ability to make accurate or inaccurate self-descriptions and reflect their state of self (Kuhl and Kazen, 1994; Sheldon and Elliot, 1999). Negative affect can impede conscious access to individuals' extended personality system, resulting in inaccurate self-descriptions (Kuhl, 2000) and less

10.3389/fpsyg.2023.1115160

TABLE 2 Correlations among goal self-concordance, goal self-efficacy, positive and negative emotions, and trait anxiety.

Variable	Mean	*SD*	1.	2.	3.	4.	5.
1. Positive emotions	4.27	1.32	–				
2. Negative emotions	3.27	1.77	−0.38**	–			
3. Self-concordance	2.81	2.22	0.31**	−0.34***	–		
4. Self-efficacy	4.89	1.21	0.48***	−0.26**	0.33***	–	
5. STAI-T	41.9	11.3	−0.37***	0.43***	−0.46***	−0.36***	–

($n = 91–105$); **$p < 0.01$, ***$p < 0.001$.

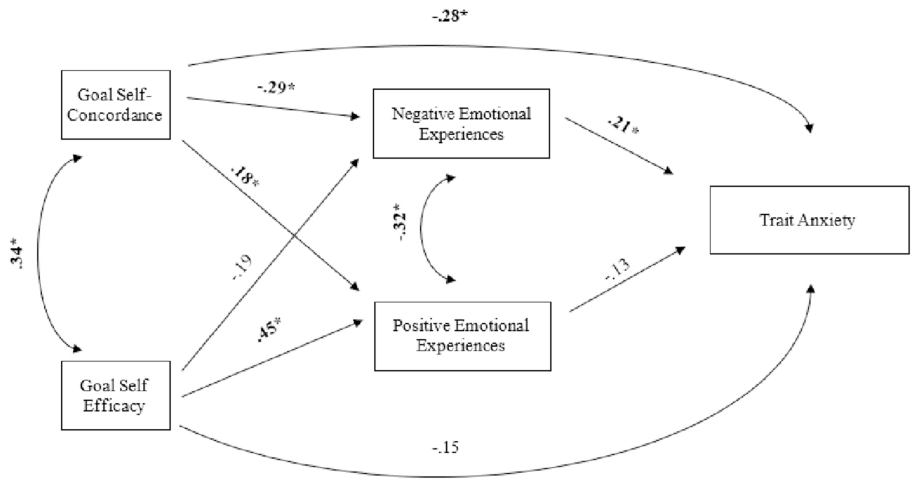

FIGURE 2
Path Diagram I. The diagram shows the standardized path coefficients. The sample size for the path model was n=101. p for SE and NE was 0.06. *p<0.05.

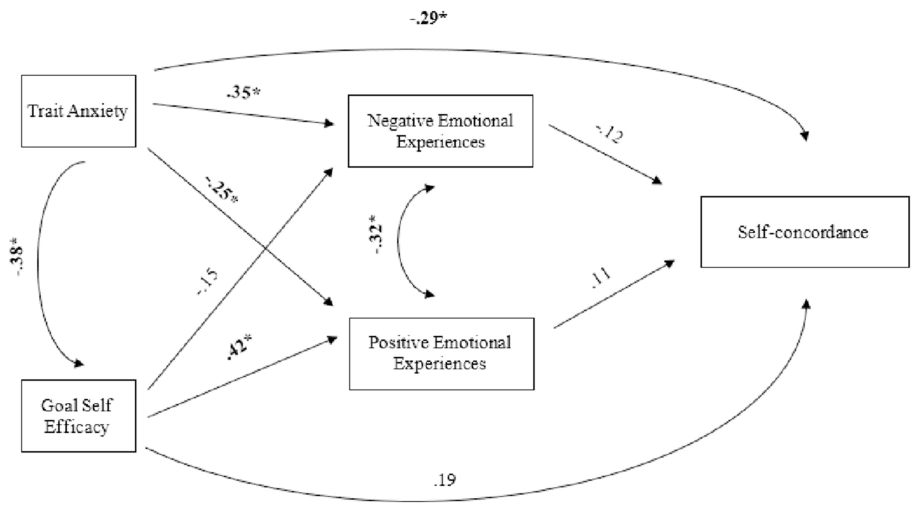

FIGURE 3
Path Diagram II. The diagram shows the standardized path coefficients. The sample size for the path model was n=88.

self-concordant aspirations. According to our results, anxiety can hinder the ability to connect with their inner needs and formulate goals in a self-concordant manner. The results of this pilot study can guide future research on the role of anxiety in successful goal integration and the mechanisms by which self-concordance may improve self-management in patients with IBD.

