The Effect of Long-Term Body Awareness Training Succeeding a Multimodal Cognitive Behavior Program for Patients with Widespread Pain

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ABSTRACT. *Objectives:* Multimodal cognitive behavior programs are found to be appropriate treatment for patients with chronic widespread pain [CWP]. The aim of this study was to investigate whether follow-up body awareness group training could cause a greater long-lasting effect and promote more patients to return to work.

Methods: In a randomized controlled trial, 52 patients with CWP and more than 10 tender points were enrolled after having participated in a multimodal program. The intervention group attended a psychomotor physiotherapy group training 18 times during 1.5 years. The training started one month after the end of multimodal treatment. The control group received treatment as usual. Outcome measures were work status, Global Physiotherapeutic Examination, pain levels, and quality of life. All patients were tested within two weeks after the multimodal treatment, after 12 months, and after 18 months.

Results: Improvement in test scores was demonstrated in both groups over time. However, the intervention group demonstrated fewer tender points and a reduced distribution of pain. After one year, two-thirds of the intervention group and one-third of the control group was back at work, while after 1.5 years the difference between groups was less and not statistically significant.

Conclusions: Improvement over time was obtained for all patients who had participated in the multimodal program. Indication was provided that follow-up psychomotor physiotherapy based on body awareness training might cause additional improvement of symptoms and a higher rate of return to work. The research question should be further examined in randomized controlled trial studies providing similar baseline data between participating groups. doi:10.1300/J094v15n03_04 *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com>*

KEYWORDS. Chronic widespread pain, long-term sick leave, return to work, body awareness, group training

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INTRODUCTION

Chronic widespread pain [CWP] has become a major health problem for individuals, as well as for society. Population studies in Great Britain and the United States have shown a prevalence of CWP of about 11 percent (1,2). The fibromyalgia syndrome [FMS], which is also characterized by CWP, accounted for 0.8 percent of all sick listed in Norway in 2000, while musculoskeletal pain accounted for 48.5 percent (3). Of the latter patients, most had back problems. However, as found by Natvig et al. (4), only 25 percent of persons with low back pain had a local problem. Accordingly, low back pain may often imply widespread rather than localized pain (4).

Chronic widespread pain is defined as pain on both sides of the body, axially, above and below the waist, being present for at least three months (5). The FMS is a musculoskeletal pain disorder where CWP is the principal criterion for the diagnosis, and in addition, 11 of 18 defined tender points [TePs] are required (5). Tender points may, however, be regarded as expressions of general distress, independent of pain (6). The FMS is considered a complex functional disturbance, and common symptoms are emotional and psychological distress, fatigue, sleep disturbance, irritable bowel, headache, lack of concentration, paraesthesia, and morning stiffness. Endocrine, traumatic, and infectious factors may trigger the condition. It is suggested that behavioral and cognitive responses are perpetuating factors (7).

Chronic widespread pain and FMS are more common among women than men (8). The prevalence increases with age and is associated with low income. The prevalence of FMS according to gender varies in different studies from one to 5.2 percent among women and from 0.1 to 0.9 percent among men, depending on the narrowness of the diagnostic criteria (9-12). As the diagnostic criteria of CWP and FMS are descriptive and based on subjective symptoms, there is dissent on the legitimacy of the diagnosis, and its socio-economic effect is criticized (13). There is growing acceptance for placing the distribution of pain along a continuum ranging from no pain to widespread pain (2). Patients seem to move along this continuum of pain over time (14,15).

What constitutes appropriate treatment for patients with CWP and FMS is not fully understood. Symptoms often abate, however, in connection with treatment. A review (16) comparing various multidisciplinary interventions for FMS patients concluded that cognitive behavioral therapy, relaxation, and education are important treatment modalities for this group of patients. Similar conclusions have also been drawn from other researches (17-20). Several studies have shown a decrease in TeP counts in patients who have participated in a low intensity aerobic exercise program (21-23) where endurance training is emphasized. In one study (24), it was found that patients with FMS got better results from Basic Body Awareness Training [B-BAT] (25) and Feldenkrais exercises than from treatment as usual. Body awareness and functional training of the body as a whole rather than treating specific symptoms is emphasized in both treatment modalities. These are also major components of Norwegian Psychomotor Physiotherapy [NPMP]. There are, however, differences between the therapies when it comes to the way body awareness is addressed, which functional exercises are performed, and how they are performed. The NPMP is used to relieve musculoskeletal symptoms. The therapy is most often given as individual treatment, but the principles of treatment are also used in group therapy (26). The effect of NPMP is, however, scarcely documented.

