

Targeting Catastrophic Thinking to Promote Return to Work in Individuals With Fibromyalgia

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In this study, a sample of 30 individuals with fibromyalgia (FM) were enrolled in a 10-week risk factor targeted intervention designed to promote return to work. Participants completed measures of pain severity, pain catastrophizing, fear of movement, depression, and self-reported disability at three points in time through the course of the intervention. Results showed that most individuals with FM were agreeable to participate in the return-to-work intervention. Treatment response of individuals with FM was compared to a matched sample of individuals with chronic low back pain (CLBP). Analysis of variance (ANOVA) revealed that both groups showed comparable reductions in pain catastrophizing, depression, and fear of movement through the course of treatment. Individuals with FM were less likely than individuals with CLBP to show clinically meaningful reductions in pain severity and self-reported disability. Patients with FM were less likely to return to work (23%) than participants with CLBP (50%). The findings suggest that although individuals with FM are more treatment resistant than individuals with CLBP, a significant proportion can still benefit from participation in a rehabilitation intervention with a stated objective of return to work. Implications of the findings for the structure and content of rehabilitation interventions for FM are discussed.

Keywords: fibromyalgia; chronic low back pain; work disability; rehabilitation

Fibromyalgia (FM) is a rheumatic condition characterized by the presence of chronic widespread pain and hypersensitivity to a variety of noxious stimuli (Julien, Goffaux, Arsenault, & Marchand, 2005). Individuals with FM often experience several symptoms other than pain, including fatigue, sleep disturbances, and a variety of neuropsychiatric problems such as memory difficulties, slowed information processing, and depressive symptoms (Mease, 2005). Epidemiological studies indicate that FM occurs in approximately 2% of the population, and women are more likely to be affected than men (McNally, Matheson, & Bakowsky, 2006; Mease, 2005). FM is most commonly diagnosed in working-age individuals between the ages of 20 and 50.

Reviews of the literature highlight the relatively disappointing long-term effects of pharmacological and nonpharmacological treatments for FM (Mease, 2005; Sim & Adams, 2002).

Recent meta-analyses of the literature have concluded that even intensive multidisciplinary rehabilitation programs have not been shown to yield meaningful long-term impact on physical or psychological disability associated with FM (Garcia-Campayo et al., 2008; Karjalainen et al., 2000).

In recent years, pain catastrophizing has emerged as one of the most powerful and robust psychological predictors of adverse pain outcomes (Keefe et al., 2002; Shelby et al., 2008; Somers et al., 2009; Sullivan et al., 2001). More than 900 studies have documented a relation between pain catastrophizing and adverse pain outcomes (Quartana, Campbell, & Edwards, 2009; Sullivan et al., 2001). Pain catastrophizing has been broadly defined as an exaggerated negative orientation toward actual or anticipated pain comprising elements of rumination, magnification, and helplessness (Sullivan et al., 2001). Several prospective studies have revealed that initial levels of catastrophizing are predictive of long-term pain and disability (Edwards, Bingham, Bathon, & Haythornthwaite, 2006; Granot & Ferber, 2005). There are also indications that high levels of catastrophizing might compromise the effectiveness of physical, pharmacological, and surgical interventions for pain-related conditions (Quartana et al., 2009; Sullivan, Lynch, Clark, Mankovsky, & Sawynok, 2008). In a research on work-related back injury, pain catastrophizing has been discussed as a psychosocial risk factor for the prolonged pain and disability (Sullivan, Feuerstein, Gatchel, Linton, & Pransky, 2005).

It is possible that interventions specifically designed to target pain catastrophizing might also be of benefit to work-disabled individuals with FM. The Progressive Goal Attainment Program (PGAP) is a risk factor targeted intervention that was originally designed to reduce pain catastrophizing as well as correlates of pain catastrophizing (i.e., fear of pain, negative outcome expectancies, disability beliefs) associated with musculoskeletal injury (Sullivan, Adams, Rhodenizer, & Stanish, 2006). The underlying rationale was that an intervention specifically targeting the psychosocial factors that contribute to disability might yield positive outcomes for individuals who were work-disabled because of a musculoskeletal condition (Sullivan, Ward, et al., 2005). To date, the results of numerous investigations have shown that the PGAP can be effective in reducing pain, distress, disability, and facilitating return to work in individuals with whiplash injuries and work-related musculoskeletal injuries (Adams, Ellis, Stanish, & Sullivan, 2007; Sullivan & Adams, 2010; Sullivan et al., 2006).