We also hypothesized that self-efficacy would be associated with positive and negative emotions, and our results partly supported this

hypothesis. In both models, self-efficacy was significantly related to positive emotions but did not show a significant association with negative emotions. Additionally, self-concordance significantly predicted trait anxiety, while trait anxiety also predicted self-efficacy. These distinct emotional patterns in self-concordant and self-effective goal striving support previous research indicating that although self-efficacy and self-concordance are linked, they represent different aspects of goal striving (Fuchs et al., 2016; Downes et al., 2017).

4.1. Limitations

Our study has several limitations that should be considered when interpreting the results. Firstly, the cross-sectional design of the data assessment prevents us from establishing causal relationships between variables. Future studies employing longitudinal designs would provide a clearer understanding of the causal effects. Secondly, the pilot study had a relatively small sample size, which may limit the generalizability of the findings. However, the effect sizes observed in our study can serve as a basis for determining sample sizes in larger studies involving IBD patients. Additionally, the small sample size could impact the precision of the estimated model parameters. Future studies with larger sample sizes would enhance the statistical power of the analyses (Wolf et al., 2013). Lastly, we could not assess goal attainment due to the cross-sectional design. Long-term assessments would be valuable in examining the importance of self-concordance for goal achievement.

4.2. Conclusion

The findings of our pilot study highlight the significance of health goal integration in more effective self-management and the psychological functioning of individuals with IBD. Health goals can be valuable tools for monitoring patients' self-management processes, including successful lifestyle change and adherence. However, further research is needed to explore the complex role of goal integration in long-term well-being and the interplay between self-concordance, self-efficacy, and emotional experiences during disease management. By enhancing patients' goal-related self-efficacy and self-concordance, clinicians can facilitate successful lifestyle changes and promote adherence in individuals living with IBD.

4.3. Plans and perspectives for future research

Based on the study, setting self-concordant goals is an internal capacity that can help patients with inflammatory bowel disease to maintain lifestyle changes and be more effective in disease management. This finding will serve as a basis for further research. Our research team is currently conducting a longitudinal study that will follow up with 300 IBD patients at 3 and 6 months to validate the proposed model and investigate causal relationships.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Regional Research Ethics Committee (RKEB) of the University of Szeged, Albert Szent-Györgyi Health Centre. The patients/participants provided their written informed consent to participate in this study.

Author contributions

TMa, BH, AD, and SN led the data collection. BH and TMa done the study conceptualization, data cleaning, data analysis, and writing. AD, VS, BR, KO, MC, and TMo was done the review of the paper and interpretation of the results. All authors contributed to the article and approved the submitted version.

Funding

The research was supported by research project no. K 138372, provided by the Ministry of Innovation and Technology of Hungary from the National Research, Development and Innovation Fund, and financed under the K_21 funding scheme.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2023.1115160/full#supplementary-material

References

Addolorato, G., Capristo, E., Stefanini, G. F., and Gasbarrini, G. (1997). Inflammatory bowel disease: a study of the association between anxiety and depression, physical morbidity, and nutritional status. *Scand. J. Gastroenterol.* 32, 1013–1021. doi: 10.3109/00365529709011218

Austin, J. T., and Vancouver, J. B. (1996). Goal constructs in psychology: structure, process, and content. *Psychol. Bull.* 120, 338–375. doi: 10.1037/0033-2909.120.3.338

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychol. Rev.* 84, 191–215. doi: 10.1037/0033-295X.84.2.191

Bandura, A. (2001). Social cognitive theory: an Agentic perspective. *Annu. Rev. Psychol.* 52, 1–26. doi: 10.1146/annurev.psych.52.1.1

Barlow, C., Cooke, D., Mulligan, K., Beck, E., and Newman, S. (2010). A critical review of self-management and educational interventions in inflammatory bowel disease. *Gastroenterol. Nurs.* 33, 11–18. doi: 10.1097/sga.0b013e3181ca03cc

Bhamre, R., Sawrav, S., Adarkar, S., Sakaria, R., and Bhatia, J. S. (2018). Psychiatric comorbidities in patients with inflammatory bowel disease. *Indian J. Gastroenterol.* 37, 307–312. doi: 10.1007/s12664-018-0870-9

Byrne, G., Rosenfeld, G., Leung, Y., Qian, H., Raudzus, J., Nunez, C., et al. (2017). Prevalence of anxiety and depression in patients with inflammatory bowel disease. *Can. J. Gastroenterol. Hepatol.* 2017, 1–6. doi: 10.1155/2017/6496727

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*. 2nd Edn. Lawrence Erlbaum Associates.

