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ILLNESS BELIEFS AND TREATMENT OUTCOME IN CHRONIC FATIGUE SYNDROME

ALICIA DEALE, TRUDIE CHALDER and SIMON WESSELY

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Abstract—Longitudinal studies have shown that physical illness attributions are associated with poor prognosis in chronic fatigue syndrome (CFS). Speculation exists over whether such attributions influence treatment outcome. This study reports the effect of illness beliefs on outcome in a randomized controlled trial of cognitive-behavior therapy versus relaxation. Causal attributions and beliefs about exercise, activity, and rest were recorded before and after treatment in 60 CFS patients recruited to the trial. Physical illness attributions were widespread, did not change with treatment, and were not associated with poor outcome in either the cognitive-behavior therapy group or the control group. Beliefs about avoidance of exercise and activity changed in the cognitive behavior therapy group, but not in the control group. This change was associated with improved outcome. These findings suggest that physical illness attributions are less important in determining outcome (at least in treatment studies) than has been previously thought. In this study, good outcome is associated with change in avoidance behavior, and related beliefs, rather than causal attributions. © 1998 Elsevier Science Inc.

Keywords: Chronic fatigue syndrome; Cognitive behavior therapy; Attributions; Illness beliefs; Avoidance; Outcome.

INTRODUCTION

Chronic fatigue syndrome (CFS) is a disabling condition of unknown origin. Despite medical uncertainty over cause, most CFS sufferers seen in specialist clinics believe themselves to have a physical illness caused by a virus [1–9]. Such attributions are of interest because they have been associated with poor prognosis in several longitudinal and naturalistic studies of CFS [7–10].

If physical illness attributions are associated with worse outcome, there may be a case for altering physical illness attributions through treatments such as cognitive-behavioral therapy [9]. A randomized, controlled trial, which found brief graded activity to be ineffective for CFS [11] has been criticized for failing to challenge physical illness attributions [12]. In contrast, another randomized, controlled trial found CBT (cognitive restructuring with graded activity) to be superior to standard medical care [13]. The efficacy of treatment in this study was ascribed to its emphasis on reevaluating illness beliefs. Others have questioned this interpretation, arguing that the attributions of patients in the study did not actually *change* substantially, and the essential therapeutic ingredient was altering avoidance behavior [14].

Department of Psychological Medicine, Kings College Hospital, and Institute of Psychiatry, London, UK.

Address correspondence to: Alicia Deale, Department of Psychological Medicine, Kings College Hospital, Denmark Hill, London SE5 9RS, UK. Tel: 0171-346-3181; Fax: 0171-346-3226.

This study reports the role of physical illness attributions and beliefs about avoidance of exertion in outcome for CFS patients enrolled in a randomized, controlled trial of CBT versus relaxation [15]. The hypotheses were that: (a) physical illness attributions would not change with treatment, and would not affect outcome; (b) beliefs about avoidance would change more in the CBT group than in the control group, and such changes would be associated with good outcome.

METHOD

Subjects and procedures

Sixty patients attending a fatigue clinic who met criteria for CFS [16, 17] were randomized to 13 sessions of either CBT or a control treatment of relaxation (30 patients per group). Twenty-seven CBT patients and 26 relaxation patients completed treatment, and were followed-up for 6 months after treatment ended. Subjects were typical of CFS patients seen in specialist settings, with long illness duration, marked fatigue, and disability. Full details of the trial have been published elsewhere [15].

The CBT group received a program of planned, graded activity and rest. Causal attributions were not challenged, but a distinction was drawn between precipitating and perpetuating factors. Beliefs about avoidance of exercise and activity were challenged, both in discussion, and through the graded activity program. The control group received a course of relaxation exercises. Causal attributions and illness beliefs were not challenged or discussed in detail.