The PGAP consists of 10 weekly meetings between a trained PGAP provider and a client. An educational video is used to orient the client to the procedures of the intervention as well as to foster positive outcome expectancies. A client workbook is provided to the client and serves as the platform for the intervention techniques that will be used. The primary goals of the PGAP are to reduce psychosocial barriers to rehabilitation progress, promote reintegration into life-role activities, and facilitate return to work. These goals are achieved through targeted treatment of psychosocial risk factors, structured activity scheduling, graded activity involvement, activity exposure, thought monitoring, goal setting, and motivational enhancement (Sullivan & Adams, 2010). In the initial weeks of the program, the focus is on developing a structured activity schedule for the client to facilitate resumption of preinjury activities. Activity goals are established to promote resumption of family, social, and occupational roles. Cognitive and behavioral techniques are invoked to target specific obstacles to rehabilitation progress (e.g., catastrophic thinking, fear of pain, disability beliefs). In the final stages of the program, the intervention focuses on activities that will facilitate reintegration into the workplace.

The PGAP differs from many other rehabilitation interventions in that most of the techniques included in the intervention have activity resumption, as opposed to symptom reduction, as their primary objective (Sullivan et al., 2006). There were several reasons for developing a program that focused more on function than symptom reduction. First, research in other areas of rehabilitation indicates clearly that symptom reduction is not a precondition to successful return to work (Sullivan, 2003). Second, available research suggests that symptom-reduction interventions for

FM yield disappointing results (Mease, 2005). Third, symptom-reduction techniques, whether pharmacological or psychological, tend to be passive in nature, and passive techniques have been shown to be detrimental to return-to-work outcomes (Waddell, Aylward, & Sawney, 2002). Finally, a focus on symptom reduction might inadvertently reinforce individuals' beliefs that symptoms must be eradicated before occupational activities can be resumed.

The purpose of the proposed research was to conduct a feasibility trial of the usage of PGAP for facilitating return to work in individuals with FM. A sample of 30 individuals with a confirmed diagnosis of FM participated in the PGAP. Treatment outcomes were compared to a group of individuals with chronic low back pain (CLBP), who also participated in PGAP, who were matched on sex, age, pain duration, and pretreatment pain severity. The study sought to determine the degree to which this type of intervention was acceptable to individuals with FM, and the degree to which individuals with FM responded to this type of intervention. Individuals with FM were compared to individuals with CLBP on reductions in pain severity, depression, self-reported disability, and return to work.

METHODS

Participants

The study sample consisted of 30 women with FM and 30 women with CLBP. Participants in both groups were matched in terms of age (+ or - 3 years), initial pain severity (+ or - 2 on a 0–10 scale) and pain duration (+ or - 4 weeks). The mean age of the sample was 42.6 years ($SD = 10.3$ years), with a range of 18–61 years. The mean duration of pain was 131 weeks ($SD = 28$ weeks). The mean number of years of education was 12.7 ($SD = 2.0$). Most of the sample (84%) was married or living in common law. Participants with FM were diagnosed using the American College of Rheumatology (Wolfe et al., 1990) criteria for FM. At the time of referral, all participants were receiving disability benefits from a long-term disability insurer.

Measures

Pain Severity. Participants were asked to rate the severity of their pain on an 11-point numerical rating scale with the endpoints (0) *no pain* and (10) *excruciating pain*.

Depression. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) was used as a self-report measure of depressive symptom severity. The BDI-II has been shown to be a reliable ($\alpha = .86$) and valid index of depressive symptoms in patients with chronic pain and primary care medical patients (Arnau, Meagher, Norris, & Bramson, 2001; Beck, Steer, & Garbon, 1988).