Devlen, J., Beusterien, K., Yen, L., Ahmed, A., Cheifetz, A. S., and Moss, A. C. (2014). The burden of inflammatory bowel disease: a patient-reported qualitative analysis and development of a conceptual model. *Inflamm. Bowel Dis.* 20, 545–552. doi: 10.1097/01.MIB.0000440983.86659.81

Dibley, L., and Norton, C. (2013). Experiences of fecal incontinence in people with inflammatory bowel disease. *Inflamm. Bowel Dis.* 19, 1450–1462. doi: 10.1097/mib.0b013e318281327f

Dickerhoof, R. M. (2007). Expressing optimism and gratitude: a longitudinal investigation of cognitive strategies to increase well-being (Ph.D. Thesis). University of California, USA.

Downes, P. E., Kristof-Brown, A. L., Judge, T. A., and Darnold, T. C. (2017). Motivational mechanisms of self-concordance theory: goal-specific efficacy and person–organization fit. *J. Bus. Psychol.* 32, 197–215. doi: 10.1007/s10869-016-9444-y

Dudley-Brown, S. (2002). Prevention of psychological distress in persons with inflammatory bowel disease. *Issues Ment. Health Nurs.* 23, 403–422. doi: 10.1080/01612840290052596

Ernst, A., Philippe, F. L., and D'Argembeau, A. (2018). Wanting or having to: The role of goal self-concordance in episodic future thinking. *Conscious Cogn.* 66, 26–39. doi: 10.1016/j.concog.2018.10.004

Fernández, M. E., Gonzales, A., Tortolero-Luna, G., Williams, J., Saavedra-Embesi, M., Chan, W., et al. (2009). Effectiveness of Cultivando La Salud: A breast and cervical Cancer screening promotion program for low-income Hispanic women. *Am. J. Public Health* 99, 936–943. doi: 10.2105/ajph.2008.136713

Fuchs, R., Seelig, H., Göhner, W., Schlatterer, M., and Ntoumanis, N. (2016). The two sides of goal intentions: intention self-concordance and intention strength as predictors of physical activity. *Psychol. Health* 32, 110–126. doi: 10.1080/08870446.2016.1247840

Gaudreau, P. (2012). Goal self-concordance moderates the relationship between achievement goals and indicators of academic adjustment. *Learn. Individ. Differ.* 22, 827–832. doi: 10.1016/j.lindif.2012.06.006

Goodhand, J. R., Wahed, M., Mawdsley, J. E., Farmer, A. D., Aziz, Q., and Rampton, D. S. (2012). Mood disorders in inflammatory bowel disease: relation to diagnosis, disease activity, perceived stress, and other factors. *Inflamm. Bowel Dis.* 18, 2301–2309. doi: 10.1002/ibd.22916

Graff, L. A., Sexton, K. A., Walker, J. R., Clara, I., Targownik, L. E., and Bernstein, C. N. (2016). Validating a measure of patient self-efficacy in disease self-management using a population-based IBD cohort. *Inflamm. Bowel Dis.* 22, 2165–2172. doi: 10.1097/mib.0000000000000856

Graff, L. A., Walker, J. R., Clara, I., Lix, L., Miller, N., Rogala, L., et al. (2009). Stress coping, distress, and health perceptions in inflammatory bowel disease and community controls. *Am. J. Gastroenterol.* 104, 2959–2969. doi: 10.1038/ajg.2009.529

Habibi, F., Habibi, M. E., Gharavinia, A., Mahdavi, S. B., Akbarpour, M. J., Baghaei, A., et al. (2017). Quality of life in inflammatory bowel disease patients: A cross-sectional study. *J. Res. Med. Sci.* 22:104. doi: 10.4103/jrms.JRMS_975_16

Izaguirre, M. R., Taft, T., and Keefer, L. (2017). Validation of a self-efficacy scale for adolescents and young adults with inflammatory bowel disease. *J. Pediatr. Gastroenterol. Nutrit.* 65, 546–550. doi: 10.1097/mpg.0000000000001552

Judge, T. A., Bono, J. E., Erez, A., and Locke, E. A. (2005). Core self-evaluations and job and life satisfaction: the role of self-concordance and goal attainment. *J. Appl. Psychol.* 90, 257–268. doi: 10.1037/0021-9010.90.2.257

Kane, S., Cohen, R., Aikens, J., and Hanauer, S. (2001). Predictors of non-compliance with mesalamine in quiescent ulcerative colitis. *Am. J. Gastroenterol.* 96, 2929–2932.

