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ORIGINAL ARTICLE

Self-Worth Beliefs Predict Willingness to Engage in Psychotherapy for Fatigue in Inflammatory Bowel Disease

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Abstract

Background Fatigue in inflammatory bowel disease (IBD) is poorly controlled, with few existing interventions. Psychotherapy interventions for IBD fatigue show promise; however, due to mixed findings in efficacy and attrition, current interventions need improvement. Some research shows beliefs about psychotherapy and stigma toward psychotherapy may impact engagement in psychotherapy interventions.

Aims This study aimed to examine the effects of IBD activity, fatigue, mental health status, previous experience with psychotherapy, and stigma toward psychotherapy on willingness to use psychotherapy as a fatigue intervention.

Methods An online cross-sectional survey was conducted, and linear regression models were used to examine willingness to engage in psychotherapy for fatigue.

Results Overall, 834 participants completed the survey. Regression analysis examining demographics, mental health status, IBD activity, fatigue, pain, antidepressant use, psychotherapy experience, and self-worth intervention efficacy belief significantly explained 25% of variance in willingness to use psychotherapy for fatigue. Significant factors included antidepressant use ($b = .21$, $p < .01$), pain ($b = -.05$, $p < .001$), and self-worth intervention belief ($b = -.27$, $p < .001$), which uniquely explained 18% of variance in the outcome.

Conclusions Willingness to engage in psychotherapy for fatigue in IBD appears to be driven by expectations related to specific self-worth beliefs, rather than stigma, IBD activity, or any prior experience with psychotherapy. Clinicians should directly address these expectations with their patients.

Keywords Inflammatory bowel disease · Crohn's disease · Ulcerative colitis · Psychotherapy · Fatigue

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Introduction

Fatigue is a common symptom of inflammatory bowel disease (IBD) and is described by patients as the most debilitating [1]. Fatigue is commonly experienced during disease flares, occurring in 86% of patients with CD with moderate–severe levels of inflammation [2]. However, as many as 41–48% of patients in remission still experience fatigue. Concerningly, fatigue is a difficult symptom to manage due to the lack of evidence-based intervention options. A recent review of fatigue by Borren, van der Woude [3] broke down the conceptualization of IBD into biopsychosocial factors that differ among patients and include active inflammation, medication, sleep disturbances, micronutrient deficiency (B12 and iron), and psychological comorbidity such as depression. Achieving remission and improving nutritional deficiencies can be

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effective for some patients. But for patients without any obvious biological mechanisms, there are few treatment options available.

Psychological interventions appear beneficial for IBD fatigue, though evidence is scant [4]. Solution-focused therapy interventions did show some promise for significantly reducing fatigue scores [5, 6]. However, effects were not maintained and declined over time. A psychoeducation trial showed just three group sessions had a positive effect on reducing fatigue impact and severity [7]. Additionally, a cognitive behavior therapy (CBT) intervention [8] demonstrated some initial success with reducing fatigue scores. However, fatigue worsened again over time and many patients dropped out of the intervention. As CBT appears to be a successful intervention for targeting fatigue in other chronic conditions, including multiple sclerosis and cancer [9, 10], it is unclear why there have been poor outcomes in IBD. However, a variety of systematic reviews and meta-analyses on other outcomes using psychological therapies in IBD report mixed results [11–13]. A systematic review [11] found that psychological interventions had minimal effect on disease symptomology, quality of life (QoL), and psychological symptoms. In contrast, Gracie et al. (2017) reported that CBT may have limited short-term benefits on depression scores and QoL. A review [13] published in the same year showed benefit for CBT in patients with psychological comorbidity, in addition to small support for hypnotherapy and mindfulness. The body of evidence was described as small with small sample sizes in all three reviews, with Gracie, Irvine [12] and McCombie, Mulder [11], highlighting the potential for better outcomes in patients with greater need of support like those with fatigue. However, outcomes such as patient satisfaction, barriers to uptake and engagement, and dropout were not assessed and there is limited evidence to base the development on future interventions on. Thus, while promising, there is a need for a more in-depth analysis of how to best develop psychological interventions to meet the needs of people with IBD.