At the Outpatient Spine Clinic, Haukeland University Hospital, Bergen, Norway, approximately 60 percent of the women with low prognosis for returning to work (27) had returned to work one year after participation in a four-week extensive multidisciplinary treatment. However, after two years, the percentage at work had decreased to approximately 50 percent.

The aim of the present study was to examine the effect of an extended group-training program based on principles from NPMP for patients with CWP.

MATERIALS AND METHODS

Design

The study was designed as a randomized controlled trial. During the enrolment period

from June 2002 to June 2003, patients who met the inclusion criteria were given written and oral information and asked to participate in the study. It was emphasized that participation was voluntary. Patients who accepted the enrolment signed an agreement form. The study was accepted by the Regional Ethics Committee and the Norwegian Data Inspectorate.

The patients were randomized into intervention and control groups by the Department of Biological and Medical Psychology, University of Bergen. A table of random digits was used for allocating patients to the two groups.

Subjects

The inclusion criteria for participation were CWP lasting more than three months and at least 11 TePs (5). The patients were employed, but might be on sick leave. Exclusion criteria were active rheumatologic disease, progressive neurological disease, serious cardiac or other internal medical conditions, malignant neoplasms, acute traumas, infections, or stroke. The participants were also excluded if they were pregnant, had insufficient knowledge of the Norwegian language, suffered from loss of vision or hearing, or were registered substance abusers. Qualifying females and males were asked to participate.

Treatment

Multimodal Treatment: All patients had participated in a four-week multimodal treatment which consisted of 11 visits, each lasting four hours. The treatment consisted of aerobic training, cognitive behavioral therapy, relaxation, body awareness, and education. In addition, all the patients were given an individual treatment schedule and encouraged to comply with it after finishing the multidisciplinary treatment. This schedule included recommendations regarding weekly endurance training, light strength training, movement training, stretching, and relaxation training. The patients were asked whether they adhered to their schedule when they were followed-up individually one month after the program. Individual follow-ups were also done on request during the following year.

Control Group: The control group had treatment as usual as described above.

Intervention Group: After having participated in the multimodal program, the intervention group was to attend a training group once a week, 18 times, during the following 1.5 years. The group training, based on the NPMP, started one month after the end of the multimodal treatment. Aspects like functional movements, body awareness, relaxation ability, and balance are emphasized by Øvreberg (26,28), who developed the group training method. Aspects like flexibility of the foot, alignment of the foot, knee and hip, movements giving stretch impulses, and strengthening of lower extremities, are addressed in training. Balance is considered dependent on strength, flexibility, and cooperation between the muscles of the trunk and lower extremities. The movements of the thorax are trained not to restrict freedom of arm movements and mobility in the neck and jaw. The interaction between breathing and muscle tension is stressed in training and the levels of coordination and stretching during exercises are gradually increased during standing and moving. The first author was in charge of instructing the group.

Instruments

Registrations and assessments were made before randomization and after 12 and 18 months. A physiotherapist blinded to group allocation performed the physical assessments [Global Physiotherapeutic Examination [GPE-52]] while the first author, who was not blinded, examined TePs. The following measures were used to assess outcome:

Work Status: Work status was registered following standard procedures at the Spine Clinic.

The participants were asked whether they were sick listed or not. If they answered yes, they were asked to write the first date of sick listing for the actual illness. They also registered their present work status; working full time or partially [with an estimated percentage], sick listed full time or partially [with an estimated percentage], full or partial compensation, other, or unemployed.

Global Physiotherapeutic Examination: The GPE-52 measures bodily divergence from defined ideal norms with regards to posture, respiration, movements, and muscle/skin palpation. The GPE-52 was considered closely

related to the functional aspects addressed in treatment and used as an outcome measure. Extensive research has been performed to examine reliability, validity, and responsiveness of the measure among patients with musculoskeletal pain (30-35). The GPE-52 is based on a broader examination by Sundsvoll (36-38). A research project (34) demonstrated the ability of the measure to discriminate between patients with localized musculoskeletal pain [mean score 44.5 points], patients with generalized pain [mean score 48.0], and healthy subjects [mean score 35.0]. The differences between the groups were statistically significant.

