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Dorrian, A., Dempster, M., & Adair, P. (2009). Adjustment to inflammatory bowel disease: The relative influence of illness perceptions and coping. *Inflammatory Bowel Diseases*, 15(1), 47-55. <https://doi.org/10.1002/ibd.20583>

Published in:
Inflammatory Bowel Diseases

Document Version:
Peer reviewed version

Queen's University Belfast - Research Portal:
[Link to publication record in Queen's University Belfast Research Portal](#)

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Adjustment to Inflammatory Bowel Disease: The Relative Influence of Illness Perceptions
and Coping

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Abstract

The Common Sense Model (CSM) of illness representations was used in the current study to examine the relative contribution of illness perceptions and coping strategies in explaining adjustment to inflammatory bowel disease (IBD). Participants were 80 adults consecutively attending an outpatients' clinic with a diagnosis of either Crohn's disease or ulcerative colitis. Respondents completed and returned a questionnaire booklet which assessed illness perceptions, coping and adjustment. Adjustment was measured from the perspectives of psychological distress, quality of life and functional independence. Illness perceptions (particularly perception of consequences of IBD) were uniformly the most consistent variables explaining adjustment to IBD. Coping did not significantly add to predicting adjustment once illness perceptions were controlled for and therefore did not mediate the relationship between illness perceptions and adjustment, as proposed in the CSM. The results suggest the importance of addressing illness perceptions in developing appropriate psychological interventions for IBD.

Keywords: Inflammatory Bowel Disease, Common Sense Model, Illness Perceptions, Coping, Adjustment.

Introduction

Dealing with the uncertainty of the symptoms and the unpredictability of Inflammatory Bowel Disease (IBD) can greatly inhibit the individual's personal, social, employment and recreational functioning (1). Schwarz and Blanchard (2) carried out a review of the literature exploring the relationship between psychological distress and IBD. Their review suggested that people with IBD are more psychologically distressed than healthy controls. Other research has shown that patients with higher disease activity were more likely to have higher psychological distress than those in remission (3,4).

Few studies have examined coping among people with IBD. Kinash et al. (5) found that individuals with IBD adopting emotion-focused coping strategies report a poorer quality of life than those using problem-focused coping strategies. Smolen and Topp (6) support these findings in their study of 52 individuals with IBD. They examined the relative value of coping strategies in predicting psychological well-being, perceived health status and functional independence. Their findings suggest that emotion focused coping predicts poorer adjustment. However in contrast to Kinash et al.'s findings, problem focused coping did not significantly predict adaptive functioning.

It has been shown that quality of life is reduced in people with IBD compared to healthy controls (7,8), with little difference between people with Crohn's Disease (CD) and people with ulcerative colitis (UC) (9). When compared to people with other diseases (such as back pain and rheumatoid arthritis), individuals with IBD report similarly poor perceptions of quality of life (10).

Other research has focused on determining the factors that better predict quality of life. Less frequent recurrence of symptoms, longer disease duration, higher level of education, symptom inactivity, male gender and non-necessity of hospitalisation have been found to

predict better quality of life (1). There were no differences between those with CD or UC. Symptom activity was reported as the factor exerting the strongest effect on quality of life.

Despite the lack of decisive empirical evidence of a temporal relationship between stress and disease course, many psychological interventions have focused on stress and anxiety management. However, treatment outcome studies have proved disappointing (11,12). Casati and Toner (13), conclude that an “integrative approach ...that identifies and incorporates psychological issues into current treatment modalities and helps patients cope with symptoms and improve their quality of life is badly needed” (pp.389). The need for interventions to be empirically driven is an important part of psychological research. A better understanding of the psychological components that influence an individual’s adjustment to IBD is important, so that clinical interventions can be derived from a research informed evidence base.

Social cognitive models offer important theoretical perspectives for examining the influences of cognitive and perceptual factors underlying health related behaviour. One influential model in this field, which may have potential for explaining adjustment to IBD, is the Common Sense Model (CSM) of illness representations (14). The CSM examines the influence of an individual’s beliefs, cognitions, or perceptions of their illness (otherwise known as illness representations) on the coping behaviours adopted by the individual and the individual’s adjustment to the illness.