Considering the broader psychotherapy literature, a variety of factors may impact the success of psychotherapy intervention. Potentially important contributing factors are patient attitudes and expectations toward mental health treatment. An epidemiological survey (N = 1,261) reported that dropout was more likely to occur for patients who are uncomfortable with seeing mental health professionals and have a negative attitude toward mental healthcare [14]. A large cross-sectional survey (N = 2,999) also found that perceived stigma toward seeking help was negatively associated with informal health seeking in a Dutch and Flemish population [15]. Research has also suggested that stigma attached to mental-health and mental-health services may impede people from fully seeking or fully engaging in mental-health services [16].

However, despite the well document barriers to using and engaging in psychotherapy in the general population, no study to date has examined how these factors may impact treatment uptake and engagement in the IBD population. This study explored whether these beliefs and stigmas toward psychological interventions could be associated with the engagement of the IBD population when developing psychological interventions to manage fatigue, in addition to disease-related factors.

Therefore, this study addressed the following hypotheses: high levels of disease activity, high fatigue, and poor mental health are significantly associated with willingness to use psychological therapy for fatigue management in people with IBD. Additionally, stigma toward psychotherapy is negatively associated with, and previous experience with psychotherapy is positively associated with, willingness to use psychotherapy for fatigue management in patients with IBD.

Materials and Methods

Design

Data from this study are derived from a large international mixed-methods online survey conducted in April 2020.

Participants

People with a self-reported diagnosis of Crohn's disease, ulcerative colitis, or IBD unclassified who were aged 18 years or older were recruited via social media.

Sample Size Calculation

Based on a power analysis, 199 participants are required to detect an interaction effect of small magnitude Cohen's $f^2 = 0.04$ (small effect), with 80% and an alpha of 0.05. As there was no prior research to base this off, a conservative approach was taken in our estimates of the effect size.

Procedure

We advertised the survey via social media, online IBD patient fora, and patient organization websites. Potential participants were invited to follow an online link to the anonymous online survey that took 10–20 minutes to complete. No reimbursements or incentives were offered for participating in the survey.

Measures

Demographics

As the survey recruited internationally, demographics were adjusted to capture a diverse sample. Measures included age, gender, country of residence, education level, marital status, language spoken at home, ethnicity, health insurance, and employment status.

Disease Characteristics

We measured IBD subtype, year of diagnosis, smoking status, drinking status, BMI, IBD medication, antidepressant use, opioid use, and anything participants had ever been prescribed to manage their fatigue.

Disease Activity

Disease activity was measured using the Manitoba index [17], a single-item disease activity measure to screen disease symptom activity in both patient's with CD and UC. The PRO3 [18] was also used to measure disease activity in patients with CD, consisting of 3 items. The PRO2 [19] was used for patients with UC, consisting of 2 items.

Psychological Symptoms

The Depression, Anxiety and Stress Scale (DASS) short-form [20] was used to measures symptom of depression, anxiety, and stress. The scale consisted of 21 items, with scores ranging from 0 (did not apply to me at all) to 3 (applied to me very much most of the time). Total scores on subscale are doubled for comparison with normative values. Normal levels of symptoms range from 0 to 9 for depression, 0 to 7 for anxiety, and 0 to 14 for stress symptoms.

Fatigue

The Fatigue Symptom Inventory [21] interference subscale was used to provide an overall measure of how much participants fatigue interfered with their lives. Scores from the 7 items were summed to provide an overall measure of fatigue interference.

Pain

The numerical pain rating scale [22] was used to provide a measurement of pain. The scale consists of one item, asking participants to pick a number between 0 and 10 which best describes their pain with higher scores indicating worse pain.

