Treatment for "Helpless" Women Suffering from Chronic Spinal Pain: A Randomized Controlled 18-Month Follow-Up Study

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This prospective randomized controlled outcome study was designed to evaluate whether a MultiModal Cognitive—Behavioral Treatment for chronic spinal pain (MMCBT) specifically designed for women has an increased effect on well being and return to work compared to a regular MMCBT regimen. In Sweden, spinal pain is most prevalent among women. A tremendous amount of money is spent on secondary prevention of spinal pain. Yet, little is known about the effect of the interventions. A need for well designed outcome studies exist. Fifty-four subjects from a cohort of all registered sick-listed women in three districts of Stockholm participated in the study. Subjects were allocated by central randomization into two groups. One group was treated with a regular MMCBT program and the other group with a MMCBT program specifically designed for women. Assessments were performed at pretreatment–posttreatment (last treatment day) and at 6 and 18 months posttreatment. Questionnaires covering the bio-psycho-social spectra of the chronic pain syndrome, and sick leave were used to measure outcome. Intention to treat and true to protocol analyses were performed. The only significant differences found between groups were improvements in self-reported disability and in coping with pain, favoring the experimental treatment. About one-third of the variance in disability was explained by the set of pain-coping strategies assessed in the study. The results do not lend sufficient statistical support to warrant acceptance of the experimental treatment as superior to the regular treatment in improving health and sick leave. Further investigation with larger groups is needed before a solid scientific conclusion can be drawn.

KEY WORDS: randomized; intervention study; bio-psycho-social; behavior medicine; spinal pain; helplessness; coping skills.

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INTRODUCTION

In the Western world, chronic back and neck pain are still one of the most common causes of work disability. Overall, women account for the majority of the long-term sick leave and disability compensation for back and neck pain in Sweden (1–3).

The results of a 1995 survey of Swedish workers from the Workers Compensation Register, a register covering about half of the working population in Sweden, show that there have been very few interventions to enhance return to work of long-term sick-listed subjects. (Jensen *et al.*, unpublished data). Although the employer is legally responsible for rehabilitation and the National Health Insurance Authority (NHIA) was supplied with a yearly budget of 700 million Skr for rehabilitation, such interventions were provided for only about 20% of the sick-listed sufferers.

For 1995, the cost of sick-listing and disability pension was about 63 Billion Skr (3). Yet, as illustrated by the survey, the officers in the NHIA do not take advantage of scientifically evidenced methods in the rehabilitation of chronic low back pain. The most common intervention provided was sick-listing and traditional "hands on" physical therapy. There is little evidence that these interventions are effective in the long term for improving health and reducing sick-leave in neck and back pain sufferers (4–6). On the contrary, in several studies sick-listing has been shown to impede recovery (5). Stronger evidence exist for the effectiveness of multidisciplinary treatment programs aimed at modifying behavior (5,7,8).

This study attempted to overcome the disparity between evidenced- based clinical practice and current practice by officers at NHIA. It was developed as a joint project between the Karolinska Institute, NHIA, and a rehabilitation clinic, Åre Rehabilitation Center in Northern Sweden. The treatment staff at the clinic performed the intervention. A researcher from Karolinska Institute (the first author) was the project director. The NHIA supplied two research assistants to perform the evaluation under supervision of Karolinska Institute.

Even though most outcome studies performed have not investigated gender differences in effectiveness of treatment, there is growing evidence that treatment interventions have differential effects on men and women (9,10). On the other hand, a few studies investigating gender differences in outcome did not find any differences (11,12). The results of the studies up to this time are far from conclusive. Yet, in three previous studies of Multimodal Cognitive Behavioral Treatment (MMCBT) for chronic spinal pain, using two different samples, we have found the MMCBT to be more effective for women than men (10). Even though women benefit most from the MMCBT, the effect was limited to subgroups of women and the variation in improvement was high.

One component of the MMCBT is a cognitive-behavioral intervention performed by a psychologist with the main purpose of improving coping skills. Coping skills can be viewed as either an active coping style, e.g., reinterpreting pain sensations, increase activity level, or a helpless coping style, e.g., catastrophizing, perception of low control (13). Catastrophizing has been shown to predict treatment outcome and to be related to dysfunction (13–22). In a previous study, we have

shown that women tend to have a helpless coping style, such as catastrophizing, to a higher degree than men (23,24). We can only speculate on whether this is a social aberration descending from the socialization of women into the female sex role or a biological gender difference.