The model proposes that an individual generates both cognitive and emotional representations in response to perceived health threat. The individual is motivated to manage both the cognitive and emotional representations simultaneously by deriving an action plan to cope with the perceived health threat (15). Firstly the individual generates the representation, their thoughts of the event and the emotions that follow it. Secondly, the individual develops, and actions a response to cope with both the event itself and the emotions. Thirdly, the individual appraises the action plan by determining its success. This appraisal stage feeds

back information to the preceding stages and can change the coping strategies and/or how the event has been represented.

Illness perceptions give personal meaning to symptoms and/or disorder. The content of an illness perception can be ordered into five dimensions, based on extensive factor analysis (16). These are cause, consequence, identity, timeline, cure/controllability. The causal dimension refers to perceptions regarding possible causes of the illness including biological; emotional; environmental and psychological causes. Consequence refers to perceptions about the impact of the disease; illness identity represents perceptions about the illness label and knowledge about its symptoms; timeline refers to the individual's beliefs about the course of the disease while cure/controllability concerns perceptions of empowerment regarding coping behaviours. Construct and discriminative validity has been shown for the dimensions (17) and factor analyses across a variety of illnesses usually extract these same dimensions (18).

The CSM has mostly been used to examine cognitive illness representations and how these beliefs impinge upon coping strategies and illness outcomes, such as quality of life and psychological well being. For example, patients with psoriasis who perceived their condition as chronic, serious, and identified strongly with their disorder had poorer quality of life (19). Conversely, people who believed they had more self-control over their illness reported better quality of life. Similar findings have been reported for other illnesses, for example, for irritable bowel syndrome (20), asthma (21) and Chronic Fatigue Syndrome (16). Illness perceptions have also been shown to predict decisions to seek health care (22), self-management among people with diabetes (23), medication adherence (24) and return to work (25). Preliminary results on interventions that seek to modify illness perceptions to improve adjustment have shown promising results (26).

The CSM proposes a mediation model where illness representations cause coping strategies (the mediator) to be adopted, which in turn influence adjustment. Few studies, have

directly examined coping as a mediator and there is little support for this relationship (20,27). It has been argued that illness representations are associated with adjustment relatively independently of coping, as well as more strongly associated with adjustment than coping (19,28). However, a recent meta analysis of 45 published studies examining illness perceptions in a variety of chronic illnesses (for example, diabetes, back pain, arthritis and HIV) concluded that moderate to strong relationships exist between illness perceptions, coping behaviours and adjustment (29).

Little is known about the illness perceptions of individuals with IBD. The aim of the current study is to examine the extent to which adjustment to IBD is influenced by illness perceptions and coping strategies. Three hypotheses are addressed: Firstly, individuals who perceive their IBD as more serious, chronic, cyclical, and identify more with the symptoms report poorer adjustment, while individuals who perceive more treatment and personal control, and have a more coherent understanding of their condition report better adjustment. Secondly, emotion-focused coping is associated with poor adjustment and problem focused coping associated with better adjustment. Thirdly, coping mediates the relationship between illness perceptions and adjustment.

Method

Participants

Participants were 125 adults with IBD consecutively attending an Intestinal Failure Clinic in secondary care for an outpatient appointment over a 5 month period. Inclusion criteria included male and female patients over 18 years of age with a diagnosis of either CD or UC.

Measures

The questionnaire contained demographic and medical history questions about participants, including diagnosis, length of time since diagnosis, body mass index, number of bowel surgeries, and whether or not the participant had an ileostomy or colostomy. Other issues addressed by the questionnaire were as follows.

Disease severity

For participants with a diagnosis of CD, disease activity was determined by the Crohn's Disease Activity Index (CDAI) modified for survey research (30). The modified CDAI includes questions on stool frequency, abdominal pain and general well being. For participants with a diagnosis of UC, disease activity was determined by the Colitis Activity Index (CAI) (31). CAI has a possible range from 0 to 21 and a higher score indicates more disease activity. Scores less than 10 signify inactive disease state and remission.

