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Integrating Psychosocial and Behavioral Interventions to Achieve Optimal Rehabilitation Outcomes

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Introduction: *Psychosocial factors are important contributors to work disability associated with musculoskeletal conditions. The primary objectives of this paper were 1) to describe different psychosocial interventions that have been developed to prevent prolonged work disability, and 2) to identify future research directions that might enhance the impact of programs targeting psychosocial risk factors for work disability.* Methods: *Selective review of scientific literature on psychosocial and behavioral interventions and work disability.* Results: *Most prior interventions focused on psychosocial risk factors that exist primarily within the individual (e.g., pain catastrophizing, beliefs, expectancies). Successful disability prevention will require methods to assess and target psychosocial risk factors "outside" of the individual (e.g., interpersonal conflict in the workplace, job stress, etc.) using cost-effective, multipronged approaches. Research to explore interactions among different domains of psychosocial risk factors in relation to RTW outcomes is needed. Challenges to effective secondary prevention of work disability include developing competencies to enable a range of providers to deliver interventions, standardization of psychosocial interventions, and maximizing adherence to intervention protocols.* Conclusion: *Effective secondary prevention of work disability will require research to develop cost-effective, multipronged approaches that concurrently target both worker-related and workplace psychosocial risk factors.*

KEY WORDS: psychosocial risk factors; biopsychosocial; work disability; musculoskeletal disorders; return to work; secondary prevention; psychosocial intervention.

INTRODUCTION

Biopsychosocial models of work disability are emerging as the dominant conceptual frameworks used to explain and treat work disability associated with musculoskeletal

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disorders (1,2). These models have proceeded from the view that successful re-integration of the injured worker into the workplace will require consideration of biomedical, behavioral, organizational and workplace factors (1). The purpose of this paper is to provide a road map for future research on psychosocial intervention for the prevention of work disability. The current state of knowledge concerning psychosocial risk factors for work disability and related approaches to manage and prevent disability are briefly described. Current obstacles to advance in this domain of research are highlighted and recommendations for future investigations are provided.

Prior to the widespread adoption of biopsychosocial perspectives on work disability, the prevailing model was one that emphasized a disease-based view of persistent pain and disability. Traditional biomedical models assumed an isomorphic causal relationship between a specific physical pathology and the presence and extent of a pain symptom. For centuries, treatment efforts concentrated on identifying and eradicating the cause of pain symptoms by rectifying the physical pathology, or by cutting or blocking the pain pathways surgically or pharmacologically. The biomedical promise of a cure for persistent pain and the elimination of pain-related disability have never been realized.

Biopsychosocial models have been important in drawing attention to the role of psychosocial factors in work disability (1,3). However, until recently, the focus has remained primarily on factors within the individual with a relative neglect of person-environment factors that might contribute to work disability. It is becoming clearer that successful interventions for achieving sustainable return to work (RTW) following injury must address both risk factors that exist outside of the individual (e.g., job stress, workplace exposure factors) and those that exist within the individual (4–6).

It is important to clearly distinguish between psychosocial risk factors for work disability and diagnosable mental disorders that might be associated with work disability. Psychosocial risk factors might include predispositions such as attitudes or beliefs, emotional reactions such as fear or distress, or relational factors such as conflict or lack of support. Psychosocial risk factors are neither mental disorders nor would they necessarily be considered indices of mental dysfunction in the absence of musculoskeletal symptoms. Nevertheless, their presence increases the probability that pain-related disability will persist over time. The psychosocial interventions discussed in this paper focus on the reduction or management of psychosocial risk factors, not on the treatment of mental health disorders.

The present paper focuses on musculoskeletal conditions that impact on the degree to which individuals are able to meet occupational demands. The term "work disability" refers to individuals who have discontinued their participation in occupational activities, consistent with the definition of disability advanced by the International Classification of Functioning, Disability and Handicap (ICF) (7). This paper considers disability due to musculoskeletal conditions affecting the back; upper and lower extremity musculoskeletal disorders are not addressed.

The present focus on psychosocial risk factors should not be construed as a neglect or minimization of other domains of risk for work disability. It is recognized that there are many other risk factors that have been identified in relation to work disability, such as medical, physical, and work-place factors (1). However, this paper focuses on interventions that target psychosocial variables and therefore research on psychosocial risk factors will be emphasized.