The greater improvements in women treated in a MMCBT, shown in previous studies, was, in the present study, hypothesized to depend on the interventions aim at improving dysfunctional coping skills. This premise was a primary factor in the design of the current study. The treatment was designed specifically for women with the purpose of improving pain-coping skills in different areas of women's everyday lives. Further, a specific topic in the treatment was to address sex roles and their influence on our behavior, emphasizing a possible association between pain coping and the traditional female sex role with passivity and helplessness.

The aim of the study was to evaluate whether a MMCBT program specifically designed for women suffering from a moderate degree of learned helplessness has an increased effect on well being and return to work compared to a regular MMCBT regimen.

A moderate or higher degree of learned helplessness was defined as subjects reaching 20 points or higher on the Rheumatology Attitudes Index (RAI) (25). The scale is described in more detail in the assessment section of this paper.

METHOD

Intervention

Two different interventions were conducted in this study. Both of them took place at the same site but not during the same periods. Each treatment offered a full-time program comprising 8 hours per day. The treatments were conducted alternately about every sixth week. This means that no subject was on the waiting list for more than 6 weeks. Due to incommensurable reasons the same treatment staff was involved in both treatments. This is not an optimal situation but, in order to minimize possible bias, both treatments were conducted according to a standardized written protocol. The main comparison in the study was to see if an increase of psychologist-led sessions oriented specifically to women's issues would increase the benefit of the treatment.

Regular Intervention. This program was based on a conventional MMCBT program for neck and back pain combining exercise therapy and cognitive-behavioral therapy, described in detail elsewhere (10). It was a multidisciplinary intervention, involving a team of staff representing the various aspects of the bio-psycho-social approach (physician, nurse, psychologist, physical therapist, alcohol/drug counselor) with exercise therapy, education, problem solving, goal setting, applied relaxation, and self efficacy training as treatment components. The focus in this intervention was on exercise therapy (2/3 of the time) and education. The intervention was an inpatient group-based program lasting 5 weeks, 8 hours per day. In this program, the psychologist led a weekly 1-hour session. These sessions addressed only pain-related topics. Topics addressed during sessions were (1) tension—relaxation—

breathing; (2) stress—stress patterns—stress reduction; (3) cognition—cognitive errors—cognitive restructuring; (4) gate control theory—pain control; (5) problem solving—goal planning—goal setting. Follow-up contacts by telephone were provided by a nurse every 6 weeks during 6 months after the intervention.

Experimental Intervention. This intervention was also based on the regular MMCBT program but with an added component of psychologist-led group sessions aiming to further elucidate coping behavior, helplessness, and gender-specific behavior. Compared to the regular intervention, this intervention entailed 3 hours less per week of physical training. Instead, ten psychologist-led group sessions of 2-hours each, were conducted during the 5-week intervention period. All sessions addressed the different pain- related topics described above using a gender-oriented approach, i.e., stress and the differences in stress patterns between men and women, differences in communication/language, etc. Additional topics directly related to the traditional female sex role were included.

Topics addressed during the ten sessions were: (1) sex roles—communication—self esteem—personal integrity—how to say "no"; (2) cognition—cognitive errors—learned helplessness cognitive restructuring; (3) problem solving—goal planning—goal setting with focus on the female sphere (housework, childcare, interpersonal relations; (4) concluding discussions with feedback, contract setting, and setting up follow-up contacts. After the 5-week intervention period, the psychologist in the team had follow-up contacts with the subjects by phone and mail about once per month during 6 months posttreatment. A detailed description of the program is available upon request (at present only in Swedish).

Study Design

The study was a 2 × 4 experimental cohort study with two groups and four assessments. The allocation of subjects was done by central randomization which, using a random number table, placing subjects in either the experimental or the regular rehabilitation program. All assessments were conducted by a research assistant outside the treatment setting who was blind to the subjects' treatment allocation. The four assessments were conducted at pretreatment (1 week before treatment start), the week posttreatment, 6 months posttreatment, and 18 months posttreatment.

Study Subjects

The selection of subjects was delegated to three local NHIA offices within Stockholm. A total of 178 women fulfilled the first six criteria listed as: (1) female gender, (2) age between 20 and 55, (3) suffering from nonspecific spinal pain without neurological signs, (4) sick-listed for a minimum of 1 month and a maximum of 12 months during the past year, (5) currently employed, and (6) raised in the Swedish cultural environment.

