The Self-Regulatory Model In Women With Rheumatoid Arthritis: Relationships Between

Illness Representations, Coping Strategies, And Illness Outcome

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ABSTRACT

Objectives. The self-regulatory model proposes that an individual's cognitive representations of illness threat (illness representations) influence the selection and performance of strategies to cope with that illness (Leventhal, Meyer & Nerenz, 1980). Also implicit in the model is the proposal that such coping strategies influence illness outcomes. These relationships represent a mediational model (Baron & Kenny, 1986). The aim of the present study was to test the hypothesis that coping strategies partially mediate the relationship between illness representations and illness outcome in women with rheumatoid arthritis.

Design and Methods. The study was an observational cross-sectional design. Self-report measures of illness representations, coping strategies, and illness outcome were collected from 125 women with rheumatoid arthritis attending rheumatology outpatient clinics. Clinical measures of disease activity and severity were obtained from hospital records.

Results. Avoidant and resigned coping was found to partially mediate the relationship between symptom identity and the illness outcome measures of disability and psychiatric morbidity. As in other studies, strong relationships were found between illness representations and illness outcome.

Conclusions. The finding that avoidant and resigned coping partially mediated the relationships between the illness representation dimension of symptom identity and two of the illness outcome measures (disability and psychiatric morbidity) provided some support for the hypothesis. However, the hypothesis was not fully supported, as coping did not partially mediate the relationship between any of the other illness representations and illness outcomes.

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In recent decades various psychological models have postulated a range of beliefs and

attributions to be precursors of health behaviour. These include Fishbein's Theory of Reasoned

Action (Fishbein & Ajzen, 1975), Ajzen's Theory of Planned Behaviour (1988), Rosenstock's

Health Belief Model (1974), Levenson's Locus of Control construct (1973), and Bandura's Self-

Efficacy Theory (1977). Such social-cognition models have been used to help identify the

complex processes involved in mediating between disease, pain, disability & adjustment.

However this research has been inconclusive, as none of the individual factors studied have

consistently predicted health and illness behaviours (Turk, Rudy & Salovey, 1986). Marteau

(1993) suggests that this may either be due to inadequacies in the research, or may indicate that

the above theories do not contain the cognitions that predict health behaviour and outcomes. In

the last decade much attention has been directed towards Leventhal's self-regulatory model

(Leventhal et al. 1980) in the hope that this will provide a more complete model of health

behaviour.

An advantage of utilising the self-regulatory model with individuals who are diagnosed

with a chronic illness is the potential to explore sophisticated responses to an illness from a

number of domains. The self-regulatory model proposes that an individual's cognitive

representations of illness threat (illness representations) influence the selection and performance

of strategies to cope with that illness, which in turn influence outcome appraisals (Leventhal et

al., 1980). Also implicit in the model is the proposal that such coping strategies influence illness

outcomes (Leventhal et al., 1980). The model therefore proposes a mediational relationship

exists between illness representations, coping strategies and illness outcome, whereby coping is hypothesised to mediate the relationship between illness representations and illness outcome.

A growing body of research has supported elements of the self-regulatory model, in that illness representations have been found to be associated with coping behaviour (e.g. Moss-Morris, Petrie & Weinman, 1996, Hampson, Glasgow & Toobert, 1990, Hampson, Glasgow & Foster, 1995) as well as having a direct influence on illness outcome (e.g. Moss-Morris et al., 1996). Hagger & Orbell (2003) conducted a meta-analysis of the available empirical tests of the intercorrelations between the components of the model and found significant relationships between some of the illness representations and certain categories of coping strategies, and between certain illness representations and illness outcomes. However, there was no support for the hypothesis that coping strategies mediate the illness representations-illness outcome relationship (e.g. Heijmans, 1999, Scharloo et al., 1998) and no research was available on the role of outcome appraisals, which appears to be relatively untested in the literature (Hagger & Orbell, 2003).

In this study individuals with rheumatoid arthritis were investigated. One of the features of this disease is the relationship with autoimmune functioning (Anderson, Bradley, Young, McDaniel & Wise, 1985), although there is increasing evidence that non-biological factors play an important role in the outcome of rheumatic disease (Pimm, 1997). For example, there are poor relationships between objective measures of disease activity (biochemical markers of autoimmune activity) and severity (radiographic measures of joint damage), pain, and depression (e.g. Dekker, Boot, van der Woude & Bijilsma, 1992, Summers, Haley, Reveille & Alarcon, 1988). Smith, Dobbins and Wallston (1991) found that despite there being a relationship between pain and depression, when pain is controlled for, there is still considerable variation in

psychological adjustment to rheumatoid arthritis - as with similar levels of pain some do better than others.

