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**THE HONG KONG POLYTECHNIC UNIVERSITY**  
**THE DEPARTMENT OF REHABILITATION SCIENCE**

**THE EFFECTS OF A 'RETURN TO WORK' PROGRAM FOR  
LONG-TERM INJURED WORKERS IN HONG KONG:  
A RANDOMIZED CLINICAL STUDY**

**BY EDWARD JIA-QI LI**

**A THESIS SUBMITTED TO RESEARCH AND POSTGRADUATE  
STUDIES OFFICE IN PARTIAL FULFILMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF MASTER OF  
PHILOSOPH IN THE DEPARTMENT OF REHABILITATION  
SCIENCE (OCCUPATIONAL THERAPY)**

**JULY 2005**

*Dedicated to my family:*

*My wife, Lily, for your agape love and support.*

*My parents, for your guidance to my life.*

## **STATEMENT OF SOURCES**

The idea and planning of the present study resulted from discussion between the author and supervisors, Dr. Cecilia Li-Tsang, and Prof. Chetwyn Chan.

All experiments in the present study were completed solely by the author of this study except otherwise stated in the text.

The author declared that the work presented in this thesis is, to the best of the author's knowledge and belief, original, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for a degree at this or any other universities.

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Edward Jia-Qi LI

July 2005

## **Abstract**

A clinical randomized trial was conducted in this study to investigate the effects of a 6-week programme including two phases of training and job placement designed for local long-term sick leave workers due to work injuries on their return to work rate. The aim of phase I study was to investigate the effect of training on job readiness of return to work for injured workers, while the aim of phase II study is to explore the effect of job placement on return to work and to evaluate the combined effect of training and job placement on maintaining return to work. A total of 123 long-term leave workers with musculoskeletal injuries, with an age of 20 to 58 years old, was recruited and randomly assigned into training group and control group in phase I at initial in-taking, with 78 subjects in training group and 45 in control group respectively. All the recruited subjects had completed vocational rehabilitation and left work for at least over 3 months. In phase I, a 3-week training programme focusing on readiness of return to work provided by a multi-disciplinary professional team was given to training group, while control group did not receive training just in a waiting list. In phase II study, 73 subjects in training group were randomly allocated to placement and self placement group. Placement group received 3-week placement services while self placement group was asked to do the self placement in the same period. Some assessment protocols including Spinal Functional Sort(SFS), LLUMC, Lam Assessment on Stages of Employment Readiness (LASER), the Chinese State Trait Inventory (C-STI), General Health Status (SF-36), were adopted to evaluate the training effects. Employment outcome was used to evaluate the effectiveness of combined training and placement.

The results of one-way ANOVA showed that there were no significant differences on

demographic baselines either between the training and control groups or between the assisted placement and self placement groups ( $p > 0.1$ ), and no significant difference was found on the results of first assessment between the two groups ( $p > 0.1$ ). For the phase I study, The results of repeated measure ANOVA of the 2<sup>nd</sup> assessment between training and control groups showed that statistically significant differences were observed on contemplation stage ( $p < 0.04$ ) and action stage ( $p < 0.05$ ) of LASER; C-STAI ( $p < 0.04$ ); sub-scales of physical function ( $p < 0.04$ ), health condition ( $p < 0.02$ ) and body pain ( $p < 0.02$ ) of SF-36 as well as the total score of SF-36 ( $p < 0.03$ ) between the two groups. For the phase II study, chi-square test showed that the return to work rate in placement group was significantly higher than that in self placement group ( $p < 0.03$ ). No significant differences were found on average working hour of each week and monthly job income between these two groups using independent t test.

The results of the research showed that the training part of the “Return to Work Programme” could facilitate the behaviour change of job readiness towards return to work for workers with musculoskeletal injuries. The objectives could be reached through solving the problems inhibiting the process of behaviour change of return to work such as chronic pain, stress, anxiety, quality of life. The placement service part of the programme was demonstrated to help achieve the ultimate goal of the programme which was to improve the outcome of return to work rate based on the workers’ psychological and action preparation for reemployment. This programme with combined training intervention and placement services was beneficial to facilitate local long-term leave workers with musculoskeletal injuries due to work to get reemployment.

### **Publications arising from the thesis**

Li, E.J., Li-Tsang, C.W.P. & Chan, C.C.H. (2004). A randomized control study on the effect of an innovative “Return to Work” programme for injured workers. Proceeding of the 4<sup>th</sup> Pan-Pacific Conference on Rehabilitation, Hong Kong, 24-26 September, 65.

Li, E.J., Li-Tsang, C.W.P. & Chan, C.C.H. (2005). The effect of a “Return to Work” programme for long-term injured workers in Hong Kong: a randomized control study. Proceeding of the Hong Kong Society for Surgery of the Hand: 18<sup>th</sup> Annual Congress, Hong Kong, 21-22 May, 45.

Li, E.J., Li-Tsang, C.W.P. & Chan, C.C.H. (2005). A randomized control study on an return to work program. Proceeding of the Canadian Association of Occupational Therapists Annual National Conference, Vancouver, Canada, 26-28 May.

Li, E.J., Li-Tsang, C.W.P., Lam, C.S., Hui, K.Y.L. & Chan, C.C.H. (2006). The effect of a “training on work readiness” program for workers with musculoskeletal injuries: A randomized control trial (RCT) study. *Journal of Occupational Rehabilitation* 16(4), 529-541.

Li, E.J., Li-Tsang, C.W.P., Chan, C.C.H. & Lam, C.S. (2006). “行為認知及再就業訓練” 計畫對香港工傷工人重返工作的效果. *中華物理醫學與康復雜誌*. 28(9), 601-605.

Li, E.J., Li-Tsang, C.W.P., Lam, C.S., Hui, K.Y.L. & Chan, C.C.H. The effect of “Training and Placement” programme for long-term sick leave workers with musculoskeletal injuries: a randomized control study (In preparation)

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## **Chapter 1**

### **Introduction**

#### **1.1 Introduction**

Work plays an integral role in developing self-esteem and a sense of being part of society for all people, including individuals with disabilities (Freedman & Fesko, 1995). Work injuries due to accidents, accumulated strain or repetitive use have long been a major and widespread health problem. They constitute a social issue that impairs workplace productivity and are associated with major societal costs (Wassel, 2002). Return to work (RTW) has always been the ultimate goal of the vocational rehabilitation services offered to injured workers by health care professionals (Selander et al., 2002).

#### **1.2 Background of the study**

Work-related musculoskeletal injuries represent a major source of work disability (Williams & Westmorland, 2002). The common problem among many industrial countries is the great number of people who do not or cannot resume work duties after their work-related musculoskeletal injuries (Punnett & Wegman, 2004). It is important to note that previous research studies found that the severity of the work related injuries did not directly correlate with the rate of RTW. Instead, a range of

psychological, psychosocial and social-economic variables seems to contribute to the failure of resuming work roles after these injuries (Burton et al., 1999). These factors, including low self-confidence, depression or anxiety arising after the work related musculoskeletal injuries (Magni et al., 1994); poor self perception of general health (Oleske et al., 2000); and the perception of chronic pain associated with the residual physical dysfunction, seemed to be the major concerns for most injured workers. Some even had the fear that resuming the work role would further aggravate pain and cause re-injury (Tulder et al., 2000; Marhold et al., 2002). Predisposing factors such as perceptions of work and the workplace, the wage compensation/benefit system, conditions of employment, and social policy may also influence the injured workers' decision to RTW (Main and Burton, 2000).

Prolonged unemployment can decrease physical abilities and activity levels which might result in lower job competence and coping abilities (Kraut et al., 2000; Mason, 1994). When an injured worker wants to resume his/her work role after long period of sick leave, he/she may have lost the physical capacity and endurance required for the job, thus lacking competence in job hunting and job acquisition skills (Watson, 2004). In the past, conventional vocational rehabilitation programmes addressed the needs of these injured workers in medical settings. These programmes often targeted at building up work tolerance, endurance and physical abilities of



injured workers to prepare for their RTW. However, it was found to be insufficient to just send those injured workers after long term sick leave back to the work force (Selander et al., 2002; Marnetoft & Selander, 2002).

Recently, a local survey using telephone interview was conducted with 127 injured workers regarding their current job status and their needs to RTW (The Hong Kong Worker's Health Centre, 2002). Although those injured workers with musculoskeletal injuries had received vocational rehabilitation services following injuries, the results indicated that almost 40% of these workers could not resume a work role. Other than the physical disability, psychological and psychosocial domain factors were the major obstacles preventing them from getting reemployment, including the stress due to injuries and lost job, discrimination from former employers or during new job interview, financial embarrassment, poor communication with family or co-workers, and worrying about aggravation of pain or getting re-injury while re-taking the job roles. This report suggested that a support service should be reinforced for those injured workers. Therefore, it is essential to develop a RTW programme for these injured workers that can help them to resolve their psychosocial and psychological problems arising from their injuries.

### **1.3 Vocational rehabilitation for injured workers**

In Hong Kong, current vocational rehabilitation services are mainly conducted in large hospitals. These programmes usually include general strengthening exercises, functional capacity evaluations, progressive work hardening and work conditioning programs, job analyses and ergonomic modification, education on proper body mechanics, and stress management (Chan et al., 1999). However, despite the vigorous physical training, work hardening and conditioning, some injured workers still failed to RTW. The management of the psychosocial aspects of disability and the adjustment of workers towards the disabilities are often missed in these programmes.

What can we do to facilitate those injured workers who are encumbered with a number of psychological and psychosocial difficulties and can not RTW after prolonged sick leave, even after finishing vocational rehabilitation? The target should be concentrated on solving these obstacles by providing problem-matched interventions. A large source of previous research has provided reasonable and trustworthy methods that can be applied to resolve these problems. They include chronic pain management (Jensen et al., 1998; Frieke et al., 2004); stress management (Gardinera et al., 2004); behavior changes (Panas et al., 2003); and job placement (Tourigian, 2003), etc.

#### **1.4 Significance of the study**

The aim of this program was to evaluate the effectiveness of a combined training and job placement programme specially designed to manage the psychosocial and psychological problems of injured worker using a randomized clinical trial (RCT). The ultimate goal was to enhance the employability of injured workers so that they can reintegrate into the workforce. This tailor-made program was a comprehensive service that could not only provide intervention on psychological and psychosocial levels, but offer direct job placement and coaching. The procedures of the program were designed to resolve the common psychological and psychosocial problems encountered by the injured workers after prolonged sick leave, thus helping them to RTW.

## **Chapter 2**

### **Literature review**

#### **2.1 The values of work**

Work is one major area of occupation and is the “productive activity” or “productivity” through paid employment (Bambrick & Bonder, 2004). Work is significant to human development and functioning (Freedman et al., 1995). Work is also an important conduct through which we experience social contact and maintain a sense of belonging in our communities and society (Vandergroot, 1987). Beyond providing subsistence and financial resources for the individual and his family, work helps define a person's status, provides satisfaction and a sense of self-worth, is a milieu in which social interactions and friendships develop, and offers an activity around which to organize one's time (Walling, 1996).

#### **2.2 Injuries at work**

Work related injuries mean that an employee sustains an injury as a result of an accident arising out of and in the course of his/her employment. A variety of adverse impacts can occur due to the work related injuries, including short-term as well as long-term consequences (Pransky et al., 2005). Some injuries such as spinal cord

injuries, severe head trauma, may result in long term disabilities leading to total functional loss. People with so severe injuries cannot resume a work role within society and often require long term medical and nursing care.

For some workers who sustained mild to moderate injuries such as fractures or soft tissue injuries, the medical intervention may help to regain full or partial recovery. These people might have such problems as residual pain, loss of some physical functions such as limitations in movements or poor muscle strength (Pransky et al., 2002).

Musculoskeletal injuries are common among different kinds of work-related injuries and work disability in many western countries (Williams et al., 2002). They appeared to be the most prevalent medical problems of the working population, affecting 7% of worker population and accounting for approximately 14% of physician visits and 19% of hospital stays for employees (NIOSH, 1997). Most of the musculoskeletal injuries may not result in severe long term disability and lost independent body function, but it can leave the person with chronic pain, physically disconditioning, decreased soft tissue flexibility or reduced endurance (Punnett et al., 2004).

### **2.3 Problems related to work injuries**

The prominent problems resulting from work injuries were the indirect and direct economic, industrial and social losses (Williams et al., 2002). Direct losses to the society resulting from work injuries mainly come from the compensation payments to injured workers. In The Netherlands, for example, expected compensation costs for an employer include both a disability benefit and at least 70% of the employee's income. The corresponding work situation was affected and consequently led to loss of productivity and to additional pay costs (Janssen et al., 2003). From 2000 to 2003, total compensation paid to injured workers in Hong Kong annually was HK\$1.002, HK\$1.007, HK\$1.12 and HK\$1.24 billion, respectively (Labour Department, 2004). They corresponded to 0.7‰, 0.8‰, 0.9‰ and 1‰ of Gross Domestic Produce (GDP) in the respective years.

According to the previous literature, if the total consecutive time is more than 90 days since the day when an injured worker has completed both medical treatment and vocational rehabilitation with the stable level of health and impairment condition, it is considered as a long term sick leave (Selander et al., 2002; Marnetoft & Selander, 2002). Indirect losses result from the long-term absence of injured workers from the work place. The employers may have to replace the workers injured and thus incur extra expenditure at the work place. If there is no replacement, other co-workers will

have to take over some of the tasks. This increases the co-workers' own job demands and may lead to a decrease in the employee morale and efficiency (Wassel, 2002). It can lead to loss of productivity, thus leading to a reduction in profits for the employers (Janssen et al., 2003). On the other hand, indirect losses also include the costs of hiring and training new employees or temporary workers to substitute for the injured worker. The total number of work days will be reduced due to the increasing number of sick leave days among the injured workers. In Hong Kong, the total number of loss work days was 1.507, 1.554 and 1.473 million days respectively from 2000 to 2003 (Labour Department, 2004).

Long-term leave after work injuries can cause economic losses to the society and generate psychological and health problems for individuals. A study of workers' compensation claims in the United States found that for low back pain claims, one quarter of the claimants accounted for 96% of the costs. Similarly, for all work related injury claims, 25% of the claims made accounted for 97% of the total costs (Feuerstein et al., 1999). In another study on 100,000 low back injury claims, 10% of claimants were responsible for 86% of the total costs (Franche & Krause, 2002). 7% of the claims involved disabilities that lasted longer than one year, accounting for 75% of the costs and 84% of the total disability days. Research conducted by Isernhagen and Franklin also reported similar findings. They found that 7% of claims for

work-related upper extremity musculoskeletal disorders involved disability for longer than one year, and these accounted for 60% of the costs and 75% of the total disability days (Isernhagen, 2001).

#### **2.4 Return to work after work injuries**

Timely and safe RTW is always the ultimate goal in the management of work injuries. Previous researchers have pointed out that the chance of returning to work after a period of absence from musculoskeletal injuries decreased over time, and the longer a worker was on leave, the less chance they would return to work (Waddell, 1987, 1992; Feuerstein et al., 1999; Watson, 2004; Oleske et al., 1992). Watson (2004) and his co-workers found that when a person had been off work with back pain for two years, they were unlikely to RTW. Janssen et al. (2003) found that the long sick leave (over 4 months) was significantly related to lower likelihood of returning to work. Another study found that if a worker had not returned to work by 3 months, there was a 50% chance that he or she would not be working in 15 months (Turner et al., 2004).

Over the last two decades, attention has shifted from survival to functional outcome as the prime determinant of effective trauma care. RTW has become the most important component of a functional outcome (Robin & Roessler, 2001). Long-term



absence from the labor force often leads to lowering the quality of life and sometimes results in social stigmatization. For the employer, absence from work has great administrative and practical consequences. For the community, the consequences are mainly economic (Bond, 1998). Therefore, it is essential to provide an early vocational rehabilitation programme for these injured workers such that the process of RTW can be improved, thus reducing the length of sick leave among these workers.

## **2.5 Factors affecting the RTW**

Why do injured workers have difficulties in returning to work after a prolonged period of sick leave (more than 6 months)? A number of personal or social factors have been found to be significantly related to RTW (Shaw et al., 2002; Adams & Williams, 2003). Many studies have confirmed that RTW for workers seemed to be influenced by psychological and psychosocial factors such as illness behavior, work satisfaction and compensation status (Gatchel et al., 1995 & Kinney, 1995). RTW for injured workers taking long-term sick leave is indeed a process of behavioral change controlled under those psychological and psychosocial factors. The readiness of RTW is the prerequisite for the positive change of behaviour (Berglind & Gerner, 2002).

It is therefore essential to identify all the factors that affect the injured workers' RTW so that rehabilitation professionals can ensure the best case management to

facilitate the process of RTW. Research in recent years has highlighted several factors related to RTW and they are discussed in the following paragraphs.

### **2.5.1 Severity of injuries**

Impairment and disability to a person resulting from work related injuries may be variously dependent on the severity of injury itself and the body parts damaged or influenced by injury. To a certain extent, impact of severity of injury on RTW has a close relationship with the level of individual's physical limitation or disability following the injury. Obvious functional or physical limitation and impairment due to injury such as loss of ability to standing and walk, serious cognitive and behavioral problems might result in significant effects on RTW outcomes (Chan & Man, 2005; Leung & Man 2005; Yasuda et al., 2001). Yasuda et al. (2001) reported in their literature review that the problems of significant physical disability, cognitive impairment limited the ability of persons with traumatic brain injury to become successfully employed. Tomassen and his colleagues (2000) mentioned that the re-employment rate of persons after spinal cord injury was only 37%. They interviewed 234 persons with spinal cord injuries between 18 and 65 years of age. Their results showed that the most important predictive factor for return to gainful employment was a high score on the Barthel Index (indicating body's self-care and movement ability). Fisher et al. (2003) investigated 100 patients of working age who

had sustained unilateral lower limb amputation at least 1 year previously and found that the Handicap Scale scores and mobility were correlated with RTW and stump, phantom limb pain and multiple limb amputations were negatively related to successful re-employment.

In a recently released local research, an investigation on the barriers to RTW for a focus group of 16 participants with spinal cord injury was carried out. The feedback implicated that their physical impairment such as the loss of limb functions (whether partial or total) and being wheelchair-bound had limited their consideration and initiation of seeking jobs and returning to work, and further reduced their motivations to work. On the other hand, they were either rejected by the employers due to their visible disabilities or impeded by inaccessible environmental factors (Chan & Man, 2005). In another recent local predicting study about vocational outcome with 317 subjects with brain injury, a significant relationship was found to exist between the severity level of injury and eventual return to work upon discharge from rehabilitation institutes (Leung & David, 2005)

### **2.5.2 The factors of work related musculoskeletal disorders and RTW**

Comparatively to those serious injuries which may lead to obvious handicap and functional limitation, a large amount of work accidents belongs to the musculoskeletal injuries such as low back pain, accumulated or repetitive strain injury (Jensena &

Bodin, 1998; Sullivan et al., 2005). Other than severe physical impairment, functional limitation and obvious disabilities, chronic pain is one of the prominent problems resulting from the injury. Chronic pain and correlated issues have close relationship with prolonged sick leave. Self-perceived levels of pain are predictive of RTW outcome (Sullivan et al., 2005; Fishbain, 2002). The higher level of pain, the less likely the injured worker would return to work (Fishbain, 2002). Most of the available studies suggested that return-to-work after a period of sick leave due to chronic pain resulting from work-related musculoskeletal disorders seemed to be more influenced by psychological and psychosocial factors and less by physical aspects of disability and physical requirements of the job (Anema et al., 2002; Sullivan et al., 2005; Watson et al., 2004; Adams & Williams, 2003). Biopsychosocial models have been widely used in the intervention strategies for chronic pain management for RTW such as cognitive behavior therapy (Sullivan et al., 2005). Pain management with psychological models such as cognitive behavior therapy which focused on dealing with psychological problems had showed its effectiveness in reducing work disability and facilitating RTW (Sullivan & Stanish, 2003; Jensen & Bodin, 1998). Factors such as depression, poor problem solving, pain catastrophizing, pain-related fear, and low expectations for recovery and pain beliefs also emerged as determinants for prolonged work disability (Sullivan et al., 2005).

Among the psychosocial factors of chronic pain, the most frequently associated with long-term sick leave from job were poor expectations for recovery, pain avoidant beliefs, fears of pain or movement, pain catastrophizing (a particular response to pain symptoms), and poor self management skill on pain and pain related depression (Shaw & Huang, 2005). In a recently published local research paper on the investigation of psychosocial factors and their influence among local musculoskeletal injured workers with long term sick leave, researchers have found that the psychological and psychosocial factors directly influenced injured worker's motivation on RTW. 64 subjects with work related chronic low back pain and cumulative trauma were invited to participate in a questionnaire investigation on their self-perceived general health, anxiety and depression state, bodily pain, and stage of job readiness. The results showed that bodily pain was negatively correlated to the motivation and job readiness. Compared to physical disability, mental health problems such as emotional distress, depression and social function were found to significantly impact RTW of those injured workers (Cheng & Li, 2005).

As mentioned earlier, psychological and social factors have been found to have a major impact on RTW. Self-confidence, depression and anxiety, life satisfaction, motivation, belief and readiness for behavior change have all been shown to be related to RTW probability.

Psychological impairment can of course be a significant factor in limiting return to employment. A delay in return to normal function was associated with poor psychosocial functioning (Atroschi et al., 2002). A prolonged absence from the workplace has a deleterious effect on mental and physical health (Franche et al., 2002).

General self-confidence obviously affects an injured worker's RTW. People with high self-confidence and self-esteem are more likely to RTW. Wiegmann et al. (1998) found that those with a strong belief in internal control showed better improvement of their physical functioning than those without it.

Depression and anxiety levels are negatively correlated with the rates of RTW. As the intensity of depression and anxiety increase, the rate of RTW of injured workers will decrease. Marhold's group (2002) conducted a research on psychosocial and physical risk factors for pain and disability in the workplace. The psychosocial risk factors were found to include high time pressure, monotonous or boring work tasks, low job satisfaction, low social support, and uncertainty about how to perform one's work tasks. They concluded that the improvement of psychological factors such as depression could promote injured workers to RTW.

Another study done by Giezen et al.(2000) showed that sick leave among employees with chronic low back pain was more related to psychosocial and

economic factors and less related to more physical factors like ADL-capacity, radiating pain, physical requirements in the job, or the labor sector in which the person was employed (e.g. construction). Bernacki (2004) has also addressed the importance of psychosocial factors in limiting outcomes after work-related injury. In his retrospective cohort study, 1600 patients with low back pain were investigated, and he found that psychological impairment was a significant factor in limiting patients' return to employment. However, in another study, subjects with great pain, severe disability, and complex medical history were found to have a lower chance to RTW (Selander et al., 2002). Thus, there seems to be no significant relationship between severity of injury and vocational status (Fisher et al., 2003; Kowalske et al., 2000; Yasuda et al., 2002; Wiegmann & Berven, 1998; Fisher et al., 2003).

### **2.5.3 Age, gender and educational background of workers**

A number of previous studies have tried to investigate the RTW outcome for injured workers in relation to age, gender, marital status and educational level among the workers (Marhold et al., 2001, 2002; Anema et al., 2002). These factors were found to be weak predictors of RTW. However, there was a general trend that getting back to a job after injury decreased with age. Persons aged between 25 to 49 years old had relatively higher rates of RTW compared to those aged 49 years and above (Barlow et al., 2003, Watson et al., 2004). This might be due to the better general

health in younger workers. The younger workers might also be more motivated than their older counterparts and, thus, they were more attractive to the labor market in general (Anema et al., 2002).

Little correlation has been found between gender and RTW (Marhold et al., 2002, 2001; Giezen et al., 2000). Educational level among the manual workers also seemed to have no direct effect on RTW (Barlow et al., 2003; Marhold et al., 2001, 2002; Anema et al., 2002; Watson et al., 2004).