Forty-nine subjects either declined participation or could not be contacted by mail or phone. The remaining 129 subjects filled in the RAI and reached or ex-

ceeded the RAI cut-off point (20 points). Consequently, all 129 subjects were offered to participate in a rehabilitation program at the clinic in northern Sweden.

Due to the location of the rehabilitation clinic (an inpatient clinic about 600 km from Stockholm), 66 subjects elected not to participate in the offered rehabilitation program. Thus, the resulting study group consisted of 63 subjects who were randomly assigned to either the experimental treatment or the regular treatment provided at the clinic. Informed written consent was obtained from all participants. The information contained a general description of the study but withheld all data about two treatment alternatives (to keep the patient "blind") as well as the women's helplessness aspect. The invitation to participate was made as an offer, completely free of charge, to participate in a back pain treatment program. The written information further stated that the participation was voluntary and could be terminated by the subject at any time without consequences from the research group or the NHIA.

Measurements of Dependent Variables

To cover the multidimensional aspects of chronic pain, a broad range of assessments were obtained. The assessments were made primarily through the use of self-administered questionnaires. All questionnaires used are evaluated and found valid and reliable. All subjects also underwent a structured clinical examination by an orthopedist.

Sick-Leave. Leave of absence was obtained from the National Health Insurance Authority for 1 year prior to the treatment and for 18 months following participation in the program. All information about sick leave was in the form of printouts from a daily updated computerized register. In Sweden, all employees are covered by the national insurance scheme. Employees may be absent during a full day or a part of the day due to illness. Before January 1992, regulations required that both the employer and the insurance authority be notified of an absence by the end of the same business day in order that the employee should receive benefits. This means that virtually all absences are on record. From January 1992, sick leave absence of up to 14 days is recorded and paid by the employer. The government has recommended that employers report all short-term sick leave to the NHIA but this has not been done. Consequently, we include only sick leave periods which exceed 14 days (recorded absence from NHIA) in this study.

Pain Intensity and Anxiety. These data were recorded in a diary by the patients for 7 days leading up to the time of the administration of the other tests. The observations were made three times daily (morning, noon, and evening) using a 100-mm visual analogue scale (VAS) (26). A high score indicates higher pain/anxiety level.

Depression. The Beck Depression Inventory (BDI) (27) was used in this study. Scores range from 0–60 with higher scores indicating severity.

Perceived Helplessness. The Swedish version of the Rheumatology Attitudes Index (RAI) slightly modified to focus on neck, shoulder and back pain, was used to assess the concept of learned helplessness (25,28,29). This 15-item measure requires

subjects to rate the extent to which they believe they can control the consequences of pain. It is self-administered. A high score indicates a high level of perceived helplessness (range 0–60).

Coping Strategies. Coping strategies were measured using the Swedish version of the Coping Strategy Questionnaire (CSQ) (13,30). The questionnaire assesses seven different coping strategies for pain: (1) diverting attention (think about something nice, count numbers in my head), (2) re-interpreting pain sensation (pain is thought of as a vague, warm feeling), (3) coping self-statements (be brave, nothing can stop me from doing what I want), (4) ignoring sensations (I don't think about the pain, I tell myself it doesn't hurt), (5) praying and hoping (someday someone is going to find a cure), (6) catastrophizing (it's terrible and I feel it's never going to get any better, I feel my life isn't worth living), and (7) increased behavioral activities (shopping, visit a theater, socialize). Each strategy consisted of six different items. On a scale ranging from 0 to 6, subjects were asked to indicate how often they used a particular item in a given strategy when they experienced pain (0 = never use it, 6 = always). Scores range from 0 to 36 for each of seven strategies reviewed. Higher scores indicate greater use of the particular strategy concerned. Strategies 1–4 are considered to be related to internal control. Strategies 5–6 are considered to be related to external control.

Subjective Health Status. This variable was assessed by the Global Self-rating Index (GSI) developed by Spangfort and tested for validity and reliability by Salen. The subjects were asked four questions to determine whether they considered their physical and psychological condition as being worse than it normally was. Each of the questions contained options of both physical and psychological discomfort. All options could be selected. A total score of 10 could be obtained. A high score indicates a perception of bad health.