Within the field of rheumatoid arthritis very few studies have examined the basic elements of the self-regulatory model together– that is, illness representations, coping strategies, outcome appraisals - and related these to each other as well as illness outcome measures. Studies have tended to focus on one or two aspects of the model (e.g. one or more dimension of illness representations) and related these to various illness outcome measures. For example, Schiaffino, Shawaryn & Blum (1998) used the Implicit Models of Illness Questionnaire (IMIQ) to assess components of illness representations. They found significant relationships between several components of illness representations and illness outcome, such as rheumatoid arthritis patients who believed their illness to be curable, and that they were somehow to blame for their illness, reported higher levels of depression. Other evidence that illness representations are related to various illness outcome measures in rheumatoid arthritis includes the following studies, Pimm, Byron & Curson, (as cited in Pimm, 1997), Affleck, Pfeiffer, Tennen and Fifield (1987a) and Affleck, Tennen, Pfeiffer & Fifield (1987b).

There is also evidence that some coping strategies are related to illness outcomes. For example, in their extensive review of coping with arthritis, Manne & Zautra (1992) concluded that the use of passive coping strategies were associated with greater emotional distress and the use of active coping strategies were associated, albeit less consistently, with less emotional distress. The only rheumatoid arthritis study that examined the five dimensions of illness representations as well as coping strategies and illness outcomes found that although there was a significant impact of illness representations on illness outcomes, there was very little impact of illness representations on coping strategies (Scharloo et al., 1998).

Given that Scharloo et al.'s (1998) study was, to our knowledge, the only rheumatoid arthritis study to investigate the hypothesis that coping mediates the illness representation - illness outcome relationship and that the hypothesis was not supported, it was deemed appropriate to re-examine the self-regulatory model with another sample of patients with rheumatoid arthritis. It was hoped that this would help provide clarity for professionals and patients about optimal ways to manage disease processes in rheumatoid arthritis by determining which self-regulation processes are related to the best illness outcomes, as well as re-testing the hypothesis that coping mediates the illness representation – illness outcome relationship. Thus the aim of the present study was to test the hypothesis that coping strategies mediate the relationship between illness representations and illness outcome in women with rheumatoid arthritis.

Method

Participants and Procedure

The sample was drawn from a population of female patients attending three outpatient rheumatology clinics in an NHS region. The area is relatively affluent, white and middle class. To fit the entry criteria patients were required to have a diagnosis of rheumatoid arthritis. A total of 200 questionnaires were consecutively given to patients who fitted the criteria. One hundred and twenty-five of these patients chose to participate in the study by returning the questionnaires. It is thought that the reasonably high non-response rate may have been due to patients having difficulty filling in a questionnaire as a result of their arthritis. Following data screening procedures (described in the results section), six participants were excluded from the study for failing to meet the entry criteria, and cases with more than 10 missing responses across the

questionnaire were deleted from all further analyses. The final sample consisted of 106 women with rheumatoid arthritis. Demographic information is presented in Table 1.

The study had a cross-sectional design. Ethical clearance was obtained from the relevant Health Authority's Ethics Committee prior to the commencement of the study. Patients who attended the rheumatology clinic, and who were eligible to take part in the study, were given an information sheet and a booklet of questionnaires to be completed and returned in a prepaid envelope. Information about clinical measures of the disease was obtained from consenting participants' files by the consultant rheumatologist.

Outcome Measures

Psychiatric disorder. Participants' mental health was measured using the General Health Questionnaire – 12 (GHQ-12, Goldberg, 1992). This instrument has satisfactory reliability and is claimed to be the best-validated self-administered measure for detecting psychiatric morbidity in a British population (Johnston, Wright & Weinman, 1995). The validity and reliability of the GHQ-12 is equivalent to the full version of the GHQ (GHQ-60), but it does not include symptoms of physical illness and as such it has been widely used in studies with people with chronic illness (Johnston et al., 1995). The GHQ-12 was scored according to GHQ scoring as described by Goldberg (1992). Due to typographical errors in two of the questions on the GHQ-12, the responses to questions 3 and 5 were not included in the analysis. The scores from the remaining ten questions were summed, divided by ten and multiplied by twelve to derive the total GHQ score. The Cronbach Alpha internal reliability/consistency coefficient for the GHQ-12 without questions 3 and 5 was $\alpha = 0.87$.

Physical Functioning. The modified Stanford Health Assessment Questionnaire (HAQ; Kirwan & Reeback, 1986), adapted for use in the UK, was used as a measure of physical

functioning. Studies have shown that data from the HAQ are as effective as any available

clinical measure in predicting functional disability (Pincus, Swearingen & Wolfe, 1999) and the

scale has been extensively used in studies of rheumatoid arthritis. The scale covers performance

of daily activities including dressing, grooming, walking, hygiene, arising, eating and reaching.