#### **2.5.4 Confidence and readiness to RTW**

RTW following an injury or illness has been recognized as a process of behavior change influenced by a variety of social, psychological, and economic factors (Franche et al., 2002). If an injured worker does not develop job readiness, especially in regard to the psychological preparation aspect, then the chance of RTW would be lower. Job readiness is gained with the motivation and strong belief on behavior change of (Shaw et al., 2002; Berglind & Gerner, 2002). Injured workers being in the stage of job readiness have showed more likely to be employed than those being in the stage of not readiness for behavior change (Gatchel et al., 2002).

Priestley (1998) explained the decision making in RTW. Any decision to take action or change behavior was supported by one's motivation or thinking behind the action. He suggested that RTW after work injuries was a social phenomenon shaped



by individual and societal issues. Furthermore, individual issues were related to personal determinants, subjective attitudes and beliefs associated with disability. Berglind et al. (2002) identified the effect of motivation on RTW among long-term sick listed people and mentioned three basic factors related to motivation: what the individual wants (preference), what the person thinks he is capable of doing (perceived competence) and what he thinks he can get (opportunities). These three aspects were more or less correlated. One hundred eighty-five people were asked to response to a questionnaire which contained the respondent's own view of his or her present and future situation, types of work they wanted, and whether they could manage this type of work if they could get such job. The results of their study showed that wanting to RTW was connected to the subject's view of his/her capabilities. What a person wanted was not an isolated opinion, but clearly connected with other aspects, particularly competence ('can manage'). These results suggest that a person's self-confidence might be closely related to her/his motivation and helping a person to gain confidence could be important. One of the major limitations of this study was that it failed to present either physical disability or psychological and psychosocial factors related to differentiate motivated or unmotivated injured worker on RTW.

Cheng et al. (2005) investigated the effect of psychosocial factors influencing local musculoskeletal injured workers with long term leave on their readiness of

return to work. Prochaska and Lam's 'stages of change' model (to be further discussed in later part of the chapter) was initially considered to prescribe the process of behavior changes on RTW where work readiness represented the motivational factors contributing to and maintaining behavioral change. The level of readiness was assessed by Lam Assessment on Stages of Employment Readiness (LASER). The results of this study affirmed that self-perceived bodily pain and emotion functioning such as depression or anxiety significantly influenced the injured worker's readiness to return to work. Injured worker's social function and family states and the relationship with family members also play a role in developing job readiness for injured workers. Shaw et al. (2005) investigated the self-efficacy and outcome expectancy related to work readiness on injured workers with low back pain using the Prochaska's theoretical model of 'Readiness for Change Model'. Self-efficacy was described as the belief in one's capabilities to organize and execute the courses of action required to produce given attainments, while outcome expectancy defined as 'detrimental or beneficial physical effects, favorable or adverse social reactions, and positive or negative self-evaluative reactions' that were expected to result from a given behavior. Their results suggested that self-efficacy for return to work consisted of beliefs about the ability to perform discrete physical tasks, beliefs to control pain and mental stress, prevention of re-injury and to cope with pain on work performance.

Positive expectations that RTW would improve finances, self-esteem, and social support without increasing pain, and negative expectations that RTW would lead to re-injury and stigmatization, diminished self-worth, and jeopardized employment opportunities were also found in their study.

Sustaining complicated situation and experiences during long term sick leave dealing with variety of issues post injury, i.e. impairment, individual, family, employer, compensation, society and economy, RTW becomes a process of behavior change for injured workers. Facing this process, the prominent concerns for injured workers might be why to change, how to change and how to maintain the new behavior.

An adaptation orientation for RTW would suggest that individual perceptions of work readiness may be equally important as pain reduction or physical measures of strength, endurance, or flexibility.

### **2.5.5 Job preparation and job acquisition skills**

When an injured worker is prepared to RTW after prolonged sick leave, a number of factors influence the path of getting job (seeking re-employment) when coming back to former employer is impossible. If an injured worker could not go back to a same or similar job role as before injury due to the limitation by the physical disability, seeking for a new job with different role would be a big challenge (Watson et al., 2004). Lacking of new job skills may decrease their employment competence or their

outdated vocational skills may prevent them from identifying suitable and sustainable employment (Selander et al., 2002). Due to long term sick leave and stay at home, injured workers tended to have less communication with outside world or society and consequently the available job resource and information for them were quite limited (Fisher, 2003). Injured workers often feel lack of confidence due to their injury compared to other competitors during the process of job interview on job market. Poor interview skills, insufficient experience on job hunting or prejudice from the employers because of their past history of work injury also obstructed them from successfully getting reemployment (Strunin & Boden, 2000). If an injured is objective to be out of reemployment when he or she has already gotten work readiness within a certain time frame e.g. three or four weeks, it is easy for him or her to be frustrated and lose the readiness again. Watson et al. (2004) pointed out that injured workers might face a number of difficulties when seeking re-employment. They might become progressively less fit through inactivity. Rehabilitation programmes did not include job seeking and occupational advice. There might be prejudice from employers for people with injuries. Even after they came back to their former or a new place of employment, those factors could influence their long-term or permanent employment status (Franche et al., 2002). Some injured workers may have adjustment problems following the injuries or disabilities (Ford & Swett, 1999; Franche et al., 2002). Others

may have more concerns on whether return to employment would aggravate the injury.

## **2.6 Current issues of long-term leave injured workers in Hong Kong**

From 2001 to 2003, the numbers of occupational injuries in Hong Kong reported were 47,000, 42,000 and 44,000 and the corresponding injury rate per 1,000 workers was 19.2, 17.7 and 18.1, respectively (Labour Department, 2005). The highest incidence rate was from workers in the wholesale, retail, restaurants and hotel industries, accounting for 30.4, 29.2 and 31.7 percent of all injuries in years 2002, 2003 and 2004. From 2002 to 2004, the amount of total compensation paid to injured workers was HK\$1.002, HK\$1.007, HK\$1.12 and HK\$1.24 billion annually across the three years (Labour Department, 2004). The sum corresponded to 0.7‰, 0.8‰, 0.9‰ and 1‰ of Gross Domestic Produce (GDP) in the respective years. The total number of loss work days was 1.507, 1.554 and 1.473 million days respectively from 2001 to 2003 (Labour Department, 2004).

According to the statistics from Labour Department (2003), most of the workers injured at work took sick leave of 7 days or less (about 50%). Around 6538 workers took more than 90 days of sick leave (around 21%) and 15% (980) of them took more than 180 days of sick leave or eventually left the labour market permanently. Among

6538 sick leave injured workers, only 1896 workers returned to work (29%).

Through the years from 2000 to 2002 the Hong Kong Workers' Health Centre conducted a questionnaire survey on 127 local injured workers using convenient sampling method. The aim was to find out the problems that they had encountered and the rehabilitation services that they had received after their injuries (The Hong Kong Worker's Health Centre, 2002). The workers were aged from 30 to 50 year old with 55% male and 45% female. All of them suffered from musculoskeletal injuries such as low back pain, repetitive strain or overuse injuries, and pain in the upper limb. About 90% of the subjects received rehabilitation services in the hospital after the injuries including physiotherapy and occupational therapy. More than 40% of them waited for 1 to 6 months for rehabilitation consultation. 60% of the subjects who had finished the rehabilitation services were unable to return to previous work due to loss of work competence, chronic pain, dismissed by the previous employers or difficulties in finding new jobs.

On the other hand, all those 127 injured workers had joined the retraining programme for RTW in the centre and finally 51 (40%) of them did not RTW. All the 127 injured workers had ever encountered or were facing a number of common problems or difficulties influencing their RTW after injuries. They were mental stress, chronic pain, economic pressure, longer waiting for receiving rehabilitation, difficult

to find jobs, and communication or relationships barriers with family members or colleagues. As mentioned before in this chapter, it was found by a recently published local research that psychological factors such as self-perceived pain, anxiety level and psychosocial functions influenced the readiness and the motivation for RTW for long-term sick leave injured workers with musculoskeletal injuries.

This might also explain why some injured workers could not return to work even after intensive vocational rehabilitation from hospital or rehabilitation settings. These workers have to seek help from other means. They must be physically or psychologically be ready and motivated to work. HKWHC is one of the voluntary agencies helping injured workers return to work. It is suggested that based on the current medical and rehabilitation services that focused on restoring physical impairment and functional incapacity resulting from injury, reinforce proper assistances such as pain and stress management and psychosocial adjustment programme should be provided to handle the psychological and social barriers of the injured workers especially for those with long term sick leave in order to help them successfully RTW.

## **2.7 Current systems related to long-term leave injured workers in Hong Kong**

As mentioned above, the problems of injured workers themselves, such as

psychological, family, social and physical problems and the concerns on compensation issues may prevent them from RTW. Except those interior factors, some existing exterior factors also played a role in the delay of RTW for injured workers (The Alliance of Professionals, 2002). A review of the existing workers' compensation and occupational rehabilitation services suggested that the system was built around compensation rather than active rehabilitation and return to work for the injured workers (The Alliance of Professionals, 2002).

Under current system, an injured worker first receives medical treatment aimed at reducing the impairment as a result of the injury, and then is referred to the rehabilitation professionals who will offer programmes to restore the lost functions and to reduce disability as a result of the impairments. There are currently resource constraints and many contextual limitations, like a missing link between different major stakeholders at the end of the rehabilitation service for injured workers. Many injured workers, after going through the whole process of conventional medical treatment and rehabilitation, frequently find themselves unable to cope with their job and very often have to choose to continue staying away from their job, i.e. on sick leave, until they have fully utilized their legal entitlement.

The current local occupational rehabilitation system mainly put emphasis on disability by means of restoring injured workers' physical abilities and work capacities



rather than on RTW through resolving their psychological and social problems. Under the current compensation system for work injuries in Hong Kong, temporary incapacity is always considered to be 100%. An injured worker can only be either fully on the job or entirely off the job (The Alliance of Professionals, 2002). The injured worker is often given the 'benefit of the doubt' by health care workers, who may not want to be caught up in a situation where returning an injured worker prematurely to work causes additional injury and harm. Ironically, the so-called 'benefit' sometimes does more harm than good to all parties involved, including the injured workers and their families. It is not uncommon to find workers who have been put off work for two years suffering from a relatively trivial back injury (The Alliance of Professionals, 2002). This is not only a burden for the company or employer but also quite detrimental to the workers themselves.

An occupational injury not only brings about physical impairment or loss of function, but is also a traumatic experience for most workers, which can have prolonged psychological and social implications. Although psychological and social disturbances (like taking on the sick role, loss of status, loss of confidence and concern for compensation) may not be the direct results of the injury, we cannot entirely disregard these consequences as they frequently contribute to the prolonged incapacity resulting from injury. Injured workers have a number of barriers and

hurdles to get over before they can go back to their original jobs. These include physical barriers, psychological barriers and social barriers. In patients who are recovering slowly, psychosocial and medico-legal factors increasingly determine disability. It has been found that after six months, as much as half of any persisting pain was related to these non-medical factors (Giezen & Nijhuis. 2000).

The rehabilitation professionals working in hospitals or rehabilitation centers have been doing a quite good job in terms of restoration of functions. Unfortunately, this purely function-oriented approach is not entirely satisfactory or adequate for injured workers whose ultimate goal would be RTW. In order to fill the gap between the current system and reemployment for long-term injured workers, it is necessary to develop a new programme aiming at handling the psychological and social problems obstructing the injured workers from getting reemployment.

## **2.8 Current practice in vocational rehabilitation**

Vocational rehabilitation is a process of facilitating optimal vocational development in individuals with disabilities through screening, evaluation, counseling, planning, training and placement (Wing, 1999). The ultimate goals of vocational rehabilitation for people with disabilities are placement in competitive employment, personal satisfaction with the placement, and satisfactory performance on the job

through the reduction of the dysfunction (Rubin & Roessler, 2001; Wing, 1999).

Current vocational rehabilitation services focus mainly on physical aspects of injured workers to train up the body's physical function in coping with work demands through the process of work capacity evaluation, work hardening training, job analysis and job matching. However, psychological problems and preparation, such as job readiness, behavioral change of RTW often are not taken into consideration. Even following a bout of rehabilitation, injured workers that have had long-term leave due to psychological problems – especially for the reasons of motivation and readiness of behavioral change–will gradually lose the job competence that have been achieved through the vocational rehabilitation programme.

## **2.9 Stages of Readiness to Change Model**

The Stages of Change Model (Prochaska et al., 1992) offered an integrative picture on the structure of people's intention of a given behavior change and gave a deep description for the behavior change. It was reported that individuals made behavior changes in five motivational stages, as determined by their self-efficacy, decisional balance, and change processes (Gatchel et al., 2002). The model suggested that individuals would progress from one stage to the next; however, they might “relapse back” to a previous stage at any point. The stages of change model has been

helpful in conceptualizing motivation to change for clinicians working in different areas of risky behaviours, such as smoking and hazardous and harmful alcohol consumption (John & Prochaska, 2002). According to the model, an individual is more or less receptive to different kinds of action depending on his or her stage of change. The first of five stages of change was labeled **Precontemplation** and is characterized by lack of problem recognition. During the next stage — **Contemplation** — the individual starts to consider a change. Progressing to the stage of **Preparation**, a decision to change is taken and plans are made on how to succeed. The following stage is **Action**, which implies that the individual is experimenting with alternative behavioral patterns. The fifth stage, **Maintenance**, includes long-term reinforcement of the individual's new healthier behaviors in order to stabilize these behaviors. The descriptions of each of the five stages are shown in Table 1.

This model generalizes the various behaviors (addictive and no addictive, socially acceptable and not, legal and illegal, frequent and not frequent) and it has been particularly well-validated and received strong empirical support in the area of health-risk behaviors (John et al., 2002). People moved through the stages of change in a spiral or cyclic pattern, i.e. relapse might occur as they progress from the pre-contemplation to maintenance stage (Prochaska et al., 1992). Fortunately, most people learned from the mistakes during the relapse and fell into contemplation or

preparation stage instead of going back to the very beginning of Pre-contemplation stage (Prochaska et al., 1992).

Table 1: Definitions of stages of the Stage-of-Change Model.

Stage	Definitions
Pre-contemplation	At this stage people are generally unaware of their problem or greatly underestimate it and have no serious intention of changing their behavior now or in the foreseeable future.
Contemplation	At this stage people are aware that a problem exists and have been seriously thinking about overcoming it but have not yet made a commitment to action.
Preparation	At this stage combined with intention and behavioral criteria, people are preparing tried to change.
Action	At this stage people modify their behavior, experiences, or environment in order to overcome their problems.
Maintenance	At this stage people work to prevent relapse and consolidate the gains attained during action

Prochaska and his colleagues have devoted 20 years to investigating the stages of change in people with a variety of mental disorders and behavior problems (John et al, 2002). They believed that by identifying these stages, mental health professionals can improve their understanding of how therapeutic change could make treatments more effective, and reach millions of people who are not getting the help they need.

## **2.10 Treatment matched with the stages of behavior change**

People suffering from behavioral disturbances differ greatly in their readiness to take action to solve their problems (Norcross & Prochaska, 2002). As prescribed before, a certain behavior change process would undergo 5 different stages from psychological no intention to preparation till maintaining a new behavior acquired through taking action. Problems or difficulties impeding behavior change are labeled with the characters of stage's matching or specificity. It has been widely accepted that the intervention or treatment provided to precede the movement along stages should be matched with individual stage. A number of interventions or treatment mentioned in previous studies or researches have demonstrated to be effective to help people changing their behavior within the model of stages of change. Those intervention or treatment were mainly applied to treat risk or health related behaviors, such as smoking, drug use, dietary habits, physically inactive life style.

Individual counseling is one of commonly used and powerful tools to help people to change their behaviors. Specific counseling skills have been selected to tailor the stage of change. For the persons in the precontemplation stage, the aim of counseling is to make them aware their present situation or consciousness rising of proper behavior. Veen, van et al. (2002) found that stage-matched individual counseling based on stages of change was beneficial to help people with

cardiovascular disease to change their diet habit by reductions in dietary fat intake in the short and long terms and by weight loss in the short term. In their study 143 target subjects were recruited and randomly allocated into intervention and control group. Average 20 minutes per session and total 7 sessions of counseling intervention within 8 weeks were delivered to each subject in intervention group. Specific counseling targets were set up based on the stages of the subjects, such as aiming at raising consciousness about dietary behavior in the precontemplation stage, motivating to change dietary behavior in the contemplation while reinforcing the information about the practical aspects of dietary change in the action stage.

Another RCT study (Jimmy & Martin, 2005), aiming at evaluating the feasibility of a physical activity intervention based on stages of change with individual counseling, educational written materials to a group of patients with chronic cardiac and pulmonary conditions and sedentary life style, has showed that tailor made programme promoted the transfer from physical inactive behavior to physical active behavior. This programme lasted for total 4 weeks and a 45-minute counseling once per week was run with stage-matched manner. For patients in precontemplation stage, the emphasis was on why to change and facilitating motivation of behavior change. For the contemplation stage, how to change and the practical aspects of change were the emphasis. For the preparation and action stages the target was shifted to providing

specific exercise direction and helping goal setting or making an action plan.

Motivational counseling is another approach with evidence from control trials demonstrating its effectiveness on stages of change with variety issues such as substance abuse (Wagner & McMahon, 2004), exercise behavior (Jane et al., 1999), health behavior change (Zimmerman et al., 2000). Zimmerman et al. (2000) demonstrated that motivation counseling could effectively help patients at the precontemplation and contemplation stages to move forward along the stages. Furthermore, counseling incorporated with empathy and patient-center created and maintained a positive relationship between therapist and patients. Another controlled study (Jane et al., 1999) has showed that motivational counseling coupled with developing discrepancy, avoiding argumentation and supporting self-efficacy successfully helped sedentary patients change to increase their physical activities. Most of those successful patients were at either contemplation or preparation stages.

Integrated intervention combined with individual counseling and group based programmes also displayed their common effectiveness on promoting stages of change on health related or dietary behaviors. In a self-controlled study (Burns et al., 2005), a 4-week multidisciplinary treatment integrated with a group programme (biofeedback, education and cognitive-behavioral therapy) 5 hours per week and individual counseling one hour per week were provided to 65 patients with chronic



musculoskeletal pain. Those patients were at different stages from precontemplation to action on adopting self-management approach on pain. Their results showed that the shift from precontemplation to contemplation and preparation to action stages were significant. It was also suggested that multidisciplinary pain programmes tended to treat patients uniformly irrespective of their degree of preparedness to accept and abide by guiding principles of self-management. In another controlled study (Resnicow et al., 2003) a combined intervention including a main component of 23-minute video story, printed education materials and 3 tailor-made telephone counseling calls was adopted to explore within the same group whether precontemplators responded differently over time compared with those in the preparation stage, a group assumed to be more likely to change their dietary behavior. Although not being specifically as a stage-matched intervention, two parts of their video programme focused on 'why to change' and 'how to change' which could be considered tailored to those in the earlier stages of change and individuals in the latter stages of change, respectively. They came to the conclusion with their findings that precontemplators should not be excluded from intervention studies, as they might ultimately become just as likely to change their behavior as those in more advanced stages, even without stage-tailored intervention.

Up to now, large amount of researches or studies on stages of change model and

related stage-matched intervention have mainly focused on health related, substance abuse, addiction, risk behaviors, such as dietary habit, physical inactive life style, smoking and high risk sexual behavior, etc. Although it has been advocated that RTW after work injuries could be recognized as a process of behavior change (Franche et al., 2002), no studies have explored the effectiveness of using available strategies or tailored intervention to help injured workers to get reemployment post injuries under the framework of stages of change.

### **2.11 Stages of work readiness for injured workers**

Returning to work can be conceptualized as a complex human behavior change, involving physical recovery, motivation, behavior, and interaction with a number of parties (Franche et al., 2002). According to Prochaska et al. (1992), any type of behavioral change would have five stages which are connected to one another in a spiral manner. They are pre-contemplation, contemplation, preparation, action, and maintenance.

Lam in 1997 applied Prochaska's 'Stages of Readiness to Change' Model (Prochaska et al., 1992) to vocational rehabilitation for the first time. He proposed a relevant model of stages of work readiness for injured workers to go back to work after long term sick leave. This model described the process and stages of behavior

change of RTW and emphasized on the issue of workers' readiness to work. Similar to Prochaska's model used in health related or substance used behavior, stages of work readiness model suggested that an individual injured worker would also undergo total five stages of behavior change before going back to work and would progress from one stage to the next; however, he or she could "relapse back" to a previous stage at any point. The titles of each stage in Lam's model are just the same as those in Prochaska's model which are pre-contemplation, contemplation, preparation, action, and maintenance. In the context of injured workers and their return to work process, pre-contemplation stage is signified by the workers not having the intention to work in the foreseeable future. Behaviorally, workers might feel that they are being "forced or coerced" into attending a work program and express a desire to change the environment or the system, not themselves (McConnaughy et al., 1989). The contemplation stage is characterized by the workers aware of the problem, beginning to consider the prospects of change, but having not made a commitment to change. It is common that they seesaw and weight the pros and cons of leaving from the compensation system to work. The preparation stage is that the workers intend to go back to work in the near future. They are actively seeking information regarding return to work, testing their abilities to do so, and making a concrete plan to return to work. Moreover, they may have made efforts to look for work, but they have yet to

reach the criterion of employment. In the action stage, the injured workers are involved in overt modification of the problem behavior, and hence ready to leave the compensation system and return to work. In the maintenance stage, the workers put efforts to consolidate the gains, prevent injured, and continue their employment.

Stages of work readiness model focused on properly recognizing the current stage which an individual is in, further more specific coping and stage matched intervention or services should be provided for individuals to achieve job readiness. Otherwise service providers were likely to underserve or disserve the majority of their clients (Lam, 1997).

Based on this model, Lam designed an assessment tool to measure the stages of readiness for employment, 'The Lam assessment of stages of employment readiness' (LASER). LASER aims at measuring subjects' readiness towards RTW and predicting the subsequent employment outcomes. It divided the readiness into three stages for interpretation. They are Pre-contemplation, Contemplation and Action. Subjects at Pre-contemplation stage do not show interest in working and they are not considering working as part of their life. Subjects at Contemplation stage do consider working as part of their life but they have not pursued work yet. Finally, subjects at Action stage are ready for job placement and are actively involved in job seeking and job interviewing. The preparation stage and maintenance stage were not included due to

the non-significant difference between the responses (Rollnick et al., 1992). The LASER is not concerned with job tenure or the preparation stages of readiness to change. It consists of 14 self-rated items, and subjects have to state their level of agreement with the statement on each item. The higher the sub-score, the more likely the subject would be at that stage. With the identification of specific current stage of an injured worker, corresponding stage-matched intervention could be carried out to further promote his forward movement along the process of stages to change his behavior.

Interventions suggested or proven to be effective include cognitive behavior therapy, specific problem resolving such as chronic pain and stress management, education, goal and plan development, motivation, and interview techniques.

## **2.12 A job preparation and job placement RTW model**

For an injured worker with more than six months of sick leave, his or her behavioral change cannot be addressed by the traditional vocational rehabilitation which mainly tackles the physical work capacity in preparation for work re-entry (Shaw et al., 2002).

RTW after long term sick leave due to injury is a process of behavior change

(Franche & Krause, 2002). Prochask and Lam's models have given a clear picture on how an injured worker would get job readiness through progressing on the stages of change. Up to now, there is still lack of researches either to develop a related intervention model for injured workers targeting at RTW or to evaluate the effectiveness of such a programme. A RTW programme was set up based on the theoretical frame work of stages of change model and stages of job readiness in this study. The ultimate goal of this programme is to help local injured workers with prolonged sick leave to RTW. Injured workers' readiness on RTW was facilitated by providing stage-matched intervention in the programme. As mentioned previously in this chapter, both overseas and local researches and studies have confirmed that psychological and psychosocial factors significantly influenced job readiness and RTW for injured workers. Those factors include chronic pain, anxiety and depression, low motivation on job, lack of job interview skills, lack of confidence on RTW, worry about re-injury on work, difficulties in locating suitable job. The training part of the programme was designed to train injured workers to progress along stages of change through adopting individual components to deal with corresponding factors while the placement part of the programme was to get reemployment with assisted placement. The format of training intervention was integrated with individual counseling and group training. The format of placement was integrated with providing job

recruitment information, guided job interview and employment recommendation within the employer network.