Disability (DRI). The level of disability was assessed by asking the subjects to rate their ability to perform 12 different everyday activities. The ability was rated on a 100-mm VAS-scale with the anchors "without any difficulties" to "not at all able." The 12 items were then computed into an index of disability (32).

Statistical Analyses

Two analyses were performed for the purpose of investigating between group differences regarding outcome over the short (6 months) and long term (18 months). The endpoints were analyzed by ANCOVA (analysis of covariance) with repeated measures and assessment 1 (pretreatment) as covariate. In the analysis of short-term effect, assessment 1 was entered as covariate and assessments 2 and 3 were time factors. Subsequently, in the long-term analysis assessments 2, 3, and 4 were entered as time factors. An "intention to treat" analysis[5] of sick leave was conducted. On all other variables the only possible analysis was "true to protocol"[6] since no other posttreatment data were available for the drop-outs.

[5]All subjects allocated to the treatments, $n = 63$.
[6]All subjects who completed the treatment and the questionnaires, $n = 54$.

Multivariate regression analysis was performed to investigate the effect of coping style on sick leave and well-being. Only the coping variables with a significant between group difference posttreatment were entered into the regression as independent variables. Each of the five measured health factors and sick leave were entered as dependent variables. Sick leave 6 months pretreatment was added into the regression model as an independent variable in a final analysis. The scores from assessments 2 and 3 were used for the independent variables to analyze their effect on the dependent variables at assessment 4. In this way, time was used with two dimensions (12 and 18 months). Furthermore, by using assessments posttreatment, a control for treatment effect was obtained.

RESULTS

Study Subjects and Drop-outs

From the originally invited 63 subjects, 54 were followed during the whole study period. Four women (two Experimental Intervention (EI), two Regular Intervention (RI)) dropped out during the intervention period due to various personal reasons such as sudden death in the family. No subject discontinued the intervention due to dissatisfaction with the program. Five subjects (two EI, three RI) did not return the postal questionnaires during the follow-up period. Thus, a total of 14% dropped out during the study period. The result on all variables except sick leave was analyzed using data only from those subjects who completed all the assessments. A description of the subjects is shown in Table I.

Physical and Psychological Well-Being

The results revealed that the only significant differences between groups over time, was found in level of disability with the experimental group showing a conspicuous decrease in disability compared to the increase in disability in the RI group (Table II). A significant between group difference was also found in depression at the 6 months assessment. The EI group improved significantly on all variables at the second and fourth assessments while the RI group showed either no significant improvement or a slight decline in health. At the fourth assessment, the EI group shows a decrease in gain when compared to the second assessment.

Sick-Leave

The *intention to treat* analysis (63 subjects) revealed that sick leave showed a similar pattern in both groups pretreatment and posttreatment. As Fig. 1 reveals, the EI group has a slightly lower level of sick leave up to the fourth assessment. However, no significant differences were obtained between groups either pre- or posttreatment. For both groups, the steep increase in sick leave pretreatment leveled out and after 6 months the sick leave fell below pretreatment levels. The *true*

Table I. Description of the Study Samples at Pre-assessment

	Experimental intervention (n = 29)	Regular intervention (n = 25)	Missing cases (n = 9)
Age (mean (*M*), stand deviation (SD))	45 (8)	43 (9)	44 (8)
Married, n (%)	23 (79)	17 (68)	4 (44)
Education level (number of years), n (%)			
<10 years	12 (14)	8 (32)	3 (33)
10–13 years	13 (45)	15 (60)	3 (33)
≥14 years	4 (14)	2 (8)	3 (33)
Occupation, n (%)			
Service and care	22 (75)	15 (60)	6 (67)
Blue collar	1 (3)	5 (20)	1 (11)
White collar	5 (17)	5 (20)	2 (22)
Entrepreneur	2 (7)	0	0
Sick-leave mean days 1 year pretreatment (M, SD)	73 (49)	84 (58)	69 (56)
Pain location, n (%)			
Neck/shoulder	9 (31)	9 (36)	4 (44)
Low back	2 (7)	0	1 (11)
Whole back	18 (62)	16 (64)	4 (44)
Pain duration, months, (M, SD)	44 (66)	51 (68)	67 (56)
Spinal mobility (M, SD)[a]	97 (26)	102 (16)	96 (23)
Total neck mobility (M, SD)[b]	296 (69)	288 (51)	297 (53)
Impaired reflexes, n (%)			
Upper extremities	3 (10)	3 (12)	0
Lower extremities	2 (7)	1 (4)	0
Positive Laséque, n (%)[c]	4 (14)	4 (16)	1 (10)

[a]Total sagital mobility (thorakal+lumbal) measured with kyphometer (37).
[b]Measured with Myrin Goniometer (38).
[c]No cases of crossed SLR (well-leg raising) were found.

to protocol analysis (54 subjects) revealed the same result as the intention to treat analysis.