Self-Rated Disability. The Pain Disability Index (PDI; Pollard, 1984) assesses the degree to which respondents perceive that they are disabled in seven different areas of daily living (home, social, recreational, occupational, sexual, self-care, life support). For each life domain, respondents are asked to provide disability ratings on 11-point scales with the end points (0) *no disability* and (10) *total disability* (Tait, Chibnall, & Krause, 1990). The PDI has been shown to be internally reliable ($\alpha = .86$) and associated with objective indices of disability (Tait et al., 1990).

Catastrophizing. The Pain Catastrophizing Scale (PCS; Sullivan, Bishop, & Pivik, 1995) was used as a measure of catastrophic thinking related to pain. The PCS has been shown to have high internal consistency ($\alpha = .87$) and to be associated with heightened pain, emotional distress, and disability (Sullivan et al., 1995; Sullivan et al., 2001).

Fear of Movement/Reinjury. The Tampa Scale for Kinesiophobia (TSK; Kori, Miller, & Todd, 1990) is a 17-item questionnaire that assesses fear of (re)injury because of movement. The TSK has been shown to be internally reliable (coefficient $\alpha = .77$; Crombez, Vlaeyen, Heuts, & Lysens,

1999). The TSK has been shown to be associated with various indices of behavioral avoidance and self-reported disability (French & Roach, 2002; Vlaeyen, Kole-Snijders, Boeren, & van Eek, 1995).

Return to Work. Return to work was assessed by self-report in a telephone interview 12 months following termination of treatment. Participants were classified as employed if they were gainfully employed at least 25 hours per week at the time of the telephone interview. All others were classified as unemployed.

Procedure

This program of research received ethical approval from the Institutional Review Board of the *Centre de recherche interdisciplinaire en réadaptation du Montréal métropolitain* (CRIR). Participants with FM were consecutive referrals to one of three rehabilitation treatment centers in Eastern Canada. Participants with FM were recruited during a period of 20 months. In all cases, participants were referred by a disability insurer. Once the target sample size of 30 participants with FM had been reached, participants with FM were matched to individuals with CLBP on age, sex, pain duration, and pain severity. Because individuals with FM and CLBP differ on a number of demographic and condition-related parameters, it was necessary to select matched CLBP participants from a substantively larger sample. The data for participants with CLBP were drawn from a larger sample ($N = 145$) of individuals, who were treated in the same treatment centers. The sample of CLBP participants were drawn from a cohort referred during a period of 36 months.

The Intervention. The PGAP was delivered by one of six occupational therapists who completed a 2-day training workshop on the assessment and treatment techniques of PGAP. In addition to the training workshop, the occupational therapists were required to become familiar with the contents of the PGAP treatment manual that describes all the assessment and intervention techniques of the program.

Because PGAP is a risk factor targeted intervention, clients are only considered as potential candidates for the intervention if they obtain scores in the risk range (defined as a score above the 50th percentile in the distribution of scores in normative samples) on at least one of the following measures: MPQ, PCS, TSK or PDI. When the screening evaluation reveals that a client is an appropriate candidate, the PGAP provider invites the client to watch the information video. In this video, a narrator describes the negative consequences of inactivity and proposes involvement in PGAP as a means of promoting recovery and increasing quality of life. In addition, interviews with medical experts are depicted, each emphasizing the importance of activity participation for the management of persistent pain conditions. The narrator also describes all procedural aspects of the intervention program. Although the narrator of the information video states clearly that return to work is the primary goal of PGAP, he or she qualifies this objective by noting that even if return to work is not possible, participation in PGAP can still lead to improved quality of life by maximizing the client's involvement in meaningful and satisfying activities of daily life.