The McGill Pain Questionnaire Short form (SF-MPQ) (32) was used to assess pain. This measure of pain consists of 15 descriptors (11 sensory, 4 affective) which are rated on an intensity scale as 0= none, 1=mild, 2=moderate or 3=severe. Three pain scores are derived from the sum of the intensity rank values of the words chosen for sensory, affective and total descriptors. The SF-MPQ calculates Present Pain Intensity (PPI) which is rated using one of five pain descriptors (mild, discomforting, distressing, horrible and excruciating) to indicate current pain intensity and a Visual Analogue Scale (VAS) consisting of a 10cm line anchored with the words "no pain" and "worst possible pain".

Illness perceptions

The Revised Illness Perceptions Questionnaire (IPQ-R) (33) is a theoretically derived measure of a person's perceptions about their illness, initially designed to measure the illness perceptions: identity, cause, timeline, consequences and cure/control. The revised version includes perception of duration of illness ('timeline acute/chronic') and fluctuations of illness

over time ('timeline cyclical') and also distinguishes perceptions of control over illness into 'personal control' and 'treatment control'. Two new measures, 'illness coherence' (how clear and understandable an individual believes their illness to be) and 'emotional representation' were added to the revised version. The emotional representation subscale was excluded as an independent variable from the analysis in the current study, as including a measure of emotional representation in addition to the outcomes assessing emotional well-being would be tautologous (34). Identity was assessed using a 12-item symptom checklist. Some of the symptoms were IBD disease-specific and other generic symptoms. Participants were asked to indicate which of the symptoms listed they experienced due to their IBD. Perceptions of the cause of IBD are assessed according to four subscales derived from factor analysis; 'psychological factors', 'risk factors', 'altered immunity' and 'chance' (33). Items are scored on a five-point scale ranging from 'strongly agree' to 'strongly disagree'. Subscale scores are the mean of items (after reverse scoring as necessary). The internal reliability (Cronbach's alpha) for each sub-scale ranged from 0.70 to 0.83, apart from the "treatment control" subscale which showed low internal reliability (0.20) and it was therefore omitted from the regression analysis.

Coping strategies

The situational version of the Coping Operations Preference Enquiry (COPE) (35) contains 15 conceptually distinct sub-scales, based on the theoretical literature about functional coping strategies. Five sub-scales measure conceptually distinct aspects of problem-focused coping: active coping, planning, suppression of competing activities, restraint coping, seeking of instrumental support. Five sub-scales measure emotion-focused coping: seeking emotional support, positive re-interpretation, acceptance, denial, and turning to religion. Five sub-scales measure other less useful coping responses: use of alcohol, humour, focus on and venting of emotions, behavioural disengagement and mental

disengagement. Responses to the items are scored 1 to 4 and the sub-scale items are summed with higher scores indicating that a coping strategy is adopted to a greater extent.

Adjustment measures

Three measures were selected to determine different aspects of adjustment: a measure of psychological distress, a disease specific measure of quality of life and a generic measure of function. All the adjustment measures were coded so that high scores represented poorer adjustment.

The Hospital Anxiety and Depression Scale (HADS) (36) is a widely used scale to measure emotional adjustment, anxiety and depression in clinical populations with physical disease. The scale contains 14 items to give a measure of emotional distress/adjustment (7 items for a separate anxiety score and 7 items giving a depression score). Possible scores on the HADS range from 0 to 42. Higher scores represent higher levels of emotional distress and scores greater than 14 are considered to represent either severe depression or anxiety (37).

The Inflammatory Bowel Disease Questionnaire (IBDQ-British Version) (38) was developed to assess changes in disease-related dysfunction and health-related quality of life for people with Crohn's disease and ulcerative colitis. It consists of 32 questions in five sub-scales: gastro-intestinal (bowel) symptoms, systemic symptoms, emotional dysfunction and social dysfunction. In the UK-version each question contains various 4 point response categories (e.g. relating to frequency, severity, satisfaction). A score is calculated for each of the sub-scales and an overall quality of life score is also calculated (possible range: 0 to 100), where a higher score indicates poorer quality of life.

