

PERSPECTIVES IN REHABILITATION

Adapting principles of chronic pain self-management to the workplace

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Purpose: To evaluate the extent to which the principles of chronic pain or illness self-management (SM) programs might be adapted to focus on the workplace concerns of adults with persistent or recurrent pain and lead to new workplace intervention opportunities. **Method:** Eight SM programs were selected as representative evidence-based programs and then compared to extract common instructional elements. Elements were analyzed for potential application to four workplace problem domains identified by workers with pain: activity interference, negative self-perceptions, interpersonal challenges, and the inflexibility of work. **Results:** Of 24 instructional elements, 17 were shared by at least half of the SM programs. Instructional elements judged to be best suited for dealing with workplace concerns included those focused on reducing pain and discomfort, making informed decisions, communicating effectively, and dealing with thoughts and feelings. However, aspects of the workplace that may alter the feasibility or effectiveness of SM strategies include the level of physical demands and limitations, job leeway, and the nature of workplace roles and relationships. **Conclusions:** Principles and methods of SM intervention programs are generally well suited to address pain-related problems in the workplace, but tailoring of messages may be necessary to incorporate the unique organizational, physical, and social aspects of work into psycho-educational programs.

Keywords: Low back pain, pain self-management, workplace intervention

Introduction

Approximately 10–20% of working adults report persistent or recurring musculoskeletal pain conditions that limit their ability to work [1]. Among chronic health conditions causing work limitations, back disorders are the third leading cause,

Implications for Rehabilitation

- Chronic pain is a growing problem among working age adults that can contribute to workplace difficulties and disability.
- Pain self-management interventions applying psycho-educational techniques are generally well-suited for dealing with workplace problems.
- Pain self-management interventions may reduce pain and discomfort in the workplace, help with job-related problem-solving and decision-making, provide methods for communicating needs effectively, and deal with negative thoughts and feelings at work.
- Applying existing pain self-management techniques in the workplace requires that some changes be made to incorporate the unique organizational, physical, and social aspects of the workplace.

surpassed only by depression and arthritis [2]. Among low-wage workers with high physical workloads, the prevalence of musculoskeletal complaints may exceed 60% [3]. Though many workers report serious work limitations due to pain, others appear to manage pain episodes and flare-ups quite well, often without the need for formal job accommodation or physician-ordered restrictions [4,5]. Though workers may be less effective during pain episodes [6], they are presumably able to continue working because of peer and supervisor support, employer leeway, personal fortitude, and the ability to manage pain successfully while continuing to meet job demands. Strengthening these informal processes may be one way to prevent work disability.

Theoretical perspectives on work disability have acknowledged that sickness absence is a multidimensional problem influenced by personal and workplace factors and as well

as by the rules and procedures adopted by healthcare, legislative, and insurance systems [7]. Legislative frameworks vary with respect to employer efforts to deal with disabling medical conditions and provide reasonable accommodation. Financial incentives for employers to reduce sickness absence also vary by country and by insurance system. Examples of recent legislative changes to increase employer responsibilities include requirements to designate return-to-work coordinators (Australia [8]), expanded definitions of disabling health conditions (USA [9]), and legislative reforms in many European nations intended to shift responsibility for disability prevention efforts from social insurance systems to employers. Overall, these changes reflect a gradual trend toward greater employer involvement in workforce health and wellness [10,11].

Despite variability among systems, researchers have generally concluded that in addition to sound clinical treatment, workplace-based intervention strategies are key to improving disability outcomes [12,13]. Although most studies of workplace-based intervention have focused on employer support, communication, and accommodation [14], the coping skills of workers may be another avenue for intervention. Although not all structural elements of work and the work environment are within the control of workers, qualitative studies have shown that workers expend considerable effort to manage pain and other medical conditions at work [15–17]. Advice, counseling, and support from both clinicians and peers may help workers choose the most appropriate methods for managing pain while attending to the unique constraints of individual work settings.

Chronic or recurrent pain can interfere with occupational function by limiting physical capacity, reducing work productivity, straining relationships with peers and supervisors, and creating a need to alter or modify job tasks to reduce discomfort [18–27]. To counter these negative impacts, workers must learn to manage pain while maintaining job productivity; judge how and when to disclose pain problems to supervisors and co-workers; find ways to obtain social support and assistance in the workplace; and learn how to initiate or request changes in work habits or physical demands [27]. Workers who are able to communicate effectively with supervisors and co-workers and who feel confident in overcoming problems and reducing discomfort may experience improved quality of work life and productivity, fewer sickness absences, and longer job retention.

Self-management (SM) interventions apply psycho-educational techniques borrowed from cognitive-behavioral therapy to enhance coping skills and provide individualized plans for problem solving and dealing with temporary set-backs. Such interventions have been shown to reduce the experience of pain, functional limitation, and distress in clinical trials, especially when intervention strategies are tailored to symptom severity [28–37]. What makes SM different from other types of CBT interventions is a stronger reliance on group peer support and education; a greater emphasis on patient empowerment, responsibility, and self-care; and usually a focus on less severe (but recurrent or chronic) medical symptoms. These social and motivational elements of SM

intervention may have particular relevance in a workplace context and setting, but this idea has not been well-developed as a possible element of clinician counseling and advice or as a workplace intervention strategy. The aim of this article was to evaluate the extent to which the principles of chronic pain SM programs might be adapted to focus on the workplace concerns of adults with persistent or recurrent pain.