Tender Point: A TeP test was used (5) to examine 18 points located bilaterally in different body parts [occiput, low cervical, trapezius, supraspinatus, second rib, lateral epicondyle, glutei, greater trochanter, and knee]. They were palpated digitally with an approximate force of 4 kg. The subjects reported whether palpation was painful or not.

Pain: A visual analog scale [VAS] was used to measure subjective pain intensity of the body (39), while the distribution of pain was examined by pain drawing (40, 34). The area of pain was measured by counting the number of squares marked on the pain drawing. The highest possible score was 108.

Health Status: Health status was measured by the Fibromyalgia Impact Questionnaire [FIQ] (41). This is a condition-specific questionnaire developed for patients with FMS. The results of fatigue and stiffness measurements are included in the tables, as are the 11 activities of daily living scores. Fatigue and stiffness are measured separately on a VAS. An activities of daily living score of 10 [3.0 × 1.33] indicates the lowest possible functional level. The highest possible sum score of 100 indicates a poor health status.

Health-Related Quality of Life: The health survey Short Form 36 [SF-36] was used as a generic measure of health related quality of life. It can be used across age, disease, and treatment groups (42). The highest possible sum score, 100, indicates the most optimal health related quality of life. All instruments have been found to be reliable and valid.

Statistics

Statistical analyses were performed in Statistical Package for the Social Sciences version 11.5 for Windows. All P-values are two-sided and values less than 0.05 were considered statistically significant. Chi-squared test, Mann-Whitney U-test, and t-test for independent samples were used to compare baseline values. As the samples were small and not all data were normally distributed, non-parametric and parametric statistics was used. Baseline values were compared between the randomized groups, between study participants of the groups excluding drop-outs, and between participants and drop-outs within each group. Change in outcome variables within groups was examined by paired t-tests and Wilcoxon signed test. Comparisons of change between groups were analyzed by independent t-tests and Mann Whitney U-test, and further explored by analysis of covariance, with post-test scores as dependent variables and baseline scores and group as covariates. The data were analyzed according to intention-to-treat principles (43). Because improvement was expected in both groups (27), missing data at 12 and/or 18 months were replaced by the sum of the last observation and mean group change in respectively intervention patients and controls. A per-protocol analysis was also made to assess change in patients who participated throughout the study.

RESULTS

Ninety-two patients [89 females and three males] were asked to participate. They were recruited consecutively after having participated in multidisciplinary treatment at the Outpatient Spine Clinic, Haukeland University Hospital. However, many patients went back to work after the multimodal treatment and would not participate in the follow-up group training offered at daytime at the Spine Clinic. Also, many patients lived outside Bergen and had a long distance to travel and refrained from participation for that reason. All the patients who made it into the study had a long history of being sick listed.

A total of 52 patients were randomized, 26 into the intervention group and 26 into the con-

trol group [Figure 1]. Baseline characteristics of demographic and test variables are shown in Table 1. No statistically significant differences were found between the groups except for higher VAS fatigue in the control group [P = 0.002]. Many patients [40 percent] dropped out during the course of the study, as shown in the flow chart of Figure 1, but there were no statistically significant differences between drop-outs and completers in the study groups, except for age in the intervention group [P = 0.002]. While mean age in the drop-outs was 31.8 years, it was 43.9 years in the completing participants. In the intervention group a total of 12 patients [46 percent] dropped out, seven after the randomization, but before the intervention started. Participants who lived outside Bergen [18 persons] tended to drop out in both groups. In the intervention group, seven of 11 participants living outside the city of Bergen dropped out. Smoking habits showed a statistically significant relationship with drop-out rate [P = 0.02]. In the intervention group, 50 percent of the participants were smokers [75 percent of the drop-outs in the intervention group were smokers], while in the control group 29 percent of the participants were smokers [67 percent of the drop-outs in the control group were smokers].

Baseline characteristics of the completing study participants [N = 34] showed that intervention patients [N = 14] tended to be older [P = 0.09], less educated, having a longer history of being sick listed [P = 0.03], and to perceive worse physical health [SF-36; P = 0.03] than the controls. Mean sum scores measured with GPE-52 were high in both groups.

