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Illness Perceptions, Coping, Benefit Finding, and Adjustment in Individuals with Hepatitis C

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Objective: To investigate the ability of illness perceptions, adaptive, and maladaptive coping strategies, and benefit finding to predict physical and psychosocial adjustment among individuals diagnosed with the hepatitis C virus (HCV), within an expanded self-regulatory model of illness (SRM).

Method: A total of 126 participants with HCV completed an online questionnaire assessing illness perceptions, coping, benefit finding, and four adjustment outcomes, depression, physical functioning, life satisfaction and positive affect.

Results: Illness perceptions made significant contributions to the variance in adjustment outcomes across the four psychosocial and physical adjustment areas. At an individual level, personal control, identification with HCV symptoms, perceptions related to illness duration, illness coherence, and emotional responses to HCV made significant contributions to the prediction of adjustment. Similarly, the combined contributions of adaptive and maladaptive coping strategies explained significant variance across the four adjustment areas. Greater adoption of maladaptive coping strategies predicted poorer physical health, higher reported depression, greater life satisfaction, and positive affect outcomes, while increased engagement with adoptive coping strategies predicted higher positive affect. Increased benefit finding predicted greater positive affect, life satisfaction, and higher depression.

Conclusion: Results demonstrate the ability of the SRM features of illness perceptions and coping, and benefit finding to predict physical and psychosocial adjustment outcomes within the context of HCV.

Key words: adjustment; benefit finding; coping; hepatitis C; illness perceptions.

What is already known on this topic

1 Hepatitis C is a potentially chronic illness that is associated with potentially serious long-term consequences.
2 The self-regulatory model of illness has been linked to adjustment outcomes across a number of chronic diseases.
3 Benefit finding provides individuals with an opportunity to discover meaning within the context of adverse life events, including chronic illness.

What this paper adds

1 Evidence for the ability of illness perceptions and coping to predict adjustment outcomes for individuals with hepatitis C.
2 The ability of an expanded self-regulatory model, including benefit finding, to account for variance in physical and psychosocial adjustment among individuals with hepatitis C.
3 Support for including features of the self-regulatory model of illness, illness perceptions and coping, and benefit finding in assessment and treatment models for individuals with hepatitis C.

The hepatitis C virus (HCV) is a chronic blood borne illness associated with significant physical and psychological difficulties, and is the leading cause of liver morbidity and mortality in the world (Chen & Morgan, 2006; Hauser, Zimmer, Schiedermaier, & Grandt, 2004; Lee & Abdo, 2003; Lee & Harrison, 2005; Shiffman et al., 2004; Simmonds, 2001). Estimates suggest that approximately 170 million individuals worldwide have HCV, but only a small percentage undergo anti-viral treatment (Lee & Abdo, 2003; Shiffman et al., 2004). A number of studies have assessed the ability of a range of bio-medical markers to predict HCV treatment outcomes (Lee & Abdo, 2003; Shiffman et al., 2004). However, in comparison, little research has been conducted that has focused on the ability of psychological variables to account for variance in physical (perceptions

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related to general health and physical functioning), and psychosocial (psychological well-being) adjustment among individuals with HCV (Hagger & Orbell, 2003).

Leventhal, Diefenbach, and Leventhal (1992) developed a psychological framework, the self-regulatory model of illness (SRM), to explain the links between cognitive and emotional representations of illness and health-related behaviours (Leventhal et al., 1992; Rogan, Fortune, & Prentice, 2013). The model suggests that individuals construct cognitive and emotional representations of their illness, also referred to as illness perceptions, which form the basis for subsequent health-related coping behaviours. Coping behaviours are linked to health-related outcomes within a continuous feedback loop, where both illness perceptions and coping behaviours are adjusted in response to health-related outcomes (Broadbent, Petrie, Main, & Weinman, 2006; Lau & Hartman, 1983; Leventhal et al., 1992).