It was totally 15 days within 3 weeks for running training programme and another 3 weeks for running the job placement services. A timetable of intervention arrangement would be delivered to each participant upon his or her agreement of involvement. The training programme was run full time for 7 hours per day. All participants were asked to attend training complying with the timetable. A participant should report for application leave in case of being unable to attend training temporarily and the corresponding compensation training sections would be rearranged for the participant in the following programme term. If a participant delayed over 15 minutes for a single training section, he or she would be kept out of this section until the starting of next one. We adopted a full-time training pattern in a consecutive period and set up time discipline system, trying to simulate a working time restrain model in real workplace circumstances. Such a time frame model should provide an opportunity for each participant to adapt to routine duty behavior and temporarily suspend from their current daily routine that might have last for a long time. The progress and process of such a full time course indeed was a sort of work adjustment training for subjects to develop appropriate work habits such as attendance and punctuality; work attitudes such as the performance during the training;

appropriate personal hygiene and general appearance. The format of training was combined with stage-matched counseling strategies including individual counseling and group training. Total 3 counseling sections would be offered to each participant and each section would last for about 50 minutes. Before the starting of programme, the information about participant's stages of job readiness was gathered using LASER. Based on current job readiness level on RTW, corresponding counseling strategies and skill would be applied to each participant by individual counselor. During the first section of counseling, counselor would try to facilitate the subjects to tell his or her 'stories' which contained the information regarding his or her present situation, difficulties, problems, cares, expectations especially related to work injuries and RTW. For the precontemplators, the goal is to "think about return to work". The strategies are to identify any specific reasons of not considering return to work, to provide the information about the benefits and values of work to individual well-being and family, to let participant think any possibility about return to work, to help participants to weight the pro and cons on financial loss due to not resuming a paid work duty, to facilitate the client to recognize the needs, values, and interests, to set realistic vocational goals with respect to the identified needs and values, and to remove return to work barriers. For the contemplators, the goal is to "get ready for RTW". The strategies are to consider the specific benefits and barriers of RTW, to develop a list of



solutions to overcome specific barriers on RTW, to enhance the client's self-esteem, reestablish worker's role, understand the meaning, value, and demands of work, to modify attitudes and work behavior, relate to coworkers and employer, and accept supervision, and obtain information on the labor market. For the participants in action stage, the goal is to "keep on it". The strategies are to help participants to set up realistic vocational goals, to discuss with participants on overcoming barriers or difficulties in carrying out their action plans, and to increase confidence in job seeking.

Three sections of individual counseling would be scheduled to be once a week within the three-week training time. Between two individual counseling sections, group based training sections would be run full day for all the participants. The format of group training was similar to a course delivered interactively by a conductor. Each group session would last for around 50 min with total 6 sessions per day. Educational and skill training components of group training provided opportunities for participants to learn coping strategies that promote self-management of pain and stress, to learn new skills related to job finding and interviews, work adjustment in work place, getting along with co-workers or supervisor, etc. Even though the group training was not carried out in totally individualized approach, the individual components covered by the group sections touched issues or problem which different participants may

commonly encounter or face at different stages of work readiness. Interactive group courses also provided the opportunities for participants to share and exchange personal experiences of management of work injuries, looking for jobs, commonly cared issuers related to RTW with others. Another advantage of group training is to provide participants with exposure to others with similar problems and to share the successful experience on dealing with difficult problems associated with readiness of change (Veen et al., 2002). The components of group training would include pain and stress management, work adjustment, job acquisition and interview skills, psychosocial adjustment. The detailed information of each component will be further discussed in chapter 3.

Through literature review it could be found the time duration to design a psychological intervention program. In this programme, individual counseling time for each participant was total 3 times with 50 minutes each. It was found in the literature that individual counseling time to facilitate the progress on stages of readiness to change behavior was different in length. In generally, several kinds of time frame were commonly adopted, such as duration with around 30 minutes, with a total number of 3 times within 3-5 weeks (Veen et al., 2002; Kim et al., 2004); 50 minutes per time twice within 2 weeks (Jimmy & Martin, 2005), or two or three 15-min individual counseling sessions (Linda et al., 2005). For pain, stress management

intervention and other cognitive-behavioral RTW programmes, the total time of intervention was usually around 20-40 hours with a duration of 2-12 weeks and with each session lasting for 2-6 hours (Marhold et al., 2001; Nieuwenhuijsen, 2004; Linton et al., 2005; Haraldsson et al., 2005).

The second part of the programme was supported by job placement in which the assistant placement was provided to the participants based on their development of work readiness right after finishing training on work readiness. The ultimate goal of this programme is to facilitate the RTW outcomes for long term sick leave workers with musculoskeletal injuries. It is believed that participants should be placed in jobs efficiently and effectively as early as possible. Through successful job placement, injured workers could earn their living, have their self-respect and confidence reinforced, and become integrated into the society as contributing citizens. The path obstacle should be cleared and the information gap between employers and injured workers should be bridged by providing information about job vacancies, details such as qualifications required, job incumbent characteristics, salaries, and so on (Chan & Tam, 2005). A number of methods or strategies have been proven to be effective to promote the successful work resettlement for persons with chronic diseases or disabilities under local situations (Lee & Chan, 2005). Those strategies included setting realistic job placement post before assigning clients to appropriate and relevant

job; soliciting job placements in employment establishments using various marketing strategies such as cold calls, call up companies which place job advertisement and personal networking; preparing job placements and arranging for job entry by practicing job interviews and job hunting skills; identifying the best job for the clients and accompanying the clients to their job interview (Lee & Chan, 2005). In vocational rehabilitation services for local injured workers with long term sick leave, no such placement services had been available to facilitate their RTW. In our study a placement strategy was set up with a number of elements adopted including establishing job information resources bank and employment network, preparing job placements and arranging for job entry by practicing job interviews and job hunting skills, accompanying job interviews and hunting. A placement officer was responsible for the placement services. Further description of the placement programme will be touched in chapter 3.

### **2.13 A randomized clinical trail**

Will this model work to facilitate injured workers after prolonged sick leave to get re-employment? A clinical research trial can assist in providing the evidence needed to determine the effectiveness of this model in clinical use.

Currently a lot of attention has been paid to the direct clinical practice based on

evidence. It is known as evidence-based practice (EBP) (Newhouse et al., 2005). EBP provided the potential for the health care professionals to close the gap between available knowledge, research, service needs, and clinical practice (Susan & Katherine, 2004). It is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients (Sackett et al., 1996). The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research (Newhouse et al., 2005). What is the best evidence? A hierarchy of evidence has been developed, which contained a total of 7 levels of evidence from the lowest level (level VII) to highest level (level I) (Melnyk & Fineout-overholt, 2005). A brief introduction of the levels is as follows:

Level I: Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs), or evidence-based clinical practice guidelines based on systematic review of RCTs

Level II: Evidence obtained from at least one well-designed RCT

Level III: Evidence obtained from well-designed controlled trials without randomization

Level IV: Evidence from well-designed case-control and cohort studies

Level V: Evidence from system reviews of descriptive and qualitative studies

Level VI: Evidence from a single descriptive or qualitative study

Level VII: Evidence from the opinion of authorities and/or reports of expert committees.

From the above descriptions of the hierarchy of evidence, RCT could add more reliable information to the current evidence available to based EBP. Thus, an RCT study was adopted in this research project.

#### **2.14 The purpose and objectives of the study**

The purpose of this research project was to investigate the effectiveness of a 'Return to Work Programme' (RTWP) on promoting RTW for local long-term leave workers due to work-related musculoskeletal injuries. This program included two parts – a 3-week training intervention and a 3-week job placement part. Based on the 'Stages of Change Model' postulated by Lam in 1997 and 'The Readiness for Change Model' proposed by Prochaska et al. in 1992, it tried to explain the process of stages of job readiness and behavior change addressing the motivational factors contributing to and maintaining behavior change. The objectives of this study were:

1. To compare the effectiveness of training intervention on job readiness between the subjects who received training and those in the control group.
2. To investigate the effectiveness of assisted job placement on RTW

measures compared to self-placement.

### **2.15 Hypotheses of the study**

Based on the objectives of the study as stated above, hypotheses were made for objectives 1 and 2. For objective 1, it was hypothesized that injured workers in the training group would have improved job readiness through the individual counseling section, along with improved self-perceived health and functional status, better chronic pain and stress management compared to the control group. Further more, injured workers in training group would be more ready for work, and would advance in the LASER assessment. For objective 2, it was hypothesized that assisted job placement (phase II) would further enhance the RTW rate for workers at similar stage of job readiness compared with self-placement.

## **Chapter 3**

### **Methodology**

#### **3.1 Introduction**

This chapter is to present the methodology adopted in this study. The information presented here includes the research design, subject recruitment, intervention methods, assessment protocol and tools, data analysis.

The RTW programme was designed for injured workers who were unable to resume work following their injuries. It was divided into two parts, the training part and the job placement part.

#### **3.2 Research design**

This study adopted a randomized, controlled, single-blind experimental design (RCT) to evaluate the effect of a RTW programme on injured workers. The RTW programme is comprised of two parts, namely the training programme and the job placement. The study was conducted in two phases. Phase I of the study was to evaluate the effect of the training programme on the injured workers compared to a control group. Phase II evaluated the differences between a combined training and



placement programme and a training only programme. Each phase lasted for 3 weeks and the total length of the RTW programme lasted for six weeks.

There were altogether 3 assessment occasions to measure the progress of the interventions. The first assessment was pre-test assessment which was done prior to the phase I of the training program. The baseline information of the subjects in training (T) group and control (C) group was gathered through the first assessment. The second assessment was post-test assessment and done after the completion of the training program. The aim of the second assessment was to compare the effects of training between T group and C group. The third assessment was done at the last stage of phase II of the study which was at the end of the three-week placement period. For the third assessment, the effects of placement were compared between training plus placement (TP) and the training only (TO) groups. A schematic of the study is presented in Figure 1. In each phase of the study, the effect of the intervention group was compared with a control group. Subjects were randomly assigned into either the intervention group or the control group. An independent researcher prepared two sealed envelopes containing a sheet of paper with a “T” (intervention) group or “C” (control) group. Participants learned their group assignments after a research assistant completed the baseline assessment and delivered the sealed envelope to them. In

phase II of the study, the same randomization procedure was used to divide the subjects into the TP and the TO groups.

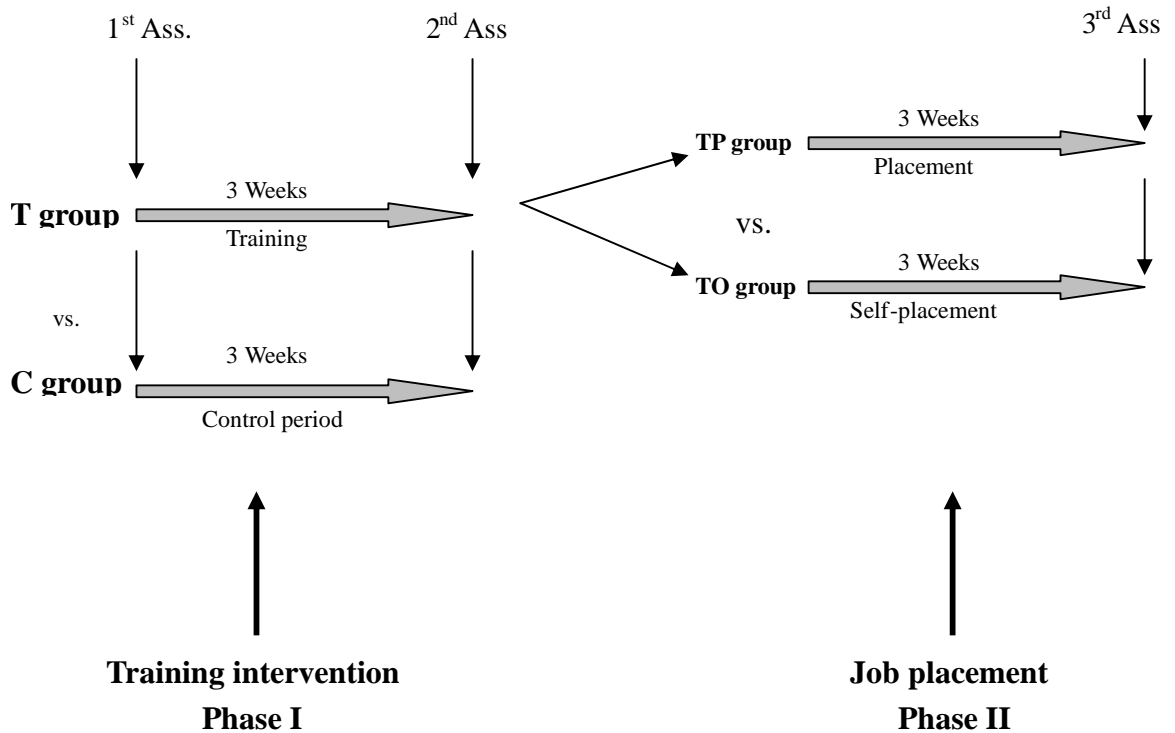


Figure 1. The intervention and assessment procedure of the study

Two research assistants who collected the data were blind to the treatment allocation. All participants were repeatedly asked not to reveal any information about their treatment allocation to the research assistant. The participants and treatment providers were not blind to treatment allocation.

### **3.3 Location of the research study**

The whole process of this research including sampling, assessment, program running and cases follow-up were carried out in the Hong Kong Workers' Health Centre, a non-profit and non-government organization (NGO). The main purposes and the missions of the centre are to provide services on promoting occupational health care, preventing occupational injury and diseases, protecting the health of workers as well as promoting return back to work and community for injured workers. Over the past 5 years, this centre has provided services for more than several hundreds of workers with occupation injuries or diseases referred mainly from the local hospitals, clinics, organizations or employers. These services focus on helping injured workers RTW through resolving their psychological and social problems with the forms of education, training, case management, counseling, and vocational assessment by the professional team formed with social workers, occupational and physical therapists. It has successfully run a number of researches related to occupational injury and disease collaborating with other universities, hospitals, organizations and government agencies.

### **3.4 Recruitment of subjects**

For the sample size consideration, the effect size was set as 0.7, statistical power

set as 0.8 and the alpha as 0.05. The corresponding sample size was estimated as 33 participants in each group. At least a total of 66 subjects would be required to ensure adequate power for statistical analysis. All subjects were recruited from a local Workers' Health Center in Hong Kong (HKWHC). The HKWHC is a non-government organization that provides services for returning to work for injured workers. These subjects had been previously injured and received medical interventions and rehabilitation programme including both physiotherapy and occupational therapy in hospitals. If they were still not reemployed six months after they had finished the medical service in hospital and their physical condition was stable, they would then be referred by hospital doctors or rehabilitation personnel to the center to receive further help in work settlement. All the subjects were suffered from musculoskeletal injuries due to work and their injuries had been formally reported to the labor department. All the subjects came to the center voluntarily. The inclusion and exclusion criteria are as follows:

### **3.4.1 Inclusion criteria**

- Diagnosed work related musculoskeletal injuries including the spine, the upper limbs and the lower limbs;
- Between 20 to 59 years old;
- Work injury related absence from work for over 6 months;

- Have completed clinical intervention and vocational rehabilitation; and
- Stable general health status.

#### **3.4.2 Exclusion criteria**

- Previous history of psychiatric illness;
- Musculoskeletal symptoms due to tumor, infection, systemic inflammation, and cauda equina syndrome;
- Lack of independent physical functional ability due to several disabilities such as traumatic brain injuries, spinal cord injury or limb amputee;
- Pregnancy;
- Severe spinal deformity (i.e. kyphoscoliosis); or
- Injuries that are non-work related injuries.

The entire research process, including the provision of the training and placement programme and the assessments was carried out at the HKWHC from July 2003 to March 2005.

#### **3.5 Ethical consideration**

Subjects were asked to give the written consent prior to their involvement in the RTW programme. For the phase I study, subjects in T group received group training and individual counseling for three weeks. Subjects in C group were in the waiting list

for the same three weeks to serve as the control to T group. There was no intervention provided to C group in three weeks. For ethical considerations, subjects in C group were then placed back into the T group after three weeks of control period, but their progress was not used for data analysis. For the phase II study, subjects in TP group received job placement for three weeks, while subjects in the TO group were asked to do the placement for themselves for the same three weeks. For ethical consideration, after the three weeks of placement, subjects in TO group who failed to RTW were provided placement service; accordingly their subsequent data were not included in the data analysis.

### **3.6 Intervention procedures**

This RTW program was a standardized clinical protocol designed based on the stages of change model (Prochaska et al., 1992; Lam, 1997) and job readiness model (Lam, 1997) to facilitate injured workers to seek competitive employment. The program was comprised of training intervention and job placement service.

#### **3.6.1 The intervention team**

A multi-disciplinary team of rehabilitation professionals was involved in provision of the intervention programme (Kearns, 1997). The team was led by a team leader who is a certified rehabilitation counselor together with four other case

managers with a background of training in occupational therapy or social work. The team leader and the case managers provided counseling services and group intervention in phase I of the study. Two research assistants with background in occupational therapy were recruited to assess all the subjects. The team leader and the case managers also provided job placement services for those who enrolled into phase II study. The author of this research was among the case managers to provide individual service for participants and to run the group intervention on pain management and interview skill training.

### **3.6.2 Phase I of study**

A 40-minute briefing session according to a standardized procedure purposing to introduce and explain the targets, contents and procedure of whole RTW programme was carried out by one of the team members one week before the starting of each term of programme to the subjects referred to the center from the hospitals. At the end of briefing, if the subjects agreed to participate in the programme, a consent form and personal information sheets containing demographic data were gathered after signed and filled out by each participant. The personal information of each participant was randomly allocated to one of the four case managers by one research assistant in order for them to take charge of corresponding participants during entire research period. The participants were informed by their case managers to participate in the

programme a week later after the briefing session. The programme was run periodically. The average number of participants for each term of programme was around 7 with the maximum number of 10 and minimum number of 6. On the first day of phase I study of the training programme, the 1<sup>st</sup> assessment session was administered by research assistants to participants for collection of the baseline data. Each participant's assessment information was transferred to corresponding case manager. Following the initial assessment, the participants were randomly assigned to either training or waiting list control group by research assistants. A timetable of intervention arrangement (see appendix II) would be delivered to each participant upon his or her agreement of involvement. It is a full-time programme running 7 hours per day. All participants were asked to attend the training complying with the timetable. A participant should report for application leave in case of being unable to attend training temporarily and the corresponding compensation training sections would be rearranged for the participant in the following programme term. If a participant delayed over 15 minutes for a single training section, he or she would be kept out of this section until the starting of next one. We adopted a full time training pattern in a consecutive period and set up time discipline system in order to simulate a working time restraint model in real workplace circumstances. Such a time frame model should provide an opportunity for each participant to adapt to routine duty



behavior and temporarily suspend from their current daily routine lasting for a long time.

The phase I training program was run for an average of 6 hours per day and 5 days per week for three successive weeks. The training intervention was comprised of the group training program and individual counseling.

### **3.6.2.1 Stage-matched individual counseling**

The purpose of stage-matched individual counseling was to facilitate participant's work readiness with stage specific counseling strategies corresponding to individual participant's current stages of work readiness. There were three main procedures in the individual counseling sessions, (a) identification of work barriers and solutions, (b) vocational counseling and guidance, and (c) education and self-advocacy (Allaire et al., 2005). The main skills used for individual counseling were listening and attending; responding; empathy and probing; and challenging (Lam, 1997; Smith, & Norton, 1999).

A total of 3 sessions of individual counseling was conducted concurrently with the training sessions within three weeks. 3 counseling sessions were arranged once per week with an interval of 7 days between 2 sessions. The duration of each counseling session lasted for around 50 minutes. Team members provided counseling individually and face to face with participants. Before the initial counseling session,

the team members would comprehend each participant's current stage of work readiness through pre-reviewing baseline information of assessment to form initial counseling strategies for them. During the first session of counseling, the counselors would try to encourage the subjects to tell their 'stories' which contained the information regarding their present situation, difficulties, problems, cares, expectations especially related to work injuries and RTW, to identify any specific reasons not considering RTW. For the contemplator, the goal was to understand reasons that made participants to weigh the pros and cons on RTW; and for the participants in action stage, the goal was to know the sources of motivation on RTW and if the participant had made any feasible and concrete plan on job hunting or interview. The counseling skills used included attending, listening, questioning and information gathering.

In the second session of counseling, the goal for the precontemplator was to "think about return to work". The strategies were to identify any specific reasons not considering return to work, to provide the information about the benefits and values of work to individual well-being and family, to let participants think any possibility about return to work, and to help participants to weigh the pros and cons on financial lost due to not resuming a paid work duty. The strategies consisted of consciousness raising, decisional balance and self-efficacy. For the contemplator, the goal was to

“get ready for RTW”. The strategies were to consider the specific benefits and barriers of RTW, to develop a list of solutions to overcome specific barriers on RTW, to enhance the client’s self-esteem, reestablish worker’s role, understand the meaning, value and demands of work, modify attitudes and work behavior, relate to coworkers and employers, and accept supervision, and obtain information from the labor market. For the participants in action stage, the goal is to “keep on it”. The strategies were to help participants to set up action plan and realistic vocational goals, to discuss with participants on overcoming barriers or difficulties for them to carry out their action plans, and to increase confidence in job seeking.

During the first individual counseling session, the aim was to focus on facilitating the subjects to tell his or her ‘stories’ which contained the information regarding his or her present situation, difficulties, problems, cares, expectations especially related to work injuries and RTW. While listening, close attention was necessary to capture the key information. In this session, a trust relationship should have been set up between the client and the counselor. In the second counseling session, the counselor facilitated the client to deal with his/her problems that were associated with his/her work injuries such as loss of work role, financial implications, fear of pain and re-injury, etc. The counselor would help the client to have a clear picture of his/her current situation and to prepare him/her to think of his/her future

after the injury. In the final counseling session, the counselor tried to help the client to set up realistic goals related to RTW, to prepare a step-wise and concrete action plan and then to achieve these goals that could be followed up by the client. Further information which would assist the subject to handle other difficulties or problems associated with RTW would also be provided.

For the subjects in the C group, after finishing the 1<sup>st</sup> assessment, they were wait listed for the same 3 weeks when the T group received intervention. Within 3 weeks there would be no specific intervention or services provided for the C group. The center kept contact with them to follow up on their situations.

### **3.6.2.2 Group training**

Total 4 group training sessions were conducted in parallel with the individual counseling sessions. The training included “Pain and stress management”, “Job acquisition and preparation” and “Pre-employment training”. The group training was conducted once per day within the three-week intervention. Each group would consist of eight to ten participants and each session would last for around 2-3 hours.