The HAQ was scored applying the same method as used by Pincus et al. (1999).

   Pain. Pain was measured using a standard 10cm horizontal Visual Analogue Scale

(VAS) anchored by 'no pain' and 'pain as bad as it could be'. The VAS for pain has established

reliability and validity (Huskisson, 1983). This method of assessing pain is the most widely

used, and scores correlate with Melzack's McGill Pain Questionnaire (American College of

Rheumatology, Dictionary of the Rheumatic Diseases, Vol III, 1988).

Other Measures

   Basic demographic and educational information. The questionnaire assessed basic

demographic and educational information (e.g. age, occupation, age at leaving school, ethnic

group, and illness duration). The question regarding ethnic group was the same as that used in

the 1991 Census of Population (HMSO, 1991).

   Clinical Measures of Disease. Clinical measures of rheumatoid arthritis included

erythrocyte sedimentation rate (ESR), number of present second line agents (including steroids)

and surgical intervention.

   Illness Representations. Illness representations were assessed using the Illness

Perceptions Questionnaire (IPQ; Weinman, Petrie, Moss-Morris & Horne 1996). This

questionnaire is claimed to have good reliability and validity (Weinman et al., 1996) and has

been widely used in studies with people with chronic illness. The questionnaire was scored as

described by Weinman et al. (1996). The Cronbach Alpha internal consistency coefficients for

each dimension were as follows: Symptom Identity $\alpha = 0.73$; Cause $\alpha = 0.56$; Time-line $\alpha =$ 0.88; Consequences $\alpha = 0.74$; Controllability $\alpha = 0.65$. The IPQ dimension 'cause' was not used in the study as it was below the usually accepted minimum Cronbach Alpha score of $\alpha = 0.70$. The Controllability measure was retained for analysis despite its poor reliability as control beliefs are consistently found to be important in predicting health behaviours.

Coping. The coping strategies of participants were measured using the London Coping with Rheumatoid Arthritis Questionnaire (Newman, Fitzpatrick, Lamb & Shipley, 1990). The questionnaire has 36 items and has been designed specifically for rheumatoid arthritis populations. It was developed from interviews with people with rheumatoid arthritis, existing coping checklists and specific strategies suggested by health care staff. Each item is scored from 1(never) to 6 (always) according to how often a particular coping strategy is used. Newman et al. analysed their data using cluster analysis methods, which grouped together people with similar coping patterns. They chose this method as it does not prejudge the benefit (or otherwise) of certain coping strategies, and it also considers the overall pattern of responses. The present study attempted to use cluster analysis methods for these reasons. However, as described and explained in the results section below, factor analytic methods (technically Principal Components Analyses) were subsequently used to interpret the questionnaire.

Results

The analysis proceeds first to establish the properties of the coping measure, then to establish relationships between illness perceptions and coping strategies, and finally to formal tests of the mediation hypotheses. Prior to analysis, variables were examined through various SPSS programs for accuracy of data entry, missing values, and fit between their distributions and

assumptions of parametric analysis. Participants with more than 10 missing responses across the questionnaire were deleted listwise. Remaining cases with missing data were deleted on a pairwise basis.

Interpreting the London Coping with Rheumatoid Arthritis Questionnaire

Factor analytic methods, comprising of Principal Components Analysis with oblique rotation, were used to identify subsets of coping strategies thought to reflect underlying processes (Tabachnick & Fidell, 1996). The Scree plots were examined in order to determine the number of components to be extracted. The pattern matrix for the analysis is shown in Table 2.

Items loading highly (> 0.4) on each component were assessed to see if they would form simple composite scales. The Cronbach Alpha internal consistency coefficients for each are as follows; - active and information seeking (FI), $\alpha = .77$; avoidant and resigned (FII), $\alpha = .71$; cognitive strategies and internalising (FIII), $\alpha = .72$; faith (FIV), $\alpha = .80$; diet (FV), $\alpha = .73$; rest (FVI), $\alpha = .67$; and emotional expression (FVII), $\alpha = .61$. The reliability of the emotional expression scale is lower than desirable but is included in subsequent analyses as emotional expression is clearly an important coping strategy.