A number of studies have investigated the efficacy of the SRM to predict both physical and psychosocial adjustment, and in a more limited number of studies, bio-medical treatment outcomes (e.g., Chilcot, Wellsted, & Farrington, 2011) across a range of chronic diseases. For the purpose of the present study, a chronic disease is defined as a health condition that generally exists for periods of time greater then three months, for example, irritable bowel syndrome (IBS) (Hagger & Orbell, 2003; Vaughan, Morrison, & Miller, 2003). Within the context of chronic disease, illness perceptions have consistently predicted variance in both physical and psychosocial adjustments (Fortune, Richards, Griffiths, & Main, 2002; Heijmans, 1999; Helder et al., 2002; Rutter & Rutter, 2002; Scharloo et al., 2000; Steed, Newman, & Hardman, 1999; Vaughan et al., 2003). However, coping strategies have produced inconsistent results, with a number of studies demonstrating significant predictive ability related to adjustment outcomes, whereas others have not revealed these same predictive relationships (Fortune et al., 2002; Heijmans, 1999; Helder et al., 2002; Moss-Morris, Petrie, & Weinman, 1996; Rutter & Rutter, 2002; Scharloo et al., 2000; Steed et al., 1999). For example, Steed et al. were unable to identify a significant role for coping strategies in accounting for variance in psychosocial adjustment in a cohort of individuals with atrial fibrillation (AF). However, Rutter and Rutter demonstrated the ability of coping strategies to contribute the variance in adjustment outcome results both independently of, and after controlling for, the contribution of illness perceptions among a cohort of individuals with IBS.

Although the SRM has demonstrated links between illness perceptions, coping behaviours and health-related outcomes, other psychological models have identified associations between positive meaning, personal growth, and physical and psychosocial adjustment (Helgeson, Reynolds, & Tomich, 2006; Leventhal et al., 1992). For example, cognitive factors such as benefit finding and meaning making have been linked to positive adjustment outcomes in chronic health conditions such as multiple sclerosis (MS) (Pakenham, 2007). Benefit finding has been described as a process where individuals find meaning in the context of adverse life events and situations, including the experience of chronic disease (Fortune, Richards, Griffiths, & Main, 2005; Pakenham, 2011; Rogan et al., 2013; Seligman & Csikszentmihalyi, 2000; Siegal & Schrimshaw, 2000; Thompson, 1985). In response to adversity, examples of benefits found by individuals have included strengthened relationships, a greater appreciation of life, spiritual and personal growth, changes in life priorities and goals, changes in health behaviours, and illness acceptance (Helgeson et al., 2006; Pakenham, 2011; Stanton, Bower, & Low, 2006).

To date, a number of studies have demonstrated predictive links between benefit finding and physical and psychosocial adjustment within the context of chronic disease (Littlewood, Vanable, Carey, & Blair, 2008; Luszczynska, Sarkar, & Knoll, 2007; Park, Chmielewski, & Blank, 2009; Tennen, Affleck, Urrows, Higgins, & Mendola, 1992). For example, Littlewood et al. reported benefit finding was positively associated with better physical and psychosocial adjustment, including increased physical activity and decreased depression among a group of individuals diagnosed with human immunodeficiency virus (HIV). Other studies have produced less consistent results (Helgeson et al., 2006; McMillen & Fisher, 1998; Sears, Stanton, & Danoff-Burg, 2003; Tomich & Helgeson, 2004). For example, Helgeson et al. (2006) investigated relations between benefit finding and both psychosocial and physical health adjustment following traumatic life events, including the experience of chronic disease, found that benefit finding was associated with lower depression, but was unrelated to physical health adjustment outcomes.

Research to date has not examined relationships between features of the SRM, illness perceptions and coping strategies, and benefit finding and physical and psychosocial adjustment among individuals with HCV. The primary aim of the present study was to investigate whether features of the SRM would contribute to variance in adjustment outcomes, and determine whether benefit finding would predict adjustment outcomes above the SRM for individuals with HCV. Illness perceptions, adaptive, and maladaptive coping strategies were expected to predict physical health, life satisfaction, and positive and negative mood adjustment outcomes. Benefit finding was also expected to make significant contributions to the predictive model after controlling for the combined contributions of the SRM features, illness perceptions, adaptive, and maladaptive coping.

Method

The present study was provided research ethics approval by both the Bond University Human Research Ethics Committee, and the Gold Coast Hospital and Health Service Human Research Ethics Committee. Both ethics committees are located in the state of Queensland, Australia.

Participants

There were 126 individuals with HCV who were recruited for this study. Inclusion criteria included a current HCV diagnosis, at least 18 years of age (HCV treatment is not available to individuals under the age of 18), access to the internet, and a current email address. Table 1 summarises demographic information.