Evidence-based pain self management programs

A number of existing pain SM programs are reported in the scientific literature, though none of these have focused on workplace concerns. Also, the specific content of programs has varied. To provide a summary of the various psycho-educational elements and domains, we conducted a content analysis of eight existing SM programs (though none of these have focused on workplace concerns [38–45]). The eight SM programs were identified using a multimodal approach including use of internet search engines, textbook references, inquiries with colleagues and peers, the expertise of the research team, and a Medline search (publication years 1989–2009; English language only) with the keywords of “self-management,” “chronic pain,” “chronic illness” and “intervention.” Because many self-care books and programs on chronic pain are commercially available, we gave preference to programs that: (1) were supported or evaluated using scientific evidence, (2) involved the use of a detailed handbook or facilitator manual that could be easily obtained, (3) could be administered in a group, individual, or self-taught format, (4) appeared consistent with the principles of SM described by Lorig and colleagues [46,47], and (5) were endorsed or published by national or international scientific organizations. Chronic illness SM programs were also included because these programs tend to have a considerable emphasis on managing pain.

All eight SM programs provide a similar rationale or conceptual framework emphasizing both the psychological impact of experiencing persistent pain or illness and the cyclic nature of pain/impairment, distress, and disability. Programs differ, however, with respect to length, intended method of conveyance (individual, group, or self-taught), and the use of instructional devices (case examples, worksheets, behavioral exercises, homework assignments, surveys, etc.). Only one of the eight programs [38] includes a chapter dedicated to workplace concerns; otherwise, specific mention of the workplace is rare. A brief description for each of the SM programs is provided below:

Manage Your Pain [38] is a self-help guidebook designed to help those patients with chronic or persisting pain who would like to improve their personal efforts in managing pain. The book is intended to be self-taught, though content is based on a randomized clinical trial that showed improved outcomes for patients randomized to inpatient and outpatient pain management programs at the St. Thomas’ Hospital in London in the 1990s [48]. Currently, the book is used as part of the “ADAPT” program, a 3-week intensive group intervention program developed at the University of Sydney Pain Management and Research Centre at the Royal North Shore

Hospital in Sydney, Australia. The emphasis of the program is on setting realistic activity goals, finding ways to accomplish them, and leveraging support in the home and work environments.

Feeling Better [39] is a self-help book designed to help people with benign chronic symptoms. The program is intended to be self-taught and is tested and found effective in a randomized controlled trial. It is presented in 6 chapters; one for each of the 6 weeks intended to complete the program. The emphasis is on changing ways of thinking and thereby behavior.

Living a Healthy Life with Chronic Conditions [40] is a self-help guidebook designed to expand principles of SM to any chronic health condition. The book consists of 14 chapters dedicated to specific SM techniques and four additional chapters to improve understanding of some of the most common chronic health conditions (lung disease, heart disease, hypertension, arthritis, and diabetes). The emphasis of the program is on adopting and maintaining positive health habits, understanding symptoms and treatments, finding available resources, and communicating effectively with family and health care providers.

The Arthritis Helpbook [41] is a SM program designed to help individuals manage symptoms of arthritis and fibromyalgia. The book is intended to be self-taught, but the book is largely based on a series of peer-led arthritis education classes that have been the subject of substantial research at the Stanford Arthritis Center since 1979. The book has 25 chapters divided into six major headings, and the emphasis of the program is on pain relief, increasing mobility, preventing deformity, interacting with the health care system, and tailoring treatment plans and SM strategies by incorporating individual circumstances and preferences.

Pain Management for Older Adults [42] is a self-help guidebook designed to help seniors manage typical pain symptoms of later life. The book was developed by pain researchers and health care professionals, and readers are suggested to spend one week on each chapter, completing the book over a 10-week period. Although the program emphasizes the unique needs of seniors, the authors indicate their recommended techniques are helpful for many pain patients, regardless of age.

The Pain Survival Guide [43] is a self-help guidebook designed to help people with chronic health conditions, especially chronic pain, reduce symptoms and restore quality of life. The book is organized into ten lessons, each incorporating SM principles shown effective in research trials. The overall emphasis is on overcoming feelings of helplessness and hopelessness and improving daily function after repeated curative efforts have failed.

The Pain Relief Handbook [44] is a collection of self-help methods for managing pain based on methods used in a 4-week pain relief clinic at Walton Hospital in Liverpool, England and research carried out at the adjoining Pain Relief Research Institute. The self-help book is divided into ten chapters, with each chapter addressing a different SM strategy. Some of the stated aims of the program are to reduce distress and disability, increase daily activities and physical fitness, and reduce dependence on doctors and the health care system.

Managing Chronic Pain [45] is a SM program designed as a resource for psychotherapists treating patients with chronic pain, in either a group or individual format. The therapist guide and companion workbook for patients are organized into eleven sessions and include educational materials and homework forms. The emphasis of the program is on behavioral activation and changing negative thoughts associated with pain.

Principal psycho-educational elements

A review of the content from existing SM programs shows evidence of 24 instructional elements (Table I). Most of the instructional elements (17 of 24) were common to at least four programs, reflecting some degree of overlap, but only one element (relaxation methods) was common to all eight programs. SM techniques included ways to adopt or maintain healthy habits (e.g. sleep, exercise), ways to regulate thoughts or emotions (e.g. relaxation, distraction, challenging unhelpful thoughts), ways to improve health care interactions (e.g. communicating with providers, understanding treatments and diagnostics), ways to overcome relationship problems (e.g. effective communication, stress or anger management), ways to perform activities more comfortably (e.g. body mechanics, use of gadgets and tools), and ways to make better decisions (e.g. problem solving, finding resources). Some, but not all, of these SM concepts are easily applied to the workplace context.