Katon, W., and Ciechanowski, P. (2002). Impact of major depression on chronic medical illness. *J. Psychosom. Res.* 53, 859–863. doi: 10.1016/s0022-3999(02)00313-6

Katon, W., Lin, E. H. B., and Kroenke, K. (2007). The association of depression and anxiety with medical symptom burden in patients with chronic medical illness. *Gen. Hosp. Psychiatry* 29, 147–155. doi: 10.1016/j.genhosppsych.2006.11.005

Keefer, L., Kiebles, J. L., and Taft, T. H. (2011). The role of self-efficacy in inflammatory bowel disease management. *Inflamm. Bowel Dis.* 17, 614–620. doi: 10.1002/ibd.21314

Kemp, K. (2012). Understanding the health and social care needs of people living with IBD: A meta-synthesis of the evidence. *World J. Gastroenterol.* 18, 6240–6249. doi: 10.3748/wjg.v18.i43.6240

Koestner, R., Otis, N., Powers, T. A., Pelletier, L., and Gagnon, H. (2008). Autonomous motivation, controlled motivation, and goal Progress. *J. Pers.* 76, 1201–1230. doi: 10.1111/j.1467-6494.2008.00519.x

Kovács, Z., and Kovács, F. (2007). Depressive and anxiety symptoms, dysfunctional attitudes and social aspects in irritable bowel syndrome and inflammatory bowel disease. *Int. J. Psych. Med.* 37, 245–255. doi: 10.2190/PM.37.3.a

Kuhl, J. (2000). "A functional-design approach to motivation and self-regulation: the dynamics of personality systems interactions", in *Handbook of Self Regulation*. eds. M. Boekaerts, P. R. Pintrich and M. Zeidner (Academic Press), 111–169.

Kuhl, J., and Kazen, M. (1994). Self-discrimination and memory: state orientation and false self-ascription of assigned activities. *J. Pers. Soc. Psychol.* 66, 1103–1115. doi: 10.1037/0022-3514.66.6.1103

Lamers, C. R., de Roos, N. M., Heerink, H. H., van de Worp Kalter, L. A., and Witteman, B. J. M. (2022). Short term effects of a combined lifestyle intervention in patients with inflammatory bowel disease. *Inflamm. Bowel Dis.* 28:12. doi: 10.1093/ecco-jcc/jjab076.671

Little, B. R. (1993). "Personal projects and the distributed self: Aspects of a conative psychology" in *The self in social perspective: psychological perspectives on the self*. ed. J. M. Suls (Mahwah: Lawrence Erlbaum Associates), 157–185.

Lo, C., Khalili, H., Song, M., Lochhead, P., Burke, K. E., Richter, J. M., et al. (2021). Healthy lifestyle is associated with reduced mortality in patients with inflammatory bowel diseases. *Clin. Gastroenterol. Hepatol.* 19:1. doi: 10.1016/j.cgh.2020.02.047

Lorig, K. R., and Holman, H. R. (2003). Self-management education: history, definition, outcomes, and mechanisms. *Ann. Behav. Med.* 26, 1–7. doi: 10.1207/s15324796abm2601_01

Mann, T., de Ridder, D., and Fujita, K. (2013). Self-regulation of health behavior: social psychological approaches to goal setting and goal striving. *Health Psychol.* 32, 487–498. doi: 10.1037/a0028533

Martos, T. (2009a). Goals, projects, strivings. I. Theoretical considerations and possibilities of application. *Magyar Pszichológiai Szemle* 64, 337–358. doi: 10.1556/mpszle.64.2009.2.3

Martos, T. (2009b). Goals, projects, strivings. II. Psychometric issues and empirical demonsstration. *Magyar Pszichológiai Szemle* 64, 573–592. doi: 10.1556/mpszle.64.2009.3.7