Relationships between Illness Representations, Coping Strategies, Illness Outcome and Clinical Measures of the Disease

Table 3 shows the correlations between variables. There were no significant[1] relationships between any of the illness representations and clinical measures of the disease (erythrocyte sedimentation rate, surgery and the number of present second line agents) or between clinical measures of the disease and any of the illness outcome measures. However,

significant relationships were found between Symptom identity which was positively correlated with psychiatric morbidity (r = .46, p < 0.001), disability (r = .60, p < 0.001), and pain (r = .38, p < 0.001). Perceiving the illness to be long term was positively correlated with disability (r = .34, p < 0.001). Perceiving the illness to have serious consequences was positively correlated with psychiatric morbidity (r = .41, p <0.001) and disability (r = .48, p < 0.001). Perceiving the illness to be controllable was negatively correlated with pain (r = -.35, p < 0.001). Avoidant and resigned coping was positively correlated with psychiatric morbidity (r = .38, p <0.001), and disability (r = .34, p < 0.001).

Results of Mediation Tests

In order to establish that mediation exists between illness representations and coping strategies in relation to outcome measures, Baron and Kenny (1986) state that the following conditions must be met. First that the predictor variable must be related to the potential mediator; second that the predictor variable must be related to the outcome variable; thirdly that the potential mediator must be related to the outcome variable; and finally that the effect of the independent/predictor variable must be less strong in the third analysis than in the second.

The correlation between illness representations and coping strategies and illness representations and illness outcome measures was examined. An arbitrary cut-off point of r = 0.3 was implemented so that only those variables that explained at least 9% of the variance were included in further analyses. After applying this cut-off criterion, there were no substantial relationships between any of the illness representations and the coping strategies of faith, rest, active and information seeking, and diet.

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[1] Due to the number of correlations being performed, a Bonferroni correction was applied to reduce the possibility of a Type I error, so that the null hypothesis was rejected if p=<0.0002.

Multiple regression analyses revealed only two instances where the third condition of mediation was met, as can be seen in Table 4. The standardised beta weights for the independent variable were compared with and without the presence of the mediator to check that the fourth condition of mediation was also satisfied.

The hypothesis that coping partially mediates the relationship between illness representation and illness outcome was only accepted in the following cases that met the four criteria for mediation. Avoidant and resigned coping partially mediated the relationship between symptom identity and disability and Avoidant and resigned coping partially mediated the relationship between symptom identity and psychiatric morbidity. The hypothesis was rejected for all remaining combinations of the variables.

Discussion

Many of the present findings provide further support for the Self-Regulatory Model. Four of the five illness representations measured were significantly correlated with at least one of the illness outcome measures. The strong relationship between illness representations and illness outcome supports the findings of similar research in the field of rheumatoid arthritis and other forms of chronic illness (e.g. Scharloo et al., 1998, Moss-Morris et al., 1996). One explanation for the strong link between illness representations and illness outcome is that individuals' illness representations are an accurate reflection of the nature of the illness. Those with more negative illness representations would be expected to be in greater pain, have higher levels of disability and suffer increased psychiatric morbidity because their illness was more active and severe. However, this explanation is not supported by the findings of many studies, including the present one, which have shown poor relationships between objective measures of disease

activity/severity and illness outcome (e.g. Dekker et al., 1992, Summers et al., 1988). In addition, this study found that there was no significant correlation between clinical measures of disease activity/severity and illness representations, which might suggest that individuals' representations of the illness are not simply a reflection of the current status of the illness.

Another explanation for the link between illness representations and illness outcome is that illness representations lead to the performance of certain coping strategies, which in turn influence illness outcome. This explanation would be consistent with the self-regulatory model, but it is not supported by the results of this study, as most illness representations were not strongly related to coping strategies and most coping strategies were not strongly related to illness outcome. Similarly, Scharloo et al. (1998) found no evidence to support the claim that coping is a mediating factor between illness representations and illness outcome in rheumatoid arthritis. An alternative, and more straightforward, explanation for the consistently demonstrated link between illness representations and certain illness outcome measures is that maladaptive perceptions of the illness result in greater depression, pain and disability.

Mediational Role of Avoidant and Resigned Coping

The self-regulatory model implies that coping acts as a mediator between illness representations and illness outcome (Leventhal et al., 1980). The results of this study only supported a mediational role for one of the coping strategies, avoidant and resigned coping, which was found to mediate, and then only partially, the relationship between symptom identity and the illness outcome measures of disability and psychiatric morbidity. It is possible that focusing on the symptoms of the illness makes people feel more self-conscious and different, whereby they engage in more avoidant and resigned forms of coping that result in social isolation and reduced levels of enjoyable activity, thus impacting negatively on illness outcome.

Many combinations of illness representations and coping strategies were excluded for failing to meet the first criteria of mediation. If there were indeed weak relationships between illness representations and coping strategies, this would contradict one of the fundamental claims of the self-regulatory model. However, this study needs to be seen in the context of previous research into the self-regulatory model within other fields of chronic illness, which would suggest otherwise (e.g. Hampson et al., 1990, Hampson et al., 1994, Hampson et al. 1995, Moss-Morris, 1997). It is possible that the failure of this study to find a strong relationship between illness representations and coping was due to limitations in the measure used to assess coping.