After having viewed the information video, the PGAP provider asks the client if he or she would be interested in participating in the intervention. If participants indicate reluctance to enroll, the PGAP provider asks the participant to consider participating for a period of only 2 weeks; after which time, if the participant is not interested in continuing, the intervention can be terminated. Using this technique, the PGAP provider communicates his or her belief that the intervention can be beneficial, communicates interest in working with the participant, and reduces the degree of commitment required of the participant. The rationale was to use engagement techniques that would maximize the probability that the participant would be willing to begin the intervention, with the view that the development of the working relationship and initial gains made would be sufficient to maintain the participants' involvement through to completion of the intervention. The intervention is only initiated if the client agrees to participate.

Sessions of the PGAP are scheduled weekly and are approximately 1 hour in duration. The PGAP consists of a maximum of 10 weekly contacts between a trained PGAP provider and a client. The PGAP is terminated when the client indicates readiness to return to work even if less than 10 weeks of treatment have been completed. When a client agrees to participate in the intervention, he or she is provided with a copy of client workbook that will serve as the platform for the intervention techniques that are used in the PGAP.

In the initial weeks of the program, the focus is on the establishment of a strong therapeutic relationship through the use of disclosure and validation techniques. The focus then changes to the development of a structured activity schedule to facilitate resumption of preinjury/illness activities. Activity goals are established to promote resumption of family, social, and occupational roles. Additional intervention techniques (e.g., thought monitoring, exposure) are invoked to specifically target specific obstacles to rehabilitation progress (e.g., catastrophizing, fear of pain, and disability beliefs). In the final stages of the program, the intervention focuses on scheduling activities that will facilitate reintegration into the workplace.

Data Analytic Approach

Means and standard deviations were computed on all study variables. *T*-tests for independent samples were used to compare the FM and CLBP groups on pretreatment measures. Mixed model ANOVA were computed on measures of pain, catastrophic thinking, pain-related fears, perceived disability, and depression. Percentage change values on measures of pain, function, and psychosocial risk are presented to compare the clinical significance of change between the two groups. Finally, logistic regression analysis was performed to identify the treatment-related determinants of return to work.

RESULTS

Acceptability of the Progressive Goal Attainment Program to Individuals With Fibromyalgia

The ultimate impact of an intervention program is determined in part by the degree to which individuals are agreeable to participate in it. In this study of 35 individuals with FM who were invited to participate after having viewed the information video, 30 agreed, representing an acceptability rate of 86%. Of the 30 individuals who agreed to participate, 6 initially declined but then agreed to participate when asked for a commitment of only 2 weeks. All six participants who agreed to a 2-week commitment went on to complete 10 weeks of treatment. In this study, the acceptability rate for the group with CLBP could not be assessed because these clients were not consecutive referrals but rather, were selected from a larger sample to match the FM group. In previous research, more than 80% of individuals who were invited to participate in the PGAP, agreed to take part in the intervention (Sullivan et al., 2006).

Sample Characteristics

Table 1 shows the means and standard deviations on pretreatment measures for participants with FM and CLBP. There were no differences between groups on age, $t(58) = -.31, ns$; education, $t(58) = 1.3, ns$; pain duration, $t(58) = -.50$; or pretreatment pain severity, $t(58) = -.80, ns$. There were no significant differences between groups on measures of fear of movement, $t(58) = -1.1, ns$; or self-rated disability, $t(58) = 1.5, ns$. Individuals with FM obtained higher scores on catastrophizing, $t(58) = -2.7, p < .01$; and depression, $t(58) = -3.6, p < .001$. Scores

TABLE 1. MEANS AND STANDARD DEVIATIONS ON DEMOGRAPHIC AND PRETREATMENT PAIN-RELATED VARIABLES

	FM (<i>n</i> = 30)	CLBP (<i>n</i> = 30)	<i>p</i>
Age	36.9 (9.8)	36.1 (10.9)	.75
Pain duration (weeks)	133.0 (28.4)	130.0 (27.9)	.61
Education (years)	12.7 (3.0)	11.6 (3.2)	.78
Pain severity	5.3 (1.8)	5.0 (1.3)	.42
PDI	27.4 (5.5)	32.0 (13.6)	.12
BDI-II	19.2 (10.6)	10.7 (7.7)	.001
PCS	23.8 (10.3)	16.4 (9.7)	.008
TSK	44.8 (7.3)	42.4 (8.6)	.25