Table 1 Sample Characteristics (N = 126)

Characteristic	*n*	(%)	*M*	*SD*
Age			41.6	11.9
Gender				
Male	68	54.0		
Female	58	46.0		
Liver cirrhosis (n = 86)	29	33.7		
Medical co-morbidity	49	38.9		
Recreational drug use (n = 121)	41	33.9		
Alcohol consumption	38	30.2		
Nicotine dependence	40	31.7		

Measures

Illness perceptions

The Brief Illness Perception Questionnaire (BIPQ: Broadbent et al., 2006) includes eight-items designed to measure illness perceptions. For the present study, the word "illness" was substituted with "HCV." Scores on each item range from 0 to 10. Sample items from the BIPQ include "How much does your HCV affect your life?" and "How concerned are you about your HCV?" (Broadbent et al., 2006). The measure contains three subscales: cognitive illness representations (illness consequences, timeline, personal control, treatment control, and identity); emotional representations (concern and emotions); and one item measuring illness understanding. Higher scores on the illness consequences, timeline, identity, concern, and emotion questions indicate greater negative or threatening illness perceptions, whereas higher scores on the personal control, treatment control and illness understanding questions indicate more positive illness-related perceptions. The BIPQ has shown good test–retest reliability and concurrent validity along with good predictive and discriminant validity (Broadbent et al., 2006).

Coping

Coping was measured by the Brief COPE (Carver, 1997). The Brief COPE is a 28-item multidimensional coping inventory that was developed on theoretical grounds (Carver, 1997). Sample items include "I've been thinking hard about what steps to take" and "I've been expressing my negative feelings." The Brief COPE has 14 subscales. Each subscale is measured by two items. Participants rate each of the two items for each of the 14 subscales from 1 (*don't do this at all)* to 4 (*do this a lot*). Scores for each subscale range from 2 to 8. Higher scores on individual scales indicate the extent to which each described type of coping was used (Carver, Scheier, & Weintraub, 1989; Weinman, Wright, & Johnston, 1995). Following previous work (Rogan et al., 2013), the 14 coping subscales were divided into nine adaptive (mental disengagement, active coping, use of emotional support, use of instrumental support, positive reframing, planning, use of humour, acceptance, and use of religion), and five maladaptive (denial, substance use, venting, self-blame, and behavioural disengagement) strategies (Carver, 1997; Rogan et al., 2013). Both the adaptive (.57–.82) and maladaptive (.50–.90) subscales have demonstrated acceptable Cronbach alpha values in previous research (Carver, 1997; Cooper, Katona, & Livingston, 2008; Rogan et al., 2013).

Benefit finding

Benefit finding was measured by the Perceived Benefits Scale (PBS: McMillen & Fisher, 1998). The PBS has 38 items of which 30 reflect benefits since diagnosis. The measure includes eight items reflecting negative changes, and in accord with the scoring procedures, responses to these items were excluded from analyses (McMillen & Fisher, 1998). Participants were asked to indicate how well "each statement describes your experience" by using a 5-point Likert scale ranging from 0 (*not at all like my experience*) to 4 (*very much like my experience*). Sample items from the PBS include "Because of this illness, I have learned how good people can be" and "This illness has made me a stronger person" (McMillen & Fisher, 1998). Higher scores on the PBS reflect higher levels of positive benefit finding. The PBS has shown good test–retest reliability, and good concurrent, predictive and discriminant validity (McMillen & Fisher, 1998; Park et al., 2009).

Depression

Mental health adjustment was measured using the depression subscale of the Depression, Anxiety and Stress Scales (DASS-21: Lovibond & Lovibond, 1995). The DASS-21 is a 21-item short form version of the 42-item self-report DASS. The seven-item Depression subscale requires respondents to rate the extent to which they experienced each symptom over the past week on a 4-point Likert scale (0 = *did not apply to me at all* to 3 = *applied to me very much or most of the time*). Sample items from the Depression subscale include "I couldn't seem to experience any positive feeling at all" and "I felt that life was meaningless." A total score was created by summing subscale scores and then multiplying the total score by two (Lovibond & Lovibond, 1995; Miller, Pallant, & Negri, 2006). Scores for the Depression subscale range from 0 to 42, with higher scores indicative of higher depression (Lovibond & Lovibond, 1995; Miller et al., 2006). The DASS-21 Depression subscale has demonstrated good internal consistency (Cronbach's α = .92; Lovibond & Lovibond, 1995), and adequate construct, convergent, and discriminant validity (Clara, Cox, & Enns, 2001; Henry & Crawford, 2005; Lovibond & Lovibond, 1995; Miller et al., 2006).