Pain self-management in the workplace context

To evaluate the potential applicability of SM intervention strategies to the workplace, we assessed the relevance and practicality of applying or adapting each of the 24 instructional elements to any one of four workplace problem domains identified in a qualitative study of workers with chronic back pain [17]: (a) pain interfering with work activities, (b) pain contributing to negative self-perceptions, (c) pain leading to interpersonal conflicts and (d) the inflexibility of work making it difficult to manage pain. Table II shows the summary analysis of SM instructional elements. In each cell, potential areas of relevance are described with regard to the corresponding problem area. Nine instructional elements were judged as minimally applicable to workplace concerns, so these are not listed in Table II. The three topics of “medical education,” “communicating with providers,” and “understanding treatments and diagnostics” are minimally useful because of their focus on health care rather than workplace interactions (though the health care system is clearly a SM resource for workers with pain). The two topics of “sex and intimacy” and “nutrition” are minimally useful because of their focus on non-occupational activities. For the three topics of “goal setting,” “pleasant activity scheduling,” and “self rewards,” we judged these as minimally useful because of their focus on tracking and rewarding specific health behaviors (e.g. number of cigarettes, calorie consumption, miles walked) that might be difficult to define in the workplace context. The topic of “finding resources” in the workplace context can be subsumed within the larger category of effective communication.

Table I. Key instructional elements of eight representative pain or chronic illness self-management programs.

Instructional element	Description	Pain and illness self-management programs							
		Manage your pain [34]	Feeling better [35]	Living with chronic conditions [36]	The arthritis helpbook [37]	Pain management for older adults [38]	The pain survival guide [39]	The pain relief handbook [40]	Managing chronic pain [41]
Relaxation methods	Practicing and using diaphragmatic breathing, progressive muscle relaxation, or visual imagery to increase relaxation	•	•	•	•	•	•	•	•
Sleep hygiene	Improving sleep by altering timing of sleep, sleep behaviors, sleep environment, or evening health habits	•	•	•	•	•	•	•	•
Understanding treatments and diagnostics	Describing conventional and alternative treatments and diagnostics and personal factors in treatment decision making	•	•	•	•	•	•	•	•
Communicating with providers	Preparing for a medical appointment with specific questions to frame the discussion	•	•	•	•	•	•	•	•
Problem solving	Applying a systematic stepwise process to define, analyse, and overcome functional difficulties associated with pain or illness	•	•	•	•	•	•	•	•
Attention techniques	Focusing attention on plans, images, or thoughts that distract from pain	•	•	•	•	•	•	•	•
Cognitive restructuring	Identifying and replacing automatic thoughts and cognitive errors about pain that contribute to distress	•	•	•	•	•	•	•	•
Time-based pacing	Regulating activity to avoid extremes of physical activity that increase pain and require recuperation time	•	•	•	•	•	•	•	•
Effective communication	Avoiding interpersonal conflict through assertive communication and by requesting help effectively	•	•	•	•	•	•	•	•
Goal setting	Setting specific and intermediate behavioral goals that can be reasonably achieved within a short time frame	•	•	•	•	•	•	•	•
Stretching and exercise	Providing exercise rationale and instruction, and finding ways to overcome barriers to exercise	•	•	•	•	•	•	•	•
Sex and intimacy	Examining methods for improving the quality of sexual intimacy and intercourse without increased pain	•	•	•	•	•	•	•	•
Nutrition	Analyzing and improving dietary habits to improve health	•	•	•	•	•	•	•	•
Planning for flare-ups and set-backs	Making a formal plan of action in order to reduce the functional and emotional impacts of flare-ups and set-backs	•	•	•	•	•	•	•	•
Stress management	Identifying internal and external stressors and making behavioral or lifestyle changes to reduce stress	•	•	•	•	•	•	•	•
Medical education	Providing physiological information about body functions and the pathological origins of pain or illness	•	•	•	•	•	•	•	•
Pain diary	Preparing a daily record of pain and function in order to examine thoughts and actions that correlate with pain distress	•	•	•	•	•	•	•	•

(Continued)

Table I. Continued

Instructional element	Description	Pain and illness self-management programs							
		Manage your pain [34]	Feeling better [35]	Living with chronic conditions [36]	The arthritis helpbook [37]	Pain management for older adults [38]	The pain survival guide [39]	The pain relief handbook [40]	Managing chronic pain [41]
Pleasant activity scheduling	Making a list of pleasant activities to counter negative thoughts and emotions or to set goals for increased activity		•			•	•	•	•
Anger management	Increasing environmental, physical, and behavioral awareness of anger, modifying responses to communicate assertively		•	•				•	•
Gadgets, tools, and devices	Using mechanical devices to avoid awkward postures, assist with daily living activities, or alleviate pain or discomfort				•	•			
Finding resources	Distribution of websites, mailing addresses, or telephone contacts to obtain information or assistance			•	•				
Ergonomics/body mechanics	Avoiding awkward postures or other ergonomic risk factors that contribute to pain or discomfort				•	•			
Self rewards	Establishing contingent self-reinforcements to reward positive behavioral changes			•					
Overcoming obstacles and barriers	Recognizing and overcoming personal beliefs or circumstances that prevent or impede positive behavior change	•	•						

The remaining fifteen SM instructional elements may have potential application to workplace concerns, and we categorize these under four general headings: (a) reducing pain and discomfort, (b) making informed decisions, (c) communicating effectively, and (d) dealing with thoughts and feelings. These types of SM concepts seem particularly relevant to coping with pain in the workplace and are discussed in more detail below.

Reducing Pain and Discomfort: The project team identified seven SM instructional elements that could be adapted to reduce pain and discomfort at work: time-based pacing; stretching and exercise; ergonomics/body mechanics; relaxation methods; gadgets, tools, and devices; stress management; and sleep hygiene. Such elements in a SM intervention might provide participants increased options for modifying job tasks, altering work style, increasing body awareness, reducing job stress, and feeling more rested and energetic at work. However, adapting these messages to a workplace context poses some important limitations (e.g. progressive muscle relaxation and visual imagery exercises may be impractical while working, but there are many other ways of relaxing that can be done at work), and many jobs may not allow the job flexibility needed for workers with chronic pain to make changes in the way their job tasks are organized. Nevertheless, most of these SM strategies appear to be consistent with existing efforts by employers to improve employee well-being through fitness, stress management, and participatory ergonomics.