At baseline, all participants except one were sick listed. However, six patients [15 percent, three in each group] were only partly on sick leave. The only one working full time belonged to the control group. After one year, two-thirds of the intervention group [65 percent] and one-third of the control group [35 percent] were back at work [Figure 2]. The group difference was, however, not statistically significant [P = 0.09]. After 1.5 years, the difference was less, as 57 percent of the intervention patients and 47 percent of the controls were working. In the intervention group, 50 percent of blue-collar workers and seven percent of white-collar workers were back at work after 1 1/2 years, a difference between workers that was statistically significant [P = 0.028]. In the control group 23.5 percent of blue- and white-collar workers were back at work after 1.5 years. There were differences in distribution of pain and FIQ scores among those who had returned to work [pain drawing: mean 18.9, FIQ: 37.5] and those who had not [pain drawing: mean 24.5, FIQ: 42.4]. The differences were, however, not statistically significant.

After 1.5 years, improved scores on the GPE-52 were obtained in both groups, based on intention-to-treat analysis as shown in Table 2. The mean change in the intervention group was 3.4 [P = 0.020], while it was 2.2 [P = 0.006] in the control group [Table 2]. In TeP counts, the intervention group had improved more [mean = 3.2 points] than the control group [mean = −0.07 point], and this difference in change between the groups was statistically significant [P = 0.001]. There was a statistically significant decrease in pain registered by VAS in the intervention group 1.37 [P = 0.009] and in the control group 1.09 [P = 0.032], but no statistical significant group difference was shown. In pain drawing the mean decrease in scores for the intervention group was 8.1 points [P = 0.004], meaning less extension of pain, while there was no change in the control group. The difference in change between the groups was not statistically significant [P = 0.061]. As to physical health summary score [SF-36], a statistically significant improvement for both

FIGURE 1. Flow Diagram Describing Subjects During the Study Period

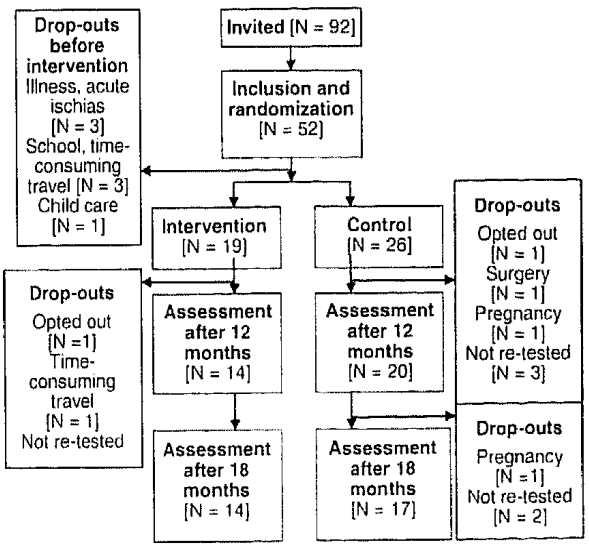

TABLE 1. Baseline Characteristics of Demographic and Test Variables in Randomized Groups

Variables	Intervention Group [N = 26]	Control Group [N = 26]	Test for Difference t, χ^2, z	P
Demograghic Variables				
Age, yrs [mean ± SD]	38.4 ± 10.5	37.4 ± 9.8	0.34[1]	0.73
Body mass index, kg/m^2: [mean ± SD]	24.5 ± 4.4	25.1 ± 4.8	0.28[1]	0.78
Gender: women, men [%]	96, 4	100, 0	1.02[2]	0.31
Duration of sick leave: ≤ 6 months, > 6 months [%]	16, 84	35, 65	2.33[2]	0.13
Civil status: married or cohabiting, single [%]	76, 24	73, 27	0.06[2]	0.81
Education: primary school, high school, university [%]	39, 46, 15	23, 50, 27	1.90[2]	0.40
Occupation: blue, white collar, Unspecified [%]	65, 31, 4	65, 27, 8	0.40[2]	0.82
Smoking habits: smoking, non-smoking [%]	62, 38	42, 58	1.93[2]	0.17
Homeplace: Bergen, outside Bergen [%]	58, 42	3, 27	1.36[2]	0.24
Physical Performance				
GPE-52 [mean ± SD]	53.0 ± 10.4	53.9 ± 8.4	−0.33[1]	0.74
Weekly training: 0-1x, ≥ 2x [%]	39, 61	42, 58	0.03[2]	0.86
Pain				
Tender points [mean ± SD]	14.3 ± 2.3	14.3 ± 2.0	0.00[1]	1.00
Pain drawing [mean ± SD]	29.2 ± 16.0	22.4 ± 9.6	1.88[1]	0.07
Health Status				
FIQ [mean ± SD]	53.2 ± 11.8	54.5 ± 13.7	−0.35[1]	0.73
Function [mean ± SD]	3.9 ± 1.8	3.3 ± 2.1	1.12[1]	0.27
Fatigue: VAS [mean ± SD]	5.8 ± 2.3	7.4 ± 1.3	3.24[1]	0.002
Stiffness: VAS [mean ± SD]	6.7 ± 1.8	6.0 ± 2.0	1.24	0.22
Pain: VAS [mean ± SD]	5.9 ± 1.7	5.6 ± 2.1	0.52	0.61
Health-Related Quality of Life				
SF-36: Physical health summary score [mean ± SD]	32.2 ± 7.0	36.0 ± 7.3	−1.89[3]	0.07
Mental health summary score [mean ± SD]	45.9 ± 13.4	43.0 ± 10.3	0.88[3]	0.38