PSYCHOSOCIAL RISK FACTORS FOR WORK DISABILITY

A vast literature currently exists on psychosocial risk factors for pain and disability (8). The review that follows is necessarily selective, and serves primarily to provide a platform for discussion of intervention approaches that have been developed to target psychosocial risk factors for prolonged work disability. For the purposes of this paper, risk factors that exist primarily "within" the individual will be referred to as Type I psychosocial risk factors, and risk factors that exist primarily "outside" of the individual will be referred to as Type II psychosocial risk factors.

Type I (Worker-Related) Psychosocial Risk Factors

Systematic reviews of population-based or prospective cohort studies indicate that initial levels of perceived pain and perceived functional disability are predictive of prolonged work disability (9). Gheldolf *et al*. (10) found that pain-related fears were significant determinants of the inability to work in individuals with back pain. Research has shown that individuals' beliefs about the severity of their health condition are significant predictors of RTW outcomes (11,12). Cross-sectional and prospective studies have shown that high levels of pain catastrophizing are associated with more severe disability in injured workers and more prolonged work absence (13–15). Poor problem solving abilities, low expectancies about the probability of returning to work, and lack of confidence in the ability to perform work-related activities have been associated with prolonged work disability (12,16,17). Pain severity and depressive symptoms have been associated with premature termination of involvement in pain management programs, with greater occupational disability, and have been implicated as factors contributing to the transition from acute to chronic pain (13,18).

Several additional potential Type I psychosocial risk factors might be significant determinants of work disability, but to date, they have not been addressed within prospective designs. For example, the results of qualitative surveys reveal that human resource managers consider negative worker attitudes to be an obstacle to successful RTW (19). Employers report that poor motivation on the part of the injured worker can be an important obstacle to successful RTW (20). It has been suggested that "feelings of shame" concerning disability may cause the injured worker to withdraw from his or her social involvement, thereby impeding reintegration into the workplace (21).

Type II (Workplace- or System-Related) Psychosocial Risk Factors

Qualitative and quantitative surveys have begun to address more systematically the psychosocial dimensions of the work environment as potential risk factors for prolonged work disability. For example, job stress and coworker support have been shown to be related to the duration of work disability (22). Hoogendoorn *et al*. (23) reported that the lack of social support at work and work dissatisfaction were predictors of prolonged work disability. Pransky *et al*. (24) reported that employer attitudes toward work disability might also impact RTW outcomes. Van Duijn *et al*. (19) reported the results of a survey of occupational health physicians and human resources managers showing that lack of

coworker support for modified work re-entry programs was perceived as a major obstacle to successful RTW. Based on a review of the literature, Teasell and Bombardier (25) reported that lack of availability of modified work and lack of autonomy in the workplace were predictors of prolonged work disability.

INTERVENTIONS TARGETING PSYCHOSOCIAL RISK FACTORS FOR WORK DISABILITY

Research highlighting the important role of psychosocial factors in pain and disability has prompted the development of intervention approaches designed to target psychosocial risk factors associated with musculoskeletal conditions. The following section describes different psychosocial intervention programs that have either been specifically designed to facilitate RTW, or have implications for RTW programs.

Intervention approaches for work disability have typically been discussed in terms of primary, secondary or tertiary prevention. Primary prevention programs aim to prevent the onset of disability, secondary prevention programs aim to prevent the progression from an acute condition to chronic disability, and tertiary prevention programs aim to prevent the development of further disability in someone whose condition has evolved into a chronic state of disability (2). Secondary prevention is the primary focus of this review. Secondary prevention efforts for Type I and Type II psychosocial risk factors are presented separately, in order to set the stage for a discussion on how these might usefully be combined in order to maximize RTW outcomes.

Cognitive behavioral approaches have dominated intervention research on psychosocial risk factors for work disability. These approaches proceed from the view that individuals' interpretation, evaluation and beliefs about illness, and their coping repertoire with respect to pain and disability will impact on the degree of emotional and physical disability (26,27). The term cognitive-behavioral does not refer to a specific intervention, but rather to a class of intervention strategies that might include self-instruction (e.g., motivational self-talk), relaxation or biofeedback, developing coping strategies (e.g., distraction, imagery), increasing assertiveness, minimizing negative or self-defeating thoughts, changing maladaptive beliefs about pain, and goal setting (26,28). As a function of the presenting problems, a client participating in a cognitive-behavioral intervention may be exposed to varying selections or combinations of these strategies.