Other than work conditioning and work hardening training focusing on restoring injured worker’s physical function and work capacities meeting with the requirements of resuming a specific job, educational and skill training components of group training provided opportunities for participants to learn coping strategies that promote

self-management of pain and stress, and to learn new skills related to job finding and interviews, work adjustment in work place, getting along with co-workers or supervisor, etc. Even though the group training was not carried out in totally individualized approach, the individual components were covered by group section touch issues or problems which different participants might encounter in different stages of work readiness, or commonly faced by the participants. Interactive group courses also provided the opportunities for participants to share and exchange personal experiences on management of work injuries, looking for jobs, commonly cared issues related to RTW with others. Another advantage of group training was to provide participants with exposure to others with similar problems and to share with successful experiences on dealing with difficult problems associated with readiness of change. Each session of group training was conducted by a therapist or a social worker who served as the facilitator of the group. Each participant was encouraged to actively participate in the group sessions and to share their views with their peer group members. The details of each training session are listed below:

- Pain management

The aims of pain management were to help the participants to develop the coping and management skills for chronic pain. This part was run for total 6 sessions and each session lasted for around 50 min. Cognitive behavior therapy (CBT) was the

main technique adopted in the pain management. CBT has been proved to be a successful method in management of musculoskeletal pain including injuries resulting from work injuries (Bond, 1998; Marhold et al., 2001). The main contents of the first two sessions were educational components related to several pain issues. The initial stage was about knowledge on the development of chronic pain, its physical and psychological effects on human body; physical and psychological reactions to it. Later, the gate control theory of pain (Melzack & Wall, 1965) was told to the participants, about the pattern of negative cycle between fear, stress and increasing of pain. Finally, the risk factors provoking or increasing pain and strategies and methods coping with pain in ordinary living were introduced (Turk et al., 1983). In the following two sessions of the pain management, initially, a case analysis was shared and discussed among the participants. It was a real story about an injured worker suffering from chronic low back pain. Even though her medical and physical conditions were stable after receiving both medical care and physiotherapy, she was still worried and controlled by catastrophic thoughts about residue pain. By the end of story, she got stuck down in deep psychological and behavior crisis in daily living. The participants were asked to analyze her problems caused by her negative psychological believes and cognitive to chronic pain. In the following session, participants were encouraged to list their own strategies or methods to coping with their chronic pain during

ordinary life and to share them among the participants. Those strategies and methods were also analyzed by the lecturer. In the final two sessions of pain management the three main topics were stretch exercises, relaxation technique practice and the strategies and methods to prevent re-injury both in work place and ordinary life. Stretch exercise was taught to the participants through a 15 minute video tape show and they were asked to practice the exercise following the show direction. This exercise aims at alleviating pain due to muscle stress and maintaining physical function. The participants were asked to do this exercise at home periodically. The relaxation method was introduced with the mental imagery relaxation technique during the session and the participants were asked to practice following the direction of an audio tape. This technique could help participants to alleviate the psychological stress caused by pain. The strategies and methods of injury prevention were to teach participants to perceive and recognize the risk factors in work place which might cause injuries to human body and to deal with or handle the work tasks using proper body mechanism and in a safe way during work activities. The proper coping skills were also taught in this part.

- Stress management

The aims of stress management were to help the participants to develop the coping and management skills to stress chronic pain. This part was run for total 6

sessions with each session lasting for around 50 min. CBT and problem-solving approach were the main techniques adopted in this stress management process. CBT can help subjects to understand nature of their own problems, realize their own patterns of automatic thoughts, beliefs and feelings as events that can be questioned and tested rather than as fact (Morley et al., 1999). These two methods have been proved to be successful in the management of work-related and injury-related stress (Feuersteina et al., 2004; Long et al., 2004). The main contents of the first two sessions were educational components related to several stress issues. Initially they included knowledge on the resources and development of stress, its physical and psychological effects on human body and human's physical and psychological reactions to it. Secondly they were about the signs, symptoms and performing pattern of the stress. In following two sessions of stress management firstly the participants were asked to share their individual methods coping with stress. Their experiences and what they gained from their individual methods were also shared and discussed among the participants. After this part a case study related to problem-solving was conducted in the group. It was about an injured worker who suffered from much stress caused by lost work role and other issues related to work injuries. Due to poor problem-solving skills on stress management, his ordinary life was disturbed by psychological stress and finally was difficult to resume a work role. In final two



sessions of stress management, problem-solving skills and relaxation exercise were taught to the participants. For problem-solving skill, the general procedure, steps and key issues involved in the problem-solving were introduced and the participants were then facilitated to apply this skill to really life. The aim of relaxation exercise was to teach participants to learn a simple, practical and effective method to loose stress temporarily. It was a kind of progression muscle relaxation to relax or decrease physical and mental anxiety and tensions due to stress (Haraldsson et al., 2005). All participants practiced this exercise following the oral guidance recorded in an audio tape in the class.

- Training of job acquisition and interview skills

Altogether, six training sessions in this area were carried out that focused on the improvement of workers' interviewing skills and other generic work skills to enhance their abilities to RTW. The formats adopted in this part were group teaching, role play, video show and group discussion. During the first two sessions, the main content was about the preparation for job interview. The programs included general introduction about present job classification and categories; common methods to seek for new job information; the proper way to inquire information by phone; and the methods to prepare resume and fill in the application forms for employment. All participants were asked to fill in an employment application form including common information seen

in the job market designed by the center. In the following four sessions, the program would concentrate on training skills for interview. They included the preparation before and during the job interview process; preparation of sampled questions that were commonly raised by the interviewer during the job interview; and preparation of related document and materials for the interview. A video about the job interviewing process was also prepared and shown to the participants. Each participant was asked to imitate the real job interview scene through a role play. Feedback was provided to each participant by group leader and other participants of the group.

- Preparation for re-employment

These training sessions were planned to help the workers to physically and psychologically prepare for RTW. There were a total of 6 training sessions in this area and each session lasted for approximately one hour. The topic of the first two sessions was to realize the relationship between work and individuals. The topic of following sessions was on the preparation for re-employment. The final two sessions focused on training of the interpersonal relationships and communication skills in the work environment.

### **3.6.3 Phase II of the study**

The second part of the RTW program was directly related to helping the injured workers to get into the highly competitive job market. Each subject in the TP group

was provided with the job placement services lasting for three weeks immediately following the training of phase I. In contrast, the subjects in the TO group were only asked to find jobs in the job market on their own for a period of 3 weeks. TO group was set up as the control for TP group to compare the training plus placement effects.

The purpose of the job placement services was to promote the successful RTW outcome based on the effects of training. Even though an injured worker is ready to get back to the work force and to resume his/her work roles, he or she might face serious challenges in finding a suitable job in the competitive job market.

#### **3.6.3.1 Establishing work resource data banks**

The purpose of this part was to set up 2 daily up-dated data banks containing the job hunting and recruitment information in job market. The associated job information provided to the subjects in TP group was coming from these 2 data banks. One data bank was established through an internet connection with Interactive employment services of Labour Department of Hong Kong Government. The information is updated daily and the website covers most of the jobs sent to the Labour Department. The selected work information categories were matched with our subjects' physical abilities, previous working experience, current professional skills or qualifications. Another data bank was paper based work information. The paper based resource mainly came from the job advertisement editions in a number of popular daily local

newspapers and free daily recruitment information booklets delivered to public areas.

Suitable work information under our main categories was gathered, classified and centralized in several folds every day.

### **3.6.3.2 Setting up networks with suitable employers and referral systems**

A network with a number of employers was set up. The companies behind those employers mainly belonged to service industries and had relatively good reputations.

With this connection, our participants had priority to the given employment opportunities, if the subjects met the requirements for open employment. In our work referral system, one system was to introduce the subjects to the selective recommendation employment service in Labour Department with referral letters. The other one was to introduce our subjects to the employers in our networks via referral letters.

### **3.6.3.3 Job interview or hunting**

Job interview is the pre-request or the reasonable pathway through which someone may find suitable job or get employment. Within three-week assistant job placement period, we adopted a number of methods to help the participants to engage in job interview activities or job hunting. A concrete job hunting and interview plan or strategy was set up for individual participant by corresponding case manager. Each plan or strategy was formed mainly based on individual participant's physical and

work abilities, former job experiences, and personal work interests. From daily updated work resource data banks and work opportunities from employer's net work, suitable work opportunities were selected for corresponding and individual participant, the center kept daily contact with the participants by telephone and informed them with suitable work information. They were asked or facilitated to carry out those recommended job interviews. If the participants failed to pass the interview, they would be still offered alternative interview information within three weeks by the centre. Before interview, the centre would provide opportunities to help participants to rehearse the interview process face to face. Another way to help the participants to take job interview was to let them participate in local employment exhibitions directed and coached by team members in our centre periodically. During the exhibitions, on-site guidance and coaching were provided to subjects. These included selecting suitable job positions; guidance on writing the application forms; rehearsing and reminding the process and details for job interview procedures.

### **3.7 Outcome measures**

For phase I of the study, the effectiveness of the training interventions was quantified by the following measures: perceived functional physical abilities measured by the **Loma Linda University Medical Center Activates Sort (LLUMC)**

and the **Spinal Functional Sort** (SFS); the level of work readiness measured by **Lam's Assessment on Stages of Employment Readiness** (LASER); the chronic pain and self-perceived quality of life measured by **The Short Form of Health Survey** (SF-36); the anxiety level measured by **The Chinese State Trait Inventory** (C-STAI). For the phase II of the study, the effectiveness of the placement was evaluated by the following measures: the number and the percentage of subjects RTW in both groups, average working hour per week and average income per month.

The outcome measures evaluated the effects of each part of the study. For the first part, subjects' physical function and psychological states were evaluated to compare between the T and C groups. In the literature review, it has been found that both psychological and physical disability significantly influenced the RTW for long-term sick leave workers due to work injuries. The most common factors included their self perception of general health (Oleske et al, 2000); chronic pain (Jensen, et.al, 2004); anxiety and stress (Fisher, 2003; Elinson et al., 2004); and the individual's readiness to RTW (Lam, 1997; Franche, 2002). The training part of the program was concentrated on providing interventions on the above factors and facilitating subjects' job readiness through behavioral change.

### **3.7.1 Spinal Functional Sort (SFS)**

SFS is a self reporting evaluation developed to assess participants' quantified ability to perform work tasks. SFS is a collection of drawings and descriptions of 50 tasks, which include a wide range of daily and vocational activities that place a demand on the spine. Each of the 50 drawings in the test booklet is accompanied by a simple task description. (See appendix III). The SFS has been regarded as a reliable tool for assessing perceived functional status. Five previous studies were performed, which indicated the test-retest reliability of this tool. R values ranged from 0.768 to 0.854 for various groups tested ( $p < 0.001$ ) (Matheson & Matheson, 1993). The SFS is an untimed paper and pencil test. The participants were instructed to look at each drawing and read the description, then on a separate answer sheet, to indicate their current level of ability to perform the task. The answer sheet provided a 1-5 point rating scale (1 = able, 2 = only slight restriction, 3 = restricted, 4 = very restricted and almost unable, and 5 = unable). Operational definitions of these adjectives were provided in the standardized instructions. There was also a sixth rating which is depicted as "?" indicating "I don't know." These items were then summed to give a total score. The range of scores varies from 50 and 200. The higher score reflects stronger physical abilities to perform spinal movements (Sufka et al., 1998).

### **3.7.2 Loma Linda University Medical Center Activates Sort (LLUMC)**

LLUMC is a self-report assessment, which was designed to evaluate the extent to which patients perceive their competence in handling household tasks through manipulation of various domestic tools (Chan et al., 2000). (See appendix IV). In LLUMC drawings of handling and fingering tasks are supplemented by 65 drawings that depict common activities of daily living and work tasks. Each of the 65 drawings in the test booklet is accompanied by a simple task description. LLUMC is an untimed paper and pencil test. The participant was instructed to look at each drawing and read the description. On a separate answer sheet, participant was asked to indicate his/her current level of ability to perform the task. The answer sheet provided a 5-point rating from “able” to “restricted” to “unable.” The participant was to rate each item on a five-point scale where “0” indicates normal, “1 ” indicates reducing speed on handling, “2” indicates break needed on handling, “3” indicates unable to handle and “4” indicates no idea to handle. The scope of total score is from 0 to 65. Low score indicates better handling function while high score indicates poor function.

### **3.7.3 Lam’s Assessment on Stages of Employment Readiness (LASER)**

The purpose of LASER is to assess participant’s current stage of work readiness. It was developed by Lam (1997) based on Prochaska’s (1992) model of stages of behavior changes to measure behavior changes of stages of job readiness. The LASER



can classify clients into three stages: Pre-Contemplation (unaware and have no intention to work), Contemplation (weighing the pros and cons of work) and Action (ready to work). The English version of LASER was translated into Chinese by Chan et al. 2002 and was found to be a valid predictor of employment outcome with the highest percentage of individuals who found employment classified as in the Action Stage and the highest drop-out rate among those classified as in the Pre-Contemplation Stage (Chan et al, 2002) (see appendix V). Previous studies have found the content-related validity, test-retest reliability, construct validity, and predictive validity of LASER were good (Joseph & Li, 2005). LASER contains 18 questions in randomized sequences which describe behaviors in the pre-contemplation (6 items), contemplation (6 items) and action stages (6 items). Among those 18 questions, 5, 9, 10, 13, 16 and 18 belong to the pre-contemplation stage, questions 1, 3, 4, 7, 11 and 15 belong to the contemplation stage while questions 2, 6, 8, 12 14 and 17 belong to the action stage. The participants were asked to rate each question on a five-point Likert Scale with “1” indicating strongly disagree to “5” indicating strongly agree. The scores were then added and allocated under different sub-scores representing the corresponding stages which formed a continuous measure. The corresponding total score for each stage was from 0 to 16. The higher the score at each stage, the more inclination the subject will fall into the corresponding stage of

work readiness. Subjects at the pre-contemplation stage did not regard unemployment as a problem and they were often not interested in working, nor did they believe that they could work. Subjects at the contemplation stage began to consider pros and cons of working, but they have not yet participated in any related action such as job seeking. Subjects at action stage decided to work and engage in behaviors to increase the probability of being hired.

#### **3.7.4 The Short Form of Health Survey (SF-36)**

The SF-36 is used to measure the self-perceived general health status of the participants. It is a multipurpose, short-form health survey with 36 questions designed to describe the self-reported assessment of health-related quality of life of both the physical and mental components of health across eight sub-scales: physical functioning, role-physical, body pain, general health, vitality, social functioning, role-emotional and mental health. Eight SF-36 sub-scales form distinct physical and mental health clusters based on factor analyses (Gatchel et al., 1998). 4 sub-scales belong to physical health, they are: 1. limitations in physical activities - because of health problems - this sub-category is about whether there are specific movements or actions that you cannot do because of your health problem, like climbing stairs or putting on tights because of stiffness; 2. limitations in everyday activities due to physical health problems - about whether there are whole activities that you cannot do

because of your health problems, for instance being unable to go into the town centre to go shopping because there are few public toilets and you might get caught short; 3. body pain and 4. general health perception. 4 sub-scales belong to mental Health, they are: 1. mental health (levels of psychological stress and anxiety) - about how people are feeling and high scores indicate feeling happy, peaceful and calm while low scores reflect feeling nervous and depressed; 2. social functioning (limitations in social activities because of physical or emotional problems) - about whether people feel able to join in the activities with their family and friends that are expected of them; 3. emotional role (limitations in everyday activities because of emotional problems) - about whether emotional problems are limiting everyday activities or work; 4. vitality (energy levels and fatigue) - an indication of how much zest for life people have. The outcome is obtained by adding up of the scores of each sub-scale. The total score ranges from 0 (poor health) to 100 (optimal health). High scores reflect better health while low scores indicate poor health. SF-36 has been adopted extensively in chronic pain research to predict the outcome of work injuries and to measure the effectiveness of management on work related musculoskeletal injuries (Flores et al.,1997; Ware, 2000). It has been applied extensively in clinical use to patients who had a variety of chronic medical conditions due to its brevity and good psychometric properties (Atroshi et al., 2002; Gatchel et al., 1999 & Gatchel et al., 1998; Tufescu & Buckley,

2001) (see appendix VI). The translated Chinese version was found to be equivalent in concepts to the original version (Lam et al., 1998). The SF-36 is suitable for self-administration in written format, computerized administration, or administration by a trained interviewer in person or by telephone and can be administered in 5–10 minutes.

### **3.7.5 The Chinese State Trait Inventory (C-STAI)**

The Chinese-STAI(C-STAI) was used to assess the anxiety levels of the participants. The original State-Trait Anxiety Inventory (STAI) was developed by Spielberger (1983). It had been used to measure the chronic pain related anxiety (McKellar et al., 2003). The C-STAI was translated by Tsoi and his colleagues (1986) and later tested in Hong Kong. It has been found that the C-STAI possessed acceptable psychometric properties in measuring anxiety in the Chinese culture with the internal consistency reported to be 0.90 and 0.81 for A-State and A-Trait, respectively (Shek, 1988) (see appendix VII). The C-STAI consists of two self-report scales to measure two distinct constructs: (1) State-Anxiety, which refers to a transitory emotional state that fluctuates (A-State); and (2) Trait-Anxiety, which refers to a relatively stable disposition to be anxious (A-Trait) (Cheung et al., 2001). Each construct consists of 20 short affirmative statements. The A-State scale asks subjects to indicate ‘how they feel at that moment’ on a 4-point scale with increasing intensity

from 'not at all' to 'very much so', scored 1-4 accordingly. The A-Trait scale requests subjects to indicate 'how they generally feel' on a 4-point intensity scale from 'almost never' to 'almost always' scored 1-4 accordingly. Possible scores for each scale range from 20 (indicating positive feelings, i.e. not anxious), to 80 (reflecting feelings of apprehension and fearfulness, i.e. high anxiety). Low scores reflect positive feelings (i.e. not anxious) and high scores indicate fear and apprehension (i.e. high anxiety). For the purpose of the present study, only the state anxiety portion of C-STAI was used to measure anxiety level, because state anxiety is a transitory emotional state which can be evoked by a particular situation and provides a measure of the individual's anxiety level at that moment. This portion consists of 20 statements for which subjects were asked to indicate how they felt 'at that moment' using a Likert 4-point scale ranging from 'not at all to 'very much so'.

### **3.7.6 The employment outcome**

The RTW outcome was the number of subjects that returned to work in 'training & placement' and 'training only' groups at the end of the 3-week placement services. At the same time, the average RTW hours per week, average monthly incomes and number of jobs acquired for the subjects between 'training & placement' and 'training only' groups were compared.

The Employment Ordinance of Hong Kong Government (1968) stated that all employees covered by the Employment Ordinance, whether temporary or part-time, are entitled to basic protection under the Ordinance. These provisions include payment of wages, restrictions on wage deductions, the granting of statutory holidays, etc. A continuous contract of employment is employment in which the employee has worked continuously for 4 weeks or more for at least 18 hours per week. Employees who are employed under a continuous employment contract are entitled to share further benefits. The Employment Ordinance is the main piece of legislation governing conditions of employment in Hong Kong. Therefore, the outcome of RTW used in this research was based on this ordinance, i.e. when a worker is able to return to at least part time work for more than 18 hours per week for four weeks, he/she is regarded as employment.

### **3.8 Schedule of assessment**

The 1<sup>st</sup> (pre-test) assessments were given to all subjects in the two groups at the initial in-take interview. The 2<sup>nd</sup> (post-test) assessments were given to the subjects in TP and TO groups at the end of the training session as well as the subjects in C group at the end of controlled period. The 3<sup>rd</sup> assessments were given to the subjects in TP and TO groups at the end of job placement. The purpose of the 1<sup>st</sup> assessments was to

set up the baseline information for the three groups. The purpose of the 2<sup>nd</sup> assessments was to find out the outcomes of training effects and the 3<sup>rd</sup> assessments were to evaluate the effects of job placement services.

### **3.9 Data analysis**

All analyses were conducted with the SPSS Window 11.5 computer software.

#### **3.9.1 Phase I (training part)**

The subjects' demographic characteristics were compared between T and C groups. Scale data such as age, pre-injury income were analyzed with independent t-test, while nominal and ordinal data such as gender, marital status, education level, types of injuries were analyzed with chi-square test. The 1<sup>st</sup> assessment results between T and C groups were analyzed with independent t-test as the baseline comparisons. The 2<sup>nd</sup> assessment results between the two groups and across 1<sup>st</sup> and 2<sup>nd</sup> assessment results within group were analyzed with repeated measures analysis of variance (repeated measures ANOVA).

#### **3.9.2 Phase II (job placement part)**

The subjects' demographic characteristics were compared between TP and TO groups. Scale data such as age, pre-injury incomes were analyzed with independent t-test; nominal and ordinal data such as gender, marital status, education level, types

of injuries were analyzed with chi-square test. The 2<sup>nd</sup> assessment results between P and SP groups were analyzed with independent t-test as the baseline comparisons. The RTW outcome using RTW rates as a percentage between the two groups was compared by using chi-square test. The outcomes related to employment such as incomes, average working time were also compared between the two groups by using independent t-test. The significance level was set at the 0.05 in this study.



## **Chapter 4**

### **Results and Analysis**

#### **4.1 Demographic data**

From July 2003 to March 2005, 140 injured workers suffering from musculoskeletal problems were recruited from HKWHC. Seventeen of them did not meet our inclusion criteria or refused to participate in the study (see Figure 2). The remaining 123 subjects were invited to join the study. They were randomly assigned to the T group (n = 78) or the C group (n = 45) in phase I of the study. 5 participants in the training group did not complete the training sessions due to personal reasons and 15 subjects in control group did not attend the follow up assessment due to other engagements.

Out of the 78 subjects who joined the training programme, 73 subjects were invited to join the job placement programme at the phase II of the study. These subjects were randomly assigned into the TP group (n = 37) or the TO group (n= 36).

All subjects would be assessed before and after joining the training programme. At the end of the three weeks' job placements services, the third assessment would be conducted to evaluate the RTW outcomes of the subjects. If a subject could not return to the centre for assessment, the information would be gathered through telephone

interview. Information related to the subjects' employment outcomes were collected by using a questionnaire format. The main information included the types of job acquired, nature of work tasks, mean working hours per week, mean incomes per month and total number of jobs the subjects ever took during the past 3 weeks of placement.