Physical health

The physical summary component of the RAND 36-item Health Survey 1.0 questionnaire (RAND-36) (Covic, Seica, Gusbeth-Tatomir, Gavrilovici, & Goldsmith, 2004; VanderZee, Sanderman, Heyink, & de Haes, 1996) was used to measure aspects of reported physical health-related quality of life (Covic et al., 2004; VanderZee et al., 1996). The physical summary component of the RAND-36 measures health-related quality of life across four dimensions of physical health: physical functioning, role functioning (physical), bodily pain, and general health (Brazier et al., 1992; Covic et al., 2004; VanderZee et al., 1996). For example,

the Physical Functioning subscale measures perceptions of physical functioning as a component of general health status. Individuals respond to the following question "Does your health now limit you in these activities? If so, how much?" Activities covered include "running," "carrying groceries," and "bathing and dressing." Items are rated on a 3-point Likert scale ranging from 1 (*Yes, Limited a Lot*) to 3 (*No, Not Limited at All*). Total scores for each subscale range from 0 to 100, with higher scores indicating better physical functioning and positive health perceptions (Brazier et al., 1992; Covic et al., 2004; Ngo-Metzger, Sorkin, Mangione, Gandek, & Hays, 2008; VanderZee et al., 1996).

Apart from some differences in recommended scoring methods, the RAND-36 is identical to the items of the MOS 36-item Short-Form Health Survey (SF-36) which has been shown to have sound reliability and validity (Brazier et al., 1992). For example, Brazier et al. reported good internal consistency (Cronbach's $\alpha > .85$) and test-retest reliability coefficients of .75 for the Physical Functioning and General Health subscales. Further, within the same study, the SF-36 Physical Functioning and General Health subscales demonstrated satisfactory construct validity in distinguishing expected health differences between groups.

Life satisfaction

The five-item Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was used to measure life satisfaction. Participants rated each item from 1 (*strongly disagree*) to 7 (*strongly agree*). Possible scores range from 5 to 35, with higher scores indicative of greater life satisfaction. Sample statements from the Satisfaction with Life Scale include "In most ways, my life is close to ideal" and "I am satisfied with my life" (Diener et al., 1985). The Satisfaction with Life Scale has demonstrated high levels of internal consistency ($\alpha = .87$) (Diener et al., 1985).

Table 2 Descriptive Statistics for Predictor and Criterion Variables ($N = 126$)

Variables	Mean	*SD*	Range
Illness consequences	5.8	2.6	0–10
Illness timeline	6.0	2.6	0–10
Personal control	5.2	2.7	0–10
Treatment control	7.1	2.1	0–10
Illness identity	5.4	2.6	0–10
Illness concern	7.0	2.4	0–10
Illness coherence	6.5	2.4	0–10
Emotional response	5.8	2.8	0–10
Adaptive coping	46.9	10.2	18–72
Maladaptive coping	20.0	6.4	10–40
Benefit finding	60.6	25.8	0–120
Depression	16.5	11.0	0–42
Physical health	52.7	20.9	0–100
Life satisfaction	19.5	7.1	5–35
Positive affect	15.0	4.1	5–25

Positive affect

Positive affect was measured using the Bradburn Affect Balance Scale (BABS) (Bradburn, 1969). The BABS is a 10-item scale containing five statements reflecting positive feelings and five statements reflecting negative feelings (Bradburn, 1969). The current study used the five positive items of the scale. Participants indicate on a scale from 1 (*not at all*) to 5 (*very often*) how relevant each of the statements was to them over the past few weeks (Bradburn, 1969; van Schuur & Kruijtbosch, 1995). Scale scores range from 5 to 25 with higher scores indicating better adjustment. Sample statements include "Particularly excited or interested in something" and "That things were going your way." Overall, the BABS has demonstrated sound psychometric properties in terms of acceptable reliability in both clinical and non-clinical samples (e.g., Cronbach's $\alpha = .94$; Pakenham & Cox, 2008).

Procedure

Recruitment strategies included internet-based advertising (e.g., contacting Hepatitis C peak body websites across Australia), and traditional hard-copy advertising flyers mailed to individuals preparing for HCV treatment at the Gold Coast University Hospital Liver Clinic. Online and hard-copy advertising strategies provided background information to the study and a website link. The website contained background material and information related to the consent process. Participation was anonymous. After providing informed consent, participants were provided a unique personal login identifier and password that enabled access to the questionnaires. Completion of the online survey took between 30 and 40 min. Participation incentives were not offered.

Results

Analyses were performed using the IBM Statistical Package for Social Sciences (SPSS) Version 23.0. Tests of significance were considered reliable at $p < .05$. Prior to the main tests, data were screened for normality, skewness, kurtosis, and testing for outliers and all variables were examined for accuracy of data entry, missing values, and fit between their distributions and assumptions of regression analysis. Analysis of missing values revealed no obvious pattern. Therefore, missing values were replaced by the group mean (Tabachnick & Fidell, 2001). Descriptive data for the predictor and criterion variables are shown in Table 2. Adequate power (.82) was demonstrated following a statistical power analysis undertaken using G*power statistical software (Faul, Erdfelder, Lang, & Buchner, 2007).