Secondary Prevention Interventions Targeting Type I (Worker-Related) Psychosocial Risk Factors

Intervention approaches for Type I (worker-related) psychosocial risk factors have included population health interventions (29), primary care interventions (30), clinic-based cognitive-behavioral interventions (31), and community-based cognitive-behavioral interventions (15,32).

An innovative program based on a public information advertising campaign illustrated how attitudes and beliefs associated with work disability might be targeted on a broad scale, even before work injury occurs (29). Outcome analyses revealed that the ad campaign, which ran over a period of 2.5 years in Australia, was associated with a significant shift in societal

attitudes toward injury and disability, and led to a decline in the number of compensation claims for back pain (29).

Most secondary prevention programs have been implemented within the health care system. There has been considerable emphasis placed on the role of the primary care physician in the provision of what has been termed medical reassurance. Medical reassurance refers to communication from health care providers aimed at correcting erroneous beliefs, reducing fear associated with pain symptoms, and encouraging return to an active lifestyle in spite of the persistence of pain symptoms (33). Current medical practice guidelines recommend providing patients with reassurance and clear advice about the importance of continuing their daily activities.

Several investigations support the effectiveness of reassurance and recommendations for self-management as a means of reducing the duration of work disability (34,35). Advice to stay active and information aimed at reducing fear can lead to significant reductions in sick days and higher rates of RTW (34,36,37). However not all studies have supported the efficacy of brief medical reassurance/activity advice interventions. In one study, occupational physicians were provided with guidelines for early medical reassurance, but results one year later showed no significant benefit when compared to a group receiving usual primary care (38). Von Korff *et al.* (39) screened back pain patients for functional difficulties approximately two months after their initial visit. Those with significant functional problems were randomized to an activation-reassurance group or to a control group. Although the activation-reassurance group was more active and reported fewer functional limitations, there were no differences between the groups at the follow up on disability compensation benefits.

Reviews of the literature indicate that multidisciplinary programs that include psychosocial pain management interventions are more effective in reducing work disability than programs that do not include psychosocial interventions (9,40). Functional restoration or work hardening programs yield better RTW outcomes when they include a cognitive-behavioral component (41). These reviews support the utility of cognitive-behavioral approaches in the secondary prevention of work disability, but the unique contribution of cognitive-behavioral interventions is difficult to determine within the context of a multidisciplinary program.

There have been recent efforts to develop cognitive-behavioral interventions that target psychosocial factors that are more directly linked to work disability. For example, van den Hout *et al.* (42) studied the effects of teaching problem solving skills to back pain patients off work for less than six months. Patients were randomized to a group receiving graded activity training and education or to a group receiving graded activity and problem solving. Those receiving problem solving skills training had better RTW outcomes. Marhold and coworkers (43) examined the effects of teaching specific RTW skills. Patients off work an average of 3 months were randomized to a treatment-as-usual control group or a cognitive-behavioral group that included specific RTW skills training. Results demonstrated that participants who received RTW skills training had significantly less absenteeism at 1-year follow up than did the treatment-as-usual control group.

Gatchel *et al.* developed a statistical algorithm for differentiating acute low back pain patients who were designated as either high or low risk for developing chronic disability. In one study, "high risk" acute patients were randomly assigned to one of two groups: an early functional restoration group with a cognitive-behavioral approach or a

treatment-as-usual group (44). Results showed that, relative to the treatment-as-usual group, the functional restoration group displayed significantly fewer indices of chronic pain disability on a wide range of work, healthcare utilization, medication use and self-reported pain variables.

Linton and Andersson (28) also used a risk screening procedure to select patients for a secondary prevention intervention. They compared the effects of a 6-week cognitive-behavioral group intervention to two information-provision comparison groups for individuals who were identified as higher risk based on their scores on the Örebro Screening Questionnaire for Pain. All groups showed comparable improvements in pain severity, mood and activity level. However, follow up analyses showed that the cognitive-behavioral intervention led to a significantly lower probability of being on long-term sick leave compared to the two information groups.