Stigma

Stigma toward psychological therapy was measured using the self-stigma of seeking help scale [23]. The scale consists of 10 items which are summed together, where higher scores indicate a greater concern that seeking help from a psychologist or other mental health professional would negatively impact one's self-regard, satisfaction with oneself, self-confidence, and overall worth as a person.

Previous Experience with Psychotherapy

A single question "have you tried any type of psychological therapy before" was used with a dichotomous yes/no response.

Psychotherapy Willingness

A single question Likert scale "are you willing to engage in psychological therapy for fatigue?" was used, with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate more willingness to engage in psychological therapy for fatigue. This measure was based on a measure used in a previous study [24].

Analysis

All analyses were performed using SPSS 26 software [25].

A standard linear regression model was performed estimating willingness to engage in psychological treatment using the DASS subscales, antidepressant use, education, age, gender, pain, fatigue, disease activity, previous experience with psychological therapy, and stigma toward psychological therapy.

We also performed an exploratory stepwise linear regression model predicting willingness to engage in psychological treatment using demographics, disease characteristics, pain, stigma, and each of the pain scale items from each of the scales used in the first model. The analysis indicated that two items on the stigma toward seeking help scale were driving this effect. These two items were related to positive self-worth and psychotherapy, so both items were combined into a new variable named self-worth intervention efficacy belief. The regression model was then re-run to examine the effect that this changed sub-scale made.

A final a standard linear regression model was run predicting willingness to engage in psychological treatment using the DASS subscales, antidepressant use, education, age, gender, pain, fatigue, disease activity, previous

experience with psychological therapy, and self-worth intervention belief.

Ethical Approval

The study (HEAG-H 158_2019) was approved by the Deakin University Human Ethics Advisory Group in November 2019. Participants were informed that consent would be implied by the continuation of the survey.

Results

Demographics

Overall, 834 individuals were included in the analysis. Of these, 572 (68.6%) had Crohn's disease, 254 (30.5%) had ulcerative colitis, and 8 (1%) had IBD unclassified. The mean age was 36.73 (SD = 11.21), with 697 (63.6%) female, 132 (15.8%) male, and 4 people identified themselves as genderqueer. Most participants were from Australia (68.7%), the USA (16.2%), and the UK (9.6%). At the time of the survey, 28.4% of participants were taking antidepressants, and 50.5% had tried some form of psychotherapy before. The rest of the demographics and disease characteristics are presented in Tables 1 and 2, respectively.

Predicting Willingness to Use Psychotherapy

The overall model was significant ($p < 0.001$) with a small amount of variance explained (Adj $R^2 = 0.07$). Significant variables were antidepressant use ($b = 0.27$, $p < 0.001$), age ($b = -0.01$, $p < 0.01$), pain ($b = 0.05$, $p < 0.001$), previous experience with psychological therapy ($b = -0.20$, $p < 0.01$), and stigma toward psychological therapy ($b = -0.04$, $p < 0.001$). The correlations between these variables are presented in Table 3, and the rest of the variables are seen in Table 4.

Reports of Self-Worth Are Associated with Willingness to Engage in Psychotherapy for Fatigue

The overall model was significant ($p < 0.001$), with a larger F value ($F = 21.84$), and more variance explained compared to the previous model (Adj $R^2 = 0.25$). Significant factors included antidepressant use ($b = 0.21$, $p < 0.01$), pain ($b = -0.05$, $p < 0.001$), and self-worth intervention efficacy belief ($b = -0.27$, $p < 0.001$). The correlations between these variables are presented in Table 5; the rest of the findings are given in Table 6.

Discussion

The aim of this paper was to explore whether previous beliefs and stigma toward psychological interventions are related to the engagement of the IBD population in psychological interventions to manage fatigue. Key findings indicate that some sort of previous exposure to psychological therapy and positive beliefs about psychological therapy, rather than stigma, are the most important factors associated with willingness to engage in a psychological intervention for fatigue management.