Pain Coping Strategies and Perceived Helplessness

Significant differences were obtained between the groups in several coping strategies. Overall, as seen in Table III, the experimental group managed to change their cognitive and behavioral pain-coping strategies to be more active and less focused on pain (diverting attention, reinterpreting, positive self-statement and increasing behavior activities) while the opposite was seen in the regular group. Perceived helplessness was not significantly different between groups at the third assessment (6 months posttreatment), but in the long term, at fourth assessment, a significant difference was obtained favoring the experimental group.

Table II. Descriptives and Results on Group Differences Using Covariance Analysis with Repeated Measures on Physical and Psychological Health Variables

Variables	Experimental program (EI)		Regular program (RI)		Between group differences assessment 1-3	Between group differences assessment 1-4	
	Mean	SD	Mean	SD	*F*	*F*	*df*
Depression (BDI)							1;50
Assessment 1	13.0	8.0	10.7	6.1			
Assessment 2	9.0	6.7	9.9	6.8			
Assessment 3	10.6	6.4	11.8	6.3	4.52*		
Assessment 4	10.1	6.8	10.1	8.9		2.95	
Anxiety							1;31
Assessment 1	33.3	19.6	20.9	16.9			
Assessment 2	22.2	23.5	18.4	23.1			
Assessment 3	33.6	24.0	28.9	25.6	0.27		
Assessment 4	20.3	18.4	19.0	25.0		0.43	
Disability (DRI)							1;42
Assessment 1	42.8	16.3	39.5	11.5			
Assessment 2	37.9	18.1	42.2	12.8			
Assessment 3	45.6	16.2	46.7	14.5	10.28**		
Assessment 4	41.9	16.8	46.6	17.2		5.52*	
Health perception							1.42
Assessment 1	4.0	2.0	4.3	2.4			
Assessment 2	2.2	1.9	2.6	2.1			
Assessment 3	3.7	2.0	4.2	2.1	2.48		
Assessment 4	2.9	2.1	3.6	2.8		2.36	
Pain intensity							1;32
Assessment 1	46.8	22.0	45.1	20.7			
Assessment 2	42.5	25.5	41.0	21.8			
Assessment 3	46.1	19.8	48.7	21.3	0.57		
Assessment 4	43.1	25.6	37.8	25.0		0.23	

*$p = 0.05$.
**$p = 0.01$.

Effects of Pain Coping Style and Helplessness on Well-Being and Sick Leave

The result of the regression analysis revealed that helplessness and pain coping explained between 7% and 34% of the variance in well-being within the 1 year prediction period (Table IV). The explained variance in well-being within the 18-months prediction period ranged between 8% and 23% with the highest explained variance occurring in perceived disability. In disability, the explained variance decreased from 34% to 22% in the long term.

The variance in sick leave was explained by the independent variables to 21% in the short term and to 11% in the long term. Entering sick leave 6 months pretreatment into the regression model as an independent variable did not change the explained variance in any of the dependent variables.