Hierarchical multiple regression analyses were used to investigate whether illness perceptions, maladaptive, and adaptive coping strategies, and benefit finding predicted depression, physical health, life satisfaction, and positive affect outcomes. Entry of the predictor variables was based on the SRM (Leventhal et al., 1992). For each of the four predictive models, the illness perception components were entered on Step 1, adaptive and maladaptive coping strategies were entered on Step 2, and benefit finding was entered at Step 3. The

unstandardised coefficients, beta weights, and confidence intervals for all tests are shown in Table 3.

Predictors of Depression

There were a number of significant zero-order correlations among the illness perception components, coping strategies, benefit finding and depression. Greater illness consequence (r = .38), longer illness duration (r = .29), greater identification with illness-related symptoms (r = .39), higher levels of illness concern (r = .25), and higher emotional responses to HCV (r = .47) were associated with higher depression. Conversely, higher personal control (r = −.18) and greater illness understanding (r = −.18) were associated with lower depression. Both adaptive coping (r = .16) and maladaptive coping (r = .53) were significantly and positively associated with depression. Similarly, benefit finding (r = .27) was significantly and positively associated with depression.

At Step 1, the model was significant, F (8,117) = 8.02, p < .001, and the illness perceptions accounted for 35% of the variance in depression scores, R = .60, R^2 = .35, F (8, 117) = 8.02, p < .001. Increased perceptions related to personal control (2%; β = −.17, t = 2.04, p = .043) and illness coherence (3%; β = −.18, t = 2.22, p = .028) were significant unique predictors of lower depression, whereas higher HCV illness identity (4%; β = .25, t = 2.61, p = .010) and greater emotional responses (6%; β = .35, t = 3.26, p = .001) predicted higher depression. At Step 2, the model accounted for 48% of the variance in depression scores and after controlling for the illness perception components the combined contribution of the adaptive and maladaptive coping strategies accounted for an additional 13% of the variance in depression scores (R = .70, R^2 Change = .13, F Change (2, 115) = 14.34, p < .001), which was significant, and the overall model remained significant, F (10,115) = 10.74, p < .001. Maladaptive coping strategies was the only unique contributor (10%; β = .40, t = 4.81, p < .001) such that more maladaptive coping predicted higher depression. At Step 3, the combined contributions of the illness perception components, coping strategies and benefit finding accounted for 53% of the variance in depression results and the full model was significant, F (11,114) = 11.46, p < .001. After controlling for the contributions of the illness perception components and coping strategies, benefit finding accounted for an additional 4% in the variance in depression scores (R = .73, R^2 Change = .04, F Change (1, 114) = 10.10, p < .01), such that greater benefit finding predicted higher depression scores (β = .25, t = 3.18, p = .002).

Predictors of Physical Health

There were a number of significant zero-order correlations among predictor variables and physical health. Increased negative illness-related consequence (r = −.46), illness identity (r = −.47), greater illness-related concern (r = −.33), a greater negative emotional response to HCV (r = −.42), and higher adoption of more maladaptive coping strategies (r = −.37) were all associated with lower physical health results. Perceptions related to shorter illness duration (r = −.28) were associated with higher physical functioning.

At Step 1, the combined illness perception components made a significant contribution to the model, R = .58, R^2 = .33, F (8, 117) = 7.34, p < .001. Higher illness identification was the only significant component to predict physical health scores (6%) such that greater illness identification predicted poorer physical health outcomes (β = −.33, t = −3.37, p = .001). At Step 2, the model was significant, F (10, 115) = 7.76, p < .001, accounting for 40% of the variance in physical health scores. Coping made a significant additional contribution to the variance in physical health scores (7%) (R = .64, R^2 Change = .07, F Change (2, 115) = 6.63, p < .01). Maladaptive coping (7%) was the only significant contributor such that greater maladaptive coping predicted lower physical health results (β = −.32, t = −3.63, p < .001). At Step 3, the full model accounted for 40% of variance in physical health scores, and the model remained significant, F (11,114) = 7.02, p < .001. However, benefit finding failed to add to the model, R = .64, R^2 Change = .001, F Change (1, 114) = .17, p > .05.