[1]= t-test, [2]= chi-square test, [3]= Mann-Whitney U-test
N = number, SD = standard deviation, % = percent, GPE-52 = Global Physiotherapeutic Examination, FIQ = Fibromyalgia Impact Questionnaire, VAS = Visual Analog Scale, SF-36 = Short Form 36

FIGURE 2. Working Status After 1 Year and 1.5 Years

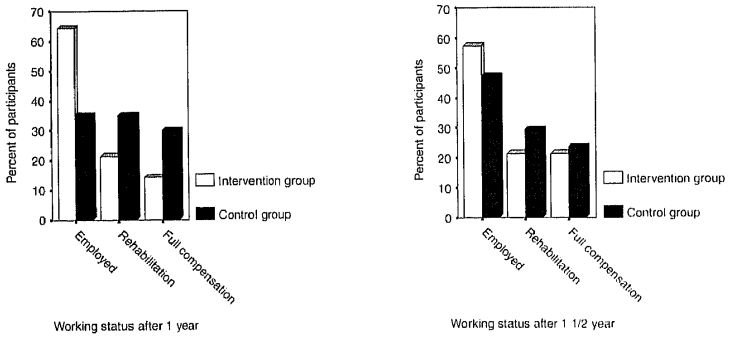

TABLE 2. Change in Test-Scores Within Group and Comparison Between Groups Using Intention-to Treat Analysis

Variables	Intervention group [N = 19] Mean	SD	Change, P-Value[1]	Control Group [N = 26] Mean	SD	Change, P-Value[1]	Overall change, P-Values[2]	Group differences, ANCOVA
Physical Performance								
GPE:								
Baseline	54.41	10.66		53.92	8.45			
12 months	50.12	10.50	0.001	49.83	8.88	0.000	0.891	0.921
18 months	51.03	11.08	0.020	51.75	8.24	0.006	0.396	0.411
Pain								
Tender points (ACR):								
Baseline	14.47	2.34		14.31	1.98			
12 months	12.55	2.15	0.003	14.87	2.82	0.308	0.003	0.002
18 months	11.25	3.10	0.000	14.37	2.72	0.892	0.000	0.000
Pain drawing:								
Baseline	29.74	13.92		22.35	9.62			
12 months	24.61	13.10	0.002	21.50	10.87	0.632	0.077	0.257
18 months	21.61	14.70	0.004	22.31	11.03	0.986	0.12	0.061
Health Status								
Fibromyalgia Impact Questionnaire								
Baseline	53.63	13.18		54.48	13.70			
12 months	46.32	17.52	0.119	48.65	16.96	0.119	0.795	0.688
18 months	40.77	18.84	0.021	42.67	16.79	0.006	0.906	0.782
Function								
Baseline	1.19	0.51		0.98	0.64			
12 months	0.95	0.66	0.022	1.02	0.65	0.724	0.064	0.122
18 months	0.86	0.53	0.015	0.75	0.61	0.032	0.541	0.952
Fatigue [VAS]								
Baseline	6.03	2.22		7.43	1.34			
12 months	5.44	2.63	0.439	6.11	2.15	0.002	0.367	0.692
18 months	5.15	2.75	0.148	5.97	2.37	0.004	0.430	0.990
Stiffness [VAS]								
Baseline	7.00	1.90		6.03	2.02			
12 months	7.00	1.80	0.875	6.69	2.59	0.186	0.318	0.635
18 months	5.84	2.70	0.044	6.20	2.59	0.738	0.091	0.216
Pain [VAS]								
Baseline	5.87	1.70		5.59	2.05			
12 months	4.97	1.74	0.089	5.52	2.48	0.892	0.247	0.297
18 months	4.50	2.42	0.009	4.50	2.81	0.032	0.691	0.768
Health-Related Quality of Life								
SF-36								
Physical health summary score								
Baseline	31.97	7.78		35.98	7.32			
12 months	35.56	6.09	0.020	35.78	8.73	0.882	0.049	0.559
18 months	37.44	8.26	0.037	40.57	8.49	0.030	0.498	0.911
Mental health summary score								
Baseline	46.34	14.31		42.98	10.34			
12 months	47.00	13.60	0.834	48.09	10.08	0.009	0.193	0.335
18 months	51.41	9.69	0.268	42.40	11.56	0.822	0.331	0.054

