The Hong Kong Polytechnic University

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The Return to Work Model for Injured Workers in Hong Kong

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CERTIFICATE OF ORIGINALITY

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Abstract

Return to work (RTW) after work injuries remains a big challenge among injured workers, employers and rehabilitation professionals. Previous studies have indicated that one of the predictors of successful RTW is work readiness of the workers. The use of Lam Assessment of Stage of Employment Readiness (LASER) for evaluation of work readiness was found to be a valid predictor for workers' RTW.

This study therefore aimed to validate the LASER for assessment of work readiness among injured workers in Hong Kong. It was first translated into the Chinese version (C-LASER). The psychometric properties including the content-related, construct and predictive validity and the test-retest reliability were then be testified. The validated C-LASER was used to test the work readiness and psychosocial aspects of the injured workers' RTW in Hong Kong before and after completion of an RTW program.

This study was divided into two phases. Phase I of the study focused on validation of the C-LASER which aimed to collect evidence of psychometric properties of C-LASER and to provide a valid assessment tool for measurement of subject's readiness towards employment. Phase II collected evidence of process of

RTW of subjects who were injured workers in Hong Kong in order to substantiate the RTW model.

In the phase I of the study, the results indicated a two-factor solution by factor analysis. Factor 1 represented those at contemplation and action stages whereas Factor II represented those at the pre-contemplation stage. Further cluster analysis with Ward's method suggested a two-cluster solution. Multivariate analysis showed that participants classified under cluster 1 (Ready for Actioners) had significantly higher Short Form 36 (SF-36) sub-scores than those under cluster 2 (Precontemplators). Results suggested that C-LASER was useful in differentiating workers' work readiness represented by at least two C-LASER profiles. The "ready for action" group of workers was found to have significantly higher physical function, less pain and higher social function than those in the "pre-contemplation" group. Although the ready for action group had a higher rate in RTW, it was statistically insignificant (Chi-square, p=0.17). One of the most significant findings was the combined contemplation and action stages. This could be attributable to the high values which Chinese workers placed on working, the existing workers' compensation and social security system in Hong Kong. However, human capital factors such as educational level and age did not associate with the "pre-contemplation" versus

“contemplation and action” effect.

Results in Phase II showed that factor 1 sub-score, social functioning and role emotional of SF-36 were found retained in the model by stepwise logistic regression. Further cluster analysis with Ward’s method suggested two-cluster solutions based on the factor sub-scores in all three assessment occasions. Significant group effects were identified by multivariate analysis which subjects in cluster 1 had significantly higher sub-scores on factor 1, while they had lower sub-scores on factor 2 than their cluster 2 counterparts in all three assessment occasions. Subjects in cluster 1 had higher RTW rate, as recorded within 6 months after the first assessment, when compared to those of the cluster 2. Results suggested that C-LASER factor sub-scores appeared to be important factors in predicting subjects’ RTW status. Through further analysis, subjects’ readiness towards RTW seemed to be much affected by their psychosocial factors such as perceived functioning and bodily pain. Franche and Krause’s model (2002) had divided the progress into three different aspects: decisional balance, self-efficacy and process of change which could explain the differences by their C-LASER factor sub-scores. The concept of secondary loss (Gatchel, Adams, Polatin & Kishino, 2002) could plausibly explain the contribution of role emotion and social functioning on subjects’ decision on RTW.

Publications Related to the Project

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Chapter 1

Introduction

1.1. Background of the Study

Work-related injuries have cost consumers and society directly and indirectly, including compensation, loss of working days, costs of hiring and training new employees or temporary workers, loss of profits, increased overhead cost during work interruption, decreased employee morale and efficiency (Wassel, 2002). Vocational rehabilitation has become one of the important services that rehabilitation professionals offer to injured workers aiming at helping them to return to work (RTW) (Ford & Sweet, 1999). It also serves as a critical part of rehabilitation services to assist individuals with disabilities in achieving community integration, to become financially self-sufficient, and to enhance quality of life (Kosciulek, 2004). However, a significant percentage of injured workers still cannot return to the work force even after intensive vocational rehabilitation in hospitals or rehabilitation settings.