Predicting Life Satisfaction

Greater personal control (r = .50), perceptions related to shorter illness duration (r = −.20), greater treatment control perceptions (r = .16), increased illness understanding or coherence (r = .26), greater adaptive (r = .25) and maladaptive (r = .22) coping, and increased benefit finding (r = .48) were all significant zero-order correlates of greater life satisfaction. Greater illness concern (r = −.23) was associated with lower life satisfaction.

At Step 1, the illness perception components accounted for 33% of the variance in life satisfaction, R = .57, R^2 = .33, F (8, 117) = 7.14, p < .01. Perceptions related to a shorter illness duration or timeline (2%; β = −.18, t = −2.03, p = .045) and greater personal control (16%; β = .44, t = 5.21, p < .001) predicted greater life satisfaction. At Step 2, the overall model remained significant, F (10,115) = 7.84, p < .001, with the combined contributions of the illness perception components and coping strategies accounting for 41% of the variance in life satisfaction. Coping strategies made a significant contribution to the model (R = .64, R^2 *Change* = .07, F *Change* (2, 115) = 7.47, p < .01). Maladaptive coping (3%) was the only unique significant contributor; more maladaptive coping strategies predicted greater life satisfaction (β = .22, t = 2.44, p = .016). At Step 3, the full model was significant (F (11,114) = 8.84, p < .001), and contributed 46% to the variance in life satisfaction scores. Benefit finding explained an additional 5% of the variance in life satisfaction, R = .68, R^2 Change = .06, F Change (1, 114) = 11.61, p < .01; greater benefit finding was associated with greater life satisfaction, (β = .29, t = 3.41, p = .001).

Predicting Positive Affect

There were a number of significant zero-order relationships between the predictors and positive affect. Increased personal (r = .51) and treatment control (r = .18) perceptions, greater illness understanding or coherence (r = .21), greater adoption of adaptive (r = .38) and maladaptive (r = .33) coping

Table 3 Unstandardised Coefficients, Beta Weights and 95% Confidence Intervals for Hierarchical Regression Analyses for the Prediction of Each Outcome Variable by the Predictor Variables (N = 126)

	Unstandardised coefficients		Standardised coefficient	95% Confidence intervals For B	
	B	Standard Error	Beta	Lower bound	Upper bound
Depression					
Step 1 (Constant)	13.74	4.41		5.01	22.46
Illness consequences	.19	.47	.05	−.74	1.12
Illness timeline	.38	.36	.09	−.34	1.10
Personal control	−.67	.33	−.17*	−1.32	−.02
Treatment control	−.33	.45	−.06	−1.21	.56
Illness identity	1.06	.41	.25*	.25	1.86
Illness concern	−.45	.42	−.10	−1.29	.39
Illness coherence	−.83	.38	−.18*	−1.58	−.09
Emotional response	1.40	.43	.35**	.55	2.24
Step 2 (Constant)	.08	4.92		−9.67	9.84
Adaptive coping	.01	.09	.01	−.16	.18
Maladaptive coping	.69	.14	.40**	.41	.98
Step 3 (Constant)	−.89	4.75		−10.30	8.52
Benefit finding	.11	.03	.25**	.04	.18
Physical health					
Step 1 (Constant)	70.55	8.46		53.80	87.29
Illness consequences	−1.66	.90	−.21	−3.44	.12
Illness timeline	−.46	.70	−.06	−1.83	.92
Personal control	1.09	.63	.14	−.16	2.33
Treatment control	.10	.86	.01	−1.60	1.80
Illness identity	−2.62	.78	−.33**	−4.16	−1.08
Illness concern	.01	.81	.00	−1.60	1.62
Illness coherence	.98	.72	.11	−.45	2.40
Emotional response	−.73	.82	−.10	−2.36	.89
Step 2 (Constant)	81.18	9.99		61.38	100.99
Adaptive coping	.32	.17	.15	−.03	.66
Maladaptive coping	−1.06	.29	−.32**	−1.64	−.48
Step 3 (Constant)	81.45	10.06		61.53	101.37
Benefit finding	−.03	.07	−.04	−.17	.11
Life satisfaction					
Step 1 (Constant)	16.82	2.87		11.13	22.51
Illness consequences	.30	.31	.11	−.31	.90
Illness timeline	−.48	.24	−.18*	−.95	−.01
Personal control	1.12	.21	.44**	.69	1.53
Treatment control	−.10	.29	−.03	−.68	.48
Illness identity	.21	.26	.08	−.31	.73
Illness concern	−.51	.28	−.17	−1.06	.04
Illness coherence	.36	.25	.12	−.13	.84
Emotional response	−.20	.28	−.08	−.75	.36
Step 2 (Constant)	9.14	3.38		2.46	15.83
Adaptive coping	.10	.06	.15	−.02	.22
Maladaptive coping	.24	.10	.22*	.05	.44
Step 3 (Constant)	8.43	3.24		2.02	14.85
Benefit finding	.08	.02	.29**	.03	.13
Positive affect					
Step 1 (Constant)	10.31	1.76		6.83	13.79
Illness consequences	.03	.19	.02	−.34	.40
Illness timeline	−.01	.14	−.00	−.29	.28
Personal control	.70	.13	.47**	.44	.96
Treatment control	.06	.18	.03	−.30	.41
Illness identity	.12	.16	.07	−.20	.44
Illness concern	−.02	.17	−.01	−.35	.31
Illness coherence	.12	.15	.07	−.18	.42