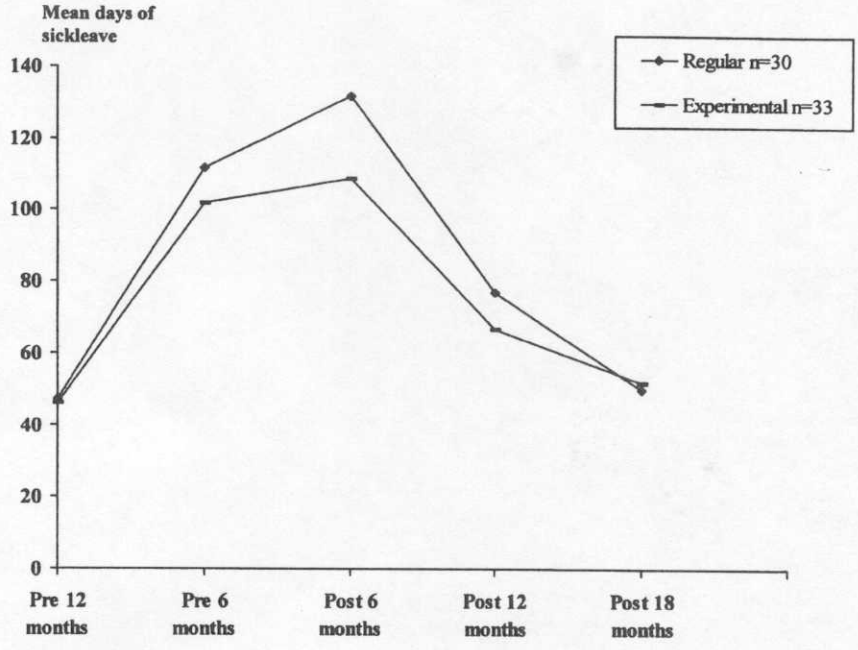

Fig. 1. Mean days of sick leave per six months. Each period represents a six-month period pre- and posttreatment.

DISCUSSION

The overall result concerning changes in health and sick leave did not reveal sufficient statistical support to accept the experimental treatment as a more effective treatment compared to the regular. The only significant difference in health between groups was found in self-reported disability and depression favoring the experimental treatment. Furthermore, it is shown that pain-coping ability was significantly improved in the experimental treatment where the specific goal was to alter dysfunctional coping skills. No difference between groups in sick leave was obtained.

Long-term sick leave (periods exceeding 14 days) during pre- and posttreatment displays the same pattern as seen in other outcome studies in Sweden concerning MMCBT (24,33–35). The sharp increase in absenteeism rate 6 months before treatment, flattens out during the 6 months after treatment and starts to decline markedly at 6 months after treatment. At 1.5 years posttreatment, sick leave averages 6.7 days a month, which is about the same as obtained in the other MMCBT studies on Swedes with chronic spinal pain. In Sweden, all employees have the option to be on sick leave between 25% and 100% of the day. The results from the studies may indicate that subjects suffering from chronic spinal pain are using the 25% sick leave option as a way of coping with pain in order to be able to keep working. Results from longer follow-up periods will hopefully cast more light on this question.

Table III. Descriptives and Results on Group Differences Using Covariance Analysis with Repeated Measures on the Coping Variables (CSQ) and Perceived Helplessness (RAI)

Variables	Experimental program (EI) Mean	SD	Regular program (RI) Mean	SD	Between group differences assessment 1-3 F^a	Between group differences assessment 1-4 F^a
Devert attention						
Assessment 1	12.8	6.1	15.6	5.7		
Assessment 2	16.4	4.1	14.7	4.2		
Assessment 3	16.5	5.3	13.7	6.2	10.28**	
Assessment 4	13.3	6.5	12.8	6.4		7.68**
Reinterpret pain						
Assessment 1	6.0	8.5	5.9	6.5		
Assessment 2	7.6	7.7	6.5	6.5		
Assessment 3	8.8	7.8	5.1	5.7	3.85*	
Assessment 4	7.5	7.5	5.0	5.4		4.46*
Self-statements						
Assessment 1	17.3	5.9	17.4	5.4		
Assessment 2	19.0	5.1	17.2	5.9		
Assessment 3	18.8	5.6	16.9	6.3	2.81	
Assessment 4	19.1	7.4	15.2	6.1		5.42*
Ignoring sensations						
Assessment 1	15.0	6.1	14.4	5.5		
Assessment 2	15.8	5.8	13.8	6.1		
Assessment 3	16.3	6.4	14.6	5.9	1.60	
Assessment 4	14.7	6.1	12.1	5.6		2.77
Pray and hope						
Assessment 1	12.1	7.7	14.6	7.4		
Assessment 2	11.8	8.0	14.1	8.2		
Assessment 3	9.6	7.4	13.0	7.8	0.59	
Assessment 4	9.0	8.1	13.5	8.7		1.49
Catastrophizing						
Assessment 1	13.0	7.0	12.8	7.6		
Assessment 2	13.4	5.7	12.8	7.5		
Assessment 3	13.8	6.0	13.2	7.8	0.12	
Assessment 4	10.7	6.6	11.8	7.3		0.03
Increase behavior activities						
Assessment 1	17.3	4.3	17.1	6.0		
Assessment 2	19.2	3.9	15.3	5.3		
Assessment 3	18.9	4.5	13.5	5.3	22.88***	
Assessment 4	17.1	6.1	13.5	6.6		18.16***
Perceived helplessness						
Assessment 1	4.21	6.0	41.0	6.1		
Assessment 2	39.0	8.4	40.8	6.0		
Assessment 3	40.1	6.8	41.0	6.4	2.41	
Assessment 4	38.6	7.6	41.3	6.3		4.46*

[a] $d,f = 1;50$.
*$p = 0.05$.
**$p = 0.01$.
***$p = 0.001$.