More recently, Linton *et al.* (31) showed that participation in a cognitive-behavioral intervention was associated with greater reduction in work disability than guideline-based treatment-as-usual. Participants with short-term back pain in a primary care setting who had higher risk profiles on a screening instrument were selected for inclusion in the clinical trial. Participants were randomly assigned to one of three intervention conditions: 1) a standardized, guideline-based, treatment as usual condition, 2) a 6-week cognitive-behavioral group condition, or 3) the combination of a 6-week cognitive-behavioral group and physical therapy condition. The two groups receiving cognitive-behavioral interventions had fewer days off work for back pain during the 12-month follow up than did the guideline-based treatment-as-usual group.

Other investigations have pointed to the potential benefit of matching intervention approaches to specific psychosocial risk profiles. A program of intervention developed by Vlaeyen and his colleagues (45) proceeds from the view that disability results from the development of high levels of pain-related fears. Individuals with high levels of pain-related fears are gradually exposed to activities that have been avoided with an approach similar to that, which would be used for the treatment of phobic conditions. A recent clinical trial has shown that this type of intervention can be effective in reducing levels of fear, pain and pain-related disability (46).

Community-based intervention programs, such as the Pain-Disability Prevention (PDP) Program, have also been developed to specifically target certain psychosocial risk factors (15). The intervention is currently provided by a network of trained psychologists widely distributed in various regions of four Canadian provinces. By adding a psychosocial component to usual care (medical care and physiotherapy), the objective is to create virtual multidisciplinary teams at the community-based level. Individuals are selected for treatment if they obtain elevated scores (above the 50th percentile) on risk factors addressed by the intervention program (pain catastrophizing, fear of movement/re-injury, perceived disability and depression). The PDP Program is a standardized 10-week intervention that uses structured activity scheduling strategies and graded activity involvement to target risk factors such as fear of movements/re-injury and perceived disability. Thought monitoring and cognitive restructuring strategies are used to target catastrophic thinking and depression. A preliminary study yielded encouraging results with 60 percent of PDP treated clients returning to work, as compared to an 18 percent base rate of return. A recent study showed that, in a sample of 215 injured workers who completed the PDP Program, treatment-related reductions in pain catastrophizing significantly predicted RTW (47).

Given the limited number of psychologists available to provide cognitive-behavioral interventions, translation to community practice is challenging. A key step forward has been described in a program developed for front line rehabilitation professionals such as physiotherapists and occupational therapists (32). The Progressive Goal Attainment Program (PGAP) is also a standardized community-based intervention that aims to reduce risk factors for prolonged work disability such as pain catastrophizing, fear of movement and re-injury and perceived disability. As with the PDP Program, individuals are selected for the intervention based on elevated scores on measures of psychosocial risk factors targeted by the intervention. The rationale behind the development of the program was that increasing front-line rehabilitation professionals' ability to detect and intervene on psychosocial risk factors would facilitate early implementation of risk factor targeted interventions. In a recent clinical trial with a sample of individuals who had been work disabled due to whiplash symptoms, 75% of individuals in the PGAP group returned to work compared to 50% who followed usual treatment (32).

In several studies summarized above, superior RTW outcomes were achieved without demonstrating a greater magnitude of pain reduction. For example, in the Linton *et al*. (31) study, there were no significant differences in pain reduction among treatment conditions. Nevertheless, the groups receiving the cognitive-behavioral interventions were able to be more active, and had fewer days of work absence despite the fact that their reported pain levels were similar to the comparison group. Sullivan *et al*. (47) reported that pain reduction was not associated with a higher probability of RTW when reductions in other psychosocial risk factors were statistically controlled. Taken together, these findings suggest that treatment-related reductions in psychosocial risk factors are important determinants of RTW, independent of reductions in pain.

Interventions Targeting Type II (Workplace- or System-Related) Psychosocial Risk Factors

Only recently have intervention programs targeting Type II psychosocial risk factors been implemented with the goal of preventing prolonged work disability. For example, the Sherbrooke Model for back pain management was developed as an integrated approach, directed at both the worker and the workplace. It is composed of three integrated components: an occupational intervention, a clinical intervention, and early rehabilitation (48). A clinical trial demonstrated better RTW outcomes and lower overall costs for patients in the Sherbrooke Model intervention compared to usual care (4).