Making Informed Decisions: A second area of potential application is in the area of workplace decision making. Workers with a chronic pain problem may face repeated

workplace dilemmas involving choice of job tasks; finding ways to overcome limitations; getting occasional help and assistance; employer disclosure concerns; decisions about overtime, work schedules, and job transfers; and more long-range career planning issues [17]. For these types of workplace concerns, three SM instructional elements (problem solving, overcoming obstacles and barriers, and planning for flare-ups and set-backs) could be applied. One advantage of applying a 6-step social problem-solving approach to pain-related limitations in a workplace context is that it closely resembles the types of management strategies already espoused by industry (e.g. to identify manufacturing inefficiencies or brainstorm organizational changes). Thus, this strategy may be more readily accepted by workers with pain and their employers than other psychologically based behavior change methods. As an example, problem-solving skills training has been shown to be a feasible intervention strategy to improve the involvement of injured workers in the return-to-work planning process [49]. When applying problem solving in the workplace context, it will be particularly important to focus on the unique behavioral constraints and opportunities of the employment setting. Roles, responsibilities, codes of conduct and expectations of involved workplace parties must be considered in analyzing alternative action plans. The problem-solving framework could also be used to increase options for coping with pain flare-ups while at work.

Communicating Effectively: Interpersonal aspects of chronic pain have received considerable research attention in the home setting (e.g. the unintentional spousal reinforcement of pain behavior), but pain-related communication in

Table II. Opportunities and limitations for adapting pain self-management programs to focus on workplace concerns.

	Opportunities to address common workplace concerns			
	Pain interfering with work activities	Developing negative self-perceptions	Experiencing interpersonal conflicts	Inflexible nature of work activities
Anger management	Not relevant	Displays of anger at work when experiencing pain may damage self-image	Anger management may help to reduce irritability and hostility associated with pain	Provide constructive ways to alleviate pain-related job frustrations
Cognitive restructuring	Countering beliefs that work is harmful may improve job performance	Countering negative self-statements may improve self-esteem and perceived value to the organization	Irritability may be rooted in dysfunctional thoughts of blame and hostility	Not relevant
Attention techniques	Concentrating on work activities and staying active may help to show that pain does not completely distract from normal activities	Not relevant	Not relevant	Not relevant
Effective communication	Not relevant	Not relevant	More effective strategies for talking about pain with co-workers may reduce interpersonal conflict	More assertive but judicious methods for requesting help may increase informal support/assistance
Ergonomics/body mechanics	Altering job methods and body mechanics may reduce awkward postures and painful tasks during flare-ups	Not relevant	Not relevant	Analyzing job tasks may increase awareness of leeway and opportunities for task modification
Gadgets, tools, and devices	Use of special equipment may reduce discomfort at work	Not relevant	Not relevant	Stowing a personal "self-care" kit at work may provide tools for coping with pain flare-ups
Overcoming obstacles and barriers	Worries and fears of re-injury may be an obstacle to change; overcoming fears may improve ability to work	Overcoming obstacles and barriers may boost self-confidence	Not relevant	Identifying challenging work activities and organizational constraints may help to guide problem-solving efforts
Pain diary	Not relevant	A pain response diary may help to identify automatic thoughts and feelings during periods of work distress and dysfunction	Not relevant	Not relevant
Planning for flare-ups and set-backs	Preparing for pain flare-ups may improve ability to work through them	Preparing for temporary flare-ups and set-backs may reduce emotional distress and pain catastrophizing	Not relevant	Not relevant
Problem solving	Systematic problem solving methods could be applied to overcome functional limitations at work	Not relevant	Systematic problem solving may interrupt negative emotional responses that lead to conflict	Systematic problem solving methods may help to provide more options for altering job tasks to reduce discomfort.
Sleep hygiene	Improved sleep hygiene may help to reduce fatigue during working hours	Not relevant	Not relevant	Changes in shift work schedule may improve sleep hygiene
Stress management	Stress management methods may involve re-organization of job tasks to reduce discomfort	Stress management methods may help to reduce feelings of being overwhelmed and unable to keep up	Stress management may reduce hostility and interpersonal conflict with co-workers	Stress management methods may reduce perceived conflict between work, home, and health
Stretching and exercising	Stretching and exercising may interrupt cycle of activity and pain that leads to perceived functional limitation	Stretching and exercising may improve self-perceptions of health and wellness	Not relevant	Not relevant
Time-based pacing	Time-based pacing may help to meet interim production goals without increasing pain	Not relevant	Not relevant	Not relevant
Relaxation methods	Use of deep breathing and self-monitoring of muscle tension might be helpful to reduce stress and discomfort	Not relevant	Not relevant	Taking better advantage of micro-breaks and lunch breaks to relax and relieve muscle tension

the workplace has not been well studied. Chronic pain may pose interpersonal challenges in the workplace by increasing irritability, over-dependence on co-workers, and feelings of isolation. Thus, the SM intervention strategies of

assertive communication and anger management seem reasonably suited to deal with pain-related communication problems in the workplace. Indeed, improved communication among stakeholders has been a consistent theme in

disability prevention research [50]. In translating concepts of assertive communication to the workplace, one important consideration will be to recognize the difference between workplace and non-workplace social relationships, the normative rules for social engagement in the workplace, and how communication strategies might vary by organizational hierarchy (e.g. communicating pain to superiors may have very different implications than communicating with co-workers). Nevertheless, most of the principles of assertive communication and anger management seem transferable to workplace interactions, and such strategies may help to reduce conflicts that emerge from pain-related limitations. In particular, it may be helpful for workers to distinguish between communication for the purpose of obtaining temporary assistance, communication to access social support, and communication to request formal job accommodation.