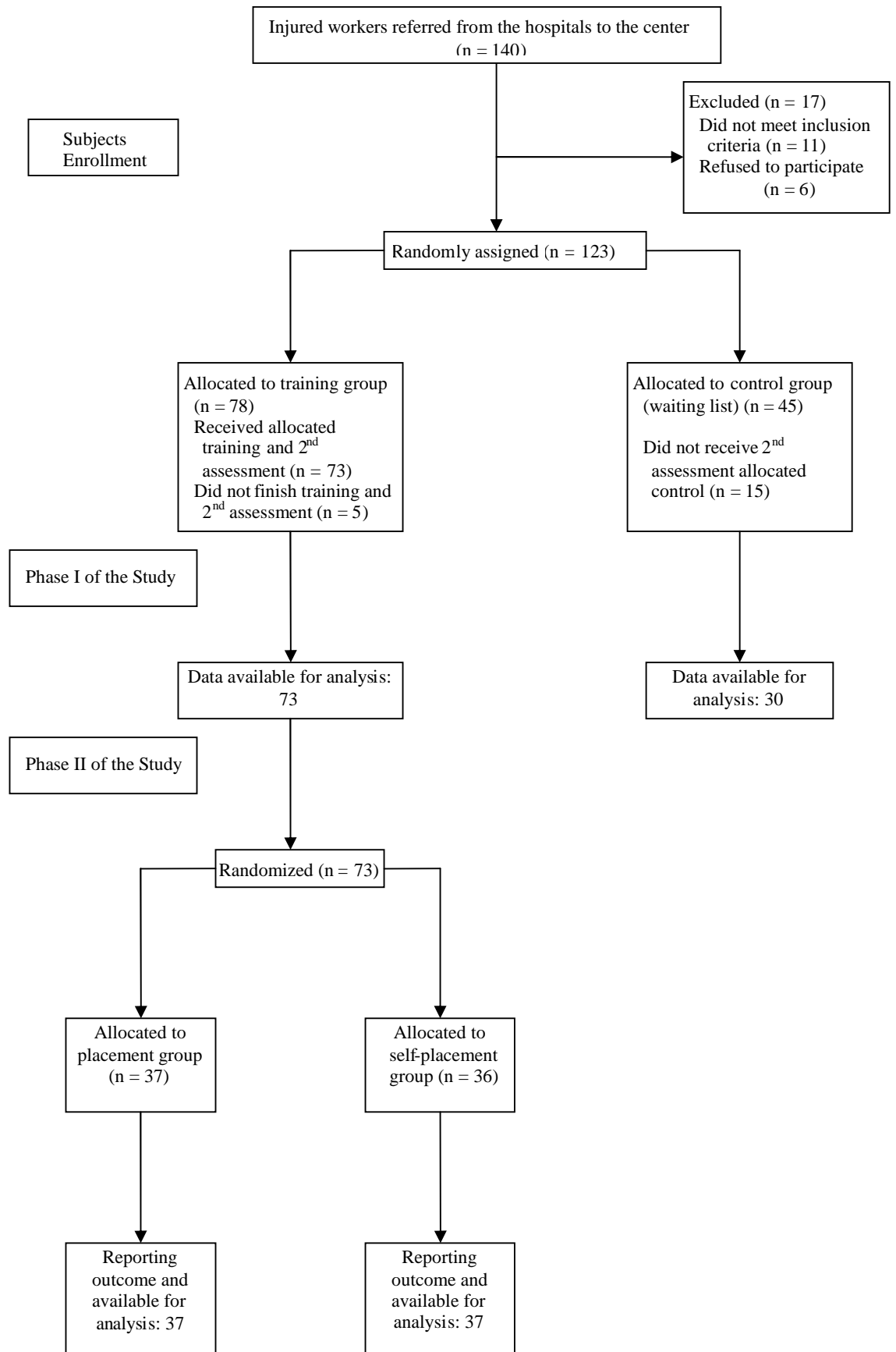


Figure 2: Flow Diagram of the progress through the phases of a randomized trial

## **4.2 Results of phase I study**

The results including demographic characteristics, statistical analysis between the baseline and post-training assessments across the two groups would be presented. Seventy-three subjects in training group received the 2<sup>nd</sup> assessment with self-rated questionnaires of C-LASER, SFS, LLUMC, C-STAI and SF-36 after finishing three weeks' training. Comparisons on training effects were carried out between the subjects in the two groups. Repeated measures ANOVA was used to do the data analysis.

### **4.2.1 Demographic characteristics of the subjects between T and C groups**

Among the 123 subjects, 63 were male and 40 were female. The mean age of all subjects was 43.35 (8.17) years and mean sick leave period was 7.2 (1.23) months. The demographic characteristics of subjects between T and C groups are showed in Table 2. The results of data analysis showed that no between group differences of the demographic characteristics could be found.

Table 2: Demographic characteristics between T and C group

	T group	C group	p value
Number of subjects	73	30	
Age(yr)	43.23 (9.14)	44.80 (7.49)	0.389 (T-test)
Gender (%)			
Male	43 (58.7)	20 (66.7)	0.56(Chi-square)
Female	30 (41,3)	10 (33.3)	
Type of injury* (%)			
LBP	30 (41.3%)	11 (38.1%)	0.06(Chi-square)
UL	18 (24.8%)	8 (26.1% )	
LL	16 (22.6%)	8 (27.6%)	
RSI	9 (11.3%)	3 (8.2%)	
Education level** (%)			
P	29 (39.7%)	11 (37.6%)	0.40(Chi-square)
S	24 (32.4%)	9 (30.2%)	
H	20 (27.9%)	10 (32.2%)	
Average Previous monthly Income	\$12,109.12(6,211.58)	\$11,341.74(5,405.12)	0.548 (T-test)

Values are mean (standard deviation), n (%) of the raw data. Significant level is set as  $P < 0.05^*$ .

\* LBP: low back pain; UL: upper limber; LL: lower limber; RSI: repetitive strain injury

\*\* P: primary school; S: secondary school; H: high school

#### 4.2.2 Baseline comparisons of 1<sup>st</sup> assessment results between T and C groups

The assessment 1 baseline results on SFS, LLUMC, LASER, C-STAI and SF-36 are in Table 3. Independent t-test showed that there were also no significant differences on any of the measures between T and C groups.

Table 3: Baseline comparison between T and C groups

	T group	C group	<i>p</i> value (t-test, 2-tailed)
Number of subjects	73	30	
1 <sup>st</sup> Spinal Functional Sort	104.67 (48.12)	106.30 (54.30)	0.87
1 <sup>st</sup> LLUMC	71.94 (53.39)	78.17 (59.64)	0.58
1 <sup>st</sup> LASER Pre-contemplation	14.26 (3.71)	13.93 (4.23)	0.68
1 <sup>st</sup> LASER Contemplation	15.59 (2.16)	15.50 (2.53)	0.84
1 <sup>st</sup> LASER Action	15.23 (2.61)	14.37 (3.05)	0.13
1 <sup>st</sup> Chinese State-Trait Anxiety Inventory	56.96 (9.53)	58.83 (7.89)	0.33
1 <sup>st</sup> SF36 Physical Functioning	21.11 (4.59)	19.80 (5.98)	0.20
1 <sup>st</sup> SF36 Role Physical	4.99 (1.31)	4.73 (1.39)	0.35
1 <sup>st</sup> SF36 Bodily Pain	5.67 (1.76)	5.30 (1.95)	0.32
1 <sup>st</sup> SF36 General Health	15.27 (3.52)	15.87 (2.87)	0.40
1 <sup>st</sup> SF36 Vitality	12.62 (4.64)	12.40 (4.07)	0.82
1 <sup>st</sup> SF36 Social Functioning	5.77 (1.88)	5.23 (1.43)	0.15
1 <sup>st</sup> SF36 Role Emotional	3.92 (1.17)	3.57 (0.94)	0.13
1 <sup>st</sup> SF36 Mental Health	17.30 (5.62)	15.57 (4.70)	0.13
1 <sup>st</sup> SF36 Reported Health Condition	2.60 (1.20)	2.57 (1.22)	0.90
1 <sup>st</sup> SF36 Total Score	89.24 (17.93)	85.03 (16.67)	0.25

Values are mean (standard deviation) of the raw data. Level of Significance is set as  $P < 0.05^*$ .

### 4.2.3 Results after 3 weeks of training on Spinal Functional Sort (SFS)

The mean scores of SFS on perceived functional physical ability across the 2 assessments are summarized in Table 4. The mean score in the training group showed an increase from 104 (48.28) to 111,(46.95) while the mean score of the control group had minimal change only (both the 1<sup>st</sup> and 2<sup>nd</sup> mean scores were around 106). Repeated measures ANOVA showed that there was no significant difference between the two groups at the 2<sup>nd</sup> assessment occasion ( $F=1.47$ ,  $p=0.23$ ). The within group difference was significant for the training group ( $F=6.56$ ,  $p=0.01$ ), but was not significant in the control group ( $F=0$ ,  $p=0.98$ ).

Table 4: Comparison of SFS between 1<sup>st</sup> and 2<sup>nd</sup> Assessment Occasion

	T group	C group	<i>F</i> value	<i>Df</i>	<i>P</i> value
Number of subject (n=)	73	30			
1 <sup>st</sup> Spinal Functional Sort	103.95(48.284)	106.34(55.257)		1	
2 <sup>nd</sup> Spinal Functional Sort	111.05(46.952)	106.28(48.056)	1.47	1	.23

Values are mean (standard deviation) of the raw data. Significant level is set as  $P<0.05^*$ .

#### 4.2.4 Results of the Loma Linda University Medical Center Activates Sort (LLUMC)

The mean scores of LLUMC on self-perceived physical handling ability at the 1<sup>st</sup> and 2<sup>nd</sup> assessment are summarized in Table 5. The rating on the LLUMC Activity Sort of all subjects indicated an increase in their perceived competence in handling the 65 domestic tools (by rating more tasks as “no change in the speed”) after the training sessions. Repeated measures ANOVA showed that there was no significant difference between the training group and control group ( $F=4.50$ ,  $p=0.59$ ). No within group difference was found before and after intervention for both the training group ( $F=3.76$ ,  $p=0.06$ ) and the control group ( $F=1.01$ ,  $p=0.32$ ).

Table 5: Comparison of LLUMC between 1<sup>st</sup> and 2<sup>nd</sup> Assessment Occasion

	Training group	Placement group	<i>F</i> value	<i>Df</i>	<i>p</i> value
Number of subjects	73	30			
1 <sup>st</sup> LLUMC	71.94 (53.39)	78.17 (59.64)		1	
2 <sup>nd</sup> LLUMC	64.06 (54.49)	70.47 (50.90)	4.50	1	0.59

Values are mean (standard deviation) of the raw data. Significant level is set as  $P<0.05^*$ .



#### 4.2.5 Results on Lam's Assessment on Stages of Employment Readiness

##### (LASER)

The results of LASER assessment scores for the two groups are summarized in Table 6. For the sub-score of precontemplation, the mean scores in the training group decreased from the pre-training of **14.24 (3.52) to the post-training score of 13.29 (3.18)**. In contrast, the mean scores of precontemplation in the control group increased from **13.93 (4.23) to 14.30 (2.93)**. Repeated measures ANOVA showed that there was no significant difference between the two groups on the pre-contemplation score ( $F=3.52, p=0.06$ ). For the control group, no significant within group difference could be observed, indicating that no significant change had occurred of the pre-contemplation scores among the subjects in the control group ( $F=0.35, p=0.55$ ). However, significant difference was found in the training group before and after the training sessions ( $F=7.99, p=0.01$ ).

For the sub-score of contemplation, the mean scores of training group changed from pre-training of **15.52 (2.11) to post-training of 15.74 (2.23) while** there were only minimal changes from **15.50 (2.53) to 14.87 (2.08)** in control group. Repeated measures ANOVA showed that there were significant differences between the training group and the control group on the contemplation score ( $F=4.36, p=0.04$ ), but no significant differences could be found either within training group ( $F=1.25, p=0.27$ ) or

within control group ( $F=3.13$ ,  $p=0.08$ ). The significant differences between the training and control groups on the 2<sup>nd</sup> contemplation scores indicated that compared to control group more participants in training group made progress to contemplation stage.

The mean score of “action” of the training group increased from pre-training of **15.16 (2.60) to post-training of 15.77 (2.57)**, while there was a decrease of score from **14.37 (3.05) to 13.98 (2.63)** in the control group. Statistical analysis using repeated measures ANOVA showed that there was significant difference between the two groups on the action sub-score ( $F=4.17$ ,  $p=0.04$ ). There was also significant within group difference in the training group between 1<sup>st</sup> and 2<sup>nd</sup> action sub-scores ( $F=6.68$ ,  $p=0.01$ ), but no significant difference within the control group ( $F=0.84$ ,  $p=0.36$ ) across two assessment occasions. The results indicated a significant positive progress from contemplation to action stage in training group compared with control group.

Table 6: Comparison of LASER between 1<sup>st</sup> and 2<sup>nd</sup> Assessment Occasion

	T group	C group	F value	df	p value Between group
Number of subject (n=)	73	30			
1 <sup>st</sup> LASER Pre-contemplation	14.24(3.52)	13.93(4.23)		1	
2 <sup>nd</sup> LASER Pre-contemplation	13.29(3.18)	14.30(2.93)	3.52	1	0.063
1 <sup>st</sup> LASER Contemplation	15.52(2.11)	15.50(2.53)		1	
2 <sup>nd</sup> LASER Contemplation	15.74(2.23)	14.87(2.08)	4.36	1	0.039*
1 <sup>st</sup> LASER Action	15.16(2.60)	14.37(3.05)		1	
2 <sup>nd</sup> LASER Action	15.77(2.57)	13.97(2.63)	4.17	1	0.043*

Values are mean (standard deviation) of the raw data. Significant level is set as  $P < 0.05^*$ .

#### 4.2.6 Results after 3 weeks of training on The Chinese State Trait Inventory (C-STAI)

The results of anxiety measures with C-SATI on subjects in the training and the control groups are shown in Table 7. The total mean C-STAI scores in training group decreased from pre-training of **56.96 (9.53)** to **post-training of 51.85 (10.41)**. The total mean C-STAI scores in control group also decreased from **58.83 (7.90)** of the 1<sup>st</sup> assessment to **58.23 (7.83)** of the 2<sup>nd</sup> assessment. Repeated measures ANOVA showed significant differences both between the two groups ( $F=4.50, p=0.04$ ) and within training group ( $F=2.68, p=0.00$ ) across testing sessions. No significant difference was found within the control group ( $F=0.10, p=0.75$ ). It has been suggested in previous

studies that subjects with a total STAI score below 67 were regarded as low anxiety and those with a total STAI score above 67 as high anxiety (Grachev et al., 2002).

Table 7: Comparison of C-STAI between 1<sup>st</sup> and 2<sup>nd</sup> Assessment Occasion

	T group	C Group	<i>F</i> value	<i>Df</i>	<i>p</i> value
Number of subject (n=)	73	30			
1 <sup>st</sup> Chinese State-Trait Anxiety Inventory	56.96(9.53)	58.83(7.9)		1	
2 <sup>nd</sup> Chinese State-Trait Anxiety Inventory	51.85(10.41)	58.23(7.83)	4.50	1	0.036*

Values are mean (standard deviation) of the raw data. Significant level is set as  $P < 0.05^*$ .

#### 4.2.7 Results after 3 weeks of training on The Short Form of Health Survey

##### (SF-36)

Table 8 presents the SF-36 scores for each of the eight primary scales and total scores for the two groups across two assessment occasions. The subjects who completed the training programs generally showed an increase in the scores of each sub-scale and total score in post training assessment. The differences of the mean scores of most sub-scales and the total scores between 1<sup>st</sup> and 2<sup>nd</sup> assessment in control group displayed a reversed decreasing tendency, with the exception of improvement on sub-scales of physical, vitality and mental health. Repeated measures

ANOVA showed significant differences on the sub-scales of physical function ( $F=4.70$ ,  $p=0.03$ ); body pain ( $F=6.85$ ,  $p=0.01$ ); reported health condition ( $F=6.45$ ,  $p=0.012$ ) and total scores ( $F=4.95$ ,  $p=0.03$ ), while other parameters did not show significant changes, such as role physical, general health, vitality, social functioning role emotional and mental health, between T group and C group. Significant differences were revealed in the T group on sub-scales of body pain ( $F=7.48$ ,  $p=0.01$ ), vitality ( $F=6.48$ ,  $p=0.01$ ), role emotion ( $F=4.13$ ,  $p=0.04$ ), social functioning ( $F=6.94$ ,  $p=0.01$ ), mental health ( $F=4.13$ ,  $p=0.04$ ), reported health condition ( $F=9.84$ ,  $p=0.00$ ) and total scores ( $F=10.85$ ,  $p=0.00$ ) before and after the training, however, there was no significant difference in the C group on any of sub-scales and total score across two assessment occasions.

#### **4.2.8 Summary of the findings of phase I study**

For phase I of the study, the 2<sup>nd</sup> assessment results showed that the training effects between T and C groups appeared significant for the C-STAI ( $F=4.50$ ,  $p=0.04$ ). This meant that T group showed improvement on the anxiety level compared with the C group. Improvements were also found on Contemplation ( $F=4.36$ ,  $p=0.04$ ) and Action stages ( $F=4.17$ ,  $p=0.04$ ) of LASER in T group, indicating the T group showed positive changes on the stages of job readiness. For the sf-36, significant differences between T and C groups appeared on the sub-scales of physical function ( $F=4.70$ ,

$p=0.03$ ), body pain ( $F=6.85, p=0.01$ ), reported health condition ( $F=6.45, p=0.012$ ) and total scores ( $F=4.95, p=0.03$ ) of SF-36. These changes indicated that T group had improvements in chronic pain, self-perceived health state. Within group differences between 1<sup>st</sup> and 2<sup>nd</sup> assessment for T group were observed on SFS ( $F=6.56, p=0.01$ ); Pre-contemplation ( $F=7.99, p=0.01$ ) and Action stages ( $F=6.68, p=0.01$ ) of LASER; C-STAI ( $F=2.68, p=0.00$ ); sub-scales of body pain ( $F=7.48, p=0.01$ ), Vitality ( $F=6.48, p=0.01$ ), role emotional ( $F=4.13, p=0.04$ ), social functioning ( $F=6.94, p=0.01$ ), mental health ( $F=4.13, p=0.04$ ), reported health condition ( $F=9.84, p=0.00$ ) and total scores ( $F=10.85, p=0.00$ ). However, except those mentioned above, significant differences of most of these variables could not be found between T and C groups. There were not any within group differences found in the C group across the two assessment occasions.

Table 8: Comparison of SF-36 between 1<sup>st</sup> and 2<sup>nd</sup> Assessment Occasion

	T group	C group	F value	Df	p value Between group
Number of subject (n=)	73	30			
1 <sup>st</sup> Physical function	21.11(4.59)	19.80(5.98)		1	
2 <sup>nd</sup> Physical function	21.72(4.32)	18.33(4.34)	4.70	1	0.03*
1 <sup>st</sup> Role Physical	4.99(1.31)	4.73(1.39)		1	
2 <sup>nd</sup> Role Physical	5.07(1.42)	4.80(1.40)	0.01	1	0.98
1 <sup>st</sup> Body Pain	5.67(1.76)	5.30(1.95)		1	
2 <sup>nd</sup> Body Pain	6.09(1.88)	4.87(1.63)	6.85	1	0.01*
1 <sup>st</sup> General Health	15.27(3.52)	15.87(2.87)		1	
2 <sup>nd</sup> General Health	15.54(3.18)	15.23(3.38)	1.80	1	0.18
1 <sup>st</sup> Vitality	12.62(4.64)	12.40(4.07)		1	
2 <sup>nd</sup> Vitality	13.52(4.60)	12.5(3.66)	1.12	1	0.29
1 <sup>st</sup> Social Functioning	5.77(1.88)	5.23(1.43)		1	
2 <sup>nd</sup> Social Functioning	6.22(1.96)	5.23(1.61)	1.52	1	0.22
1 <sup>st</sup> Role Emotional	3.92(1.17)	3.57(0.98)		1	
2 <sup>nd</sup> Role Emotional	4.18(1.35)	3.53(1.07)	1.15	1	0.29
1 <sup>st</sup> Mental Health	17.3(5.62)	15.57(4.7)		1	
2 <sup>nd</sup> Mental Health	18.25(5.81)	16.33(4.43)	.04	1	0.85
1 <sup>st</sup> Reported Health Condition	2.6(1.2)	2.57(1.22)		1	
2 <sup>nd</sup> Reported Health Condition	3.01(1.5)	2.27((0.98)	6.45	1	0.01*
1 <sup>st</sup> Total Score	89.24(17.93)	85.03(16.67)		1	
2 <sup>nd</sup> Total Score	93.60(20.01)	83.10(15.31)	4.95	1	0.028*

Values are mean (standard deviation) of the raw data. Significant level is set as  $P < 0.05^*$ .

### **4.3 Phase II of the study**

After completing the training programme, all subjects in T group who had finished the 2<sup>nd</sup> assessment were randomly assigned into either the TO group or TP group. Subjects in TP group were provided with placement service for 3 weeks while subjects in TO group were asked to do the self placement. As showed in Figure 1, there were 36 subjects in TP group and 32 subjects in TO group. This section covers three aspects of results from the data analysis for part II between TP and TO groups. Comparisons on demographic characters, baseline assessment, and RTW outcomes between the two groups were made.

#### **4.3.1 Demographic characteristics of the subjects between TP and TO groups**

The demographic characteristics of subjects between TP and TO groups are showed in Table 9. The results of data analysis showed no significant differences on any of the demographic characteristics between TP and TO groups.



Table 9: Demographic characteristics between TP and TO groups

	TP group	TO group	<i>p</i> value
Number of subject (n=)	37	36	
Age(yr)	44.13 (9.11)	40.97 (8.95)	0.10 (t-test, 2-tailed)
Gender (%)			
Male	23 (62.1)	20 (55.6)	1.00 (Chi-square)
Female	14 (37.8)	16 (44.4)	
Type of injury* (%)			
LBP	16 (43.2%)	14 (38.9%)	
UL	8 (21.6%)	10 (27.8%)	0.67 (Chi-square)
LL	9 (24.3%)	7 (19.4%)	
RSI	4 (10.9%)	5 (13.9%)	
Educational level** (%)			
P	15 (40.5)	14 (38.9)	0.19 (Chi-square)
S	13 (35.1)	11 (30.6)	
H	9 (24.3)	11 (30.6)	
Average Previous monthly Income (\$)	11,797.53 + 5,751.98	12,921.29 + 7,329.59	0.418 (t-test, 2-tailed)

Values are mean (standard deviation), n (%) of the raw data. Significant level is set as  $P < 0.05$ .\*

\* LBP: low back pain; UL: upper limber; LL: lower limber; RSI: repetitive strain injury

\*\* P: primary school; S: secondary school; H: high school

#### 4.3.2 Baseline comparisons of 2<sup>nd</sup> assessment results between TP and TO group

The results of the 2<sup>nd</sup> assessment on SFS, LLUMC, LASER, C-STAI and SF-36 in Table 10 were regarded as the baseline characteristics of the subjects between TP and TO groups. Independent t-test showed that there were no differences on any of the variables between the two groups.

Table 10: Baseline comparison between TP and TO group

	Placement	Self-placement	<i>p</i> value (t-test, 2-tailed)
Number of subject (n=)	37	36	
2 <sup>nd</sup> Spinal Functional Sort	115.93 (46.33)	97.63 (46.23)	0.08
2 <sup>nd</sup> LLUMC	57.91 (53.02)	79.13 (55.00)	0.07
2 <sup>nd</sup> LASER Pre-contemplation	13.19 (3.15)	13.54 (3.32)	0.63
2 <sup>nd</sup> LASER Contemplation	15.96 (2.19)	15.18 (2.26)	0.12
2 <sup>nd</sup> LASER Action	15.99 (2.17)	15.21 (3.39)	0.27
2 <sup>nd</sup> Chinese State-Trait Anxiety Inventory	50.71 (10.64)	53.39 (9.76)	0.23
2 <sup>nd</sup> SF36 Physical Functioning	21.83 (4.11)	21.26 (5.04)	0.58
2 <sup>nd</sup> SF36 Role Physical	5.10 (1.40)	4.90 (1.47)	0.51
2 <sup>nd</sup> SF36 Bodily Pain	6.36 (1.00)	5.87 (1.66)	0.24
2 <sup>nd</sup> SF36 General Health	15.51 (3.17)	15.65 (3.18)	0.85
2 <sup>nd</sup> SF36 Vitality	13.82 (4.40)	12.58 (5.04)	0.21
2 <sup>nd</sup> SF36 Social Functioning	6.44 (1.90)	5.81 (2.09)	0.13
2 <sup>nd</sup> SF36 Role Emotional	4.27 (1.40)	4.03 (1.28)	0.42
2 <sup>nd</sup> SF36 Mental Health	18.27 (5.94)	17.61 (5.84)	0.60
2 <sup>nd</sup> SF36 Reported Health Condition	3.04 (1.53)	3.03 (1.45)	0.99
2 <sup>nd</sup> SF36 Total Score	94.6423 (18.88)	90.34 (22.22)	0.31

Values are mean (standard deviation) of the raw data. Significant level is set as  $P < 0.05^*$ .

### **4.3.3 Comparisons on RTW outcomes between TP and TO groups**

At the end of the 3-week second stage, the successful RTW rate expressed as a percentage and job related outcomes, such as the average working hour per week and the average monthly income, were collected and compared between the two groups. The RTW outcomes for both groups are summarized in Table 11. After 3 week placement period, 27 subjects in TP group and 19 subjects in TO group successful RTW. The RTW rate in TP group was higher (73.1%) than that in TO group (51.6%). Chi-square test showed there was difference between these two rates ( $p=0.022$ ). The average working hour per week in TP and TO groups were 33.9(20.6) and 32.2(20.2) respectively. The average monthly income in TP and TO groups was \$4,468(3,145) and \$2,958(2,434) respectively. Independent t-test showed no differences existed on either working hour ( $p>0.7$ ) or income ( $p>0.05$ ) between the TP and TO groups.