Treatment outcome

In the main outcome study, a battery of reliable, valid measures of functional impairment, fatigue, and mood were given [15]. The main determinant of outcome was change in the primary outcome measure (the Medical Outcomes Survey physical functioning scale 18) at 6-month follow-up. Patients were categorized as improved or unimproved if they scored over 83 on this scale (ability to carry out moderate activities such as walking, carrying groceries, or bowling without limitations) or increased their pretreatment score by 50 points or more.

At 6-month follow-up, 19 (70%) CBT patients improved using the aforementioned criteria, compared with 5 (19%) relaxation patients ($\chi^2 11.9$, $df=1$, $p<0.001$). Improved patients showed significant reductions in fatigue symptoms and fatigue severity. Between-group comparisons on secondary outcome measures showed that CBT was superior to relaxation in improving functional impairment and fatigue, but not mood (which improved similarly in both groups). Improvements were maintained (and increased) at 6-month follow-up.

Measures of causal attributions and beliefs

Causal attributions and beliefs about activity were measured at pretreatment (immediately after randomization) and posttreatment. The measure used was a brief questionnaire. It included an open-ended question about cause, "What do you think caused your illness?," together with four statements about exercise and activity reduction, which patients were asked to rate on a four-option scale from strongly agree to strongly disagree.

Analysis

As the data gathered were nominal, nonparametric statistics were used. The McNemar test was used to examine within-group changes. Between-group comparisons and relationships between variables were tested using the chi-square test (reported with continuity correction, or Fisher's exact test as appropriate). All statistical tests were two-tailed.

RESULTS

Causal attributions before and after treatment

Answers to the open-ended question, "What do you think caused your illness?" were grouped into the categories shown in Table I. At pre- and posttreatment, around three-fourths of the entire group held physical illness attributions. Some cited a viral illness alone; others cited a virus combined with other factors: failure to rest, stress, overwork, overactivity, and/or lifestyle. One tenth of the group attrib-

Table I.—Causal attributions pre- and posttreatment by group

	CBT		Relaxation	
	Pre- (n = 30)	Post- (n = 27)	Pre- (n = 30)	Post- (n = 26)
Virus	9 (30%)	6 (22%)	14 (47%)	12 (46%)
Virus and failure to rest/ stress/overactivity/lifestyle ^a	14 (47%)	14 (52%)	6 (20%)	9 (35%)
Stress/lifestyle factors alone	2 (7%)	2 (7%)	4 (13%)	2 (8%)
No cause given	5 (16%)	5 (19%)	6 (20%)	3 (12%)

^a Difference between groups at pretreatment: χ^2 3.67, $df = 1$, $p = 0.06$.

uted their illness to stress, overactivity, or lifestyle alone. One fifth either did not know, or had no fixed views as to the cause.

At pretreatment, there was a trend for more CBT than relaxation patients to attribute their condition to a virus combined with nonphysical factors ($p < 0.06$). No other differences were found between causal attributions in CBT and relaxation groups either before or after treatment. There were no significant changes in causal attributions in either group between pre- and posttreatment.

Physical illness attributions and treatment outcome

No significant associations were found between causal attributions (whether measured at pretreatment or posttreatment) and improvement at 6-month follow-up. Physical illness attributions (alone and/or combined with other factors) were not associated with poor outcome in either the CBT or the relaxation group.

Beliefs about exercise and activity before and after treatment

At pretreatment, a total of 41 patients (68%) agreed that they should avoid exercise when tired; 37 (62%) agreed that doing less helped fatigue; 38 (63%) agreed that exercise was harmful, and only 5 (8%) agreed that they should avoid physical activity (Table II). Fewer CBT patients than relaxation patients endorsed the first three items, but this difference was not significant.

Within-group analysis showed that, between pre- and posttreatment, there was a significant reduction in the number of CBT patients who agreed that they should stop exercise when tired ($p < 0.05$); that doing less helps fatigue ($p < 0.01$), and that

Table II.—Patients who agreed/strongly agreed with items on exercise and activity by group (pretreatment)

	CBT (n = 30)	Relaxation (n = 30)	Difference between groups	
			χ^2 ($df = 1$)	p
I should avoid exercise when tired	17 (57%)	24 (80%)	2.77	NS
Doing less helps fatigue	17 (57%)	20 (67%)	0.282	NS
Exercise is harmful	17 (57%)	21 (70%)	0.645	NS
I should avoid physical activity	3 (10%)	2 (7%)	Fisher's exact, 1.00	

NS = not significant.