The main finding in this study was the model changes and how much variance was explained in the outcome by replacing the stigma variable with the newly explored and coded variable of self-worth intervention efficacy belief. Previous research in the general population found that perceived stigma toward seeking help was negatively associated with informal help seeking [15]. Furthermore, Corrigan [16] reported that stigma attached to mental health services may impede people from fully seeking help or engaging. The present study of an IBD sample contradicts these findings as it was the belief in the efficacy of psychotherapy to improve self-esteem, rather than stigma, which was the strongest factor toward willingness to engage in psychotherapy. These two variables uniquely account for just over half of the variance accounted for in the outcome of willingness to use psychotherapy for a fatigue intervention. This suggests that when creating a psychological intervention for fatigue, clinicians may find it beneficial to directly explore and challenge patient beliefs around the efficacy of such interventions. Another significant factor related to willingness to pursue a psychological intervention for fatigue management was antidepressant use. Collectively, these findings indicate that some form of previous exposure to psychological interventions (including pharmacological) and positive beliefs about psychological therapy are the most important variables associated with willingness to engage in a psychological intervention for fatigue management. When stigma was substituted for self-worth, history of psychotherapy became a non-significant factor. Additionally, depressive symptom severity became a small, positive correlate of willingness to engage in mental health interventions, psychological, or otherwise. It is specifically the expectation that an intervention will be effective in increasing a sense of self-worth that was most meaningful in this dataset. That is, if a patient expects that the psychotherapy can improve their self-image, they are substantially more likely to engage in psychotherapy regardless of their history with treatment, their experience of stigma, and their symptom severity.

Another interesting finding was the positive correlation between disease activity and psychotherapy willingness,

Table 1 Patient Demographics

	Crohn's disease (n = 572)	Ulcerative colitis (n = 254)	IBD unclassified (n = 8)
Age, M (SD)	37.06 (11.32)	35.98 (11)	37.13 (10.71)
Gender, n (%)			
Male	92 (16.1)	40 (15.7)	0
Female	475 (83.0)	214 (84.3)	8 (100)
Non-binary	3 (0.5)	–	–
Genderqueer	1 (0.2)	–	–
Education, n (%)			
Less than Year 12	51 (8.9)	11 (4.3)	–
Year 12 or equivalent	93 (16.3)	57 (22.4)	–
Vocational education	90 (15.7)	43 (16.9)	2 (25)
Bachelors degree	195 (34.1)	100 (39.4)	5 (62.5)
Masters degree	64 (11.2)	23 (9.1)	–
PhD or Doctorate degree	14 (2.4)	4 (1.6)	–
Other	65 (11.4)	16 (6.3)	1 (12.5)
Marital status, n (%)			
Single (never married)	176 (30.8)	85 (33.5)	3 (37.5)
Married/de facto	349 (61)	148 (58.3)	4 (50)
Widowed	4 (0.7)	3 (1.2)	–
Divorced	35 (6.1)	12 (4.7)	–
Separated	1 (0.2)	6 (2.4)	1 (12.5)
Country of residence, n (%)			
Australia	370 (64.7)	196 (77.2)	7 (87.5)
UK	57 (10)	21 (8.3)	–
USA	111 (19.4)	25 (9.8)	1 (12.5)
Canada	22 (3.8)	6 (2.4)	–
Europe	4 (0.7)	4 (1.6)	–
New Zealand	8 (1.4)	–	–
South Africa	–	1 (0.4)	–
UAE	–	1 (0.4)	–
Employment status, n (%)			
Employed full-time	233 (40.7)	114 (44.9)	3 (37.5)
Employed part-time	114 (19.9)	49 (19.3)	2 (25)
Unemployed looking for work	12 (2.1)	4 (1.6)	–
Unemployed not looking for work	5 (0.9)	2 (0.8)	–
Retired	12 (2.1)	5 (2)	–
Student	54 (9.4)	24 (9.4)	–
Homemaker	30 (5.2)	15 (5.9)	–
Self-employed	41 (7.2)	27 (10.6)	2 (25)
Unable to work	53 (9.3)	10 (3.9)	1 (12.5)