Table 11: Comparison of RTW Outcome between Groups at the End of Placement Section

	Training & placement Group	Training only Group	<i>P</i> value (Chi-square,2-tailed)
Number of subject (n=)	37	36	
Return to work (%)	27 (73.1)	19 (51.6)	0.03
Not return to work (%)	10 (26.9)	17 (48.4)	.
Average working hours per week	33.9 (20.6)	32.2 (20.2)	0.79
Monthly income	\$4,468 (3,145)	\$2,958 (2,434)	.007
Number of jobs taken	1.49(0.8)	1.08(0.29)	0.308(x <sup>2</sup> )

Values are mean (standard deviation), n (%) of the raw data. Significant level is set as  $P < 0.05^*$ .

#### 4.3.4 Summary of the findings of phase II study

For the phase II of the study, the 3<sup>rd</sup> assessment results for TP and TO groups showed that the RTW outcomes between the two groups was significantly different, with more subjects RTW in TP group compared to the TO group ( $p=0.022$ ). For other RTW outcomes, such as average working hour per week and average income per month, no significant differences were found between the two groups. Except those finding the job by themselves, assist placement was provided to the subjects who were difficult to RTW through individual efforts in TP group. In TO group, no such assist placement service was offered to subjects, instead, they tried by themselves to get

reemployment. Based on the feedback from subjects who felt difficult to find jobs by themselves in both TP and TO groups, insufficient resource of job information, mismatch between subject's job competition and job requirement, failure in job interview due to lack of confidence or inexperienced interview skills were the main obstacles facing by subjects who failed to RTW through individual efforts. Components in assist placement programme, for example offering more resource of job market information, referral channel with proper employers, assist job interview, might be helpful for subjects to RTW.

#### **4.4 Conclusion**

The outcome measurements revealed the effects of the training programme. For the LASER assessment measuring stages of job readiness, significance differences between the two groups was found on the contemplation ( $p < 0.05$ ) and action stages ( $p < 0.05$ ); within group differences in the training group were observed on the pre-contemplation ( $p < 0.02$ ), and action stage ( $p < 0.02$ ). For the C-STAI measuring anxiety level significant differences were found for both between group ( $p < 0.05$ ) and within subjects in training group ( $p < 0.01$ ). For the SF-36 measuring self-perceived health-state including both physical and psychological well-being, significant differences between the two groups appeared on the sub-scales of physical function

( $p=0.03$ ); body pain ( $p=0.01$ ); reported health condition ( $p=0.012$ ) and total scores ( $p=0.03$ ). Significant within group differences were found in training group on the sub-scales of body pain ( $p=0.01$ ), mental health ( $p=0.04$ ), social functioning ( $p=0.04$ ) and total scores ( $p=0.01$ ) between pre and post training.

## **Chapter 5**

### **Discussion**

#### **5.1 Introduction**

It has been shown from previous studies that the longer the period of absence from work, the lower the chance the injured worker could reintegrate back to the work environment (Waddell, 1987, 1992; Feuerstein et al., 1999; Watson., 2004; Oleske et al., 1992). RTW after prolonged sick leave for workers with musculoskeletal injuries involved a series of behavioral changes (Lam, 1997; Franche et al., 2002). Past studies have also indicated that the severity of the injuries did not seem to be the only contributing factor for failure to return to work (Fisher et al., 2003; Kowalske et al., 2000; Yasuda et al., 2002; Wiegmann & Berven, 1998; Fisher et al., 2003)

Failure to RTW may be influenced by a number of psychological and psychosocial factors arising after the injuries (Giezen et al., 2000; Marhold et al., 2001; Shaw et al., 2002; Watson et al., 2004). It is therefore important to address these factors when preparing the vocational rehabilitation programme for injured workers. However, most of the vocational rehabilitation programme was focused mainly on the physical problems arising after work injuries such as training of physical capacity, work tolerance and work conditioning. In our study, a new RTW programme was

proposed which addressed both the psychological and psychosocial problems of the injured workers. Different psycho-educational techniques have been incorporated into the RTW programme to resolve the psychological and psychosocial problems of injured workers and at the same time, to help them to be prepared for the RTW. This study was designed to evaluate the effectiveness of this new RTW programme for injured workers. This chapter will further discuss how the results can guide the rehabilitation professionals in the management of injured workers and its implications for future practice and research in these areas. The limitation and recommendations for further studies will also be discussed.

## **5.2 The theoretical framework of the RTW study and the research design**

Work injuries might give rise to a range of psychological, psychosocial, and social-economic problems, which in turn, might affect the work readiness of the injured workers. These problems might include low self-esteem, depression or anxiety (Watson et al., 2004), chronic pain, potential changes in social status (Cheng & Li, 2005; Tulder et al., 2000; Marhold et al., 2001), wrong perceptions of work and the workplace and poor self perception of general health.( Baker et al., 2005; Oleske et al., 2000; Burton et al., 1999). RTW after prolonged sick leave for injured workers involves a process of behavioral changes (Franche et al., 2002). Developing



motivation towards the work role, i.e. the work readiness, is the pre-requisite for them to RTW (Berglind & Gerner, 2002; Lam, 1997).

Originated from the Stages of Change Model (Prochaska et al., 1992), the Stages of Work Readiness model was firstly proposed by Lam in 1997 to identify injured workers's work readiness. The model proposed the three stages of work readiness, namely pre-contemplation, contemplation and action stage. It highlighted that the rehabilitation programme to improve work readiness should be planned according to workers' stage of work readiness (John & Prochaska, 2002; Lam, 1997). Previous studies also reported that the workers' readiness to RTW was often affected by chronic pain, anxiety and stress of coping with the injuries, fear of re-injury and poor self perception of general health.

This study was specially designed to address these psychological and psychosocial problems affecting the work readiness of the injured workers. The psychosocial model has been incorporated, including vocational counseling, cognitive behavioral approaches and job coaching skills, into the RTW programme to help these injured workers to RTW. As the programme involved two major components, the training and the job placement, it was further divided into two phases of study to evaluate the effect separately.

In the phase I of this study, the intervention components were designed to facilitate the participants' job readiness by resolving their psychological and psychosocial problems through the providing of individual counseling and group therapy sessions. Results showed positive effect on the workers' pain coping skills, stress management abilities, thus alleviating their psychological stress and enhancing their confidence towards return to work. Participants in the training group showed improvement on their stage of work readiness compared with those in the control group as measured by LASER. There were significant differences between the two groups in both the contemplation stage ( $p < 0.05$ ) and the action stage ( $p < 0.05$ ). The training group also exhibited significant improvements on self-perceived general health measured by SF-36, anxiety and pain level measured by C-STAI and pain score measured by SF-36. Pain and stress management components in the group therapy sessions should have contributed to this improvement. Although there was no direct outcome indicator to show the changes of the workers' abilities to search for jobs and prepare for the job interviews, it appeared that subjects in the training group showed higher action scores of the LASER indicating their readiness to RTW. They appeared to be more ready and confident in RTW. . This might be contributed by the training sessions offered to the workers on job searching, preparation and acquisition

which seemed to be one of the most important components contributing to the action stage of work readiness.

In the phase II of the study, the job placement and support programme was prepared for the workers to enhance the work acquisition skills of the individuals, thus improving the success of finding a job. The results of phase II showed that more participants in training & placement group successfully returned to work than in training only group. The placement service provided by the centre should have contributed to this finding. The effectiveness of the programme and interpretation will be further discussed in the following sections.

### **5.3 The effects of the group training on work readiness for injured workers**

Chronic pain following the musculoskeletal injuries due to work can exist for an extended time period. It has been found to be a prominent obstacle to RTW (Marhold et al., 2001; Marhold et al., 2002; Van der Giezen et al., 2000). In fact, previous studies and researches have also documented a high degree of co-morbidity between the physical impact of the injury and the psychosocial problems, and most have agreed that pain and the duration of the injury might be the main problems leading to their RTW (Gillen et al., 2004; Jensen & Bodin, 1998).

From our interviews with the participants after the intervention programme, most

of the participants considered that chronic pain was one of their major concerns after injuries. Some would seek other possible ways or alternative methods to “cure” their pain. Unfortunately, the chronic pain might not be alleviated completely due to the nature of the injuries. Pain management might be the more realistic solution to solve this problem. Some of the injured workers were worried about re-injury after resuming previous work. Some still had the perception that they should be more physically fit prior to return to their previous work. However, they did not realize that some of the physical injuries may cause irreversible damages to the body resulting in chronic pain. The pain management sessions in the training programme adopted the cognitive behavioral therapy approach (CBT) which appeared to alleviate the chronic pain problems among these injured workers. The results were similar to the findings from the studies by Staal et al. (2004) and Marhold et al. (2001), both which reported the use of CBT together with activities to control chronic pain problems for injured workers. It was also found in another study that injured workers could gain benefit on reducing pain and stress levels, while increasing the coping skills on pain management (Atroschi et al., 2002).

Chronic pain might give rise to high anxiety and stress among workers with injuries. Previous studies have reported higher anxiety level among patients with chronic back pain (Grachev et al., 2002). Some injured workers may have depressive

symptoms and greater anxiety (Watson et al., 2004). The stress and anxiety levels may be further aggravated by the loss of a work role, financial problems or associated family problems. They might also lose their competence towards other job types and lack the abilities to adapt to the market demands. Stress and anxiety may also be associated with loss of self-esteem; feelings of shame and anger; self blame and depression; inability to manage emotions due to lost work role for longer time (Yates, 2003).

The application of relaxation and other stress management skills might have contributed to the improvement among participants in the training group. The results in this study showed that the participants in the training group made improvement in their anxiety and stress. On the other hand, reduction of anxiety level might also be accompanied with the improvement on chronic pain. Our results were similar to Ong's study in 2004 that the stress management sessions helped to improve one's confidence and mental health (Ong et al., 2004).

Other than pain and stress management, the training sessions also emphasized on the job searching abilities among injured workers. After prolonged absence from work, most of the workers lost the initiatives and confidence to resume a work role. Some might feel that they could not cope with the previous work that demanded more manual strength and tolerance. Some had difficulties in searching jobs due to the lack

of job acquisition skills. The training programme therefore incorporated a series of training sessions comprised of interviewing techniques, job hunting skills, analysis of different job nature, demands, etc. In this way, these workers would be more ready to get back to the job market.

Although there was no direct outcome indicator to show the changes of the workers' abilities to search for jobs and prepare for the job interviews, it appeared that subjects in the training group showed higher action scores of the C-LASER indicating their readiness to RTW. They appeared to have more readiness to explore job opportunities. This did not seem to occur for subjects in the control group. This might have resulted from the training sessions offered to the workers on job searching, preparation and acquisition. Thus, the chance to RTW would be much higher when compared to those still in the contemplation or pre-contemplation stage. Responses from the participants regarding this part of training were extremely positive.

The results of phase I of the study supported our initial hypothesis – that the training programme developed in this study proved effective in raising injured workers' work readiness, improvement in pain and stress control and perceived health. However, the results did not show significant improvements in physical functions. This might be due to that the RTW programme was not targeted to improve the physical capacity of the workers as in other conventional vocational rehabilitation

programmes.

#### **5.4 The effect of individual counseling on injured workers' readiness to RTW**

The group training sessions were prepared to resolve the more generic problems among injured workers regarding pain and stress management, job acquisition skills. The individual training sessions were targeted to help individual workers to address their own problems in RTW and to build up self management in coping with their psychological and psychosocial problems. The ultimate goal was to facilitate their work readiness.

According to Lam's "Stages of Job Readiness" model (1997), there were three stages of readiness to work, namely, the pre-contemplation stage (no intention to work), the contemplation stage (consideration of work) and the action stage (ready for job placement). Most injured with prolonged sick leave often stayed at the pre-contemplation or contemplation stages due to various physical, psychological and psychosocial problems.

One of the pre-requisites for injured workers to seek change on their behaviors is that they are motivated and ready to RTW (Berglind et al., 2002). Injured workers' subjective feelings, personal values and beliefs on disabilities, individual's competence on work abilities, expectation from employers and insurance companies

could significantly affect the motivation to return to work (Shaw et al., 2002). The design of the individual vocational counseling sessions was to help these injured workers to be more prepared to resume their work roles. Each worker had their own problems in returning to work. Thus, individual counseling would help to address individual problems separately in addition to the group training which focused on the generic or common problems that these workers encountered after their injuries.

During the individual counseling sessions, each counselor would try to provide stage-matched counseling strategies to each participant at different stages of work readiness. Previous studies have reported its value to facilitate behavioral changes in health promotion and were successful in helping people make a shift from contemplation stage to contemplation stage or action stage (Calfas et al., 1996; Bock et al., 2001). Allaire (2005) and his colleagues found that individual counseling, including identification of work barriers and solutions, guidance on job planning, education and self-advocacy could be beneficial to those with chronic diseases in getting retention on employment. Most injured workers might have lost their self-esteem, self-worth, and identity due to the loss of the work role. They might face financial problems due to loss of income, leading to tension in the family. They might have grief and feelings of shame. These workers usually had no concrete action plan or clear goal on how they should proceed. They might lack of self-competence and



appropriate job preparation skills. The tailor-made individual counseling sessions aimed at alleviating the anxiety and stress that arises from the work injury so that they could be more prepared to resume their work role. Although only three sessions were given to each participant, the outcomes measured by LASER indicated that the work readiness among the participants in the training group was significantly higher than that in the control group. Our results are in line with the findings from the study conducted by Ekbladh and colleagues (2004).

It was noted that individuals at different stages of readiness to change require different types of interventions, with precontemplators requiring more attitudinal/motivational messages, whereas those in the preparation and action stages requiring a more behavioral and skills based intervention (Resnicow et al., 2003). It was possible that the individual counseling, including an element that was tailored to participants' interest and motivation to change, functioned like an individual tailored intervention, which could explain our findings on changes of LASER.

As mentioned before, both psychological and psychosocial factors would significantly influence the work readiness and RTW outcome for long term sick leave workers with musculoskeletal injuries (Cheung & Li, 2005). In this study, the measures of these factors using SF 36 reflected similar findings. Those factors were found to be negatively correlated with loss of working days and significantly affect

the ability of injured worker's RTW. Workers with long term sick leave had significantly worse physical and mental health, as measured with the SF-36 (Atroshi et al., 2002; Gillen et al., 2004). Correspondingly, changes on work readiness were accompanied with the improvement on the self-perceived general health measured by SF-36 (Atroshi et al., 2002). Our study showed that compared with control group, the training group displayed significant improvement on self-perceived general health measured with SF-36, and the progress of job readiness for training group was also accompanied with the improvement on the scores of SF-36.

From our study, most workers reported that their own perception of psychosocial and physical abilities, confidence with the work environment and job market were significant barriers to successful work re-entry. They might have problems of managing their emotions to cope with the stress of injuries, pain, and the psychosocial factors arised such as family and financial problems. Some might think that the compensation would help to alleviate these problems and they often had high expectations that they would receive big remunerations from the compensation.

## **5.5 The effects of job placement and support RTW outcomes for injured workers**

The second phase of this study focused on the evaluation of a combined training and job placement programme compared to the other group which received only the group training and individual counseling. Participants were randomly assigned into the job placement group (TP group) or the self-placement group (TO group) after receiving the group training and individual counseling. Results showed that after 3 weeks' job placement and support, the RTW rate (73.1%) in the TP group was significant higher than that in the self-placement group (51.6%) ( $p < 0.04$ ). 27 out of 37 participants in TP group were able to return to the work force while only 19 out of 36 participants in TO group were successful in RTW.

Regular services had been provided by local workers' health center to help the injured workers to search for new jobs using this job placement and support model. However, the effect was not significant as most workers were not ready to RTW due to various factors mentioned earlier. They had difficulties starting a new job that required different work skills.

In a local report on investigating reemployment outcomes among local long-term injured workers in 2002, the RTW rate was only 40% (The Alliance of Professionals, 2002). Compared with this report, the RTW rate in our TP and TO groups was much

higher. Our new RTW programme emphasized on training and counseling prior to the job placement services.

The ultimate goals of any vocational rehabilitation programme for injured workers are placement in open competitive employment, personal satisfaction with the placement, and satisfactory performance on the job (Rubin et al., 2001). Competitive employment means to get employment through competing with others who are ordinary persons or without physical disabilities facing the same employment opportunities. This RTW programme has incorporated both the training and placement components to facilitate the work readiness among these injured workers.

In this study, the RTW rate for participants who had received both training intervention and job placement services was 73.1%. The findings were similar to 70% which was the employment rate of unemployed healthy workers receiving employment retraining services (ERB) provided by the Hong Kong government in 2004 and was higher than the employment rate of disabled persons (64%) receiving employment training services provided by the Hong Kong government (Employment Retraining Board, 2005).

Our results were also similar with those of another recent local study which evaluated the effectiveness of a supported competitive open employment program for local people with chronic illness (Rosalia et al., 2005). In this study, among all the

participants enrolled in the programme, 71.2% obtained competitive employment. Even though the targeted participants between these two studies were different, results were still comparable in many other aspects and variables such as the local employment conditions, economic factors in the society, etc.

However, the findings of our study were not consistent with some previous studies. For instance, Watson et al. (2004) reported that the rate of return-to-work for a group of individuals with chronic low back pain was only 39.3%, which was thought to be relatively low – far less than half of those who started their programme and even lower than the RTW rate of TO group in our study. Several prominent differences could be found between these two studies. First, the programme adopted in Watson et al.'s study was an occupationally orientated pain management programme using a cognitive behavioral approach supported by physical activity and specific work advice for 12 half days over 6 weeks with up to 3 h of additional individual vocational counseling. No direct job placement service was provided consequently in their programme. Second, their follow up time was 6 months which was longer than ours. Most important of all, their study was conducted in US while our study was conducted in HK. The social and economic factors between the two societies might affect the RTW rate of the injured workers.

Different kinds of work have certain requirements on professional knowledge, skills, experiences and physical capacity. A worker has to acquire certain professional skills and knowledge in order to master the job. He/She also requires motivation and interests to pursue the particular job tasks (Lam, 1997; Bond, 1998). Individual's abilities and skills for job seeking and interview are pre-requisites for a successful employment. At the same time, when a person's needs, ability, values, job preference were matched closer with specific demands of different occupations, the person was more likely to get and retain the job placement (Janssen et al., 1987).

Besides job matching, injured workers leaving out of work for long time may face various difficulties during their placement activities. They may become progressively less fit through inactivity during the long sick leave period; their vocational skills may become outdated; they might lack of confidence to pursue a new job (Waddell, 1998; Watson et al., 2004).

In our research, we found similar problems or difficulties with our subjects. The education level of most of the subjects were below the high school level and their former job pre-injury was mainly manual labour work that demanded high levels of physical strength and endurance. Most of them could not return to their previous work due to the loss of the physical capacity. Because of their limited skills and relatively low education background, their choices for selecting a new job were minimal.

Our study incorporated a tailor-made job placement programme which was designed to help these workers to get successful placement after the training programme. For the job placement group, the percentage of workers getting back to the work force was higher compared to the self-placement group.

In our job placement services, a data bank was set up containing daily updated job recruitment and hunting information. The most updated information on job market was delivered in a timely manner to the subjects. Subjects were asked to take the job interview by the case manager as soon as possible. These subjects acquired a lot more opportunities to choose the job for interview with plentiful job hunting information.

Even though a subject had been ready to RTW, his/her self-confidence might decrease and he/she might slip away from the job readiness stage if they failed in one or two job interviews. Many subjects found it easier to get on a job when referred by a case manager who had better job matching abilities to assist the workers in making the choice. In addition, if a worker needed assistance in job interview, the case manager would assist him/her in preparing the interview. Guided job interview would help them to recall the details on the concrete preparation for the interview. With more successful interview skills, the opportunities for them to be re-employed were increased.

For those participants who failed to RTW either with placement service or

self-placement, the common problems were the chronic pain and the issues of prolonged compensation process. Some subjects were still desperate in looking for alternative medical intervention hoping that their physical problems and chronic pain would be alleviated after treatment other than paying attention to RTW. Some participants were reluctant to search for jobs mainly because of their pending compensation for “court settlement”, which was not recorded and investigated in this study. The main purpose of that group of injured workers on court settlement was try to get extra compensation through prosecuting their employers’ negligence during work. According to previous studies, this kind of “secondary income” in forms of compensation or sick leave payment could often mislead the worker thinking that they should have long term sick leave, thus becoming unemployed (Fisher, 2003). If workers were currently under medical claims or pending for court settlement, then the rate of RTW would be greatly reduced as most workers were pending their jobs to wait for the final settlement (Shaw et al., 2002). This also explained why some of the participants were still unemployed after the RTW programme. A number of others factors were found to be related to the failure of RTW from the feedback of the subjects of this study. Some subjects had to find other jobs instead of their former ones due to the limitation of physical capacity resulting from injuries. Due to lack of proper skills adaptation to new jobs they failed to RTW. Some subjects were hindered



by personal or family issues such as child care, inconvenience transportation, etc., while others could not find proper work within our limited job placement net work. It was suggested according to those feedbacks and anglicizing on RTW outcomes that this programme should be further revised and expended in order to resolve those individual problems in corresponding aspects. A specific topic on compensation issue should be integrated into group training and individual counseling in order to facilitate injured workers to shift their attention from compensation to RTW. The employment net work and referral system in the placement part of the programme should be built more diversely and efficiently to meet individual injured worker's requirement for employment. On the other hand, the whole programme should be more individualized either with a single part or combined one in order to adapt to each injured worker's own problems.

## **5.6 Implications of the study**

Previous studies indicated that prolonged period of sick leave among injured workers would lead to problems of return to work (Watson., 2004; Oleske et al., 1992). It has prominent negative effects in terms of huge social and individual economic lost, individual's physical and psychological damaging. For most of the injured workers, there would be temporary or permanent physical impairments such as pain and fatigue

as a result of injuries. In addition, psychological and social disturbances also resulted from long term sick leave. These factors have often been missed in the conventional vocational rehabilitation system.

The RTW programme proposed in this study was specially designed to address the needs of injured workers in handling the psychological and psychosocial aspects of rehabilitation. Through cognitive behavioral training, vocational counseling and job placement and coaching, the programme aimed to restore the work capacities of injured workers and helped them to RTW.

The programme aimed at facilitate the behavior change process on RTW through clearing the psychological and social barriers of injured workers by means of group training, individual counseling and job placement. Results suggested that the group training programme could help to alleviate pain and stress, enhance behavioral change on job readiness and to improve self-perceived quality of life. In addition, the job placement programme was found effective to facilitate injured workers' RTW through proper job matching, job preparation and adaptation.

At present, the vocational rehabilitation programme provided by hospital authority focused mainly on the physical aspects of training, including work assessment, work hardening and work conditioning. It is suggested that the RTW programme developed in this study could also be incorporated into the current

rehabilitation protocol such that all the physical, psychological and psychosocial factors could be addressed. This model can also be adopted in other departments aiming to enhance the employability of injured workers such as the Labour Department, the Department of Health, the Hospital Authority, etc. The success of this programme should benefit both employees and employers. Employees would be able to return to their job sooner and get all the benefits associated with gainful employment – monetary, social and psychological. They would no longer suffer from unnecessary long-term disabilities and loss of earning capacity. Employers would continue to have their trained and experienced workers who were dedicated to their job, thus could increase productivity. They could also maintain the good reputations of their businesses by avoiding unnecessary litigation and by accommodation of injured workers.