Table III.—Significant within-group reductions (pre- to posttreatment) in number of patients who endorsed items on exercise and activity (McNemar test)

	CBT (<i>n</i> = 27)	Relaxation (<i>n</i> = 26)
I should avoid exercise when tired	0.054	NS
Doing less helps fatigue	0.009	NS
Exercise is harmful	0.008	0.039
I should avoid physical activity	NS	NS

NS = not significant.

exercise is harmful ($p < 0.01$). In the relaxation group, there was a significant reduction in the number of patients who agreed that exercise is harmful ($p < 0.05$) (Table III).

At posttreatment, there were two significant differences between the beliefs of the CBT and relaxation patients (Table IV). Fewer CBT patients agreed that they should "avoid exercise when tired" ($p < 0.001$), and that "doing less helps fatigue" ($p < 0.05$).

Associations between beliefs about exercise and activity and physical illness attributions

No significant associations were found between causal attributions (pre- or post-treatment) and specific beliefs about exercise or activity reduction (pre- or post-treatment). Patients with physical illness attributions (alone and/or in combination) were neither more or less likely than those with nonphysical attributions to agree that they should avoid exercise or reduce activity, or that exercise may be harmful.

Associations between beliefs about exercise and activity reduction and treatment outcome

No associations were found between pretreatment beliefs about exercise and activity and outcome at 6-month follow-up in either the group as a whole or in the CBT or relaxation group alone.

Those patients who continued to agree with avoiding exercise and doing less at posttreatment were more likely to be unimproved at 6-month follow-up. Of those patients who agreed at posttreatment that they should avoid exercise when tired, 23 were unimproved at 6-month follow-up, and only 7 were improved ($\chi^2 11.47$, $df=1$, $p=0.000$). Of those who had agreed posttreatment that doing less helped fatigue, 17 were unimproved at 6-month follow-up, and only 5 were improved ($\chi^2 6.24$, $df=1$, $p=0.012$).

Table IV.—Number of patients who endorsed items on exercise and activity by group (posttreatment)

	CBT (<i>n</i> = 27)	Relaxation (<i>n</i> = 26)	Difference between groups	
			χ^2 ($df = 1$)	<i>p</i>
I should avoid exercise when tired	9 (33%)	21 (81%)	10.28	0.001
Doing less helps fatigue	6 (22%)	15 (58%)	4.27	0.038
Exercise is harmful	9 (32%)	11 (42%)	0.24	NS
I should avoid physical activity	0	2 (8%)	Fisher's exact, 0.86	

NS = not significant.

These associations between posttreatment beliefs and outcome at 6-month follow-up were also found in the CBT group alone. Of the CBT patients who agreed at posttreatment that they should avoid exercise when tired, six were unimproved, and three were improved (Fisher's exact test, $p=0.006$). Of those CBT patients who agreed at posttreatment that doing less helps fatigue, four were unimproved and two improved (Fisher's exact test, $p=0.04$). No associations between posttreatment beliefs and outcome were found in the relaxation group alone.

DISCUSSION

The main findings of this study were:

1. Physical illness attributions did not change, and did not affect outcome in either the CBT or the relaxation group.
2. Nonphysical attributions were just as likely to be associated with beliefs about avoidance as physical illness attributions. At pretreatment, beliefs about avoidance of exercise and reduction of activity were widely held, irrespective of causal attribution.
3. At posttreatment, fewer CBT than relaxation patients agreed that they should avoid exercise, or that doing less helped fatigue. Patients who continued to endorse such beliefs at posttreatment were likely to be unimproved at 6-month follow-up.