There is some emerging evidence that RTW rates can be improved by intervening on Type II risk factors such as supervisor attitudes, and coworker support (49). Similarly, ergonomic and modified RTW programs such as those described in the Sherbrooke Model (4) might improve RTW rates, at least in part, through the reduction of psychosocial risk factors such as pain-related fears, and perceived disability. Return to work rates might also be enhanced when rehabilitation treatment is provided within the work milieu (50). Pransky *et al*. (24) reported the results of a pilot study suggesting promising RTW outcomes for a support and guidance intervention aimed at increasing employers' involvement in facilitating the RTW process.

In a recent study, occupational health nurses and case managers from the workers' compensation system were trained to provide early intervention to back injured workers at elevated risk for disability (51). The intervention involved an individual session of motivational interviewing and RTW planning with the worker. The intervention also included phone communication with the worker's family physician, workplace visit, focused case management and follow up with the worker and employer after the return to work. The preliminary outcomes have been positive with respect to duration of disability as compared to conventional treatment (51).

SUMMARY, SYNTHESIS, AND RECOMMENDATIONS

Over the past 20 years, research has continued to accumulate highlighting the important role of psychosocial factors as determinants of pain-related disability. Initial work in this area prompted the development of intervention programs that were designed to address the psychosocial dimensions of pain, disability and work absence (52). Research, theory and practice have continued to evolve, where increasing precision is being brought to the identification of specific psychosocial risk factors, and to the development of risk factor targeted interventions. The sections below provide a road map for future avenues of enquiry that might contribute to the development of more effective interventions for individuals at risk for work disability associated with musculoskeletal conditions. Recommendations for future research are summarized in Table I.

Type I and Type II Risk Factors

A distinction was made between Type I and Type II psychosocial risk factors in order to draw attention to the fact that not all psychosocial risk factors exist within the individual. The literature that has accumulated to date suggests strongly that Type I psychosocial factors are significant determinants of work disability. Pain severity and perceived disability

Table I. Research Recommendations

Significant advance in the management of psychosocial risk factors for work disability will require
1) Operationalization of Type I psychosocial risk factors such as "motivation," "negative attitudes," and "shame"
2) Operationalization with psychometrically sounds measures for Type II psychosocial risk factors
3) Examination of the cumulative or interactive influences of Type I and Type II psychosocial risk factors
4) Examination of the dynamic and time-dependent nature of these factors' influences on RTW
5) Exploration of psychosocial interventions for primary prevention of work disability
6) Exploration of early treatment interventions matched to risk profiles of the worker and the workplace
7) Clinical trials of community-based interventions for the prevention of prolonged work disability
8) Identification of key risk factor reductions predictive of RTW outcomes
9) Development and testing interventions that concurrently target Type I and Type II psychosocial risk factors
10) Further exploration of dose-response factors (e.g., duration of interventions, hours of interventions) in psychosocial interventions on work disability
11) Elaboration and specification of key features of effective effective medical reassurance
12) Development of mechanisms designed to facilitate early implementation of interventions targeting psychosocial risk factors
13) Training programs to expand front-line health care and rehabilitation professionals' skills for identifying and intervening on psychosocial risk factors
14) Development of mechanisms to maximize adherence to treatment protocols

emerge as consistent predictors of prolonged work disability. Factors such as depression, poor problem solving, pain catastrophizing, pain-related fear, low expectations for recovery and pain beliefs also emerge as determinants of prolonged work disability. There are also indications that factors such as others' perceptions of injured workers' attitudes toward work re-entry, motivation and feelings of shame might be associated with risk of prolonged work disability. To date, however, research on the role of worker attitudes, motivation and feelings of shame has been limited to surveys of employers' or stakeholders' views of RTW obstacles. More research is needed with respect to the operational definition and assessment of these variables in order to elucidate further how these variables might impact on work disability.

Recent research is drawing increasing attention to the role of Type II psychosocial risk factors on work disability. Factors such as social support in the workplace, job satisfaction, job stress and work autonomy have been shown to be associated with RTW outcomes. This research has been important in highlighting how social or interpersonal dimensions of the work environment might influence RTW outcomes. The role of these factors in the RTW process needs to be investigated more systematically given the perception of their importance by key stakeholders involved in the management of work disability. There is a need for more precise operational definitions of relational, attitudinal and support variables in the workplace. More research is also needed in the development of methods of assessing relational, attitudinal and support variables in the workplace.