Table 3 Continued

	Unstandardised coefficients		Standardised coefficient	95% Confidence intervals For B	
	B	Standard Error	Beta	Lower bound	Upper bound
Emotional response	−.14	.17	−.10	−.48	.20
Step 2 (Constant)	3.59	1.92		−.22	7.40
Adaptive coping	.10	.03	.24**	.03	.16
Maladaptive coping	.20	.06	.30**	.08	.31
Step 3 (Constant)	3.00	1.73		−.43	6.44
Benefit finding	.07	.01	.41**	.04	.09

*$p < .05$; **$p < .01$.

strategies, and increased benefit finding ($r = .58$) were associated with increased positive affect.

At Step 1, illness perceptions accounted for 27% of the variance in positive affect scores, $R = .52$, $R^2 = .27$, F (8, 117) = 5.40, $p < .001$. Greater perception of personal control (18%) was the only significant illness predictor of positive affect ($\beta = .47$, $t = 5.36$, $p < .001$). At Step 2, the model was significant, F (10,115) = 9.06, $p < .001$, accounting for 44% of the variance in positive affect. Coping strategies contributed significantly to the prediction of positive affect, $R = .66$, R^2 Change = .17, F Change (2, 115) = 17.59, $p < .001$. Adaptive coping (4%; β = .24, $t = 2.93$, $p = .004$) and maladaptive coping (6%; β = .30, $t = 3.48$, $p = .001$) were both positively associated with the reporting of positive affect. At Step 3, the full model was significant, F (11,114) = 12.69, $p < .001$ and together the predictors accounted for 55% of the variance in positive affect. Benefit finding added a further 11% of explanatory power to the model, which was significant $R = .74$, R^2 Change = .11, F Change (1, 114) = 27.84, $p < .001$; greater benefit finding predicted greater positive affect (β = .41, $t = 5.28$, $p < .001$).

Discussion

The present study explored relationships between illness perceptions, adaptive and maladaptive coping strategies, and benefit finding as predictors, and the illness adjustment outcomes of depression, physical health, life satisfaction, and positive affect as criterion within the context of HCV. Consistent with related chronic disease studies, combined illness perception components, and both adaptive and maladaptive coping strategies made significant contributions in explainable variance across all four adjustment areas (Fortune et al., 2002; Helder et al., 2002; Rutter & Rutter, 2002; Scharloo et al., 2000). Benefit finding predicted depression, life satisfaction and positive affect adjustment outcomes, but not physical health. These results are consistent with the contribution of benefit finding reported in a number of related studies (Helgeson et al., 2006; Littlewood et al., 2008; Park et al., 2009; Tennen et al., 1992)

Personal control, illness identity, illness coherence, and emotional response made unique contributions to the variance in depression scores. These results are consistent with a number of related studies where illness perceptions accounted for significant variance in depression in other chronic diseases (Fortune et al., 2002; Helder et al., 2002; Rutter & Rutter, 2002; Scharloo et al., 2000; Vaughan et al., 2003). Illness identity was the only illness perception component to make a unique contribution to the prediction of physical health outcomes. A number of related studies have found similar associations between increased identification with illness symptoms and decreased physical health (Heijmans, 1999; Helder et al., 2002; Scharloo et al., 2000). For example, Scharloo et al. reported strong negative associations between illness identity and physical health among individuals with psoriasis. Further, personal control made unique and significant contribution to both life satisfaction and life positive affect. These highly significant individual contributions highlight the important associations between the perceived ability to influence life events and well-being, and are consistent with related studies (Rutter & Rutter, 2002; Vaughan et al., 2003). Further, shorter illness duration predicted increased life satisfaction independently of coping and benefit finding. These data are somewhat inconsistent with a number of related chronic disease studies that failed to demonstrate a link between illness timeline and psychological well-being (Fortune et al., 2002; Rutter & Rutter, 2002; Vaughan et al., 2003), and may be related to the unique potential for a treatment cure that potentially exists for HCV that sets it apart from other chronic health conditions where the focus is generally more on longer term management (e.g., multiple sclerosis).