Note. *N* = 60. Values in parentheses are standard deviations. FM = fibromyalgia; CLBP = chronic low back pain; PDI = Pain Disability Index; BDI-II = Beck Depression Inventory-II; PCS = Pain Catastrophizing Scale; TSK = Tampa Scale for Kinesiophobia.

on measures of catastrophizing, fear of movement, depression, and disability are comparable to those that have been reported in previous research (Adams et al., 2007; Crombez, Eccleston, Van den Broeck, Goubert, & Van Houdenhove, 2004; Hassett, Cone, Patella, & Sigal, 2000; Sullivan et al., 2006; Turk, Robinson, & Burwinkle, 2004).

Changes in Pain-Related Measures Through the Course of Treatment

Table 2 shows the means and standard deviations for pain-related measures prior to and at the end of treatment. A two-way (Group \times Time) repeated measures of ANOVA on ratings of pain intensity revealed main effects for Group, $F(1, 58) = 9.6, P < .01$; Time, $F(1, 58) = 31.0, P < .001$; and a significant interaction, $F(1, 58) = 11.9, P < .001$. Simple effects tests revealed that the two groups did not differ significantly in their pretreatment pain intensity, but the CLBP group had lower pain intensity ratings at posttreatment than the FM group, $p < .05$. Examination of the means shows that, with respect to pain reduction, individuals with CLBP benefitted more from the intervention than individuals with FM.

TABLE 2. CHANGES IN PAIN-RELATED MEASURES THROUGH THE COURSE OF TREATMENT

	FM			CLBP		
	Pre	Post	Ch%	Pre	Post	Ch%
Pain severity	5.3 (1.8)	4.7 (2.1)	-11%	5.0 (2.3)	2.6 (1.9)	-48%
PCS	23.8 (10.3)	17.9 (11.2)	-25%	16.4 (12.5)	9.2 (7.7)	-43%
TSK	44.8 (6.7)	39.7 (7.1)	-11%	42.4 (8.9)	38.6 (9.5)	-9%
PDI	27.4 (5.5)	21.8 (8.7)	-20%	32.0 (13.4)	16.0 (12.3)	-50%
BDI-II	19.2 (10.6)	15.0 (8.7)	-21%	10.7 (7.7)	7.1 (8.0)	-33%

Note. *N* = 60. Values in parentheses are standard deviations. FM = fibromyalgia; CLBP = chronic low back pain; Ch% = percentage reduction in scores from pre- to post-treatment; PDI = Pain Disability Index; BDI-II = Beck Depression Inventory-II; PCS = Pain Catastrophizing Scale; TSK = Tampa Scale for Kinesiophobia.

A two-way (Group \times Time) repeated measures ANOVA on self-rated disability scores revealed a main effect for Time, $F(1, 58) = 67.3, P < .001$ and a significant interaction, $F(1, 58) = 15.4, P < .001$. Tests of simple effects revealed that individuals in the CLBP group showed greater reductions in self-rated disability than individuals in the FM group, $p < .05$.

A two-way (Group \times Time) repeated measures ANOVA on depression scores revealed significant main effects for Group, $F(1, 58) = 15.7, P < .001$ and Time, $F(1, 58) = 22.2, P < .001$. Examination of means indicates that both groups showed reductions in depression through the course of treatment and that individuals with FM obtained higher scores on depression than individuals with CLBP at pre- and post-treatment assessments.

A two-way (Group \times Time) repeated measures ANOVA on catastrophizing scores revealed significant main effects for Group, $F(1, 58) = 12.1, P < .001$ and Time, $F(1, 58) = 28.5, P < .001$. Examination of means indicates that both groups showed reductions in catastrophizing through the course of treatment and that individuals with FM obtained higher scores on catastrophizing than individuals with CLBP at pre- and post-treatment assessments.

A two-way (Group \times Time) repeated measures ANOVA on fear of movement scores revealed only a main effect for Time, $F(1, 58) = 21.4, P < .001$. As shown in Table 2, both groups showed reductions in fear of movement through the course of treatment.