Martos, T., Sallay, V., and Kézdy, A. (2013). Everyday goals, religious motivations, and well-being: the mediating role of emotions. *Stud. Psychol.* 55, 221–227. doi: 10.21909/Sp.2013.03.638

McAuley, E. (1993). Self-efficacy and the maintenance of exercise participation in older adults. *J. Behav. Med.* 16, 103–113. doi: 10.1007/bf00844757

Mikocka-Walus, A., Pittet, V., Rossel, J. B., and von Känel, R. (2016). Symptoms of depression and anxiety are independently associated with clinical recurrence of inflammatory bowel disease. *Clin. Gastroenterol. Hepatol.* 14, 829–835. doi: 10.1016/j.cgh.2015.12.045

Nahon, S., Lahmek, P., Durance, C., Olympie, A., Lesgourgues, B., Colombel, J.-F., et al. (2012). Risk factors of anxiety and depression in inflammatory bowel disease. *Inflamm. Bowel Dis.* 18, 2086–2091. doi: 10.1002/ibd.22888

Narula, N., Pinto-Sanchez, M. I., Calo, N. C., Ford, A. C., Bercik, P., Reinisch, W., et al. (2019). Anxiety but not depression predicts poor outcomes in inflammatory bowel disease. *Inflamm. Bowel Dis.* 25, 1255–1261. doi: 10.1093/ibd/izy385

Navabi, S., Gorrepati, V. S., Yadav, S., Chintanaboina, J., Maher, S., Demuth, P., et al. (2018). Influences and impact of anxiety and depression in the setting of inflammatory bowel disease. *Inflamm. Bowel Dis.* 24, 2303–2308. doi: 10.1093/ibd/izy143

Park, K. T., Ehrlich, O. G., Allen, J. I., Meadows, P., Szigethy, E. M., Henrichsen, K., et al. (2019). The cost of inflammatory bowel disease: an initiative from the Crohn's & colitis foundation. *Inflamm. Bowel Dis.* 26, 1–10. doi: 10.1093/ibd/izz104

Peterman, A. H., and Lecci, L. (2007). "Personal projects in health and illness" in *Personal project pursuit: goals, action, and human flourishing*. eds. B. R. Little, K. Salmela-Aro and S. D. Phillips (Mahwah, NJ: Lawrence Erlbaum Associates), 329–353.

Podolsky, D. K. (2002). Inflammatory bowel disease. *N. Engl. J. Med.* 347, 417–429. doi: 10.1056/nejmra020831

Reed-Knight, B., Lewis, J. D., and Blount, R. L. (2011). Association of disease, adolescent, and family factors with medication adherence in pediatric inflammatory bowel disease. *J. Pediatr. Psychol.* 36, 308–317. doi: 10.1093/jpepsy/jsq076

Robertson, D. A., Ray, J., Diamond, I., and Edwards, J. G. (1989). Personality profile and affective state of patients with inflammatory bowel disease. *Gut* 30, 623–626. doi: 10.1136/gut.30.5.623

Rózsa, S., Réthelyi, J., Stauder, A., Susánszky, É., Mészáros, E., Skrabski, Á., et al. (2003). A Hungarostudy 2002 országos reprezentatív felmérés általános módszertana és a felhasznált tesztbattéria pszichometriai jellemzői. *Psychiatr. Hung.* 18, 83–94.

Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am. Psychol.* 55, 68–78. doi: 10.1037/0003-066X.55.1.68

Ryan, R. M., and Deci, E. L. (2017). *Self-determination theory: basic psychological needs in motivation, development, and wellness*. New York: Guilford Press.

Ryan, R. M., Sheldon, K. M., Kasser, T., and Deci, E. L. (1996). "All goals are not created equal: an organismic perspective on the nature of goals and their regulation" in *The psychology of action: linking cognition and motivation to behavior*. eds. P. M. Gollwitzer and J. A. Bargh (New York, NY: Guilford Press), 7–26.