The SRM coping features, maladaptive coping and adaptive coping, were less reliable predictors of physical and psychosocial adjustment outcomes when compared to the illness perception components. Consistent with a number of related studies, increased adoption of maladaptive coping strategies was associated with higher depression (Helder et al., 2002; Rogan et al., 2013; Rutter & Rutter, 2002; Scharloo et al., 2000). Further, greater adoption of maladaptive coping strategies was associated with poorer physical health outcomes. This result is consistent with Fortune et al. (2002) who demonstrated the role of increased behavioural disengagement in contributing to reduced physical health among a cohort of individuals with psoriasis. Interestingly, increased adoption of maladaptive coping strategies predicted increased life satisfaction and increased positive affect. It may be that these results indicate the potential for both adaptive and maladaptive coping strategies to contribute to improved quality of life reflecting the variance that can exist across individuals in terms of perceptions and behaviour. For example, for some individuals adopting more maladaptive coping strategies associated with denial or substance use may

help to suppress unpleasant feelings and emotions associated with their HCV, leading to improved life satisfaction. On the other hand, in the present study adaptive coping strategies were positively and uniquely associated with positive affect which is consistent with other chronic illnesses (e.g., Rutter & Rutter, 2002).

Results concerning the ability of benefit finding to account for variance across physical and psychosocial adjustment were in line with a number of related studies that have reported more inconsistent findings (Helgeson et al., 2006; McMillen & Fisher, 1998; Sears et al., 2003; Tomich & Helgeson, 2004). For example, in the present study, increased benefit finding predicted higher depression after controlling for illness perceptions and coping. Although somewhat counter-intuitive, this result is consistent with McMillen and Fisher who identified links between three benefit finding features (increased compassion, greater positive lifestyle changes, and increased family closeness), and higher depression. The results reported here are consistent with their suggestion that the processes of benefit finding and depression could theoretically and practically occur simultaneously, such that individuals may potentially discover benefits from their experience of chronic disease while continuing to experience decreased mood (McMillen & Fisher, 1998).

Consistent with results reported by Helgeson et al. (2006), benefit finding failed to predict variance in physical health outcomes after controlling for the combined contributions of both illness perceptions and adaptive and maladaptive coping strategies. However, in a related study, Luszczynska et al. (2007) found that increased benefit finding predicted increased physical functioning among a group of women and men diagnosed with HIV. Future research in this area is clearly needed to resolve these conflicting findings. Further, greater benefit finding predicted both increased positive affect and greater life satisfaction. These results are consistent with a number of related studies that have identified the important associations between benefit finding and positive wellbeing (Helgeson et al., 2006; Park et al., 2009; Tennen et al., 1992). For example, Tennen et al. identified the ability of benefit finding to predict increased positive well-being among a cohort of individuals with rheumatoid arthritis.

Although this is the first study to employ features of the SRM and benefit finding as predictors of physical and psychosocial adjustment in individuals diagnosed with HCV there are some limitations that must be noted. First, the use of a cross-sectional design is limited by the fact that the reported relationships might not generalise over time or to other cohorts. Second although the relatively small sample might inflate Type 2 errors it is likely the significant results reported here are clinically meaningful. Third, future research in this area may consider employing more contemporary methods for dealing with missing data (e.g., multiple imputation), which are seen as producing more efficient parameter estimates compared to the more traditional group mean substitution method employed here (Enders, 2006, 2013; Tabachnick & Fidell, 2001).

The results of the present study support the important role of illness perceptions and coping strategies in predicting physical and psychosocial adjustment among individuals with HCV (Fortune et al., 2002; Helder et al., 2002; Rutter & Rutter, 2002; Scharloo et al., 2000). The results reported here also demonstrate the ability of benefit finding to predict psychosocial adjustment outcomes in individuals with HCV. Finally, in clinical practice, previous research has demonstrated the effectiveness of psychological interventions in improving illness-related adjustment among individuals with related chronic illness (Daleboudt, Broadbent, McQueen, & Kaptein, 2013; Goodman, Morrissey, Graham, & Bossingham, 2005). Results reported in the present study confirm the potential effectiveness of psychological interventions that focus on modifying illness perceptions, increasing adaptive coping strategies, and assisting individuals to identify illness related benefits, with the aim of increasing physical and psychosocial adjustment among individuals with HCV.

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