It has been suggested that reductions in measures of pain and distress that are in excess of 30% are considered clinically meaningful (Dworkin et al., 2009). Individuals with FM were less likely (50%) than individuals with CLBP (70%) to show clinically meaningful reductions in pain, $\chi^2 = 4.5, p < .05$; as well as self-rated disability (40% vs. 83%), $\chi^2 = 11.9, P < .001$. Individuals with FM were as likely as individuals with CLBP to show clinically significant reductions in depression (50% vs. 57%), $\chi^2 = .29, ns$ and fear of movement (6% vs. 8%), $\chi^2 = .12, ns$. Individuals with FM were somewhat less likely than individuals with CLBP to show clinically significant reductions in catastrophizing (53% vs. 70%), but the difference was not significant, $\chi^2 = 1.7, p = .18$.

Correlates of Clinical Improvement

Significant correlations were found among all pairs of change indices (see Table 3). Reductions in pain and depression were most strongly correlated with reductions in catastrophizing. Reductions in self-rated disability were most strongly correlated with reductions in pain.

Regression analyses were conducted to assess the unique and shared contributions of catastrophizing and fear of movement to clinical improvement. In each regression, age, education, and pain duration were included in the first step of the analysis. In the regression predicting change in pain severity, reductions in catastrophizing and fear of movement did not contribute to

TABLE 3. CORRELATIONS AMONG CHANGE SCORES

	1	2	3	4
1. PainCh				
2. BDICH	.27*			
3. PDICH	.33**	.36**		
4. PCSCh	.57**	.48**	.44**	
5. TSKCh	.44**	.37**	.42**	.46**

Note. $N = 60$. Significance tests are two-tailed. PainCh = change in pain intensity; BDICH = change in BDI scores; PDICH = change in PDI scores; PCSCh = change in PCS scores; TSKCh = change in TSK scores. * $p < .05$. ** $p < .01$.

unique variance over and above the variance accounted for by age, education, and pain duration. In the regression predicting change in depression, only reductions in catastrophizing contributed to significant unique variance, $\beta = .38, P < .01$. In the regression predicting change in self-rated disability, reductions in catastrophizing, $\beta = .31, P < .05$ and fear of movement, $\beta = .30, P < .05$, both contributed significant unique variance.

Determinants of Group Differences in Return to Work

Return to work rates at 12-month follow-up were significantly lower in the FM group (23%) than in the CLBP group (50%), $\chi^2 = 4.5, P < .05$. A series of four logistic regressions were conducted to examine the variables that might account for the lower return to work rates in individuals with FM. Possible candidates would include treatment-related variables where significant group differences were found. As noted earlier, individuals with FM compared to individuals with CLBP showed less reduction in pain and self-reported disability and obtained higher posttreatment scores on catastrophizing and depression. For each logistic regression, the variable for which significant group differences emerged (i.e., change in pain, change in self-reported disability, posttreatment catastrophizing, or posttreatment depression) in the ANOVAs was entered in the first step of the analysis, and Group was entered in the second step of the analysis. Group remained a significant predictor of return to work even when controlling for changes in pain, $OR = 3.1, 95\% CI = .96 \text{ to } 10.1, p < .05$. Group was no longer a significant when controlling for changes in self-reported disability, $OR = 1.8, 95\% CI = .54\text{--}6.6, ns$, posttreatment catastrophizing, $OR = 1.7, 95\% CI = .51\text{--}6.1, ns$ or posttreatment depression, $OR = 1.7, 95\% CI = .45\text{--}5.9, ns$.

DISCUSSION

This study sought to examine the feasibility and impact of a life-role reintegration intervention on clinical improvement and return-to-work rates in individuals with FM. The results revealed that clinical symptoms (e.g., pain, depression) and pain-related psychosocial risk factors decreased significantly in a substantive proportion of individuals with FM. Follow-up telephone interview revealed that 23% of individuals with FM had returned to work. To our knowledge, this is the first study to document return-to-work rates in individuals with FM following participation in a rehabilitation intervention.