Dealing With Thoughts and Feelings: This category of SM intervention poses some challenges for workplace adaptation, as emotions are rarely considered a target of workplace intervention. Nevertheless, workers with chronic pain have readily expressed the emotional consequences of working with pain in qualitative reports [51]. These emotions tend to focus on feelings of negative self-worth (“damaged goods”), perceived inability to keep up with job demands, feeling socially isolated at work, fears of job dismissal, and concerns about the future [17]. These types of cognitions are consistent with the negative thoughts shown to predict poor adjustment to chronic pain and increased disability [52]. Cognitive restructuring techniques could be used to highlight associations between activating events (increased pain or job demands), negative cognitions (e.g. “I can’t get anything done when I’m in pain”), and feelings of despair or hopelessness that hinder immediate problem solving efforts. Simple pain diaries might be used to assist in the recognition of these unhelpful thoughts. Concerns about job security, however, may be realistic; thus, an important element of cognitive restructuring would be for workers to test their beliefs using more objective data (e.g. talking with co-workers, checking company policy, or “testing the waters” in some way, etc.). A range of options may exist for dealing with unhelpful thoughts in the workplace, e.g. adopting alternative views of the situation, accepting realities and moving forward, or addressing concerns through improved problem solving and decision making.

With regard to attention techniques, workers may find that dedicating greater attention to other activities (e.g. work tasks) makes them notice pain less, but care should be taken not to reinforce an escapist view that all pain must be avoided, denied, or put out of mind in order to accomplish functional goals. Instead, attention techniques might focus on the skill of attending to both pain and work responsibilities simultaneously, as a form of self-mastery and functional optimization. In contrast with existing SM intervention programs, a workplace adaptation may need to focus on the goal of “feeling better about yourself as a worker,” not necessarily on preventing depression in order to be acceptable in the workplace context.

Unique challenges and opportunities in the workplace context

In the process of reviewing SM intervention instructional elements, the authors identified three aspects of the workplace that would need to be interjected as complementary instructional elements of a SM intervention targeting workplace concerns: (a) assessment of physical job demands and perceived limitations, (b) estimation of job leeway (flexibility and modifiability to accommodate ill health), and (c) analysis of workplace roles and relationships. Attending to these contextual aspects of the workplace may be necessary to inform the SM strategies of workers because job types and work environments can vary widely with regard to these three dimensions. A job could be far more easily managed by a worker with pain if physical demands are easily modified, if substantial flexibility is possible for individual workers, and if plentiful support and assistance are readily available. In contrast, applying SM principles may be nearly impossible in a job involving high physical demands that cannot be altered or varied according to personal preferences and with no opportunities to obtain assistance. Possible methods for integrating these three aspects of the workplace into a SM intervention program are described below:

Assessing Physical Job Demands and Perceived Limitations: In order to effectively apply SM strategies in the workplace, it may be necessary for workers to first identify specific physical demands of their work as well as their areas of perceived functional limitation. The instructional goals of teaching them how to perform such an assessment would include: (a) establish a baseline rating of function for monitoring improvement, (b) initiate problem identification using the problem solving process, and (c) identify possible areas for job modification. To remain consistent with SM principles, this process would allow participants to serve as experts about the particulars of their jobs, without any attempt to impose scientific or industrial standards for declaring unsafe or unhealthy work practices. A number of self-report checklists are available to assess the physical and ergonomic demands of work (e.g. the Job Requirements and Physical Demands Scale [53]), and these could be integrated with SM methods to improve decision making and reduce discomfort.

Estimating Job Leeway: Flexibility to modify or customize job tasks may depend not only on the nature of job demands and activities, but also on accepted norms for behavior in the particular workplace and its organizational culture. Although employers in the US are required to provide reasonable accommodation to workers with health concerns, most workers with pain continue to work without making any formal requests for accommodation. Instead, they work within their available leeway, making adjustments in work style, altering the way specific job tasks are executed, and obtaining informal support and assistance as needed. Although these more informal efforts at job modification have been described in qualitative studies [54], their impact on workplace disability outcomes has not been studied.

Understanding Workplace Roles and Relationships: Unlike communication with family and friends, communication in

Table III. Conceptual design of 5 modules of a self-management group intervention program.