Most of the injured workers had residual physical disabilities after the injuries, such as chronic pain, limitation in movements, poor muscle strength and endurance. The vocational rehabilitation programme provided in hospitals and rehabilitation

settings often put a lot of emphasis on retraining of physical capacity, work conditioning, and work hardening through simulated post-injury work training. Despite their progress on physical rehabilitation, some of these injured workers still have difficulties to RTW. Most of the time, the problem of RTW is thought to be associated with the physical problems arising after injuries. However, a previous study has already reported that the rate of RTW was not associated strongly with the severity of the physical disabilities (Punnett & Wegman, 2004)

It appears that psychosocial factors seem to contribute to the failure of RTW as reflected by previous researchers and these factors are overlooked during the rehabilitation processes including self-perceived general health (Oleske, Andersson, Lavender & Hahn, 2000; Punnett & Wegman, 2004), low self-confidence (Magni, Moreschi, Rigatti & Merskey, 1994) and other human capital factors such as age and educational level (Bongers, Winter, Kompier & Hildebrandt, 1993; Tomassen, Post & Van Asbeck, 2000). In addition, some predisposing factors such as perceptions of work and the workplace, the salary, compensation system and conditions of employment may also affect the motivation for an injured worker to RTW (Main & Burton, 2000). All of the factors described above may have direct impact on a worker in RTW.

The process of RTW involves both psychological and behavioral changes (Berglind & Gerner, 2002) which require a more complicated process of analysis and evaluation. The introduction of stages of change model (Prochaska & DiClemente, 1992) provides a new theoretical framework in understanding both the psychological and behavioral changes among injured workers upon RTW. The injured workers will normally go through a stage of change of work readiness from the pre-contemplation stage (when the worker still concerns about the physical and psychosocial problems arising from the injury) to the action stage (when the worker is ready to return to the work force and get started). The whole process is affected by a lot of personal and environmental factors stated above. From the past experiences, workers are presumed to get into the action stage after the vocational rehabilitation programme at the hospitals and rehabilitation settings and ready to RTW. However, previous studies have indicated that even with intensive physical training, some of the workers still fail to re-enter the work force due to the fact that they are not ready to RTW. They are often misinterpreted by employers or professionals as problematic and un-cooperative. Unfortunately, they were not given appropriate intervention to help them to get ready to RTW.

It is therefore essential to develop an objective evaluation tool to provide valid and reliable evaluation of the psychological changes of the injured workers such that appropriate intervention can be implemented to these workers and to assist them in RTW.

This study is therefore designed to explore and formulate the RTW model for injured workers in Hong Kong addressing both the physical and psychosocial needs of the injured workers and to validate an objective tool to assess the stage of work readiness among these injured workers.

This study is divided into two phases. Phase I of the study focuses on the validation of the Chinese Lam Assessment of Stages of Employment Readiness (C-LASER) which aims to collect evidence of psychometric properties of C-LASER and to provide a valid assessment tool for measurement of subject's readiness towards employment in Phase II. Such validation includes expert panel review of C-LASER and its field test with injured workers. Phase II of the study aims to verify the RTW model for injured workers by testing the importance of different psychosocial factors in influencing the RTW status of a group of injured workers in order to substantiate the RTW model.

Chapter 2

Literature Review

2.1. Importance of Work among the Chinese

Work is significant to human development and functioning (Freedom et al., 1995). It helps to define a person's status, provides satisfaction and a sense of self-worthiness. People develop social interactions and friendship through working (Walling, 1996). In Chinese culture, a person has to be engaged in productive work before he/she is considered as independent in the society. Most Chinese people also consider work as more important than other chores of life such as leisure activities. If a person is injured and cannot participate in any productive work tasks, the psychological and psychosocial impact to the person would be tremendous.

2.2. Work Related Injuries and Their Impact on Society

Musculoskeletal injuries are the most common work-related injuries and disability in many western countries (Williams et al., 2002). It is among the most prevalent medical problems of the working population, affecting 7% of the 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 independent body function lost, but it can leave the person with chronic pain, physically dis-conditioning, decreased soft tissue flexibility or reduced endurance (Punnett et al., 2004).

In Hong Kong, the incidence rate of work injuries ranged from 2.36% to 1.78% in the past ten years from 1996 to 2005 (Labour Department, 2006). Although the percentage of injuries has dropped significantly from 2.36% in 1996 to 1.78% in 2005, the management of these injured workers remains a big challenge to the medical and rehabilitation professionals.