An important finding of this study was the high rate of acceptability of the intervention to individuals with FM. In rehabilitation interventions, concerns have been voiced that emphasizing return to work as a primary objective of treatment might reduce the willingness of individuals with FM to participate. In this study, a video was used to engage the participant in the intervention. After highlighting that return to work was the objective of the intervention, the narrator goes on to indicate that if return to work is not possible, then increased quality of life becomes the treatment goal. For individuals who initially indicate reluctance to participate, the PGAP provider asks the client to make a commitment to treatment for only 2 weeks. The PGAP provider is essentially using “perceptual contrast” technique to enlist the client’s participation in treatment. The 2-week commitment contrasts in magnitude with the 10-week program described in the video. Techniques such as these have been shown to have significant influence on compliance and persuasion (Cialdini & Goldstein, 2004). Within the first 2 weeks of the program, one of the objectives of PGAP provider is to develop a strong working alliance with the client. Once established, the working alliance is intended to provide the basis for the client’s willingness to continue the intervention. In this study, all participants who agreed to enroll for 2 weeks completed all 10 weeks of the program.

Treatment response in individuals with FM was compared to treatment response in individuals with CLBP. In previous research, the effectiveness of PGAP has been assessed primarily in

relation to work disability consequent to musculoskeletal injury. One study showed that participation in the PGAP yielded better return-to-work outcomes than a physical therapy intervention in individuals who has sustained whiplash injuries (Sullivan et al., 2006). Another study showed that participation in the PGAP yielded better return-to-work outcomes than physical therapy in individuals who had recently sustained work-related back injuries (Sullivan & Adams, 2010). The present findings suggest that, at least for some individuals with FM, the PGAP can be a useful intervention for promoting return to work.

The magnitude of change in symptom severity and pain-related psychosocial risk factors observed in the CLBP group in this study, as well as the return-to-work rates, are comparable to that which has been reported in previous research with participants with a similar level of chronicity (Adams et al., 2007; Watson, Booker, Moores, & Main, 2004). The results of this study suggest that compared to individuals with chronic CLBP, individuals with FM are more treatment resistant. Return to work was twice as high in the CLBP group than in the FM group. In addition, individuals with FM showed more modest reductions in pain severity and less change in self-reported disability than individuals with CLBP.

Although individuals with FM obtained higher posttreatment scores on catastrophizing and depression than individuals with CLBP, the two groups did not differ in the magnitude of the treatment-related reductions in catastrophizing and depression. The group differences in posttreatment levels of catastrophizing and depression were the result of individuals with FM obtaining higher pretreatment scores on these variables. Given that there were no differences in the magnitude of change in catastrophizing or depression, the results suggest that the intervention was as effective in reducing catastrophizing and depression in individuals with FM as in individuals with CLBP. On the basis of these findings, it is possible to suggest that better return to work outcomes might have been achieved by including additional techniques designed to reduce catastrophic thinking or depression. Alternately, better return-to-work outcomes might have been achieved for individuals with FM had the treatment duration been longer. The latter suggestion is based in the assumption that scores would have continued to decrease with additional treatment.

Logistic regression analyses revealed that group differences in return to work could not be accounted for by differences in pain reduction through the course of treatment. This finding is consistent with previous research suggesting that pain reduction is not a prerequisite for return to work in individuals with persistent pain conditions. However, when controlling for changes in self-reported disability, group differences in return to work were no longer significant. These findings suggest that reductions in self-reported disability might be an important determinant of return to work in individuals with FM.

Self-reported disability can be construed as an index of one's physical limitations but can also be construed a "perception" of one's limitations. Previous research has shown that self-report measures of disability are saturated with psychological content to a greater degree than objective measures of physical disability (Gauthier, Sullivan, Adams, Stanish, & Thibault, 2006). As such, it is possible that scores on the measure of self-rated disability reflect, at least in part, individuals' beliefs about the magnitude of their disability. Numerous investigations has shown that beliefs are significant determinants of behavior (Hanley, Raichle, Jensen, & Cardenas, 2008; Jensen, Romano, Turner, Good, & Wald, 1999); if individuals with FM believe themselves to be severely disabled, it is likely that they will behave in a manner consistent with that belief. Although research has supported the view that disability beliefs are significant determinants of disability associated with musculoskeletal conditions, little research has been conducted on the efficacy of different intervention techniques for changing disability beliefs (Jensen, Romano, Turner, & Lawler, 1994; Waddell, Newton, Henderson, Somerville, & Main, 1993; Williams, Robinson, & Geisser, 1994).