At the present time, little is known about the manner in which Type I and Type II psychosocial risk factors summate or interact to influence the duration of work disability. How the relationship between Type I and Type II risk factors on RTW outcomes changes over time is poorly understood. To date, investigations have neglected the dynamic aspects of these factors, which have no doubt interfered with the development of appropriate intervention approaches (53,54). A more comprehensive understanding of the role of psychosocial risk factors in work disability will likely emerge as research begins to examine more systematically the cumulative or interactive influence of Type I and Type II risk factors on RTW outcomes. It will also be necessary to begin to investigate the dynamic nature of Type I and Type II risk factors. Injured workers' perceptions and appraisals of their level of disability are likely to change as a function of time and rehabilitation experiences. Supervisors' attitudes, coworker support and relationships are also likely to change over time.

Interventions for Type I and Type II Risk Factors

There has been a paucity of psychosocial research on the primary prevention of work disability. Since many psychosocial risk factors cannot be assessed prior to the onset of musculoskeletal symptoms, there are likely limits to the degree that primary prevention interventions for psychosocial risk factors can be developed. However, there might be opportunities to modify psychosocial risk factors even prior to the onset of symptoms (or the submission of compensation claims). Altering societal attitudes toward back pain and disability, improving the quality of supervisor-employee relations and coworker support, and improving organizational attitudes toward disability could be targets for primary prevention interventions (24,29,49).

The research that has been conducted to date suggests that secondary prevention interventions that include a cognitive behavioral component are associated with more

positive RTW outcomes than usual care (31). An emerging trend in the secondary prevention of work disability is the development of interventions that specifically address RTW skills. Greater attention is also being given to dose- and time-dependent factors that might influence RTW outcomes. The evidence suggests that cognitive behavioral interventions have a more pronounced impact on RTW outcomes the earlier they are implemented following the onset of work disability (43). A time-dependent dose response relation may exist where brief interventions (e.g., medical reassurance) may yield improved outcomes in the very early stages (e.g., acute stage) of work disability, but interventions of longer duration addressing multiple dimensions of pain and disability may be required for individuals who have been absent from work for longer periods of time (52,55).

There has been more consideration of the potential benefits of matching interventions to specific risk profiles. There are indications that the selection of candidates for treatment on the basis of "at risk" profiles might be a rational and perhaps more cost-effective approach to the use of limited secondary prevention treatment resources (15,28). More research is needed to evaluate whether matching interventions to risk profiles yields better outcomes than traditional approaches that do not consider psychosocial risk profiles.

There is also increased interest in the development of community-based models of intervention. By enhancing the skill set of community-based professionals, specialized treatment services can be made accessible even to individuals residing in rural, remote or underserviced areas (32). In addition to issues of accessibility, community-based services can often be delivered at lower cost that those offered in the large health or rehabilitation institutions of urban centers. Although preliminary findings of the implementation of community-based intervention programs for the prevention of work disability are encouraging, there is a need for more rigorous evaluations of the efficacy of these interventions in different populations and jurisdictions.

An assumption that has guided the development of risk-factor targeted interventions for the prevention of work disability is that reductions in risk factors will be associated with a higher probability of returning to work. To date, there have been few investigations designed to verify the tenability of this assumption. Although research has pointed to psychosocial risk factors predictive of work disability, little is known about the relation between risk factor reduction and RTW outcomes. More research is required to investigate the nature and degree of risk factor reduction required to improve RTW outcomes.

In comparison to interventions targeting Type I psychosocial risk factors, few studies have addressed the impact of interventions targeting Type II psychosocial risk factors. Available research suggests that interventions provided by case managers or occupational health nurses might be an effective means of managing or preventing the development of workplace- or system-related psychosocial risk factors (24,51). This is clearly an area that will require more research attention in the future. In particular, clinical trials are required to assess the effectiveness of interventions that specifically target Type II psychosocial risk factors for prolonged work disability, as well as interventions that simultaneously target Type I and Type II psychosocial risk factors.

The need for multipronged integrated approaches for secondary prevention of work disability is being echoed in recent theorizing on the determinants of successful RTW (4,53,56). Franche and Krause (53) have put forward a conceptual framework to account for the variety of dynamic social, psychological and economic factors that influence disability and RTW. Similarly, Melhorn and Kennedy (57) and Loisel *et al.* (4) have emphasized

the importance of developing a partnership among the patient, healthcare provider, employer and insurer in order to promote successful early RTW and reduce unnecessary work disability. What is common to these perspectives is the view that the most significant gains in secondary prevention will likely emerge from intervention programs that simultaneously target Type I and Type II psychosocial risk factors.