The Functional Limitations Profile (FLP) (39) is based on the Sickness Impact Profile (40), a scale initially developed to assess changes in functioning due to ill health and is a generic measure of health related quality of life. The scale consists of 136 items arranged in 12 categories of activity: ambulation; body care and movement; mobility; household management; recreation and pastime; social interaction; emotion; alertness; sleep and rest;

eating; communication and work. Items for which respondents report limitations due to their IBD are scored using a validated weighting system. Dimension scores were calculated for a physical dimension and a psychosocial dimension score and an overall IBD-related activity limitation score was calculated (possible range: 0 to 100), where a higher score indicates greater limitation due to IBD.

Procedure

Consecutively attending patients who met the inclusion criteria were identified by the Consultant Colorectal Surgeon from the Intestinal Failure Clinic (IFC). As 80 participants were required to detect a statistically significant regression model with 90% power (41), a total of 125 patients were approached to allow for drop-out and non-response. A letter of invitation and information leaflet was posted to patients in advance of their next IFC appointment. Participants opted into the study by returning a completed consent form to the receptionist at their IFC appointment. The main researcher was available at the clinic to distribute the questionnaire booklet, answer any questions about the study and explain questionnaire completion. Participants were asked to complete the questionnaire by self-report and return in a stamped addressed envelope provided. Participants who did not wish to complete the questionnaire by self-report were given the option to complete the questionnaire as a structured interview with the main investigator in a private office following their IFC appointment. A total of 7 participants chose this option.

Statistical analysis

The criterion variables were measures of adjustment including psychological distress, quality of life and functional independence, while the predictor variables were pain impairment, disease activity, illness cognitions and coping. Bivariate correlations were computed between disease severity/pain impairment, cognitive, emotional, quality of life and functional variables. Due to the large number of coping strategies and illness perception

dimensions assessed, and to avoid Type 1 errors, interpretation of the correlations was based on the effect size and not solely on the significance tests. Hierarchical regression analyses were carried out on the psychological variables selected following bivariate analysis. Only those predictor variables with correlations of an absolute value of 0.2 or above with the criterion variables were retained and entered into the regression model.

Results

In all 81 participants returned a completed questionnaire. One questionnaire was excluded as the IPQ-R was not completed, giving a 64% response rate. There were no significant differences between responders and non-responders on the demographic variables collected (age and sex) and no statistical difference on the adjustment measures for those completing the questionnaires by self-report or interview.

The current sample is representative on the basis of age, gender and diagnosis, based on statistical information provided by the National Association of Colitis and Crohn's disease. Furthermore, the sample is representative on the basis of local and national population statistics on the basis of gender, marital status and employment status (42,43). In all, 33% of the sample reported clinically significant levels of psychological distress. The demographic and disease-related characteristics of the 26 participants with CD and 54 participants with UC are shown in Table 1. -Table 1 here-

Twenty-three (29%) of the participants were absent from work for more than 6 months in the previous year due to their IBD: six (23%) of the CD participants and seventeen (31%) of the UC participants. As seen in Table 1, a significant difference was found between the two diagnostic groups for number of surgeries, with UC participants experiencing a significantly higher frequency of surgeries than those with CD. This may suggest participants

with UC experience greater disease severity. However, it is important to note that this figure was skewed by one individual who had undergone 14 surgeries.

Table 2 shows the associations between illness perceptions and adjustment. It can be seen that individuals who perceive their condition as more severe have poorer adjustment (higher scores) on all measures. Additionally, the more participants perceive their disease course to be cyclical, the poorer their psychological adjustment (indicated by higher scores on the adjustment measures). -Table 2 here-

Table 3 shows the associations between illness perceptions and coping strategies, most of which are weak. In addition, none of the individual coping strategies assessed were strongly associated with adjustment (see Table 4). Behavioural disengagement was the only coping strategy moderately associated with poor adjustment (indicated by higher scores) for all the outcome measures. The correlations therefore suggest that individuals adopting behavioural disengagement had higher levels of psychological distress and poorer perceptions of their quality of life and functional independence. -Tables 3 and 4 here-