The London Coping with Rheumatoid Arthritis Questionnaire was chosen for use in this study because it is one of the few coping measures that has been specifically designed for use with the rheumatoid arthritis population and it covers a broad range of coping strategies. Since the measure is not adequately specific this may have distorted the relationship between illness representations and coping. For example, rest could be a positive coping strategy in the context of pacing activity, whilst in other circumstances it could be the result of an excessive and damaging burst of activity. In addition, although the current study identified the questionnaire to have seven reasonably coherent coping processes each with adequate internal reliability (with the possible exception of emotional expression), further research using larger samples and different populations is needed in order to examine the stability of these components. If the same or similar components emerged, and were related to other variables (e.g. illness outcome), the questionnaire would have more clinical utility than at present. However, if future studies showed that the factor analytic approach does not yield meaningful results, further research would be needed to develop a sufficiently specific, sensitive and psychometrically sound coping measure that is applicable to rheumatoid arthritis. Such a tool would have utility in assessment and in the evaluation of treatment, as well as for research purposes.

As in studies of other illnesses (e.g. Hampson, Glasgow, Zeiss, Birskowich, Foster & Lines, 1993), it may have been more fruitful to focus on specific self-management behaviours as opposed to generalized coping. In addition, there has recently been much debate about the lack of progress in coping research because it is largely based on cross-sectional studies (Coyne & Racioppo, 2000, Lazarus, 2000). Despite differences in the interpretation of the current state of research in the field of coping, both Coyne and Racioppo (2000) and Lazarus (2000) agree the need for prospective examinations of the day-to day interplay between various types of coping and illness outcomes. Coyne and Racioppo (2000) advocate the use of behavioural observation, experience sampling and structured daily diaries. Prospective studies of daily coping with rheumatoid arthritis by Tennen, Affleck, Armeli and Carney (2000) have showed the importance of examining the use of different combinations of coping strategies as well as how coping varies over time. They found that when peoples' daily efforts (problem-focused) to directly influence the pain were unsuccessful, the next day they tried harder to adjust emotionally (emotion-focused). Tennen et al. (2000) point out that these associations cannot be ascertained through cross-sectional or even multi-wave longitudinal designs.

Although Tennen et al. (2000) conducted a prospective study, Coyne and Racioppo (2000) acknowledge the practical limitations that would inhibit the use of prospective methods for many researchers. Until technological advances have overcome some of these limitations, it has been suggested by Cox & Ferguson (as cited in Ferguson & Cox, 1997) that it may be helpful for researchers to draw from transactional literature shifting the emphasis from what the individual does, to what the behaviours do (psychologically) for the individual.

From the results of this study, it was anticipated that it would be possible to identify coping strategies that are related to positive as well as negative illness outcome. The clinical utility of this would have been to focus treatment on increasing helpful coping strategies, rather

than focusing treatment on what people are "doing wrong". For example, it was hoped to replicate Newman et al.'s (1990) study where the use of active coping strategies, such as maintenance of activities, was associated with less emotional distress, pain, stiffness and disability, and to additionally determine which illness representations were associated with this form of coping. However, all but one of the coping strategies were not significantly related to illness outcome in this study. This lack of association fails to support the hypothesis that coping mediates the relationship between illness representations and outcome.

While it is possible that the weak relationship is due to limitations in the coping measure, an alternative explanation for the lack of relationship between coping strategies and illness outcome may be that there is no relationship between coping and illness outcome in rheumatoid arthritis. The condition remains progressive and incurable with an uncertain prognosis, and the application of self-management strategies does not lead to an automatic improvement in the same way as would be expected in other forms of chronic illness (such as a reduction in symptoms of hypoglycaemia following insulin injection). The fact that this study did not replicate Newman et al.'s (1990) findings is consistent with other rheumatoid arthritis literature where an association between active coping strategies and better illness outcome has been less consistently observed (Pimm, 1997). In addition, the tendency for most individuals with rheumatoid arthritis to adopt a range of all of the coping strategies (Newman et al., 1990) may 'dilute' the effect of those strategies that are correlated with positive illness outcome. Controlled empirical studies are needed to determine whether certain coping strategies do indeed lead to more positive illness outcome. So far research in this field is restricted to the influence of self-management techniques on self-efficacy and positive affect (e.g. Barlow, Williams & Wright, 1997b).