It is expected that future developments in the secondary prevention of work disability will ultimately reduce the proportion of individuals who continue along a chronic trajectory. It is important to acknowledge, however, that in spite of improved treatment outcomes, a certain number of individuals will not respond favorably to intervention. For example, Sullivan and Stanish (15) reported that individuals who obtained extremely high scores (e.g., above the 85% percentile) on risk factor measures were unlikely to return to work following an intervention designed to target psychosocial risk factors. As such, there will be a continued need for multidisciplinary tertiary prevention programs. In fact, as secondary prevention programs become more effective, the case mix of tertiary prevention programs will likely comprise a greater number of individuals with significant comorbid mental health conditions. The change in case mix may have implications for the type of interventions that will be required to effectively manage the more complex problems that will come to characterize the tertiary care client population.

Skill/Training Level Required for Effective Management of Psychosocial Risk Factors

Research on pain-related disability has highlighted the complexity of the factors that impact on the severity and duration of work disability. Although the complexity of work disability is being increasingly recognized, there have been few efforts to ensure that treating professionals have the necessary skill set required to effect meaningful change in psychosocial risk. The issue of competency training will be critical to the effectiveness of secondary prevention efforts.

Although there is general recognition that psychological intervention is an important component of interventions aimed at modifying psychosocial risk factors, there is wide variation in the training background of psychologists treating work disabled patients. This type of variability undoubtedly influences the outcomes of psychological interventions for work disability such that the effectiveness of psychological interventions in the community may be significantly less than that reported in the literature. Without guidelines on the credentials for psychologists working with work disabled patients, and more specific guidelines on the types of interventions that need to be implemented, psychological interventions may not be viewed in the most positive light by referral sources.

It may be possible to train health care and front line rehabilitation professionals in management of psychosocial risk factors for work disability (32,46,51,58). Medical reassurance and advice to remain active can be construed as psychosocial interventions even though they are delivered by a physician or other health care providers. Medical reassurance is essentially an attitude/belief change manipulation. Before medical reassurance can become a key component of early intervention efforts, more research is needed to determine the most effective reassurance strategy, and whether patients actually experience reassurance after these interventions.

Preliminary results from a training program offered to over 300 physiotherapists and occupational therapists suggest that front-line rehabilitation professionals can be taught to detect and intervene on psychosocial risk factors. They were able to develop skills to effectively assess and intervene on certain psychosocial risk factors and improve RTW outcomes (32). Most health and rehabilitation providers receive minimal education in psychosocial intervention, and have limited skills in detection and evaluation of psychosocial risk (59). More research is needed to determine which psychosocial risk factors can be addressed in interventions administered by front line (non-mental health) practitioners, and the nature of training required to deliver these interventions competently.

Adherence to Guidelines or Treatment Protocol

In recent years, there has been considerable discussion of issues related to the transfer of knowledge, and the adoption of evidenced-based principles of practice. The challenge of effecting changes in clinical practice has proven more formidable than anticipated. Feuerstein *et al*. (60) reported that when adherence to the acute low back pain practice guidelines did occur, general health, patient satisfaction and functional outcome, were higher and cost of care decreased. However, surveys and population health studies of actual interventions suggest that practice guidelines are seldom employed. Instead, professionals tend to employ the methods learned during their basic education (61).

Even when professionals attend training workshops on new interventions approaches, few techniques are ever incorporated into clinicians' intervention repertoires. There have been efforts to develop manualized intervention protocols, client workbooks and information videos as means of standardizing interventions, and maximizing fidelity to protocol (15,31). However, the production of treatment manuals, client workbooks and videos does not necessarily ensure standardization or fidelity to protocol. Variations in the application of treatment protocols likely compromise treatment efficacy and present challenges to the evaluation of treatment outcome.

The development of techniques to maximize adoption and adherence to new treatment protocols will be as important as the development of new intervention approaches themselves. Unless this final objective can be achieved, patients with musculoskeletal conditions will not benefit fully from new knowledge gained through clinical science.

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