Table 2 Health Characteristics

	Crohn's disease	Ulcerative colitis	IBD Unclassified
Time since diagnosis, M year(SD)	13.24 (9.51)		
Health insurance, n (%)			
Yes	397 (69.4)	183 (72)	–
No	163 (28.5)	66 (26)	–
Something else	12 (2.1)	5 (2.0)	8 (100)
Smoking status, n (%)			
Current smoker	56 (9.8)	11 (4.3)	2 (25)
Former smoker	166 (29)	70 (27.6)	–
Occasional smoker	41 (7.2)	15 (5.9)	2 (25)
Never smoked	308 (53.8)	158 (62.2)	4 (50)
Drinking status, n (%)			
> 2 standard drinks per day	12 (2.1)	7 (2.8)	
< 2 standard drinks per day	25 (4.4)	10 (3.9)	3 (37.5)
Drinking several times a week	46 (8)	31 (12.2)	3 (37.5)
Occasional drinking	355 (62.1)	146 (57.5)	1 (12.5)
Never drinking	134 (23.4)	60 (23.6)	1 (12.5)
Antidepressants, n (%)			
Yes	171 (29.9)	61 (24)	5 (62.5)
No	363 (63.5)	173 (68.1)	3 (27.5)
Opioids, n (%)			
Yes	84 (14.7)	17 (6.7)	4 (50)
No	432 (75.5)	212 (83.5)	4 (50)

and disease activity and self-worth intervention belief. Previous research [26] reported that a sub-group of patients considered "at need" of psychotherapy benefited from an online CBT intervention for IBD versus he general IBD sample which demonstrated no improvement. This could indicate an additional form of motivation for which clinicians could start to mention and introduce the patient to the idea of psychotherapy, as it appears they may see the value in such interventions when they are in need of intervention for their IBD.

These findings align with recent findings in the broader psychogastroenterology area which emphasize the importance of patients with IBD seeing psychological care as an important part of their IBD treatment. As outlined before [27] in a systematic review regarding prevalence of mental health issues in the IBD population, patients living with IBD have higher levels of depressive and anxiety symptoms than the general population. Psychological comorbidities increase the risk of disease complications, with one study finding that abnormal scores of depression and anxiety were associated with an increased risk of steroids or flare of IBD activity and an escalation of therapy [28]. As such, the importance of good psychological care is emphasized further in the IBD population.

In relation to the symptom of fatigue in IBD, depression and anxiety are consistently associated with fatigue in the existing literature [29]. Findings from the current study build upon these recent data by demonstrating that patient perceptions about psychological therapy are an important factor to consider when trying to engage patients in a psychological

Table 3 Correlations between demographics, psychological factors, disease activity, pain, fatigue, and stigma toward psychotherapy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Psychotherapy willingness	–	–	–	–	–	–	–	–	–	–	–	–
(2) Depression	.089**	–	–	–	–	–	–	–	–	–	–	–
(3) Anxiety	.057	.551***	–	–	–	–	–	–	–	–	–	–
(4) Stress	.079*	.587***	.639***	–	–	–	–	–	–	–	–	–
(5) Antidepressant use	.156***	.216***	.163***	.132***	–	–	–	–	–	–	–	–
(6) Education	.035	– .052	– .084**	– .047	– .038	–	–	–	–	–	–	–
(7) Age	– .107**	– .104**	– .162***	– .217***	.088**	– .071*	–	–	–	–	–	–
(8) Gender	.027	.024	.096**	.081*	.118***	.040	– .086**	–	–	–	–	–
(9) Pain	– .085**	.325***	.372***	.281***	.168***	– .044	.033	.073*	–	–	–	–
(10) Fatigue	.063*	.571***	.486***	.482***	.225***	– .041	– .068*	.052	.478***	–	–	–
(11) Disease activity	.037	– .221***	– .193***	– .168***	– .097**	.075*	– .007	– .038	– .475***	– .305***	–	–
(12) Tried psych therapy	– .162***	– .091**	– .049	– .104**	– .237***	– .104**	– .032	– .061*	– .002	– .092**	.003	–
(13) Stigma	– .130***	.099**	– .003	.085**	– .039	– .075*	– .033	– .034	.058	.097**	– .071*	.104**