Limitations of the Present Study

As the design of the study was cross-sectional it was not possible to determine the direction of causality in the relationships between illness representations, coping strategies, and illness outcome. Within the field of rheumatoid arthritis, experimental and longitudinal studies are much needed in order to examine the direction of causality in the relationships between self-regulatory variables. For example, if illness representations were targeted for change in a controlled treatment trial, it would be possible to detect the influence of such changes on coping strategies and illness outcome. This would also show whether illness representations were open to change, and whether such change could have a positive effect. However, as Leventhal et al. (1997) propose that self-regulation is a dynamic process, it is unlikely that the relationship is unidirectional. Therefore, longitudinal studies would also be needed to show how illness representations, appraisals and coping strategies interact and change over time during the adaptation to an unpredictable and progressive rheumatic disease (Pimm, 1997).

The study can also be criticised for failing to include outcome appraisals. Leventhal et al. (1980) viewed outcome appraisals as an important element of the self-regulatory model and yet they appear to be absent in much of the self-regulatory research. The role of appraisals is to provide an evaluation of the efficacy of behaviours adopted to cope with the illness *after* the coping behaviours have been adopted. It is difficult to examine a temporal relationship of this kind using cross-sectional methods, which is perhaps one reason why they have been inadequately examined to date. Prospective studies that examine the role of outcome appraisals in the self-regulatory process are urgently needed.

Conclusions

The results of the present study confirmed the findings of similar research in the field of chronic illness, as there was a strong relationship between illness representations and illness

outcome. Despite the large number of studies, including the present one, that have found such a strong relationship between illness representations and illness outcome, we speculate that illness representations are not being directly assessed in many clinical settings. If interventions aimed at identifying and altering unhelpful illness representations were devised, their implementation might result in more positive illness outcomes. For example, with regards to symptom identity, one approach may be to educate people concerning symptoms they experience that may not be directly caused by rheumatoid arthritis (e.g. headaches).

The finding that there were no significant correlations between clinical measures of disease activity/severity and illness representations is of interest to rheumatologists as it implies that traditional methods of measuring disease activity and severity may have little connection with patients own experiences or perception of their illness.

The hypothesis implied in the self-regulatory model, that coping acts as a mediator between illness representations and illness outcome, was also examined. The results provide evidence for partial mediation for one of the seven coping strategies (avoidant and resigned coping), which was found to mediate the relationship between symptom identity and the illness outcome measures of disability and psychiatric morbidity. This finding is also of clinical utility. Avoidant and resigned coping can be seen as similar to passive coping, and many studies have shown that passive coping is associated with worse illness outcome, such as greater emotional distress (Manne & Zautra, 1992), and pain (Covic, Adamson & Hough, 2000). However, the definition of 'passive coping' in the literature ranges from 'the degree of external control the individual relies on', to a combination of strategies including sleeping, self-blame, wishful thinking, and restriction of daily activities. Avoidant and resigned coping is more specific than many of the definitions of passive coping and is potentially more clinically useful, as it should be easier to identify and is a tangible behaviour with which to begin psychological work. Treatment

programmes could focus on the identification of such forms of coping as a "way in", before

proceeding to address the illness representations that may be responsible for the selection and use

of such coping strategies. For example, helping people to identify why they avoid situations, and

the effects of coping in this way, may relate better to people's own experiences than general

education aimed at altering illness representations. Research is now needed to examine the role

of avoidance further, and to set up behavioural experiments as a way of challenging unhelpful

illness representations that may result in such forms of coping.

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Table 1.

Participant Characteristics

Variable		Mean	Percentage	Standard Deviation	Range
Age (yrs):		58.4	-	12.6	27-86
Ethnicity:	White (%):	-	98	-	-
	Chinese (%):	-	1	-	-
	Indian (%):	-	1	-	-
Employment:	Skilled (%):	-	21.7	-	-
	Semi-skilled (%):	-	40.6	-	-
	Unskilled (%):	-	37.7	-	-
Age at Leaving School (yrs):		15.9	-	1.4	14-19
Duration of disease (yrs):		-	17.5	11.7	0.5-58
Rheumatoid Factor:	Positive (%)	-	79.8	-	-
	Negative (%)	-	20.2	-	-
Erythrocyte Sedimentation Rate (ESR):		32.5	-	20.7	4-110
Number of Present Second Line Agents:		1.4	-	0.8	0-3
Number of Total Second Line Agents:		3	-	1.6	0-8

Surgical Intervention	Yes (%):	-	46.5	-	-
	No (%):	-	53.5	-	
	-				
Disability Index HAQ:		1.34	-	0.6	0-3
Pain:		5.1	-	2.7	1-10
GHQ (Adjusted):		2.9	-	3.3	0-12

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Note. HAQ = Health Assessment Questionnaire; GHQ = General Health Questionnaire, N = 106

Table 2.