A series of hierarchical regression models were computed to examine the predictive value of illness perceptions and coping strategies upon psychological distress, quality of life and functional independence. The models presented here are the final models after all assumptions were met. The model utilised three blocks. Disease, pain and any relevant demographic and medical variables were entered in the first block to control for their influence. In the second block, relevant illness perceptions were entered to determine their relative predictive value in determining adjustment, after controlling for illness specific factors. Coping strategies were entered in the third block to examine their additional relative contribution as they are hypothesised to be mediating variables in the CSM model. Table 5 shows the results of the hierarchical regression analysis designed to ascertain whether illness perceptions predict adjustment. -Table 5 here-

Taken together, the disease and demographic variables contributed towards a significant proportion of the variance in adjustment: 23% for psychological distress, 49% for quality of life and 23% for functional independence. Illness perceptions contributed a significant additional proportion of the variance in all the criterion variables, including a unique 32% of the variance for emotional adjustment, 21% of the variance for quality of life, and 23% of the variance for independent functioning. The standardised regression coefficients show that a strong belief that IBD has serious consequences is the most important illness perception in this context.

The addition of information about coping strategies did not substantially change the associations between the criterion variables and illness perceptions. Coping only contributes an additional 3% of the variance in psychological adjustment, 2% of the variance in quality of life and 6% of the variance in functional independence. It is a necessary (but not sufficient) condition of mediation that the mediator has a significant unique effect on the outcome variable. As the coping variables contributed little to the explanation of the outcome variables in these analyses, the coping variables could not be acting as mediators, as proposed by the CSM.

Discussion

The aim of the study was to examine the relative influence of illness perceptions and coping strategies, after controlling for disease-related factors, in determining an individual's adjustment to IBD.

In all, 33% of the sample reported clinically significant levels of psychological distress. Levels of psychological distress in other chronic health populations (for example, diabetes and epilepsy) range between 9-55% with an average of 26% for diabetes in a recent

meta-analysis (44) which suggests the current sample displays similar levels of distress as other chronic health populations.

The results support the hypothesis that individuals' personal beliefs about their IBD play a significant role in their adjustment to the condition, even when the effects of disease activity and pain impairment are taken into account. Illness identity and consequences are the most important predictors of adjustment. However, there was little evidence to support the role of coping as a mediator between illness perceptions and adjustment as proposed by the CSM.

The correlations between illness perceptions and measures of adjustment in this study support similar findings in other conditions (for example, 19,20): individuals who believe that their IBD will have serious consequences, is chronic, and changeable in terms of its cyclical nature, report poorer psychological adjustment, quality of life and functional independence. The tendency to attribute a wide range of symptoms of illness to IBD (as indexed by the illness identity dimension) was also associated with poorer adjustment. Leventhal, Nerenz & Steele (45) postulate that individuals are driven to find a label for their symptoms and that if given a label, are driven to identify symptoms they believe are consistent with that label. Thus individuals may misattribute symptoms not related to IBD, which in turn indicates that their condition is becoming active, leading to decreased perceptions of functional independence, quality of life and psychological well-being. It might be argued that the identity dimension may simply be a manifestation of disease pathology, and therefore the severity of the symptoms (not the individual's beliefs about the symptoms) are associated with adjustment (17). However, as the identity dimension included symptoms not related to IBD, it is postulated that the symptoms attributed to IBD by the participants do not represent IBD biological disturbance but are more likely to represent the individual's perceptions of the effects of IBD.

Illness coherence and attributing IBD to a psychological cause were significantly associated with psychological distress. Individuals who understood their condition better (scored higher on the illness coherence dimension) were less likely to report psychological distress. Providing clear and coherent information about IBD is therefore perhaps an important protective factor against psychological distress. Furthermore, individuals attributing their disease to a psychological cause were more likely to be psychologically distressed. One possible explanation for the strong belief that psychological factors cause IBD is recall bias. Individuals may attempt to appraise otherwise inexplicable exacerbations and symptoms in a meaningful manner, a phenomenon commonly known as “effort after meaning” (46). Individuals with higher levels of psychological distress may be more likely to believe that their IBD is caused by psychological distress as a way of attributing personal meaning to their experience. While there is some evidence that psychological stress is implicated in the disease course of IBD, there is little evidence of its role in the onset of the disease (47).