The targeted group selected in our programme was local injured workers with longer term sick leave and difficulties on RTE due to lack of job readiness. Two parts of the programme could be either combined together to long term sick leave injured workers, or applied alone. For example, for those injured workers who have finished both medical care and vocational rehabilitation service in hospital or rehabilitation centre in relative short period and prepared for RTW, the direct job placement service should be provided to them immediately. This service could be offered by some NGO,

specific staff in OT department or social workers within the hospital. To those injured workers with long term sick leave, initially they should be evaluated on their current stages of job readiness with the administration of LASER. Based on the results of LASER, they should be prescribed with either one part of the programme or both parts. The services could be provided either by hospitals or similar organizations like the center where the study was carried out.

In summary, we found that those workers who were successful in getting back into the work force had the following characteristics:

- a. They had a higher motivation to RTW and their work readiness as measured by LASER was at the contemplation and action stage.
- b. They were more confident and had a better perception of their general health as measured by SF-36.
- c. Their pain and stress management skills have been improved significantly.
- d. Their age ranged from 22-50 years.

## **5.7 Limitations of the study**

There are some limitations in this study. Due to ethical reasons, the subjects in the control group were given the same training programme after three weeks of

control period. Therefore, the long term employment outcomes of subjects between the training and control group could not be measured. It is recommended that the long term employment outcomes should be documented in future studies. This was a single-center research in which all the subjects were recruited from the same center. Even though the subjects were referred from several local hospitals where they had received vocational rehabilitation, sampling bias might exist. Prochaska et al. (1992, 2004) suggested that the process of behavioral changes, for people with mental disorders and behavioral disturbances might take over six months to happen and some of them would relapse to the beginning. Some of the subjects in the training group did not show positive progress as our treatment only lasted for three weeks. Some of the behavioral changes might not be able to be measured soon after the intervention. In the study, the subjects in control group were not provided with other formal intervention within the same period of intervention. This study was conducted at one of the community vocational rehabilitation service centers called the Hong Kong Workers' Health Center. Most injured workers came to the centers to seek help for job searching, interviews and information on updated job markets. As a form of regular services, the center social workers would provide necessary information and support to these workers. Although in this study, the workers in the control group did not receive any "formal and structured training" during the three week intervention, they

were given the same services as other workers attending the center. The intensity and duration of the services would not be comparable to the intensive mode of training in our treatment group. For further studies, a placebo intervention program should be proposed for subjects in the control group. Some socio-economic factors such as the compensation system, court settlement, medical claims etc could not be controlled, but they might cause potential bias to the results. It was reported by some of the participants that they had to wait for settling down the compensation issues before considering RTW. Current employment rates in the labor market, along with other factors such as economy of the society, etc might also have affected the results of this study. Due to the limitation of manpower and resources, other than waiting list no other intervention or programme was adopted to make a comparison with the current programme. The follow up time of 3 weeks might not be sufficient to observe the long term effects of the study. Longer follow up time, such as 6 months or even longer should be needed. Finally, even though the subjects were recruited with independent physical functional ability, neither the severity and degree of physical impairment of the subjects nor its effects on RTW was reflected in the study. The physical abilities of the subjects were assessed by LLUMC and SFS both of which are self-report assessment to evaluate self-perceived physical competence of subjects in handling household and daily living tasks. The more objective and work related

functional capacity evaluation should be prescribed in the future study. In addition, the effects of physical impairment on RTW should be further investigated.

## **5.8 Recommendations for further studies**

In the first stage of this study, the comparison using randomized control was between intervention and waiting list. In order to further evaluate the training effects of this programme on long term sick leave injured workers, future research should focus on the comparison of the effects on facilitating RTW for injured workers between this programme and others. In this study, compensation issue was not within the consideration for the recruitment criteria. In fact compensation system should play an important role on RTW for injured workers. Further studies are required to examine how local compensation system would affect behavior changes on RTW for injured worker, or the effects of this programme on injured workers under the process of compensation. Longer-term effects of the training part on maintenance of job readiness state of injured workers, or the placement part on sustaining employment should be investigated further.

## **5.9 Conclusions**

In this study, a 6-week RTW programme including training and placement was

provided to long-term sick leave workers with musculoskeletal injuries to facilitate their RTW. For the training part of the program, results showed that, compared to the subjects in control group without intervention, the 3-week training program was demonstrated to be effective on facilitating subjects to develop job readiness through behavior change; improving self-confidence, self-perceived quality of life. The results of the comparison on RTW outcome between assisted and self placements indicated that assisted job placement services were necessary to help those subjects to get on job readiness through training to RTW quickly.



## References

- Adams, J. H., Williams, A. C. (2003). What affects RTW for graduates of a pain management program with chronic upper limb pain? *Journal of Occupational Rehabilitation*, 13(2), 91-106.
- Allaire, S.H., Niu, J. & LaValley, M.P. (2005). Employment and Satisfaction Outcomes From a Job Retention Intervention Delivered to Persons with Chronic Diseases. *Rehabilitation Counseling Bulletin*, 48(2), 100–109.
- Anema, J.R., Giezen, A.M. Van Der, Buijs, P.C. & Mechelen, W. Van. (2002). Ineffective disability management by doctors is an obstacle for return-to-work: a cohort study on low back pain patients sicklisted for 3-4 months. *Occupational & Environmental Medicine*. 59(11), 729-33.
- Atroshi, I., Andersson, I.H., Gummesson, C., Leden, I., Odenbring, S. & Ornstein, E. (2002). Primary care patients with musculoskeletal pain, value of health-status and sense-of-coherence measures in predicting long-term work disability. *Scandinavian journal of rheumatology*, 31, 239–244.
- Baker, P., Goodman, G., Ekelman, B. & Bonder, B. (2005). The effectiveness of a comprehensive work hardening program as measured by lifting capacity, pain scales, and depression scores. *Work*, 24, 21–31.
- Bambrick, P. & Bonder, B. (2004). Older adults' perceptions of work. *Work*. 24, 77–84.
- Barlow, J.H., Wright, C.C. & Wright, S. (2003). Development of job-seeking ability in people with arthritis: evaluation of a pilot program. *International Journal of Rehabilitation Research*, 26: 329-333.
- Berglind, H. & Gerner, U. (2002). Motivation and RTW among the long-term sicklisted: An action theory perspective. *Disability and Rehabilitation*, 24(14), 719-726.
- Bernacki, E. J., Guidera, J. A., Schaefer, J. A. & Tsai, S. (2000). A facilitated early return to work program at a large urban medical center. *Journal of Occupational and Environment Medicine*, 42(12), 1172-1177.
- Bernacki, E.J. (2004). Factors influencing the costs of workers' compensation. *Clinics in Occupational & Environmental Medicine*, 4(2), 249-257.

Bock, B.C., Marcus, B.H. & Pinto, B.M. (2001). Maintenance of physical activity following an individualized motivationally tailored intervention. *Annual behavior medicine*, 23, 79–87.

Bond, G. R. (1998). Principles of the individual placement and support model: Empirical support. *Psychiatric Rehabilitation Journal*, 22(1), 11-23.

Burns, J.W., Glenn, B., Lofland, K., Bruehl, S. & Harden, R.N. (2005). Stages of change in readiness to adopt a self-management approach to chronic pain: the moderating role of early-treatment stage progression in predicting outcome. *Pain*, 115, 322–331.

Burton, A.K., Battie, M.C. & Main, C.J. (1999). The relative importance of biomechanical and psychosocial factors in low back injuries. In: Karwowski W, Marras WS, eds. *Occupational Ergonomics Handbook*. Boca Raton, Fla.: CRC Press, 1127–1138.

Burton, A.K., Waddell, G. Tillotson, K.M. & Summerton, N. (1999). Information and advice to patients with back pain can have a positive effect. A randomized controlled trial of a novel educational booklet in primary care. *Spine*, 24(23), 2484-91.

Calfas, K.J., Long, B.J., Sallis, J.F., Wooten, W.J., Pratt, M. & Patrick, K. (1996). A controlled trial of physical counseling to promote the adoption of physical activity. *Prevention medicine*, 26, 225–233.

Chan, C.C.H., Li, W.P.C., Hung, L.K. & Lam, C.W. (1999). A Standardized Clinical Series for Work-Related Lateral Epicondylitis. *Journal of Occupational Rehabilitation*, 10, 143-152.

Chan, H.H.K., Li-Tsang, C.W.P., Chan, C.C.H., Lam, C.S. & Hui, K.Y.L. (2002). The validation of Chinese Lam assessment of employment readiness (C-LASER) for injured workers in Hong Kong. Unpublished manuscript, Hong Kong Polytechnic University.

Chan, S.K.K. & Man, D.W.K. (2005). Barriers to returning to work for people with spinal cord injuries: a focus group study. *Work*, 25, 325–332.

Cheng, J.K.C. & Li-Tsang W.P.C. (2005). A comparison of self-perceived physical and psycho-social worker profiles of people with direct work injury, chronic low back pain, and cumulative trauma. *Work*. 25, 315–323.

Cheung, Y.L., Molassiotis, A. & Chang, A.M. (2001). A pilot study on the effect of

progressive muscle relaxation training of patients after stoma surgery. *European Journal of Cancer Care*, 10, 107–114.

Ekbladh, E., Haglund, L., Thornell, L.-H. (2004). The worker role interview preliminary data on the predictive validity of return to work of clients after an insurance medicine investigation. *Journal of Occupational Rehabilitation*, 14(2), 131-141.

Elinson, L., Houck, P., Marcus, S.C., Pincus, H.A. (2004). Depression and the Ability to Work. *Psychiatric Services*. 55(1), 29-34

Enid, W.Y. Kwong & Alex Y.H. Kwan. (2004). Stress-Management Methods of the Community-Dwelling Elderly in Hong Kong: Implications for Tailoring a Stress-Reduction Program. *Geriatric Nursing*, 25(2), 102-106

Feuerstein, M., Burrell, L. M., Miller, V. I., Lincoln, A., Huang, G. D. & Berger, R. (1999). Clinical management of carpal tunnel syndrome: A 12-year review of outcomes. *American Journal of Industrial Medicine*, 35, 232-245.

Feuersteina, M., Nicholasa, R.A., Huanga, G.D., Dimberge, L., Alie, D. & Rogers, H. (2004). Job stress management and ergonomic intervention for work-related upper extremity symptoms. *Applied Ergonomics*, 35, 565–574.

Fishbain, D.A. (2003). Pain level as a predictor of return to work. *European spine journal*, 12, 451.

Fisher, K., Hanspal, R. S. & Marks, L. (2003). Return to work after lower limb amputation. *International Journal of Rehabilitation Research*, 26(1), 51-56.

Fisher, T.F. (2003). Perception differences between groups of employees identifying the factors that influence a return to work after a work-related musculoskeletal injury. *Work*, 21, 211-220.

Flores, S., Gatchel, R.J. & Polatin, P.B. (1997). Objectification of functional improvement after nonoperative care. *Spine*, 22, 1622–1633.

Ford, L. H. & Swett, E.A. (1999). Job placement and rehabilitation counselor in the state-federal system. *Rehabilitation Counseling Bulletin*, 42(4), 354-365.

Franché, R.L. & Krause, N. (2002). Readiness for return to work following injury or illness: conceptualizing the interpersonal impact of health care, workplace, and insurance factors. *Journal of Occupational Rehabilitation*, 12, 233-256.

Freedman, R. & Fesko, S. (1995). Consumer and family perspectives on the meaning of work. *Research to Practice*. 1(1), 1-2.

Frieke, V.F. Verhagen, A.P. Geilen, M. Vos, C.J. & Koes, B.W. (2004). Effectiveness of behavioural graded activity compared with physiotherapy treatment in chronic neck pain: design of a randomised clinical trial. *British medical journal of musculoskeletal disorders* 5(34): 1-7.

Gardinera, M. Love, G. & Williamson, P. (2004). Physician you can heal yourself! Cognitive behavioural training reduces stress in GPs. *Family practice*. 21, 545–551.

Gatchel, R.J., Polatin, P.B. & Mayer, T.G. (1995). The dominant role of psychosocial risk factors in the development of chronic low back pain disability. *Spine*, 20(24), 2702-2709

Gatchel, R.J., Polatin, P.B. & Kinney RK. (1995). Predicting outcome of chronic back pain using clinical predictors of psychopathology: a prospective analysis. *Health Psychology*, 14(5), 415-420.

Gatchel, R. J., Mayer, T., Dersh, J., Robinson, R. & Polatin, P. (1999). The association of the sf-36 health status survey with 1-year socioeconomic outcomes in a chronically disabled spinal disorder population. *SPINE*, 24(20), 2162-2170.

Gatchel, R.J., Polatin, P.B., Mayer, T.G., Robinson, R. & Dersh, J. (1998). Use of the SF-36 health status survey with a chronically disabled back pain population: strengths and limitations. *Journal of occupational rehabilitation*, 23, 237-246.

Gatchel, R. J., Adams, L., Polatin, P. B. & Kishino, N. D. (2002). Secondary Loss and Pain-Associated Disability: Theoretical Overview and Treatment Implications. *Journal of Occupational Rehabilitation*, 12, 99-110.

Giezen, Van der, Bouter & Nijhuis. (2000). Prediction of RTW of low back pain patients sicklisted for 3-4months. *Pain* 87, 285-294.

Gillen, M., Jewell, S.A., Faucett, J.A. & Yelin, E. (2004). Functional limitations and well-being in injured municipal workers: a longitudinal study. *Journal of occupational rehabilitation*, 14(2), 89-105.

Grachev, I.D., Fredrickson, B.E. & Apkarian, A.V. (2002). Brain chemistry reflects dual states of pain and anxiety in chronic low back pain. *Journal of neural transmission*, 109, 1309–1334

雇员再培训局, 2005. 香港康复计划方案检讨. 文件 16/2005

Haraldsson, K., Fridlund, B., Baigi, A. & Marklund, B. (2005). The self-reported health condition of women after their participation in a stress management programme: a pilot study. *Health and Social Care in the Community*, 3, 224–230.

Huang, C. Y., Liao, H. Y., & Chang, S. H. (1998). Social Desirability and the Clinical Self-Report Inventory: Methodological Reconsideration. *Journal of Clinical Psychology*, 54, 517-528.

Isernhagen, S.J. (2001). What functional analysis can do for work life. *Work*, 16(1), 53-55.

Isernhagen, D. D. (2000). A model system: Integrated work injury prevention and disability management. *Work*, 15, 87-94.

Jane, H., Martin, W., Chris, D., David, C., Lorna, F., Howel & Denise (1999). The Newcastle exercise project: a randomised controlled trial of methods to promote physical activity in primary care. *British medical journal*, 25(9), 828-832

Janssen, N., van den Heuvel, W. P., Beurskens, A. J., Nijhuis, F. J., Schroer, C. A. & van Eijk, J. T. (2003). The demand-control-support model as a predictor of return to work. *International Journal of Rehabilitation Research*, 26(1), 1-9.

Jensen, M. P., Romano, J. M., Turner, J. A., Good, A. B. & Wald, L. H. (1999). Patient beliefs predict patient functioning: Further support for a cognitive-behavioural model of chronic pain. *Pain*, 81, 95-104.

Jensena, I.B. & Bodin L. (1998). Multimodal cognitive-behavioural treatment for workers with chronic spinal pain: a matched cohort study with an 18-month follow-up. *Pain*, 76, 35–44.

Jimmy, G. & Martin, B.W. (2005). Implementation and effectiveness of a primary care based physical activity counseling scheme. *Patient education and counseling*, 56, 323–331

John, C. & Prochaska, J. (2002). Using the stages of change. *Harvard Mental Health Letter*, 5, 5-8.

Kraut, A., Mustard, C. Wald, R. & Tate, R. (2000). Unemployment and healthcare utilization. *Scand J Work Environ Health* 26, 169–77.

Kearns, D. J. (1997). Collaborative rehabilitation at the workplace. *Occupational Therapy International*, 4(2), 135-150.

Kowalske, K., Plenger, P.M., Lusby, B. & Hayden, M.E. (2000). Vocational reentry following TBI: an enablement model. *Journal of Head Trauma Rehabilitation*, 15, 989-999

Labour Department. (2004). The annual report of the commissioner for Labour.

Lam, C.L., Gandek, B., Ren, X.S. & Chan, M.S. (1998). Tests of scaling assumptions and construct validity of the Chinese (HK) version of the SF-36 health survey. *Journal of clinical epidemiology*, 51, 1139-1147.

Lam, C.S. (1997). A Conceptual Model for Service Delivery to People who are Unemployed. *Unpublished manuscript*, Illinois Institute of Technology.

LeFort, S.M., Donald, K.G., Rowat, K.M. & Jeans, M.E. (1998). Randomized controlled trial of a community-based psychoeducation program for the self-management of chronic pain. *Pain*, 74, 297–306

Leung, K.L. & Man, D.W.K. (2005). Prediction of vocational outcome of people with brain injury after rehabilitation: a discriminant analysis. *Work*, 25, 333–340.

Long, L., Linden, W. & Young, S. (2004). Stress management What is it?. *Journal of Psychosomatic Research*, 56, 133–137)

Magni, G., Moreschi, C., Rigatti-Luchini, S. & Merskey, H. (1994). Prospective study on the relationship between depressive symptoms and chronic musculoskeletal pain. *Pain*. 56(3), 289-297.

Main, C.J. & Burton, A.K. (2000). Economic and occupational influences on pain and disability. In: Main CJ, Spanswick CC, editors. *Pain management: an interdisciplinary approach*. Edinburgh: Churchill Livingstone, 63–87.

- Marhold, C., Linton, S. J. & Melin, L. (2001). A cognitive-behavioral return-to-work program: Effects on pain patients with a history of long-term sick leave. *Pain*, 91, 155-163.
- Marhold, C. Linton, S.J. & Melin, L. (2002). Identification of obstacles for chronic pain patients to return to work: evaluation of a questionnaire. *Journal of Occupational Rehabilitation*. 12, 65-75.
- Marnetoft, S.U. & Selander, J. (2002). Long-term effects of early versus delayed vocational rehabilitation - a four-year follow-up. *Disability and rehabilitation*, 24(14), 741 – 745.
- Marutaa, T., Malinchoc, M., Offord, K.P. & Colligan, R.C. (1998). Status of patients with chronic pain 13 years after treatment in a pain management center. *Pain*, 74, 199–204.
- Mason, V. (1994). The prevalence of back pain in Great Britain. Office of Population Censuses and surveys, HMSO.
- Matheson, L.N. & Matheson, M.L. (1993). Performance assessment and capacity testing Spinal Function Sort: rating of perceived capacity. *Wildwood, MO: Employment Potential Improvement Corporation*.
- McKellar, J.D., Clark, M.E., Shriner, J. & Haley, J.A. (2003). The cognitive specificity of associative responses in patients with chronic pain. *British Journal of Clinical Psychology*, 42, 27–39.
- Melnyk, B.M. & Fineout-overholt E. (2005). Evidence-based practice in Nursing & Healthcare: A guide to best practice. *Williams & Wilkins*, 1<sup>st</sup> edition, 3-20.
- Morley, S., Eccleston, C. & Williams, A. (1999). Systematic review and meta-analysis of randomized controlled trials of cognitive behavior therapy and behavior therapy for chronic pain in adults, excluding headache. *Pain*, 80, 1-13.
- National Institute of Occupational Safety & Health (NIOSH) (1997). Work-related musculoskeletal disorders, Cincinnati, OH: Center for Disease Control & Prevention.
- Norcross, J.C. & Prochaska, J.O. (2002). Using the stages of change. *Harvard mental health letter*, 2002 5, 5-7.
- Nachemson, A.L., Spengler, D.M. & Fisher, L.D. (1991). A prospective study of work perceptions and psychosocial factors affecting the report of back injury. *Spine*. 16, 1–6.

Newhouse, R., Dearholt, S. Poe, S., Pugh, L.C. & White, K.M. (2005). Evidence-based Practice A Practical Approach to Implementation. *Journal of Nursing Administration*, 35(1), 35-40.

Oleske, D.M. & Hahn, J.J. (1992). Work-related injuries of the hand: data from an occupational injury/illness surveillance system. *Journal of Community Health*, 17(4), 205-219.

Oleske, D.M., Andersson, G.B.J., Lavender, S.A. & Hahn, J.J. (2000). Association between recovery outcomes for work-related low back disorders and personal, family, and work factors. *Spine*, 25(10), 1259-1265.

Ong, L., Linden, W. & Young, S. (2004). Stress management What is it?. *Journal of Psychosomatic Research*, 56, 133–137.

Panas, L. Caspi, Y. Fournierc, E. & McCarty, D. (2003). Performance measures for outpatient substance abuse services: group versus individual counseling. *Journal of substance abuse treatment* 25, 271–278.

Pransky, G., Benjamin, K., Hill-Fotouhi, C., Fletcher, K.E., Himmelstein, J. & Katz, J.N. (2002). Work-related outcomes in occupational low back pain: A multidimensional analysis. *Spine*, 27, 864–870

Pransky, G.S., Benjamin, K.L., Savageau, J.A., Currivan, D., & Fletcher, K. (2005) Outcomes in Work-Related Injuries: A Comparison of Older and Younger Workers. *American Journal of Industrial Medicine*. 47, 104–112

Priestley, M. (1998). Constructions and creations: idealism, materialism and disability theory. *Disability and Society*, 13, 75-94.

Prochaska, J. O., DiClemente, C. C., & Norcross, J. C. (1992). In Search of How People Change: Applications to Addictive Behaviors. *American Psychologist*, 47, 1102-1114.

Punnett, L., Wegman, D.H. (2004). Work-related musculoskeletal disorders: the epidemiologic evidence. *Journal of Electromyography and Kinesiology*, 14, 13–23

Resnicow, K., McCarty, F. and Baranowski,T. (2003). Are precontemplators less likely to change their dietary behavior? a prospective analysis. *Health education research theory & practice*, 18(6), 693-705.

Rollnick, S., Heather, N., Gold, R. & Hall, W. (1992). Development of a Short 'Readiness to Change' Questionnaire for Use in Brief, Opportunistic Interventions



among Excessive Drinkers. *British Journal of Addiction* 87, 743-754.

Rosalia, K.Y., Lee & Chan, C.C.H. (2005). Factors affecting vocational outcomes of people with chronic illness participating in a supported competitive open employment program in Hong Kong. *Work*, 25, 359–368.

Rubin, S.E. & Roessler, R.T. (2001). Foundations of the vocational rehabilitation process. *Pro-Ed*, 5<sup>th</sup> ed., 375-381.

Sackett, D.L., Rosenberg, W.M.C., Gray, J.A.M., Haynes, R.B. & Richardson, W.S. (1996). Evidence based medicine: what it is and what it isn't. *British Medical Journal*, 312, 71-72

Selander, J., Marnetoft, S.-U., Bergroth, A. & Ekholm, J. (2002). Return to work following vocational rehabilitation for neck, back and shoulder problems: Risk factors reviewed. *Disability and Rehabilitation*, 24(14), 704-712.

Shaw, L., Segal, R., Polatajk, H. & Harburn, K. (2002). Understanding return to work behaviours: Promoting the importance of individual perceptions in the study of return to work. *Disability and Rehabilitation*, 24(4), 185-195.

Shaw, W.S. & Huang, Y.H. (2005). Concerns and expectations about returning to work with low back pain: identifying themes from focus groups and semi-structured interviews. *Disability and rehabilitation*, 27(21), 1269 – 1281.

Shek, D.T. (1988). Reliability and factorial structure of the Chinese version of the State-Trait Anxiety Questionnaire. *Journal of Psychopathology and Behavioral Assessment*, 10, 303–317.

Smith, S. & Norton, K. (1999). Counselling skills for doctors. *Open University Press*, 1<sup>st</sup> ed, 9-20).

Speilberger, C.D. (1983). Manual for the state-trait anxiety inventory. *Clinical Psychologists Press CA*, 1<sup>st</sup> ed, 32-45.