Pattern Matrix for Principle Components Analysis Identifying Seven Subsets of Coping

Strategies

Component	I	II	III	IV	V	VI	VII
Coping Procedure							

Active & Information Seeking

	I	II	III	IV	V	VI	VII
'I try to find as much information as possible'	*0.81*	0.05	0.03	0.04	-0.13	0.14	0.02
'I try to read books or articles about my illness'	*0.80*	0.05	-0.01	0.11	-0.13	0.12	-0.04
'I ask questions of my doctor about the illness'	*0.70*	0.16	-0.08	-0.09	0.18	0.05	0.00
'I walk as much as I can in order to stay active'	*0.56*	-0.07	0.37	-0.09	0.05	-0.05	-0.01
'I try to stay as active as possible'	*0.44*	-0.27	0.18	0.17	-0.04	-0.18	0.06
'I try to exercise the joints as much as possible'	*0.40*	-0.17	0.19	-0.18	-0.23	-0.00	-0.09
'I try to become involved in as many activities as possible to take my mind off the problems of the disease'	0.33	-0.15	0.17	-0.04	-0.28	-0.15	0.16

Avoidant & Resigned

'I take the view that there is very little anyone can do about the disease'	-0.03	*0.75*	0.05	0.00	0.07	-0.02	-0.08
'I find myself wishing that I never had arthritis'	0.09	*0.64*	0.04	0.04	-0.07	-0.06	0.20
'My arthritis can make me self-conscious, so that I avoid people'	-0.01	*0.60*	-0.01	0.02	-0.16	0.18	-0.08
'When I'm in pain I prefer to be alone'	0.01	*0.60*	0.12	-0.22	0.05	0.31	-0.17
'I try to avoid situations where my arthritis would become evident'	0.03	*0.43*	0.14	0.00	-0.21	0.18	0.18

Cognitive Strategies & Internalising

'I tell myself that the pain doesn't really hurt'	0.05	0.15	*0.70*	-0.05	0.11	0.05	-0.08
'I tell myself not to think about my arthritis'	-0.02	0.17	*0.70*	0.09	-0.00	-0.16	0.01
'I try to ignore the problem by looking at the good things in life'	0.14	-0.02	*0.61*	-0.01	0.07	0.02	0.06
'I tell myself that my arthritis is not really that bad'	0.01	-0.29	*0.57*	-0.20	0.02	-0.17	0.07
'I keep my pain to myself, so few of	-0.07	-0.05	*0.51*	0.17	-0.09	0.28	*-0.49*

my friends know I'm in pain'

'I keep any worries I may have to myself'	-0.11	0.12	*0.50*	0.04	0.01	0.14	*-0.44*

Faith

'I pray to God for relief from the arthritis'	-0.00	0.28	-0.09	*-0.87*	-0.08	-0.20	0.07
'Having rheumatoid arthritis has helped me to find new faith or some important truth about my life'	-0.05	-0.26	0.08	*-0.85*	-0.02	0.14	0.01
'I pray to God that the pain will get better someday'	0.14	0.41	-0.05	*-0.70*	-0.04	-0.26	0.04

Diet

'There are some things I avoid eating or drinking because of my arthritis'	-0.06	0.02	-0.12	0.08	*-0.83*	-0.00	0.07
'There are some special things I buy to eat or drink because of my arthritis'	-0.03	0.04	0.06	0.13	*-0.79*	-0.01	0.05
'I try to keep my weight down because of my arthritis'	0.01	0.08	-0.11	-0.18	*-0.68*	-0.07	-0.27

Rest

'I try to rest as much as possible'	0.04	0.08	0.03	0.03	0.02	*0.80*	0.06
'Resting at times during the day helps me cope'	0.20	0.01	-0.10	0.02	-0.09	*0.75*	-0.01
Emotional Expression							
'I find talking with friends and family about the problem helpful'	*0.54*	0.03	-0.20	-0.05	0.21	0.06	*0.50*
'I find it easier to cope with my arthritis by expressing my feelings outwardly'	0.14	-0.17	-0.09	-0.11	0.02	0.00	*0.77*
'When it gets bad I find myself taking it out on others'	-0.19	0.36	0.26	-0.02	-0.09	0.07	*0.56*
'If other people are sympathetic it helps me cope'	0.13	-0.07	-0.06	-0.08	-2.00	0.13	*0.47*

Note. Loadings greater than 0.4 are shown in italics.

Table 3.