Sartor, R. B. (2006). Mechanisms of disease: pathogenesis of Crohn's disease and ulcerative colitis. *Nat. Clin. Pract. Gastroenterol. Hepatol.* 3, 390–407. doi: 10.1038/ncpgasthep0528

Schlee, C., Uecker, C., Bauer, N., Koch, A. K., and Langhorst, J. (2022). Multimodal stress reduction and lifestyle modification program for patients with ulcerative colitis: a qualitative study. *BMC Complem. Med. Ther.* 22:60. doi: 10.1186/s12906-021-03478-w

Scott, K. M., Bruffaerts, R., Tsang, A., Ormel, J., Alonso, J., Angermeyer, M. C., et al. (2007). Depression–anxiety relationships with chronic physical conditions: results from the world mental health surveys. *J. Affect. Disord.* 103, 113–120. doi: 10.1016/j.jad.2007.01.015

Selinger, C. P., and Bannaga, A. (2015). Inflammatory bowel disease and anxiety: links, risks, and challenges faced. *Clin. Exp. Gastroenterol.* 8, 111–117. doi: 10.2147/ceg.s57982

Sheldon, K. M. (2002). "The self-concordance model of healthy goal striving: when personal goals correctly represent the person" in *Handbook of self-determination research*. eds. E. L. Deci and R. M. Ryan (New York: University of Rochester Press)

Sheldon, K. M., and Elliot, A. J. (1998). Not all personal goals are personal: comparing autonomous and controlled reasons for goals as predictors of effort and attainment. *Personal. Soc. Psychol. Bull.* 24, 546–557. doi: 10.1177/0146167298245010

Sheldon, K. M., and Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: the self concordance model. *J. Pers. Soc. Psychol.* 76, 482–497. doi: 10.1037/0022-3514.76.3.482

Sheldon, K. M., Elliot, A. J., Ryan, R. M., Chirkov, V., Kim, Y., Wu, C., et al. (2004). Self-concordance and subjective well-being in four cultures. *J. Cross-Cult. Psychol.* 35, 209–223. doi: 10.1177/0022022103262245

Sheldon, K., Gordeeva, T., Sychev, O., Osin, E., and Titova, L. (2022). Self-concordant goals breed goal-optimism and thus well-being. *Curr. Psychol.* 41, 6549–6557. doi: 10.1007/s12144-020-01156-7

Sheldon, K. M., and Lyubomirsky, S. (2006). How to increase and sustain positive emotion: the effects of expressing gratitude and visualizing best possible selves. *J. Posit. Psychol.* 1, 73–82. doi: 10.1080/17439760500510676

Sipos, K. (1978). A State-Trait Anxiety Inventory (STAI) magyar nyelvű változatával szerzett első hazai tapasztalatok. *Magyar Pszichológiai Szemle*. 35:291.

Spielberger, C. D. (1983). State-trait anxiety inventory for adults (STAI-AD). APA PsycTESTS Dataset. doi: 10.1037/t06496-000,

Strecher, V. J., Seijts, G. H., Kok, G. J., Latham, G. P., Glasgow, R., DeVellis, B., et al. (1995). Goal setting as a strategy for health behavior change. *Health Educ. Q.* 22, 190–200. doi: 10.1177/109019819502200207

Vansteenkiste, M., Simons, J., Lens, W., Soenens, B., and Matos, L. (2005). Examining the motivational impact of intrinsic versus extrinsic goal framing and autonomy-supportive versus internally controlling communication style on early adolescents' academic achievement. *Child Dev.* 76, 483–501. doi: 10.1111/j.1467-8624.2005.00858.x

von Wietersheim, J. V., Köhler, T., and Feiereis, H. (1992). Relapse-precipitating life events and feelings in patients with inflammatory bowel disease. *Psychother. Psychosom.* 58, 103–112. doi: 10.1159/000288617

Wagoner, S. T., and Kavookjian, J. (2017). The influence of motivational interviewing on patients with inflammatory bowel disease: A systematic review of the literature. *J. Clin. Med. Res.* 9, 659–666. doi: 10.14740/jocmr3081w

Wang, T. (2009). The relationship between goal self-concordance and organizational commitment: the mediating role of psychological empowerment. *Mark. Modern.* 10, 111–112. (In Chinese)

Werner, K. M., Milyavskaya, M., Foxen-Craft, E., and Koestner, R. (2016). Some goals just feel easier: self-concordance leads to goal progress through subjective ease, not effort. *Personal. Individ. Differ.* 96, 237–242. doi: 10.1016/j.paid.2016.03.002

Wolf, E. J., Harrington, K. M., Clark, S. L., and Miller, M. W. (2013). Sample size requirements for structural equation models: an evaluation of power, Bias, and solution propriety. *Educ. Psychol. Meas.* 76, 913–934. doi: 10.1177/0013164413495237