

Original articles

Does a decrease in avoidance behavior and focusing on fatigue mediate the effect of cognitive behavior therapy for chronic fatigue syndrome?

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Abstract

Objective: Cognitive behavior therapy (CBT) leads to a significant reduction in fatigue severity and impairment in patients with chronic fatigue syndrome (CFS). The purpose of the present study was to determine whether the effect of CBT for CFS on fatigue and impairment is mediated by a decrease in avoidance behavior and focusing on fatigue. **Methods:** For this purpose, we reanalyzed a randomized controlled trial which was previously conducted to test the efficacy of CBT for CFS. Two hundred nineteen patients completed

assessment prior and subsequent to treatment or a control group period. **Results:** Mediation analysis revealed that a decrease in focusing on fatigue mediated the effect of CBT for CFS on fatigue and impairment. Avoidance of activity and avoidance of aversive stimuli were not significantly changed by treatment and were therefore excluded from mediation analysis. **Conclusion:** A decrease in the focus on fatigue seems to contribute to the treatment effect of CBT for CFS.

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Introduction

Chronic fatigue syndrome (CFS) is characterized by a severe and disabling fatigue which persists at least 6 months and which is not the result of a medical condition or ongoing exertion [1]. Additional symptoms such as pain, concentration problems and postexertional malaise are frequently reported. According to the cognitive behavioral model for CFS [2,3], patients fail to cope adequately with a period of somatic illness or psychological stress which causes the perpetuation of their symptoms. For example, Vercoulen et al. [4] found that CFS patients who believe that their symptoms are due to an ongoing medical condition are also more likely to engage in less physical activity, which was associated with higher levels of fatigue and impairment. Other factors which contributed to higher levels of symptomatology in their model of perpetuating factors were

higher levels on focusing on symptoms and lower levels on sense of control over the complaints. Cognitive behavior therapy (CBT) intervenes in the perpetuating factors for CFS by gradually increasing the level of activity and systematically challenging illness-related beliefs [5–7]. This strategy has been shown to be effective in reducing fatigue severity, impairment and additional complaints in CFS patients [8,9].

Despite the fact that CBT for CFS is by now an evidence-based intervention, it is not yet well understood through which mechanisms of change this intervention works. Deale, Chalder and Wessely [10] found that good outcome in CBT for CFS is associated with less avoidance behavior but not with less somatic attributions. Whether the effect of the intervention was actually mediated by a decrease in avoidance behavior was not tested in this study. Mediation is the process in which one or more variables (the hypothesized mediators) intervene in the relationship between treatment and outcome [11,12]. In mediation analysis, the mechanism of change of psychological interventions is identified. This analytic strategy can substantially contribute to the validation of treatment models and the enhancement of clinical practice [13].

Moss-Morris et al. [14] conducted a mediation analysis in which the mechanisms of change in graded exercise therapy

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Table 1
The validation of avoidance behavior and focusing on fatigue (N=267)

Factor	When I feel fatigued I ...	Loading
Avoidance of activity ($\alpha=0.72$)	... stop with my activities.	.56
	... confine myself to simple activity.	.60
	... do not exert myself physically.	.74
	... rest, sitting or lying down.	.73
	... take a comfortable posture.	.63
Avoidance of aversive stimuli ($\alpha=0.73$)	... make sure that I do not get upset.	.43
	... search for a restful environment to retreat.	.72
	... avoid bothering sounds.	.69
	... avoid light.	.58
	... am careful of what I eat or drink.	.48
	... separate myself.	.65
	... try to return home as soon as possible.	.58
	... focus on the fatigue all the time.	.59
Focusing on fatigue ($\alpha=0.80$)	... think of all the things that remain undone because of the fatigue.	.72
	... start to worry.	.76
	... wonder about the cause of the fatigue.	.74
	... think that the fatigue will get worse.	.67
	... think about moments which were free from fatigue.	.59
	... think I will go mad because of the fatigue.	.49
	... think that others do not understand what it is to have such fatigue.	.45

Note. Only loadings $\geq .40$ are shown.

(GET) were analyzed. Graded exercise therapy for CFS is a behavioral intervention in which patients gradually increase their level of fitness, for example, on exercise bikes. Illness beliefs are not challenged explicitly. Their mediation analyses showed that GET did not lead to the hypothesized increase in physical fitness but a decrease in the focus on symptoms which mediated the effect of their intervention. Similarly, Wiborg et al. [15] were unable to find a persistent increase in physical activity in three randomized controlled trials (RCTs) of CBT for CFS.

In the present study, we were interested in whether decreases in avoidance behavior and focusing on symptoms might mediate the effect of CBT for CFS. For this purpose, we reanalyzed an RCT which was previously conducted by our research group to test the efficacy of CBT for CFS [16]. The intervention was based on the CBT for CFS manual described by Bleijenbergh et al. [7] and was more effective in reducing fatigue severity and impairment than two control group conditions. We hypothesized that a decrease in avoidance behavior and focusing on fatigue would mediate the effect of our intervention.

Method

Sample

In total, 270 patients were randomly assigned to either CBT or one of two control group conditions. The CBT consisted of sixteen 1-h sessions spread over a period of 8 months. In the first control group, patients received eleven 1½-h meetings of nondirective counseling spread over a period of 8 months. In the

second control group, patients received no intervention and were free to do whatever they found appropriate. The results of the two control groups were similar in the original trial [16]. We therefore approached the two control groups as one in our analyses (see also [15]).

All groups were assessed before treatment or the control group period had started (baseline), 8 months later when treatment or the control group period had been finished (second assessment) and at 6 months follow-up (i.e., 14 months after baseline assessment). In the present study, we concentrated on the mechanisms of change between baseline and second assessment which was accomplished at the end of treatment. Fifty-one patients did not complete second assessment of the coping strategies and were excluded from the present study. The mean age of the remaining 219 patients was 36.9 years (S.D.=10.2), and 79% of them was female. The mean illness duration was 5.5 years (S.D.=5.5). All patients met the Centers for Disease Control and Prevention research criteria for CFS [1], except for 14 patients who did not have four or more additional symptoms.

Instruments

Coping strategies

We modified the Pain Coping Inventory [17] by substituting the word *fatigue* for *pain* and selected all items of the second order factor *passive coping*, which reflects the tendency to restrict functioning and think negative about the symptoms. Because this modification has not been validated before, we conducted a principal component analysis in our sample, resulting in three independent factors which were named *avoidance of activity*, *avoidance of aversive stimuli* and *focusing on fatigue* (Table 1). This structure is identical with the findings of Kraaimaat et al. [17], with the exception of one item (the self-administration of physical stimuli) which was excluded because it did not load substantially on any of our factors (i.e., $< .40$).

All items were scored on a 4-point Likert scale varying between 1, *seldom or never*, and 4, *very often*. Higher sum scores indicated more avoidance of activity, avoidance of aversive stimuli and focusing on fatigue. The sum scores on the individual scales vary between 5 and 20 in the case of avoidance of activity (five items), 7 and 28 in the case of avoidance of aversive stimuli (seven items) and 8 and 32 in the case of focusing on fatigue (eight items). The internal consistency of the individual scales was satisfactory (Table 1). All three factors were significantly related to each other (Table 2).

Table 2
Pearson's correlation coefficients (N=267)

	Avoidance of activity	Avoidance of aversive stimuli
Avoidance of aversive stimuli	.42	
Focusing on symptoms	.20	.26

Note. All coefficients were significant at $P \leq .001$.

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