Contrary to previous research, perceptions of treatment and personal control were not significantly associated with better adjustment. One possible explanation for this is that the IPQ-R has not been validated with the IBD population. Reliability analysis reveals inadequate Cronbach’s alpha results for the treatment control sub-scale of the IPQ-R, perhaps due to the incongruence between controllability and curability within this population. Furthermore, there may be other factors not accounted for, such as the frequency of hospitalisations or exacerbations, which may act as mediating factors for personal control. The disease course of IBD is extremely variable. Some may have experienced relatively few exacerbations in many years, while others experienced many more. It is possible that the frequency of exacerbations or hospitalisations, or perhaps whether or not the individual has had an ileostomy/colostomy, may mediate the relationship between perceptions of personal

control and adjustment. Similarly, treatment control may well be mediated by adherence to medical treatment.

The consequence dimension was consistently associated with poorer adjustment in all the adjustment measures. A belief that IBD has serious consequences, was the best predictor of psychological distress, poorer quality of life and reduced functional independence.

One of the most important findings of the present study is that coping strategies do not add significantly to the explanation of emotional adjustment or quality of life, once illness perceptions have been controlled for, contrary to the CSM. Furthermore, differing to previous research, emotion-focused coping was not associated with poorer adjustment. One of the possible explanations for the weak associations with coping may be the choice of a generic list of coping strategies to assess coping with IBD. The COPE is designed for use in a variety of situations and may omit some important disease-specific coping strategies. It has been suggested that a coping list tailored to the specific tasks of IBD individuals may be more appropriate (48).

The current study demonstrates the importance of illness perceptions in developing our understanding of adjustment to IBD. IBD has received little attention from a social cognition perspective. Participants clearly displayed high levels of psychological distress, given that the average HADS score in the sample was just below the cut-off point which defines severe anxiety or depression. The results suggest that disease activity and pain impairment play a significant part in adjustment. This highlights the importance of assessing pain, and the possibility of implementing pain management strategies as part of the interventions used with individuals attempting to adjust to IBD. In addition, the present study shows that cognitive factors contribute significantly to our understanding of adjustment in IBD. Clinical interventions should address individuals' personal beliefs about IBD, which may foster adjustment to this disabling and unpredictable condition. Assessment and intervention should focus in particular on helping the individual to identify symptoms that are

not related to IBD, exploring their attributions about the cause of the condition, developing a more coherent understanding of the condition and, primarily, addressing their beliefs about the seriousness of its impact on their lives. Further work is required to clarify the relationship between illness perceptions and coping using more specific coping measures.

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Table 1

Demographic and disease-related data

	All (n=80)	Crohn's disease (n=26)	Ulcerative colitis (n=54)
Male	37 (46%)	12 (46%)	25 (46%)
Mean Age (yrs)	40	47	37
Age Range (yrs)	(18-81)	(23-84)	(18-81)
Married	38 (46%)	15 (58%)	23 (43%)
Employed	49 (61%)	15 (58%)	34 (63%)
Mean Disease duration (yrs)	10.9	13.3	9.7
Range	0.5-35	1.5-37	0.5-35
Active Disease	30 (38%)	8 (31%)	22 (40%)
Surgery*			
Mean frequency	1.9	1.0	2.4
Range	0-14	0-5	0-14
Ileostomy/colostomy	32 (40%)	9 (35%)	23 (43%)
Mean (SD) HADS	12.33 (7.07)	12.85 (7.13)	11.23 (6.93)
Mean (SD) IBDQ	31.94 (17.85)	33.56 (18.74)	28.59 (15.66)
Mean (SD) FLP	24.03 (20.19)	26.68 (19.71)	18.53 (20.44)

*t = 2.332, p = .022

Table 2

Pearson's correlations (and significance values) between illness perceptions and adjustment measures