Session title	SM elements	Key messages	Intended outcome/mechanism
Understanding pain; introducing the concept of self-management		<ul style="list-style-type: none"> • Understand nature of chronic pain • Appreciate psychological aspects of pain • You are the expert of your problem 	Reframe chronic pain as a problem that has withstood medical curative efforts; however, quality of life can be improved; increase perceived control and mastery of pain
Taking care of yourself and working smart	<ul style="list-style-type: none"> • Attention techniques • Ergonomics/body mechanics • Gadgets, tools, and devices • Sleep hygiene • Stretching and exercising • Time-based pacing • Relaxation methods 	<ul style="list-style-type: none"> • Increase body awareness • Find ways to feel better • Use diaphragmatic breathing • Assess the nature and demands of your work • Alter tasks and activities • Find ways to keep moving • Attending jointly to pain and work function 	Improve job satisfaction and reduce perceived work limitations by increasing relaxation and body awareness, making use of tools and strategies that reduce discomfort, and altering job methods within available leeway
Problem solving and understanding job leeway	<ul style="list-style-type: none"> • Problem solving • Overcoming obstacles and barriers • Planning for flare-ups and set-backs 	<ul style="list-style-type: none"> • Identify problematic tasks • Define functional problems and goals • Analyse contributing factors • Identify constraints and barriers • Use brainstorming • Evaluate alternative solutions • Implement trial changes • Evaluate solutions 	Reduce perceived work limitations by expanding alternative methods to complete job tasks; increase perceived control and mastery of pain by using systematic decision-making processes
Communicating about pain in the workplace	<ul style="list-style-type: none"> • Effective communication • Anger management 	<ul style="list-style-type: none"> • Understand why you're communicating • Evaluate need for pain-related communication • Recognize your support network • Recognize early signs of irritability • Observe social rules and norms • Make appropriate requests for help 	Improve workplace support by reducing unnecessary pain behavior and by improving the effectiveness of communications intended to obtain assistance, access emotional support, or request information or accommodation
Overcoming negative thoughts and emotions	<ul style="list-style-type: none"> • Cognitive restructuring • Stress management • Pain diary 	<ul style="list-style-type: none"> • Pain triggers automatic thoughts • Stress exacerbates pain • Use evidence to refute automatic thoughts • Schedule activities to reduce stress • Automatic thoughts lead to negative emotions • Emotional distress can impede problem solving 	Reduce emotional distress and perceived work limitations by countering negative automatic thoughts that are unrealistic or unsupportable

the workplace is bounded by rules of conduct and established hierarchies. Thus, in many work settings, the ways that one communicates with a co-worker is different from communication with a customer or supervisor. This element of the workplace could be incorporated into a pain SM program by asking participants to analyse their social networks at work, focusing on whether individuals usually provide tangible, emotional, or informational types of support. Communication about pain could be directed to the appropriate individual depending on whether the communication is about temporary assistance, emotional support, or a need to better understand workplace policies and practices. Another important issue is health disclosure, and the possible risks and benefits of sharing information about pain with a superior or with a human resources manager [55,56]. Perhaps workers could be encouraged to research this issue by asking trusted confidantes, by finding out how others have been treated, and by "testing the waters" before making any sizable disclosures about pain limitations. Workers with pain report polarized views on whether the problem should be disclosed to an employer [17], so workplace culture may have a large bearing on choosing the most appropriate means for communicating pain-related needs in the workplace.

Recommendations and conclusions

Based on the analysis of individual instructional elements, we provide a preliminary outline for a hypothetical 5-session SM intervention program to deal specifically with workplace pain concerns (Table III). Each session is focused on different SM strategies, with each session containing a mix of facilitator

presentation, group discussion, case illustrations, role play, completion of in-session self-assessments and activities, and brief homework assignments. Approximately equal time would be allocated to the primary topics of improving comfort, modifying work, communicating effectively, solving problems systematically, and dealing with negative thoughts and emotions. Though this outline provides a tentative design for a workplace pain SM intervention, other issues impacting design and feasibility include the readiness of workers to assume personal responsibility for managing work demands or conditions, the degree of flexibility and accommodation that is possible while maintaining job productivity, and the willingness of employers to support such ideas. Presumably, the most effective program would be one perceived as beneficial and non-stigmatizing by affected workers and one that can be supported or sponsored by employers. Future studies are needed to provide a systematic evaluation of such workplace-supported intervention strategies.

From the perspective of a worker with persistent or recurrent pain, participation in a SM intervention program might make working hours more bearable by reducing perceptions of work limitations, by increasing a sense of coping and control, and by providing more alternatives for working comfortably within allowable limits of leeway and flexibility. Such a program might be presented to workers in the spirit of improving health and safety practices, addressing typical health problems in an aging workforce, and fostering individuality and self-reliance.

From the employer perspective, a SM intervention program might have benefits of reduced sickness absence,

longer worker retention, and reduced health care costs, and these outcomes are of particular importance to employers that subsidize or pay for employee health and disability benefits directly. Where social insurance systems have primary responsibility, employers may have less of a financial incentive to support a program intended to prevent sickness absence, though other intended consequences of the program (lower turnover, improved productivity, greater job satisfaction) may have some appeal. Issues of privacy, discrimination, and unreasonable accommodation requests may be additional employer concerns. Making such programs available in the workplace might overcome some of the multiple barriers that health care providers describe when referring patients to SM programs [57]. A workplace SM intervention program that is partnered with other related organizational changes (e.g. supervisor training to respond effectively to health concerns, discounted gym memberships, etc.) may be most effective to share responsibility for disability prevention equally between employees and employer. Future studies in this area should assess not only program efficacy, but also feasibility of implementation.

In conclusion, some (15 of 24), but not all instructional elements of existing pain and illness SM programs were judged by the research team as adaptable to the workplace concerns of employees with persistent or recurring pain. Those SM strategies focusing on reducing pain and discomfort, making informed decisions, communicating effectively, and dealing with thoughts and feelings may be most relevant. Such SM strategies may help to deal with activity interference, negative self-perceptions, interpersonal conflicts, and the perceived inflexibility of work experienced by working adults with LBP. Aspects of the workplace that may need to be integrated with SM instruction include physical demands and limitations, job leeway, and the special nature of workplace roles and relationships. Our study is limited by its formative and qualitative nature, but the results may provide useful information for those piloting new workplace intervention strategies. Future studies should investigate the feasibility, acceptability, and efficacy of SM interventions in the workplace context. We conclude that principles and methods of SM intervention programs are generally well suited to address pain-related problems in the workplace, but tailoring of messages may be necessary to incorporate the unique organizational, physical, and social aspects of work. This is an intervention strategy that offers some promising opportunities, but more research is needed to evaluate its possible impact.