Significant between-group differences were found in pain-coping, favoring the experimental treatment. Dysfunctional coping skills were altered to more functional coping behavior in the experimental treatment. Thus, the results show that it is

Table IV. Explained Variance in the Dependent Variables, by the Coping Strategies Divert Attention, Reinterpret Pain, Self-Statement, Increased Behavior Activities, and Perceived Helplessness[a]

Dependent variables assessed at 18 months follow-up	Explained variance (r^2)	
	Independent variables assessment III[b]	Independent variables assessment II[b]
Depression	0.16	0.13
Anxiety	0.07	0.08
Perceived disability	0.34	0.22
Perceived health	0.15	0.22
Pain intensity	0.27	0.23
Sick leave	0.21	0.11

[a]Two Time dimensions: 1 year and 18 months.
[b]Assessment III = assessed 6 months posttreatment. Prediction period 1 year.
[c]Assessment II = assessed the last treatment day. Prediction period 18 months.

possible to alter dysfunctional pain coping skills through a structured cognitive-behavioral intervention. In accordance with previous studies we found that coping styles are related to dysfunction (14–17,20–22). In particular, this has been found in self-reported disability which also showed best improvement in the experimental group. On average, about one-third of the variance in disability was explained by the set of coping styles altered in the study. It is noteworthy that the strongest significant difference between groups in coping was found in increased behavior activities even though the experimental treatment had less physical and more cognitive training compared to the regular group. Consistent with previous research (18,19), this indicates the importance of considering cognition and coping styles in the treatment and reactivation of chronic back pain patients.

The long-term effect of treatment shows a slight decrease in many variables at 18 months as compared to 6 months. This could be an effect of the termination of treatment follow-up contacts between the psychologist and patient 6 months after completion of the treatment. The rate of refusal at the start of the study and the decrease in maintenance of treatment gains after 6 months indicate that the treatment program would benefit from being applied in an outpatient setting closer to the home environment to facilitate a relapse prevention program. An outpatient setting would also allow women who have domestic and private life which precludes staying away from home, to participate in the treatment. This study is a randomized controlled study with a cohort of subjects who were not referred by physicians (36) but were identified in the NHIA sick-leave register of all sick listed persons in the selected areas of Stockholm. About 50% of the subjects who were offered participation in the study rejected this option mainly due to problems of being absent from home for a 5-week period. Thus, the results can be generalized to the cohort of Swedish women suffering from chronic spinal pain and a moderate to high degree

of helplessness, sick-listed at the NHIA and with a life situation which makes it possible to leave the home town for 5 weeks.

A posteriori power analysis was conducted to determine the power of the findings. The effect size were set overall to 0.25 with an alpha of 0.05 which yielded a power between 0.44 and 0.70 in the different health variables assessed. An effect size of 0.40 would increase the power to 0.89. In this study, the effect size was overall about 25% or less which yields a low power. To detect a 20–25% change with an 0.80 power we would have needed a sample size of 66 subjects/group.

In conclusion, the results concerning well-being and sick leave do not lend sufficient statistical support to accept the experimental treatment as overall superior to the regular treatment. Yet, the consistent trend of larger improvements in the experimental group and the low power indicates that further investigations with larger groups are needed before a solid scientific conclusion can be reached. Moreover, it is shown that pain-coping skills can be altered through a structured intervention. Pain-coping ability is significantly more improved in the experimental group where the specific goal was to alter dysfunctional coping skills.

Although no difference between the groups in well-being and sick leave was obtained, the results from the regression analysis revealed that coping skills are of importance in the rehabilitation of chronic spinal pain. Applying the extended program in an outpatient setting would make participation in the treatment more feasible and probably increase the maintenance of the treatment effect.

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