[1] = paired samples t-test, [2] = independent samples t-test
N = number, SD = standard deviation, ANCOVA = analysis of covariance, GPE-52 = Global Physiotherapeutic Examination, VAS = Visual Analog Scale, SF-36 = Short Form 36

groups was demonstrated with no group difference. The mental health summary score improved more in the intervention group [mean = 5.1] than in the control group [mean = −0.6]. The difference in change between the groups was nearly statistically significant [P = 0.054]. When comparing change using per protocol analysis, similar results were obtained. From a total of 20 change data [10 tests examined after 12 and 18 months], 70 percent were in favor of the intervention group. However, only the number of TePs was significantly different between the groups, being lower in the intervention group.

The amount of individual treatments received in private clinics [physiotherapy, chiropractics, acupuncture] during the study after the multimodal program, was different between the groups. While 35 percent of patients in the intervention group received such treatment [mean = 2.9 treatments, ranging from 0 to 12], a total 70 percent of the controls consulted private clinics [mean = 20.4 treatments, ranging from 0 to 70].

DISCUSSION

The aim of the study was to investigate the effect of an extended group training of patients with CWP after an intensive multimodal treatment program. The widespread and long-lasting pain problems of these patients may necessitate prolonged follow-up treatment (27). Accordingly, the intervention patients of the present study were offered Norwegian Psychomotor Physiotherapy as low intensity group-training, focusing on body awareness, coordination, and relaxation 18 times during a time-span of 1.5 years. Only 52 of 92 patients agreed to participate in the study. After the multimodal program, many patients were able to return to work. Consequently, this group of patients did not have the opportunity, the capacity, or did not find it urgent enough to participate in follow-up training during the day and turned the offer down. When organizing follow-up training, we obviously should have considered evening as well as daytime training sessions to make it more convenient to participate. Others did not participate because they felt that the costs in time and energy used to travel long distances ruled out the expected benefits by participating. Accordingly, the large number of patients turning down the offer to participate does not necessarily mean that these patients did not feel in need of follow-up training. For practical reasons, it might be difficult or impossible to take part.

It is shown that the probability for returning to work decreases with higher age and sick leave longer than six months (44). Despite the fact that patients in the intervention group tended to be characterized by demographic variables that predicted a worse outcome [e.g., higher age, perceived worse physical health, etc.], still more patients in the intervention group than in the control group had returned to work after one year, which seems promising. However, the difference was not statistically significant. The total number of patients who had returned to work after one year in the present study [65 percent] was also higher than earlier found at the Spine Clinic in Bergen, as a total of 60 percent of the participants were reported to be back at work one year after participation in a multimodal program (27). However, our participants might be somewhat different as widespread pain in the study of Skouen et al. (27) was based on marks on a body chart, above as well as below a horizontal line in the thoracolumbar region (34), and thus, different from the ACR definition of CWP used in the present study. Why the patients of the intervention group in our study were more inclined to return to work after one year than the controls is not straightforward to explain. More participants in the control group than in the intervention group were on rehabilitation after one year [Figure 2], and perhaps their recovery after 1.5 years made the group difference less. The apparent difference in return to work between groups may also be random because of few participants.