*Denotes $P < 0.05$, **denotes $P < .01$, ***denotes $P < .001$. All 1-tailed significance

intervention for fatigue. A recent systematic review of four psychological RCTs for IBD showed CBT to be the most efficacious at reducing fatigue [4]. However, only two-thirds of patients in each group were retained at 3-month follow-up [8]. This is in line with findings outlined by McCombie, Mulder [11], where psychological interventions in the IBD population are prone to high rates of attrition and CBT being the most effective intervention for psychological symptoms in the IBD population. Findings from the present study may offer insight as to why high rates of attrition are occurring. Our finding that patient expectations around the efficacy of psychotherapy for improving self-worth presents a straightforward explanation—if patients do not experience a change in their feelings of self-worth after psychotherapy, they are less willing to continue. Further, we note that depressive symptom severity remains a positively associated with willingness to use psychotherapy for fatigue. Therefore, patients may be more willing to proceed if they experience self-esteem improvement even if all their other symptoms remain. Additionally, it could mean patients are motivated to try anything to alleviate their depressive symptoms.

One suggestion to enhance participation in psychological intervention in the IBD population is to include psychological screening and offer psychotherapy as part of the IBD service or an external referral. As it currently stands, usual IBD care heavily relies on the gastroenterologist and psychologists are heavily underutilized [30]. In contrast to this, patients do seem to want integrated care as outlined by a recent qualitative study [31]. Another study trialled an integrated care model and measured prevalence, patient participation, and potential benefits to mental health [32]. The study demonstrated that over a 12-month period, 335 out of the 490 patients who were approached agreed to participate and 55% of those patients demonstrated need of psychological care. Half of the patients in need accepted intervention and demonstrated improved levels of anxiety, depression, psychological distress, mental health quality of life, and overall quality of life. They were also open to psychological screening and treatment. However, it is acknowledged that this integrated care model is a novel model for IBD management, as a recent survey of patients (N = 731) found only 12.2% of patients reported access to a mental health practitioner as a part of their IBD service despite 50% of patients surveyed reporting psychological distress [33].

Based on these findings collectively, an integrated care treatment model may need to be further emphasized in IBD care for psychological interventions to be successful. Psychological care is recommended in the standards of healthcare for IBD in Australia [34], yet is lacking as highlighted before in a survey of psychological needs and attitudes [33]. For the management of fatigue, these findings collectively indicate that involving IBD specialists to encourage patients to seek psychological support when presenting with fatigue

Table 4 Multiple regression of demographics, psychological factors, disease activity, pain, fatigue, and stigma toward psychotherapy

Variable	B	t	Sr^2	R	R^2	F	Model P
				.297	.088	6.07	.000
Depression	.057	1.176	.002				
Anxiety	− .005	− .111	–				
Stress	.021	.422	–				
Antidepressants	.133***	3.558	.015				
Education	.012	.338	–				
Age	− .107**	− 2.941	.010				
Gender	− .004	− .104	–				
Pain	− .145***	− 3.280	.013				
Fatigue	.059	1.237	.002				
Disease activity	.004	.099	–				
Psychotherapy experience	− .107**	− 2.941	.010				
Stigma	− .121***	− 3.396	.14				

**Denotes $p < .01$. ***denotes $p < .001$. Sr^2 values < .001 omitted

may be an area for future prospective cohort studies to explore.