	Psychological Distress (HADS)	Quality of Life (IBDQ)	Functional Independence (FLP)
Identity	0.37(.001)	0.50(<.001)	0.44(<.001)
Acute/chronic Timeline	0.17(.133)	0.33(.002)	0.14(.226)
Cyclical Timeline	0.39(<.001)	0.42(<.001)	0.18(.120)
Consequences	0.64(<.001)	0.58(<.001)	0.59(<.001)
Personal Control	- 0.09(.422)	0.01(.965)	0.28(.013)
Treatment Control	- 0.09(.441)	- 0.08(.469)	- 0.08(.501)
Illness Coherence	- 0.35(.002)	- 0.15(.178)	- 0.16(.154)
Psychological Cause	0.34(.002)	0.03(.817)	0.08(.454)

Table 3

Pearson correlations (and significance values) between coping strategies and illness perceptions

	<i>Identity</i>	<i>Acute/Chronic</i>	<i>Cyclical</i>	<i>Consequences</i>	<i>Personal</i>	<i>Treatment</i>	<i>Illness</i>
		<i>Timeline</i>	<i>Timeline</i>		<i>Control</i>	<i>Control</i>	<i>Coherence</i>
Behavioural disengagement	0.02 (.863)	0.08 (.463)	0.20 (.066)	0.31 (.006)	-0.13 (.909)	-0.28 (.805)	0.32 (.003)
Denial	-0.03 (.737)	-0.10 (.373)	0.14 (.187)	0.29 (.008)	-0.14 (.217)	-0.03 (.774)	0.41 ($<.001$)
Positive reinterpretation	-0.09 (.416)	-0.19 (.091)	-0.11 (.322)	-0.26 (.022)	0.18 (.115)	0.18 (.108)	0.15 (.161)
Acceptance	0.05 (.648)	0.09 (.845)	-0.13 (.908)	-0.16 (.125)	0.04 (.971)	0.05 (.524)	0.19 (.084)
Humour	-0.03 (.747)	-0.12 (.287)	-0.17 (.115)	-0.29 (.009)	0.08 (.472)	0.22 (.046)	0.25 (.026)
Mental disengagement	0.12 (.292)	0.11 (.332)	0.03 (.753)	0.18 (.109)	0.02 (.814)	-0.06 (.593)	0.08 (.447)
Restraint	0.05 (.768)	0.09 (.414)	0.13 (.247)	0.17 (.150)	0.14 (.203)	0.05 (.650)	-0.07 (.537)
Active coping	-0.01 (.891)	0.08 (.479)	-0.02 (.877)	-0.12 (.302)	0.25 (.022)	0.27 (.013)	0.32 (.004)
Planning	-0.12 (.265)	0.93 (.412)	-0.11 (.331)	-0.15 (.158)	0.38 ($<.001$)	0.21 (.058)	0.30 (.006)
Instrumental Support	0.03 (.795)	-0.04 (.678)	-0.03 (.754)	-0.14 (.191)	0.27 (.014)	0.20 (.062)	0.22 (.042)
Emotional Support	0.12 (.262)	0.05 (.613)	0.01 (.875)	-0.18 (.103)	0.24 (.030)	0.16 (.148)	0.29 (.009)
Suppression	-0.08 (.439)	0.14 (.215)	0.05 (.650)	0.16 (.141)	0.31 (.006)	0.01 (.992)	0.01 (.926)
Venting emotions	0.08 (.462)	0.03 (.738)	0.15 (.183)	0.21 (.053)	0.06 (.569)	0.20 (.066)	0.02 (.853)
Religion	-0.18 (.103)	-0.13 (.224)	-0.13 (.248)	-0.27 (.014)	-0.01 (.950)	0.15 (.174)	0.14 (.209)
Alcohol	0.17 (.132)	0.08 (.460)	0.03 (.752)	0.13 (.241)	0.18 (.108)	-0.11 (.327)	-0.19 (.083)

Table 4

Pearson correlations (and significance values) between coping strategies and adjustment measures