Correlations Among Illness Representations, Coping Strategies, Illness Outcome Measures, and Clinical Measures of Rheumatoid Arthritis

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Variable

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Variable	1	2	3	4	5	6	7	8	9
1.Symptom identity									
2.Number of causes	.30*								
3. Time Line	.31*	-.60							
4. Consequences	.52**	.21	.57**						
5. Controllability	-.23	-.04	-.24	-.23					
6. Emotional Expression	.24	.34*	.06	.30*	.06				
7. Cognitive Strategies & Internalising	-.10	-.06	-.03	-.15	-.04	-.23			
8. Faith	.19	.09	-.10	-.01	-.09	.19	-.00		
9. Rest	.21	.18	.17	.24	.05	.19	-.00	.10	

10. Active & Information Seeking	.05	-.04	.01	.05	.22	.31*	.21	.16	.08
11. Avoidant & Resigned	.31*	.21	.28*	.53**	-.51**	.13	.09	.15	.31*
12. Diet	.23	.12	.02	.12	.14	.07	.01	.15	.15
13. Psychiatric Morbidity	.46**	.29*	.23	.41**	-.12	.14	-.05	.23	.21
14. Disability Index	.60**	.20	.34*	.48**	-.32*	.07	-.12	.19	.21
15. Pain	.38**	.15	.25*	.26*	-.35*	.17	-.12	.22	.10
16. Surgery	.17	.07	.20	.14	-.03	-.18	.16	-.07	.09
17. Number of present 2nd Line Agents	.01	.18	.07	.06	-.01	.18	.11	-.06	.00
18. Erythrocite sedimentation Rate	.07	-.03	.19	.13	-.15	-.06	.05	.00	.05

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Variable

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Variable	10	11	12	13	14	15	16	17
1.Symptom identity								
2.Number of causes								
3. Time Line								
4. Consequences								
5. Controllability								
6. Emotional Expression								
7. Cognitive Strategies& Internalising								
8. Faith								
9. Rest								
10. Active & Information Seeking								
11. Avoidant & Resigned	-.04							
12. Diet	.14	.16						

13. Psychiatric Morbidity	-.04	.38**	.19					
14. Disability Index	-.15	.34*	.14	.36**				
15. Pain	-.01	.29*	.05	.33*	.47**			
16. Surgery	-.13	.13	-.05	.12	.26*	.05		
17. Number of present 2nd Line Agents	.22	.00	-.10	.15	-.09	.01	-.14	
18. Erythrocite sedimentation Rate	-.12	.07	.12	.02	.29*	.19	.10	-.20

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Note. * p <0.01 (2-tailed), **p <0.0002 (2-tailed), Variables: - 1-5 = Illness Representations, 6-12 = Coping Strategies, 13-15 = Illness

Outcomes, 16-18 = Clinical Measures of Disease

Table 4.

Multiple Regression Analyses Testing the Third Condition of Mediation

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Variable: 1 Dependent Variable 2 Independent Variable 3 Potential Mediator	Adjusted R Squared	F	Standardised Beta (Beta without mediator)	p value
1) Disability:				
2) Symptom Identity	-	-	0.54 (0.59)	0.000
3) Avoidant and Resigned	-	-	0.17	0.051
*Total equation:	0.36	30.00	-	-
1) Disability:				
2) Perceived Consequences	-	-	0.45 (0.48)	0.000
3) Avoidant and Resigned	-	-	0.10	0.326

Total equation:	0.22	15.81	-	-

1) Disability:

2) Perceived Consequences	-	-	0.50 (0.48)	0.000
3) Emotional Expression	-	-	-0.01	0.548
Total equation:	0.22	15.15	-	-

1) Pain:

2) Symptom Identity	-	-	0.32 (0.39)	0.001
3) Avoidant and Resigned	-	-	0.19	0.048
Total equation:	0.17	11.31	-	-

1) Pain:

2) Perceived Controllability	-	-	-0.29 (-0.36)	0.008
3) Avoidant and Resigned	-	-	0.14	0.200
Total equation:	0.12	8.26	-	-

1) Psychiatric Morbidity:

2) Symptom Identity	-	-	0.35 (0.43)	0.000
3) Avoidant and Resigned	-	-	0.27	0.005
*Total equation:	0.23	16.03	-	-

1) Psychiatric Morbidity:

2) Perceived Consequences	-	-	0.29 (0.39)	0.01
3) Avoidant and Resigned	-	-	0.18	0.103
Total equation:	0.16	10.24	-	-

1) Psychiatric Morbidity:

2) Perceived Consequences	-	-	0.37 (0.39)	0.000
3) Emotional Expression	-	-	0.05	0.627
Total equation:	0.13	8.19	-	-

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Note. Figures in parentheses are the beta weights for the independent variable in the absence of the mediating variable

* Indicates the equations for which the third condition of mediation was met