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References

- Ricci JA, Stewart WF, Chee E, Leotta C, Foley K, Hochberg MC. Back pain exacerbations and lost productive time costs in United States workers. *Spine* 2006;31:3052–3060.
- Burton WN, Pransky G, Conti DJ, Chen CY, Edington DW. The association of medical conditions and presenteeism. *J Occup Environ Med* 2004;46:S38–S45.
- Krause N, Scherzer T, Rugulies R. Physical workload, work intensification, and prevalence of pain in low wage workers: results from a participatory research project with hotel room cleaners in Las Vegas. *Am J Ind Med* 2005;48:326–337.
- Leclerc A, Chastang JF, Ozguler A, Ravaud JF. Chronic back problems among persons 30 to 64 years old in France. *Spine* 2006;31:479–484.
- Long DM, BenDebba M, Torgerson WS, Boyd RJ, Dawson EG, Hardy RW, Robertson JT, et al. Persistent back pain and sciatica in the United States: patient characteristics. *J Spinal Disord* 1996;9:40–58.
- van Leeuwen MT, Blyth FM, March LM, Nicholas MK, Cousins MJ. Chronic pain and reduced work effectiveness: the hidden cost to Australian employers. *Eur J Pain* 2006;10:161–166.
- Loisel P, Durand MJ, Berthelette D, Vezina N, Baril R, Gagnon D, Lariviere C, Tremblay C. Disability prevention – new paradigm for the management of occupational back pain. *Dis Manage Health Outcomes* 2001;9:351–360.
- WorkCover Corporation of South Australia. A guide to the Workers Rehabilitation and Compensation Regulations 2010, published September 2010, pp. 4–6.
- Job Accommodation Network. Employers' Practical Guide to Reasonable Accommodation Under the Americans with Disabilities Act, published May 2009, pp. 6–7.
- Anttonen H, Paakkonen R. Risk assessment in Finland: Theory and practice. *Safety and Health at Work* 2010;1:1–10.
- Vanhoorne MN, Vanachter OV, De Ridder MP. Occupational health care for the 21st century: from health at work to workers' health. *Int J Occup Environ Health* 2006;12:278–285.
- Loisel P, Buchbinder R, Hazard R, Keller R, Scheel I, van Tulder M, Webster B. Prevention of work disability due to musculoskeletal disorders: the challenge of implementing evidence. *J Occup Rehabil* 2005;15:507–524.
- Franché RL, Baril R, Shaw W, Nicholas M, Loisel P. Workplace-based return-to-work interventions: optimizing the role of stakeholders in implementation and research. *J Occup Rehabil* 2005;15:525–542.
- Franché RL, Cullen K, Clarke J, Irvin E, Sinclair S, Frank J; Institute for Work & Health (IWH) Workplace-Based RTW Intervention Literature Review Research Team. Workplace-based return-to-work interventions: a systematic review of the quantitative literature. *J Occup Rehabil* 2005;15:607–631.
- Tjulín A, Maceachen E, Ekberg K. Exploring workplace actors experiences of the social organization of return-to-work. *J Occup Rehabil* 2010;20:311–321.
- Coole C, Watson PJ, Drummond A. Staying at work with back pain: patients' experiences of work-related help received from GPs and other clinicians. A qualitative study. *BMC Musculoskelet Disord* 2010;11:190.
- Tveit TH, Shaw WS, Huang YH, Nicholas M, Wagner G. Managing pain in the workplace: a focus group study of challenges, strategies and what matters most to workers with low back pain. *Disabil Rehabil* 2010;32:2035–2045.
- Dembe AE. The social consequences of occupational injuries and illnesses. *Am J Ind Med* 2001;40:403–417.
- Keller SD. Quantifying social consequences of occupational injuries and illnesses: state of the art and research agenda. *Am J Ind Med* 2001;40:438–451.
- Beaton DE, Kennedy CA. Beyond return to work: testing a measure of at-work disability in workers with musculoskeletal pain. *Qual Life Res* 2005;14:1869–1879.
- Huang YH, Shaw WS, Chen PY. Worker perceptions of organizational support and return-to-work policy: associations with post-injury job satisfaction. *Work* 2004;23:225–232.
- Huang YH, Pransky GS, Shaw WS, Benjamin KL, Savageau JA. Factors affecting the organizational responses of employers to workers with injuries. *Work* 2006;26:75–84.
- Marras WS, Ferguson SA, Burr D, Schabo P, Maronitis A. Low back pain recurrence in occupational environments. *Spine* 2007;32:2387–2397.
- Pransky G, Benjamin K, Hill-Fotouhi C, Himmelstein J, Fletcher KE, Katz JN, Johnson WG. Outcomes in work-related upper extremity and low back injuries: results of a retrospective study. *Am J Ind Med* 2000;37:400–409.
- Pransky G, Benjamin K, Hill-Fotouhi C, Fletcher KE, Himmelstein J, Katz JN. Work-related outcomes in occupational low back pain: a multidimensional analysis. *Spine* 2002;27:864–870.