The results of this study should be interpreted with caution for several reasons. First, beliefs were measured after randomization, so knowledge about treatment condition may have influenced patients' views, which cannot be taken as predictors of outcome. Second, other variables that may be important (such as perceived controllability of symptoms, "action-proneness," or perfectionist attitudes) were not measured [19–22]. Third, the measurement of beliefs about avoidance could be improved: the wording and forced-choice rating scale produced rather a blunt instrument. Open-ended questions (such as those used to measure causal attributions) and specific examples of "exercise" and doing less may be more appropriate. Fourth, the direction of causality has not been established: causal attributions and beliefs about avoidance could well be a consequence of fatigue and past experience. Patients for whom treatment was ineffective may have had such beliefs confirmed.

Despite these reservations, the results of this study are of some interest, particularly as the finding that physical illness attributions did not affect outcome contrasts with results from longitudinal and naturalistic studies [7–10]. One explanation for this is possible selection bias in the present study. Those patients with strongly held or rigid physical illness attributions may not have been referred to the study. However, the attributions of patients seen were comparable with those reported in other hospital samples [1–9, 13]. It seems unlikely that selection bias alone can account for our findings.

An alternative explanation is that physical illness attributions may simply be less relevant to outcome (at least in treatment studies) than has been previously thought. A credible and collaborative treatment regimen, with regular appointments and clear objectives may have more influence over outcome than causal attributions [23]. The findings in the present study are in keeping with those of a 4-year follow-up study of patients previously treated with CBT: many improved patients

still held physical attributions. In the present study, causal attributions were not altered, but fatigue and disability improved significantly in the CBT group. This contrasts with the view that physical illness attributions should be modified for treatment to be effective [9, 12, 13].

It has been suggested that associations between physical illness attributions and outcome observed in other studies is mediated by beliefs about avoidance of exercise and reduction of activity [25]. Cognitive-behavioral models of CFS suggest that fatigue and disability are perpetuated (in part) by a vicious circle of physical illness attributions, beliefs about the consequences of exertion, and avoidance of activities, which may exacerbate symptoms [20, 26]. In the present study, beliefs about avoidance of exercise and reduction of activity were widely held, irrespective of causal attribution. This suggests that causal attributions are less important than beliefs and behaviors related to avoidance in perpetuating CFS.

Support for the belief that exercise is harmful decreased similarly in both groups. In the relaxation group, there was no accompanying reduction in support for avoiding exercise when tired, or doing less. This probably reflects the content of treatment: relaxation patients continued to rest and reduce activity when tired, but many regarded their relaxation as "exercise," because it involved tensing and releasing muscles, together with standing and walking while relaxed. A more surprising finding was that change in the belief that exercise is harmful was not associated with improvement. This was unexpected as catastrophic beliefs about the consequences of pushing oneself have been associated with worse fatigue and disability in CFS [22]. Beliefs about the potential consequences of exertion may have less impact on outcome than specific beliefs about avoidance. Alternatively, patients may have believed (with some justification) that exercise would be unpleasant rather than harmful.

In the CBT group, beliefs associated with improved outcome reflect the emphasis in treatment on behavioral change. Change in beliefs may have been due to patients' experiences of increasing their activity levels, rather than to cognitive interventions (which were introduced midway through treatment, and focused on issues such as perfectionism, all-or-nothing thinking, and catastrophizing). Although the relative contribution of behavioral and cognitive approaches to CFS is yet to be determined, the present study suggests that behavioral change was a key component of treatment. Some support for this view comes from a recent randomized, controlled trial of graded exercise therapy for CFS [27]: outcome was comparable to outcome of CBT [13, 15], but no formal cognitive interventions were used.

In conclusion, this study suggests that physical illness attributions are less important in perpetuating CFS than has been previously argued. Patients do not need to change their beliefs about a physical basis for CFS to get better. It may be more helpful, and lead to better outcome, if patients are encouraged to test out beliefs about avoidance of activity through a program of carefully graded activity.

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