In the program of intervention used in this study, disability beliefs are targeted indirectly by progressively increasing the participants' activity involvement during the course of the treatment program. The process is similar to a cognitive dissonance manipulation where the objective is to create a reality that is inconsistent with participants' beliefs in their level of disability. When individuals are led to behave in ways incompatible with their beliefs, the probability that beliefs will change is increased. For individuals with FM, it might be necessary to use techniques that more directly target individuals' disability beliefs. A challenge, however, will be to proceed in a manner that does not communicate to the individual that the authenticity of his or her disability is being questioned.

Cost-effectiveness issues are central in the management of treatment-resistant conditions. Although multidisciplinary interventions have traditionally been considered the treatment of choice for chronic or complex pain conditions, multidisciplinary programs are expensive, often ranging in cost from \$10,000 to \$30,000 for an 8-week program. If treatment outcomes are expected to be modest for a particular population, such costs might be difficult to justify. One of the advantages of the PGAP is that it is delivered by a single clinician for a maximum of 10 direct clinical hours (i.e., 1 hour per week). As such, the costs of the PGAP are a fraction of those associated with multidisciplinary treatment. If future research shows that the PGAP can yield outcomes comparable to those of multidisciplinary treatment for individuals with FM, it might provide a viable alternative to more costly treatments.

Although individuals with FM were less likely to return to work than individuals with CLBP, individuals with FM were likely to as individuals with CLBP to show clinically meaningful reductions in depression, fear of movement, and catastrophizing. These results suggest that return to work is not the only benefit of participating in a risk factor targeted life-role reintegration program. Resumption of life-role activities is a vehicle through which return-to-work objectives are achieved in the PGAP. Resumption of life-role activities is also a vehicle through which increases in quality of life are achieved. Even for individuals who are unable to return to work, participation in the PGAP is intended to contribute to an increase in quality of life. Research has shown that participation in purposeful and meaningful activities is a central contributor to quality of life (Rosemann, Grol, Hermann, Wensing, & Szecsenyi, 2008).

Several limitations to this study must be noted. First, a no treatment control group was not included, and therefore, changes observed through treatment cannot unambiguously be attributed to the treatment program. In addition, the small sample size places limits on the nature of statistical procedures that could be used to examine processes that accounted for treatment outcomes in the FM and CLBP groups. Several logistic regressions were computed, thus increasing the probability of Type I error. Although analyses pointed to treatment-related changes in self-reported disability and end of treatment levels of catastrophizing and depression and factors that might explain group differences in return to work, it is possible that these variables do not represent distinct sources of variance. This study, however, lacked the power to assess the shared and unique contributions of these variables using a multivariate approach. It is also important to consider that only individuals with high scores on psychosocial risk measures were included in the trial. It is possible that regression toward the mean might have contributed to the pattern of findings given that high scores have a greater probability of decreasing than increasing. Finally, all individuals in this study were referred for treatment by a long-term disability insurer. It is possible that individuals' perceptions of the consequences of refusing treatment might have augmented participation rates.

Despite these limitations, the findings of this study provide preliminary evidence that a risk factor targeted life-role reintegration intervention can lead to clinically significant reductions in pain-related psychological variables in individuals with FM. Treatment participation also resulted in return to work in 23% of individuals with FM, suggesting that for at least some individuals

with FM, return to work is an achievable goal of a rehabilitation program. Finally, these gains were made through a program delivered by a single interventionist. Future research will need to address the effectiveness of different techniques in changing disability beliefs. Future research should also compare the outcomes of the PGAP to more costly multidisciplinary programs used in the treatment of FM.

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