The tendency of higher return to work for blue-collar workers in the intervention group is also difficult to explain. The social categories "blue- and white-collar workers" may hardly seem as useful categories when it comes to important differences in working conditions as well as work tasks in the Norwegian society today.

The GPE-52 sum scores at baseline for the intervention group as well as the control group

indicated that the participants were in severe bodily strain (34). As GPE-52 is an examination developed from psychomotor physiotherapy, improved scores were anticipated and demonstrated in the intervention group. However, also patients in the control group demonstrated similar improvement. Changes in body awareness may take place as a process over time. The fact that both groups were trained in body awareness during the multimodal treatment and were advised to continue training on their own may explain why both groups improved.

The subjects of the present study had baseline subscores on the SF-36 similar to those of patients with CWP in a cross-sectional and three-year follow-up population study by Bergman et al. (14). These patients did not receive intervention and were shown to deteriorate over a time period of three years. In spite of low SF-36 scores at baseline, the participants of the present study, both intervention patients and controls, had a statistically significant improvement in health-related quality of life, as measured by SF-36 compared with baseline. The most marked difference between the groups in favor of the intervention group was less TePs, but also less pain distribution, which are both typical symptoms of CWP. This change may indicate a reduction in pain although the results were not significant compared to the control group. Nevertheless, these findings indicate that the aspects addressed in the intervention were helpful for this group of patients. Pain will usually induce psychological distress and worsen mental health (45). A decrease in TeP counts was expected as a result of emphasis on body awareness and relaxation trained in the intervention group. Although the difference in pain level in the intervention group was small, it may be of clinical significance. To remark is the fact that the first author, for practical reasons, conducted the TeP tests. Ideally, a blinded person should have done the tests. Accordingly, the validity of differences between the groups can be questioned. However, differences between groups in pain distribution support the findings regarding TeP counts.

The improvement in symptoms that took place for the subjects in both groups needs to be further commented. All subjects of the study had participated in the same multimodal treatment and were followed up by the Spine Clinic throughout the year. Many patients of the control group also actively searched and received individual treatment at physical institutes after the multimodal program. Thus, both groups received treatment during the follow-up period. Together, these facts may explain why not only the intervention group, but also the control group showed some improvement of symptoms over time. Also, participation in the group training unintentionally seemed to prevent the intervention group from seeking individual treatment. An aspect to consider is that the cost of group participation is less than for individual treatment, for society as a whole, as well as for the individual. The improvement in both groups may also be partly due to the sample in the study, which consisted of probably the most motivated patients for this kind of treatment. However, considering the fact that many of the patients asked to participate were not able to take part, more patients than those included may have been motivated.

The fact that no more differences between the groups were found may partly be due to the possibility that the participants had improved to their potentials during the participation in the multimodal program. Therefore, the follow-up training might have maintained the improvement rather than causing increased improvement. Another explanation may be that the group training was not frequent enough to cause a significant difference between the groups. Throughout a year the participants in the intervention group met a total of 12 times, each time for an hour. In clinical practice, this type of treatment is usually given 24 times during one year. A similar study with a greater number of participants and more frequent follow-up NPMP is needed to answer this question more thoroughly.

Changes in central nervous processes associated with chronic pain points to sensitized and, accordingly, heavily burdened bodies (46). This indicates that high intensity training may increase pain rather than alleviate pain. Modalities of training that do not heavily exaggerate pain are most likely to succeed (47-49). In further evaluation of training programs for this group of patients, dimensions of training like body awareness and coordination may

be important to consider. Steihaug et al. (50) and Malmgren-Olsson and Armelius (24) have shown preliminary but promising results of training programs for this group focusing on these dimensions. The present study gives some support in the same direction. As Steihaug et al. (50) has pointed out, further exploration of empowering strategies as part of the intervention for this patient group also deserves consideration, an aspect the present study has not explicitly investigated.

CONCLUSION

Some indication was provided that long-term NPMP in groups following a multimodal cognitive behavior program may promote return to work and alleviate symptoms in patients with CWP. However, participation in the multimodal program [controls] also seemed to have long-term effect. Because of the high drop-out rate and small groups of participants, it is not possible to draw conclusions for a larger population. This study could not document effect on just NPMP, and further research is needed to see if this treatment modality has better effect than other training programs.

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