Limitations

A key limitation of the present study is that the data were only able to capture uptake into intervention, without being able to capture additional relevant key data related to maintenance and attrition. As this sample seems open to psychological treatment, possibly due to the large portion of participants already utilizing these services, data on whether that uptake is sustained in treatment protocols would help inform the tailoring of future interventions. Another limitation was the apparent bias in recruitment. Respondents of this survey largely were open to or already using psychological treatments. Future studies should aim to collect a more diverse sample. This study also used a cross-sectional research design to collect data. While this design did allow the collection of a large sample size from a variety of countries around the world, we are limited in our abilities to draw conclusions from the data. Further, there was a large gender bias in the present sample with a very few male participants completing the survey. Recent research has found that males gender is negatively associated with psychological help-seeking behavior [35] and it is therefore important to have adequate representation of male patients in research on psychological interventions.

Conclusion

Willingness to engage in psychotherapy appears to be driven by expectations related to specific self-worth beliefs, rather than stigma, disease severity, or any prior experience with pharmaceutical or psychological interventions. Clinicians should directly address these expectations with their patients to sustain a therapeutic relationship which may increase the success of future psychological interventions for IBD fatigue.

Table 5 Correlation between demographics, psychological factors, disease activity, pain, fatigue, and self-worth intervention belief

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Psychotherapy willingness	–	–	–	–	–	–	–	–	–	–	–	–
(2) Depression	.089**	–	–	–	–	–	–	–	–	–	–	–
(3) Anxiety	.057	.551***	–	–	–	–	–	–	–	–	–	–
(4) Stress	.079*	.587***	.639***	–	–	–	–	–	–	–	–	–
(5) Antidepressant use	.156***	.216***	.163***	.132***	–	–	–	–	–	–	–	–
(6) Education	.035	− .052	− .084**	− .047	− .038	–	–	–	–	–	–	–
(7) Age	− .107**	− .104**	− .162***	− .217***	.088**	− .071*	–	–	–	–	–	–
(8) Gender	.027	.024	.096**	.081*	.118***	.040	− .086**	–	–	–	–	–
(9) Pain	− .085**	.325***	.372***	.281***	.168***	− .044	.033	.073*	–	–	–	–
(10) Fatigue	.063*	.571***	.486***	.482***	.225***	− .041	− .068*	.052	.478***	–	–	–
(11) Disease activity	.037	− .221***	− .193***	− .168***	− .097**	.075*	− .007	− .038	− .475***	− .305***	–	–
(12) Tried psych Therapy	− .162***	− .091**	− .049	− .104**	− .237***	− .104**	− .032	− .061*	− .002	− .092**	.003	–
(13) Self-worth intervention belief	.468***	− .079*	− .049	− .016	.086**	.056	− .129***	.063*	− .097**	− .084**	.100**	− .246***

*Denotes $P < 0.05$, **denotes $P < .01$, ***denotes $P < .001$. All 1-tailed significance

Table 6 Multiple regression of demographics, psychological factors, disease activity, pain, fatigue, and self-worth intervention belief

Variable	B	t	Sr^2	R	R^2	F	Model P
				.508	.258	21.84	.000
Depression	.082**	1.880	.003				
Anxiety	.022	.507	–				
Stress	.001	.021	–				
Antidepressant	.102	3.021	.009				
Education	.016	.489	–				
Age	– .036	– 1.076	.001				
Gender	– .017	– .519	–				
Pain	– .136***	– 3.413	.011				
Fatigue	.077	1.809	.003				
Disease activity	– .019	– .520	–				
Psychotherapy experience	– .010	– .305	–				
Self-worth intervention belief	.454***	13.663	.184				

**Denotes $p < .01$. ***denotes $p < .001$. Sr^2 values < .001 omitted

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