26. Wynne-Jones G, Dunn KM, Main CJ. The impact of low back pain on work: a study in primary care consultants. *Eur J Pain* 2008;12:180–188.
27. Shaw WS, Huang YH. Concerns and expectations about returning to work with low back pain: identifying themes from focus groups and semi-structured interviews. *Disabil Rehabil* 2005;27:1269–1281.
28. Haldorsen EM, Grasdahl AL, Skouen JS, Risa AE, Kronholm K, Ursin H. Is there a right treatment for a particular patient group? Comparison of ordinary treatment, light multidisciplinary treatment, and extensive multidisciplinary treatment for long-term sick-listed employees with musculoskeletal pain. *Pain* 2002;95:49–63.
29. Kerns RD, Turk DC, Holzman AD, Rudy TE. Comparison of cognitive behavioral and behavioral approaches to the outpatient treatment of chronic pain. *Clin J Pain* 1986;1:195–203.
30. Lamb SE, Hansen Z, Lall R, Castelnuovo E, Withers EJ, Nichols V, Potter R, Underwood MR; Back Skills Training Trial investigators. Group cognitive behavioural treatment for low-back pain in primary care: a randomised controlled trial and cost-effectiveness analysis. *Lancet* 2010;375:916–923.
31. Turner JA, Clancy S. Comparison of operant behavioral and cognitive-behavioral group treatment for chronic low back pain. *J Consult Clin Psychol* 1988;56:261–266.
32. Keefe FJ, Caldwell DS, Williams DA, Gil KM, Mitchell D, Robertson D, Robertson C, Martinez S, Nunley J, Beckham JC, Helms M. Pain coping skills training in the management of osteoarthritic knee pain: a comparative study. *Behav Ther* 1990;21:496–412.
33. Keefe FJ, Caldwell DS, Williams DA, Gil KM, Mitchell D, Robertson D, Robertson C, Martinez S, Nunley J, Beckham JC, Helms M. Pain coping skills training in the management of osteoarthritic knee pain II: Follow-up results. *Behav Ther* 1990;21:435–447.
34. Nicholas MK, Wilson PH, Goyen J. Comparison of cognitive-behavioral group treatment and an alternative non-psychological treatment for chronic low back pain. *Pain* 1992;48:339–347.
35. Foster G, Taylor SJ, Eldridge SE, Ramsay J, Griffiths CJ. Self-management education programmes by lay leaders for people with chronic conditions. *Cochrane Database Syst Rev*. 2007;4:CD005108.
36. Kerns RD, Rosenberg R. Predicting responses to self-management treatments for chronic pain: application of the pain stages of change model. *Pain* 2000;84:49–55.
37. Solomon DH, Warsi A, Brown-Stevenson T, Farrell M, Gauthier S, Mikels D, Lee TH. Does self-management education benefit all populations with arthritis? A randomized controlled trial in a primary care physician network. *J Rheumatol* 2002;29:362–368.
38. Nicholas MK, Molloy A, Tonkin L, Beeston L. *Manage your pain: practical and positive ways of adapting to chronic pain*. London: Souvenir Press, 2003.
39. Barsky AJ, Deans EC. *Feeling better: A 6-week mind-body program to ease your chronic symptoms*. New York: Harper Collins, 2006.
40. Lorig K, Holman H, Sobel D, Laurent D, Gonzalez V, Minor M. *Living a healthy life with chronic conditions*, 2nd edition. Palo Alto, California: Bull Publishing, 2000.
41. Lorig K, Fries JF. *The arthritis helpbook*, 6th edition. Cambridge, Massachusetts: Da Capo Press, 2006.
42. Hadjistavropoulos T, Hadjistavropoulos HD. *Pain management for older adults: A self-help guide*. Seattle, Washington: IASP Press, 2008.
43. Turk DC, Winter F. *The pain survival guide: How to reclaim your life*. Washington, DC: American Psychological Association, 2006.
44. Wells C, Nown G. *The pain relief handbook: Self-help methods for managing pain*. Buffalo, New York: Firefly Books, 1998.
45. Otis JD. *Managing chronic pain: A cognitive-behavioral therapy approach (Therapist guide)*. New York, NY: Oxford University Press, 2007.
46. Von Korff M, Moore JE, Lorig K, Cherkin DC, Saunders K, González VM, Laurent D, et al. A randomized trial of a lay person-led self-management group intervention for back pain patients in primary care. *Spine* 1998;23:2608–2615.
47. Lorig KR, Holman H. Self-management education: history, definition, outcomes, and mechanisms. *Ann Behav Med* 2003;26:1–7.
48. Williams AC, Richardson PH, Nicholas MK, Pither CE, Harding VR, Ridout KL, Ralphs JA, et al. Inpatient vs. outpatient pain management: results of a randomised controlled trial. *Pain* 1996;66:13–22.
49. Shaw WS, Feuerstein M, Lincoln AE, Miller VI, Wood PM. Case management services for work related upper extremity disorders. Integrating workplace accommodation and problem solving. *AAOHN J* 2001;49:378–389.
50. Pransky G, Shaw W, Franche RL, Clarke A. Disability prevention and communication among workers, physicians, employers, and insurers—current models and opportunities for improvement. *Disabil Rehabil* 2004;26:625–634.
51. Welch LS, Hunting KL, Nessel-Stephens L. Chronic symptoms in construction workers treated for musculoskeletal injuries. *Am J Ind Med* 1999;36:532–540.
52. Smith TW, Aberger EW, Follick MJ, Ahern DK. Cognitive distortion and psychological distress in chronic low back pain. *J Consult Clin Psychol* 1986;54:573–575.
53. Daniels C, Huang GD, Feuerstein M, Lopez M. Self-report measure of low back-related biomechanical exposures: clinical validation. *J Occup Rehabil* 2005;15:113–128.
54. Durand MJ, Vézina N, Baril R, Loisel P, Richard MC, Ngomo S. Margin of manoeuvre indicators in the workplace during the rehabilitation process: a qualitative analysis. *J Occup Rehabil* 2009;19:194–202.
55. Munir F, Leka S, Griffiths A. Dealing with self-management of chronic illness at work: predictors for self-disclosure. *Soc Sci Med* 2005;60:1397–1407.
56. Munir F, Randall R, Yarker J, Nielsen K. The influence of employer support on employee management of chronic health conditions at work. *J Occup Rehabil* 2009;19:333–344.
57. Pitt VJ, O'Connor D, Green S. Referral of people with osteoarthritis to self-management programmes: barriers and enablers identified by general practitioners. *Disabil Rehabil* 2008;30:1938–1946.

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