	<i>HADS</i>	<i>IBDQ</i>	<i>FLP</i>
Behavioural disengagement	0.51(<.001)	0.34(.002)	0.43(<.001)
Denial	0.30(.006)	0.25(.025)	0.29(.009)
Positive reinterpretation and growth	-0.31(.006)	-0.29(.008)	-0.12(.269)
Acceptance	-0.28(.013)	-0.19(.098)	-0.14(.781)
Humour	-0.35(.001)	-0.21(.059)	-0.17(.146)
Mental disengagement	0.13(.263)	0.19(.092)	0.32(.004)
Restraint	0.25(.017)	0.23(.039)	0.31(.006)
Active coping	-0.19(.083)	-0.08(.501)	-0.08(.460)
Planning	-0.10(.358)	-0.15(.199)	-0.18(.111)
Instrumental Support	-0.13(.251)	-0.06(.570)	-0.09(.444)
Emotional Support	-0.23(.033)	-0.07(.518)	-0.05(.672)
Suppression of competing activities	0.19(.085)	0.13(.233)	0.10(.374)
Venting emotions	0.23(.039)	0.14(.202)	0.20(.066)
Religion	-0.04(.738)	-0.11(.350)	-0.07(.521)
Alcohol	0.23(.038)	0.20(.068)	0.03(.799)

Table 5

Standardised regression coefficients (and significance values) from hierarchical regression

Predictor/Block	HADS	IBDQ	FLP
Block 1			
Disease Activity Status	0.19(.082)	0.51(<.001)	0.18(.110)
Pain Impairment	0.38(.001)	0.35(<.001)	0.27(.016)
Education Status	- 0.15(.163)	0.04(.628)	- 0.24(.028)
Occupational Status	- 0.15(.147)	0.06(.503)	0.20(.053)
Adjusted R ²	0.23	0.49	0.23
F Change	6.85(<.001)	13.7(<.001)	6.7(<.001)
Block 2			
Disease Activity Status	0.24(.014)	0.44(<.001)	0.12(.222)
Pain Impairment	0.22(.020)	0.25(.001)	0.13(.184)
Education Status	- 0.08(.365)	0.11(.120)	- 0.14(.167)
Occupational Status	- 0.14(.094)	0.04(.551)	0.21(.023)
Identity	- 0.08(.458)	0.04(.585)	0.21(.060)
Acute Timeline	- 0.05(.552)	0.13(.060)	--
Cyclical Timeline	0.11(.235)	0.05(.501)	--
Treatment Control	--	--	--
Personal Control	--	--	0.09(.373))
Consequences	0.46(<.001)	0.38(<.001)	0.37(<.001)
Illness Coherence	- 0.12(.180)	--	--
Psychological Cause	0.16(.080)	--	--
Adjusted R ²	0.55	0.70	0.46
F Change	9.44(<.001)	12.26(<.001)	11.22(<.001)
Block 3			
Disease Activity Status	0.21(.027)	0.45(.021)	0.12(.203)
Pain Impairment	0.15(.136)	0.20(.015)	0.08(.414)
Education Status	- 0.05(.575)	0.11(.106)	- 0.11(.249)
Occupational Status	- 0.11(.175)	0.04(.551)	0.19(.031)
Identity	0.01(.940)	0.10(.237)	0.25(.022)
Acute Timeline	- 0.07(.403)	0.13(.076)	--
Cyclical Timeline	0.07(.438)	0.01(.951)	--
Treatment Control	--	--	--
Personal Control	--	--	- 0.16(.095)
Consequences	0.40(.001)	0.30(.001)	0.29(.008)
Illness Coherence	- 0.04(.705)	--	--
Psychological Cause	0.11(.251)	--	--
Behavioural Disengagement	0.24(.030)	0.07(.397)	0.15(.160)
Denial	0.19(.850)	0.10(.184)	0.01(.876)
Positive Reinterpretation	- 0.05(.633)	- 0.06(.444)	--
Acceptance	- 0.05(.628)	--	--
Humour	- 0.09(.320)	- 0.03(.668)	--
Mental Disengagement	--	--	0.07(.458)
Restraint	0.05(.626)	0.06(.431)	- 0.17(.100)
Adjusted R ²	0.58	0.71	0.52
F Change	1.99(.081)	1.2(.261)	3.07(.022)