Staal, J. B., Hlobll, H., Twisk, J. W. R., Smid, T., Köke, A. J. A. & van Mechelem, W. (2004). Graded activity for low back pain in occupational health care - a randomized, controlled trial. *Annals of Internal Medicine*, 140(2), 77-84.

Strunin, L. & Boden, L.I. (2000). Paths of Reentry: employment experiences of injured workers. *American journal of industrial medicine*, 38, 373-384.

- Sufka, A., Hauger, B., Trenary, M., Bishop, B., Hagen, A., Lozon, R., & Martens, B. (1998). Centralization of low back pain and perceived functional outcome. *Journal of orthopaedic & sports physical therapy*, 27(3), 205-212.
- Sullivan, M.J.L., Feuerstein, Mi., Gatchel, R., Linton, S.J. & Pransky G. (2005). Integrating psychosocial and behavioral interventions to achieve optimal rehabilitation outcomes. *Journal of occupational rehabilitation*, 15(4), 475-489.
- Sullivan, M.J.L., Ward, C., Tripp, D., French, D.J., Adams, H. & Stanish, W.D. (2005). Secondary prevention of work disability: community-based psychosocial intervention for musculoskeletal disorders. *Journal of occupational rehabilitation*, 15(3), 377-392.
- Sullivan, M.J.L. & Stanish, W.D. (2003). Psychologically based occupational rehabilitation: the pain-disability prevention program. *The clinical journal of pain*, 19, 97-104.
- Jensen, I.B. & Bodin, L. (1998). Multimodal cognitive-behavioural treatment for workers with chronic spinal pain: a matched cohort study with an 18-month follow-up. *Pain*, 76, 35-44.
- Susan, D.B. & Katherine, P.R. (2004). Closing the gap between research and clinical practice. *Top Stroke Rehabilitation*, 11(2), 60-68.
- The Hong Kong Employment Ordinance Chapter 57 (1968).
- Tomassen, P.C., Post, M.W. & van Asbeck, F.W. (2000). Return to work after spinal cord injury. *Spinal Cord*, 38, 51-55
- Tourigian, R. (2003). How is a job coach used in the return to work process?. *Case management update*. 51(7), 287-289.
- Tsoi, M.M., Ho, E. & Mak, K.C. (1986). Becoming pregnant again after still birth or the birth of a handicapped child. *In Hormones and Behavior*, 310-316.
- Tufescu, T.V. & Buckley, R. (2001). Age, gender, work capability, and worker's compensation in patients with displaced intraarticular calcaneal fractures. *Journal of Occupational Trauma*, 15(4), 275-279.
- Tulder, M.W., Ostelo, van R., Vlaeyen, J.W.S., Linton, S.J., Morley, S. J. & Assendelft, W.J.J. (2000). Behavioral treatment for chronic low back pain, a systematic review within the framework of the cochrane back review group. *Spine*, 26, 270-281.

Turner, J.A., Franklin, G., Heagerty, P.J. Egan, K., Fulton, K.D., Gluck, J.V. & Wickizer, T.M. (2004). The association between pain and disability. *Pain*, 112(3), 307-314.

Vandergroot, D. (1987). Review of placement research literature: implication for research and practice. *Rehabilitation Counseling Bulletin*, 30, 243-272.

Veen, van der J., Bakx, C., Hoogen, van den H., Verheijden, M., Bosch, van den W., Weel, van C. & Staveren, van W. (2002). Stage-matched nutrition guidance for patients at elevated risk for cardiovascular disease: a randomized intervention study in family practice. *The journal of family practice*, 51(9), 751-758.

Waddell, G. (1987). A new clinical model for the treatment of low-back pain. *Spine*, 12, 632-644.

Waddell, G. (1992). Biopsychosocial analysis of low back pain. *Clinical Rheumatology*, 6, 523-557.

Waddell, G. (1998). *The back pain revolution*. Edinburgh: Churchill Livingstone, 1<sup>st</sup> ed, 87-96.

Wagner, C.C. & McMahon, B. T. (2004). Motivational interviewing and rehabilitation counseling practice. *Rehabilitation counseling bulletin*, 47(3), 152-161.

Walling, M. (1996). *The guide: social security benefits and work incentives*. West Chester, PA. Service Enhancement Associates.

Ware, J.E. (2000). SF-36 health survey update. *Spine*, 25, 3130-3139.

Wassel, M. L. (2002). Improving Return to Work Outcomes, *AAOHN*, 50, 278-285.

Watson, P. J., Booker, C. K., Moores, L. & Main, C. J. (2004). Returning the chronically unemployed with low back pain to employment. *European Journal of Pain*, 8, 359-369.

Wiegmann, S.M. and Berven, N.L. (1998) Health-locus-of-control beliefs and improvement in physical functioning in a work-hardening, return to-work program. *Rehabilitation Psychology*, 43, 83-100

Williams, R.M. & Westmorland, M. (2002). Perspectives on workplace disability management: A review of the literature. *Work*, 19, 87-93.

Wing, L.S. (1999). *Cervical spinal disorders: a textbook for rehabilitation sciences students*. Springer, 1<sup>st</sup> ed., 227-239.

Yasuda, S., Wehman, P., Targett, P., Cifu, D. & West, M. (2001). Return to work for persons with traumatic brain injury. *American Journal of Physical Medicine & Rehabilitation*, 80(11), 852-864.

Yasuda, S., Wehman, P., Targett, P., Cifu, D. & West, M. (2002). Return to work after spinal cord injury: a review of recent research. *Neurorehabilitation*, 17(3), 177-186.

Yates, C.R. (2003). The concerns and issues of injured workers in relation to claims/injury management and rehabilitation: the need for new operational frameworks. *Disability and Rehabilitation*, 25(16), 898-907.

Zimmerman, G. I., Olsen, C.G. & Bosworth, M.E. (2000). A 'stages of change' approach to helping patients change behavior. *American family physician*, 61, 1409-1416

## Appendices I

### 香港工人健康中心 香港理工大學

項目：工傷及職業病患者康復就業支援服務

#### 同意書

本人同意參與香港工人健康中心及香港理工大學康復治療科學系統同開發的康復就業支援服務及研究計畫。本人明白這計畫會在隨機抽樣後安排我參與以下其中的一組：這包括 1) 即時開始六星期的課堂及就業輔導，2) 即時開始兩星期的課堂及延長三星期的就業輔導，或 3) 六星期的輪後時間然後開始課堂及就業輔導。本人明白這個安排不會影響我接受再培訓計畫的權利及效果，而每一個組別所接受的課程內容及職員的服務是沒有明顯的差異。

本人知道參與這個計畫會接受在能力、態度、心理及健康狀況的評估。評估的過程中需要利用簡單的器材、面試或問卷調查。評估的地點均會在香港工人健康中心進行。評估的時間每次大概是兩個半小時。本人明白在評估過程中可能感覺疲倦，但這感覺是短暫的，及在休息後會恢復正常。

本人有權在課程任何時間內提出終止服務及停止參與研究。本人也有權在評估過程中不回答認為敏感的問題。若終止服務，本人除了得不到再培訓計畫的附帶福利之外，本人是有權再參與香港工人健康中心舉辦的其他服務或計畫。

本人知道在這個服務/研究中取得的資料是絕對保密。本人同意給予香港工人健康中心及香港理工大學有限度的運用這些資料。這包括自培訓課程及就業輔導的個案安排，或在學術及教學的用途。但如作學術及教學之用時，本人的身份及北京將不會被披露，而本人也有權知道自己的資料及這些資料的用途。

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學員簽署： \_\_\_\_\_ 日期： \_\_\_\_\_

學員姓名： \_\_\_\_\_

職員/研究人員簽署： \_\_\_\_\_ 日期： \_\_\_\_\_

職員/研究人員姓名： \_\_\_\_\_

証人簽署： \_\_\_\_\_ 日期： \_\_\_\_\_

証人姓名： \_\_\_\_\_

Appendices II

**Content of the Training and Placement Program**

Parts	Components	Duration	Session contents
Training intervention	Individual counseling	3 x 50-min	To facilitate the client to recognize the needs, values, and interests, set realistic vocational goals, remove return to work barriers, tackle the psychological hurdles and to provide information on the common problems
	Pain management	6 x 50-min	To provide information and learning of strategies to combat the client's chronic pain problems with cognitive behavior approaches
	Stress management	6 x 50-min	Learning different strategies to tackle the stress associated with the disability, loss of work role, and reengagement in work role with cognitive behavioral approaches
	Work adjustment	6 x 50-min	To offer counseling to enhance the client's self-esteem, reestablish worker's role, understand the meaning, value, and demands of work, modify attitudes and work behavior, relate to coworkers and employer, and accept supervision, and obtain information on the labor market
	Psychosocial adjustment	6 x 50-min	To provide information on the common problems that the client may encounter in the family and financial status associated with the disability, lost of employment income, lesser earning capacity, and reengagement in the competitive job market
	Job acquisition and interview skills	3 x 50-min	To provide with the path to find the job resource, detail of the interview process document preparation for interview, writing application form, role play of interview scenes

To be continued

Parts	Components	Duration	Session contents
Job placement	Updated data bank of work information Job recommendation Encouraging clients to do the job hunting actively	3 weeks	To establish a daily up-dated job bank which is relevant to general profile of the client, formulate a job demand checklist for each of the jobs based on a minimum database with reference to DOT, conduct a daily worker-job match based on the client's functional capacity and psychosocial profile and to liaise with potential employers the abilities and limitations of the client Companing the clients to employing interview meeting

### 家居操作能力自評問卷

姓名：\_\_\_\_\_ 日期：\_\_\_\_\_

編號：\_\_\_\_\_ 性別/年齡：\_\_\_\_\_ 治療師：\_\_\_\_\_

與受傷前比較，現在使用此工具時 . . . . .

0 – 沒有改變，1 – 工作速度減慢，2 – 要額外休息，3 – 不能使用，4 – 不知道

工具	0	1	2	3	4
1. 購屋籃					
2. 衣車					
3. 髮刷					
4. 滴管					
5. 電腦鍵盤					
6. 鑊鏟					
7. 筆記板					
8. 抹塵布					
9. 地拖					
10. 推帚					
11. 吸塵機					
12. 掃帚					
13. 泥鏟					
14. 剪草剪					
15. 匙					
16. 購物車					
17. 盛物盤					
18. 電剪					
19. 電風筒					
20. 大煲					
21. 編織針					
22. 生果刀					

工具	0	1	2	3	4
23. 打字機					
24. 鋤頭鉗					
25. 海棉地拖					
26. 泥耙					
27. 吸塵機					
28. 電話筒					
29. 奶茶杯碟					
30. 啤酒杯					
31. 手推車					
32. 開瓶蓋					
33. 開棉潔布					
34. 刷子機					
35. 士巴拿					
36. 釘書機					
37. 鉗子					
38. 刮鏟					
39. 大剪刀					
40. 豬肉刀					
41. 平底鍋					
42. 菜刀鍋					
43. 長嘴鉗					
44. 羽毛帚拖					

Transposition				
	-ve	+ve		
1 <sup>st</sup> order			ERRORS	
2 <sup>nd</sup> order			Reliability	
3 <sup>rd</sup> order			Reliability	
4 <sup>th</sup> order			Reliability	

工具	0	1	2	3	4
45. 打孔鉗					
46. 螺絲批					
47. 噴殺虫水					
48. 手鎚					
49. 文件櫃					
50. 小鉗					
51. 燙斗					
52. 原子筆					
53. 鬆肉鎚					
54. 抹窗帚					
55. 計數機					
56. 縫衣針					
57. 小螺絲批					
58. 鋅錫批					
59. 大水瓶					
60. 小螺絲批					
61. 生果刀					
62. 海棉地拖					
63. 木鋸					
64. 漆帚					
65. 修枝剪					
Total:					



香港工人健康中心

香港理工大學

工傷及職業病患者  
康復就業支援服務

腰背功能自評問卷

就以下的操作，你總認為目前你做起來  
1. 毫無困難      2. 有些少困難      3. 有相當困難      4. 有很大困難      5. 極困難，做不來      6. 不知道

操作	1	2	3	4	5	6	操作	1	2	3	4	5	6	操作	1	2	3	4	5	6
1. 放下牛奶瓶							18. 打釘入木							35. 抱 20 磅行 100 呎						
2. 拾起鑼絲批							19. 洗碗碟							36. 攜 2X10 磅行 100 呎						
3. 用吸塵機							20. 修剪花策							37. 爬上高梯						
4. 用購物車							21. 換天花燈泡							38. 攜 20 磅桶上高梯						
5. 取放 5 磅罐							22. 裝電制插板							39. 推擦子擦地						
6. 取放 5 磅罐 (高)							23. 鋸木方							40. 用掃把掃地						
7. 搬下 10 磅箱 (高)							24. 拔木釘							41. 搬下 50 磅箱 (高)						
8. 搬下 10 磅箱							25. 倒出一小杯洗潔精							42. 提下 50 磅箱						
9. 搬下 10 磅箱 (高)							26. 運圾垃圾桶							43. 搬起 50 磅箱 (高)						
10. 搬下 10 磅箱							27. 用洗碗碟機							44. 提起 50 磅箱						
11. 放起 20 磅日用品							28. 掘泥							45. 搬下 100 磅箱 (高)						
12. 搬下 20 磅箱 (高)							29. 推大門							46. 搬下 100 磅箱						
13. 取出 20 磅日用品							30. 走進駕駛座							47. 搬起 100 磅箱 (高)						
14. 搬起 20 磅箱 (高)							31. 拉大門							48. 搬起 100 磅箱						
15. 取 2X10 磅日用品							32. 走出駕駛座							49. 在眼前處掃漆						
16. 提起 20 磅箱							33. 抬 10 磅梯行 50 呎							50. 取放 5 磅罐 (高)						
17. 在眼前處掃漆							34. 攜 30 磅桶行 50 呎							總數						
FCE:	PDC Sedentary		PDC Light		PDC Medium		PDC Heavy		PDC Very Heavy		RPC = ( )				分					
RPC Score:	100-110		125-135		165-175		180-190		>196						X4	X3	X2	X1		

## 林氏就業準備評估 – 修訂版 (L.A.S.E.R. – M.)

## 中文譯本

姓名: \_\_\_\_\_ 性別: 男 女 今天日期: \_\_\_\_\_ 出生日期: \_\_\_\_\_

此問卷可幫助我們更了解你的需要。每句句子的描述了一個人開始求職服務計劃時的感覺。請在適當的方格用別號(✓)指出你對每句句子的同意程度。請依照你現在的感覺去決定您/你的選擇，而非您/你過去或將來的感覺。

	非常 不同意	不同意	不確定	同意	非常 同意
1. 我覺得我應該準備好去搵工。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. 我正為自己搵工做一些功夫。 (例如: 見工、填職位申請表等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. 我認為花功夫在搵工上應該是值得的。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. 我已在未來數星期內預留時間為工作好準備。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. 我根本無能力工作，我不明白為何參加這計劃。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. 我終於正在為搵工做一些功夫。 (例如: 見工、填職位申請表等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. 我想現在應該是我搵工的適當時機。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. 我正在尋找關於搵工的資料。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. 我根本沒有能力工作，我覺得為搵工作好準備是浪費我的時間。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. 雖然我覺得無工做是不好，但我現在是無能為力。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. 我知我需要搵工，我認真地覺得我是須要這樣做。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. 我現正嘗試尋找搵工的途徑。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. 其他人告訴我我應該要搵工，但我並不同意他們的講法。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. 任何人都可以空談自己想搵工，但我實際正為搵工做一些工夫。(例如: 見工、填職位申請表等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. 我準備數星期內搵工。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. 所有這些關於搵工的問題都十分沉悶，為什麼人們不能讓我靜一靜?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. 我正在積極地去搵工。(例如: 見工，填職位申請表等)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. 我根本不想搵工，為搵工作準備根本是浪費時間。	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. 你對再次返工的信心有幾大?

20. 你對成功搵工的信心有幾大?

參與者對此計劃的預期

請註明: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

那些是參與者指出的就業障礙?

研究人員評語:

- |                                 |                                    |                                 |                                    |
|---------------------------------|------------------------------------|---------------------------------|------------------------------------|
| <input type="checkbox"/> 照顧子女   | <input type="checkbox"/> 學習上有困難    | <input type="checkbox"/> 照顧子女   | <input type="checkbox"/> 學習上有困難    |
| <input type="checkbox"/> 交通     | <input type="checkbox"/> 社會技能不足    | <input type="checkbox"/> 交通     | <input type="checkbox"/> 社會技能不足    |
| <input type="checkbox"/> 工作技能不足 | <input type="checkbox"/> 濫用藥物      | <input type="checkbox"/> 工作技能不足 | <input type="checkbox"/> 濫用藥物      |
| <input type="checkbox"/> 工作經驗不足 | <input type="checkbox"/> 其他: _____ | <input type="checkbox"/> 工作經驗不足 | <input type="checkbox"/> 其他: _____ |
| <input type="checkbox"/> 身體殘疾   | <input type="checkbox"/> 其他: _____ | <input type="checkbox"/> 身體殘疾   | <input type="checkbox"/> 其他: _____ |

我相信參與者提供的資料是準確的。

- 是
- 不是

評語: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

問卷由 \_\_\_\_\_ 完成

研究人員姓名

## Appendices VI

香港工人健康中心

香港理工大學

工傷及職業病患者  
康復就業支援服務

簡明健康狀況調查表 (SF – 36)

姓名：\_\_\_\_\_

說明調查是詢問您對自己健康狀況的了解。此項資料記錄您的自我感覺和日常生活的情況。

請您按照說明回答下列問題。如果您對某一個問題不能不做出肯定的回答，請按照您的理解選擇最合適的答案。

1. 總括來說，您認為您的健康狀況是：

(只圈出一個答案)

- 極好 ..... 1  
很好 ..... 2  
好 ..... 3  
一般 ..... 4  
差 ..... 5

2. 和一年前相比較，您認為您目前全面的健康狀況如何？

(只圈出一個答案)

- 比一年前好多了 ..... 1  
比一年前好一些 ..... 2  
和一年前差不多 ..... 3  
比一年前差一些 ..... 4  
比一年前差多了 ..... 5

3. 下列各項是您日常生活中可能進行的活動，以您目前的健康狀況，您在進行這些活動時，有沒有受到限制？如果有的話，程度如何？(只圈出一個答案)

活動	有很大限制	有一點限制	沒有任何限制
a. 劇烈運動，如跑步，搬重物，或參加劇烈的體育活動	1	2	3
b. 中等強度的活動，如搬桌子，使用吸塵器清潔地面或打太極	1	2	3

c. 提起或攜帶蔬菜	1	2	3
d. 上幾層樓梯	1	2	3
e. 上一層樓梯			
f. 彎腰，跪下，或俯身	1	2	3
g. 步行十條街以上(一公里)	1	2	3
h. 步行幾條街	1	2	3
i. 步行一條街	1	2	3
j. 自己洗澡或穿衣服	1	2	3

4. 在過去四星期裏，你在工作或其他日常活動中，有沒有因為身體健康的原因而遇到大列的問題? (只圈出一個答案)

	有	沒有
a. 減少了工作或其他活動時間	1	2
b. 實際做完的比想做的要少	1	2
c. 工作或其他活動的種類受到限制	1	2
d. 完成工作式或其他活動時有困難	1	2

5. 在過去四星期裏，你在工作或其他日常活動中，有沒有因為情緒方面的原因(比如或到沮喪或焦慮)而遇到大列的問題? (只圈出一個答案)

	有	沒有
a. 減少了工作或其他活動時間	1	2
b. 實際做完的比想做的要少	1	2
c. 工作或從事其他活動時不如往常細心了	1	2

6. 在過去四星期裏，你的身體健康或情緒問題在多大程度上妨礙了你與家人、朋友、鄰居或社團做日常社交活動? (只圈出一個答案)

- 毫無影響 ..... 1
- 有很少影響 ..... 2
- 有一些影響 ..... 3
- 較大影響 ..... 4
- 有極大影響 ..... 5

7. 在過去四個星期裏，你的身有沒有疼痛? 如果有的話，疼痛什麼程度?

(只圈出一個答案)

- 完全沒有 ..... 1
- 很輕微 ..... 2
- 有一些 ..... 3
- 劇烈 ..... 4
- 非常劇烈 ..... 5

8. 在過去四星期裏，您身體上的疼痛對您的日常工作 (包括上班和家務)有多大影響?

- 毫無影響 ..... 1
- 有很少影響 ..... 2
- 有一些影響 ..... 3
- 較大影響 ..... 4
- 有極大影響 ..... 5

9. 下列問題是有關您在過去四個星期裏的自我感覺和其它情況。針對每一問題，請選擇一最接近您的感覺的答案。在過去四個星期裏有多少時間: (每項只圈出一個答)

	常 常 如 此	大 部 分 時 間	相 當 多 時 間	有 時	偶 爾	從 來 沒 有
a. 您覺得充滿活力?	1	2	3	4	5	6
b. 您覺精神非常緊張?	1	2	3	4	5	6
c. 您覺得情緒低落，以至於沒有任何事能使您高興起來?	1	2	3	4	5	6
d. 您感到心平氣和?	1	2	3	4	5	6
e. 您感到精力充足?	1	2	3	4	5	6
f. 您覺得心情不好，悶悶不樂?	1	2	3	4	5	6
g. 您感到筋疲力盡?	1	2	3	4	5	6
h. 您是個快樂的人?	1	2	3	4	5	6
i. 您覺得疲倦?	1	2	3	4	5	6

10. 在過去四星期裏，有多少時間由於您的身體健康或情緒問題妨礙了您的社交活動(如探親、訪友等)？

- 常常有影響 ..... 1
- 大部分時間有影響 ..... 2
- 有時有影響 ..... 3
- 偶爾有影響 ..... 4
- 完全沒有影響 ..... 5

11. 如果用下列的句子來形容您，您此認為有多正確？

	肯定對	大致對	不知道	大致不對	肯定不對
您好像比別人更容易生病	1	2	3	4	5
您和所有您認識的人一樣健康	1	2	3	4	5
您覺得自己的身體狀況會變壞	1	2	3	4	5
您的健康極好	1	2	3	4	5

香港工人健康中心

香港理工大學

工傷及職業病患者  
康復就業支援服務

The Chinese State-Trait Anxiety Inventory

以下是一些人用來形容自己的句子。請閱讀每一句後將你現時的感覺用“O”號表示在右方適當的空間上，答案是沒有分對或錯的，不要花太多時間在任何句子上，只要將最能表達你現時感覺的答案表示出來就可以了。

- 例：我感到痛苦 請圈 (1) 如果你現在完全沒有感到痛苦  
(2) 如果你現在感到一點兒痛苦  
(3) 如果你現在感到相當痛苦  
(4) 如果你現在感到十分痛苦

	<u>完全</u>			
	<u>沒有</u>	<u>一點兒</u>	<u>相當</u>	<u>十分</u>
1. 我感到平靜	1	2	3	4
2. 我感到安心	1	2	3	4
3. 我感到壓力	1	2	3	4
4. 我是後悔	1	2	3	4
5. 我感到從容	1	2	3	4
6. 我感到煩惱	1	2	3	4
7. 我正在擔心可能會發生的不幸事情	1	2	3	4
8. 我感到安寧	1	2	3	4
9. 我感到焦慮	1	2	3	4
10. 我感到舒服	1	2	3	4
11. 我感到自信	1	2	3	4
12. 我感到緊張	1	2	3	4
13. 我感到心神不定	1	2	3	4
14. 我感到神經過敏	1	2	3	4
15. 我感到鬆弛	1	2	3	4
16. 我感到滿足	1	2	3	4
17. 我感到擔心	1	2	3	4
18. 我感到過份興奮和失措	1	2	3	4
19. 我感到喜悅	1	2	3	4
20. 我感到愉快	1	2	3	4