The impact of work related injuries is huge in terms of the personal, social and economical losses created. From the personal basis, an injured worker may not be able to regain the physical capacity as before which may affect the work tolerance and endurance. Some may have developed chronic pain due to the physical injuries, thus affecting his/her daily functions. From the social and economic perspective, loss of work days and productivity will bring out burden to the society and to the economy. In addition, there will be huge expenditure on legal claims and settlement of compensation. From 2000 to 2003, the total compensation paid to injured workers in Hong Kong annually was HK$1.002 billion, HK$1.007 billion, HK$1.12 billion and

HK$1.24 billion respectively (Labour Department, 2004). These sums corresponded to 0.07%, 0.08%, 0.09% and 0.1% of Gross Domestic Produce (GDP) in the respective years.

In addition to the huge compensation expenditure, these injured workers will have to face the challenge when returning back to the work force. If they are unsuccessful in RTW, the burden to the society will be further amplified. Due to lack of income to support their own families, these workers may have to seek financial assistance from social welfare system. In addition, workers may develop depression, anxiety and poor self esteem leading to multiple personal and social problems within their family or peer groups. In some extreme circumstances, these workers may have suicidal tendency. Therefore, it is extremely important to provide appropriate medical and rehabilitation services for these injured workers who have problems in RTW.

2.3. Rehabilitation Services for Injured Workers in Hong Kong

In Hong Kong, vocational rehabilitation services are mainly conducted in large hospitals, which usually include general strengthening exercises, functional capacity evaluation, progressive work hardening and work conditioning program, job analysis and ergonomic modification, education on proper body mechanics and stress management techniques (Chan, Li, Hung & Lam, 1999). However, despite the major vigorous physical training, work hardening and conditioning, some injured workers still fail to RTW. Musculoskeletal injuries may not lead to severe long term disability, but may result in chronic conditions such as chronic pain, physically disconditioning, decreased soft tissue flexibility or reduced endurance (Punnett & Wegman, 2004). This may cause psychosocial adjustment problems following disabilities (Bongers, Winter, Kompier & Hildebrandt, 1993), which are in relation to low control on the job, lack of social support and perceived stress, or due to distress (Tomassen, Post & Van Asbeck, 2000) in relation to lack of long-term support in job seeking of less demanding job. The management of psychosocial aspects of disabilities and the psychosocial adjustment of workers towards the disabilities are often missed in our conventional vocational rehabilitation programme provided in hospitals and rehabilitation centers.

Previous studies indicate that these psychosocial aspects appear to be better predictors on RTW instead of focusing only on the physical outcomes (Schultz et al., 2004). Some workers with more severe injuries may still be successful in RTW but some with minor physical trauma may end up idling at home. Therefore, it is essential to have an in-depth analysis of the behavioral changes of these workers subsequent to their injuries. A more comprehensive model to explain these phenomena should be developed to identify the underlying problems of these injured workers such that the vocational rehabilitation programme can be enhanced to facilitate injured workers in RTW.

2.4. Factors Affecting Injured Workers' Return to Work

2.4.1. Age, Gender and Social Background

Previous studies have reported there are positive relationships between age, gender, social background and workers' RTW (Marhold, Linton & Melin, 2001, Anema, Giezen, Buijs & Mechelen, 2002). There is a general trend that younger workers may have a higher RTW rate when compared to an older group of workers (Barlow et al., 2003, Watson et al., 2004). This may be due to better general health in younger workers. The younger workers may also be more motivated than the older ones to seek for job opportunities. Thus, they are more attractive to the labor

market in general (Anema et al., 2002). The readiness and the inner drive to RTW seem to vary from workers to workers which affect the success to RTW.

2.4.2. Psychological Factors

Different studies have tried to identify the psychosocial factors that affect injured workers' RTW. The most commonly identified factors include their self perception of general health (as measured by self-rated general health status) (Oleske, Andersson, Lavender & Hahn, 2000), low self-confidence, depression or anxiety arising after the work related musculoskeletal injuries (Magni, Moreschi, Rigatti & Merskey, 1994), and the psychosocial adjustment problems following the acquired disabilities (Bongers, Winter, Kompier & Hildebrandt, 1993).

Self perceived health status appears to be one of the key factors that affect an injured workers' view to 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 in their physical functioning than those without it. Their rate of RTW also appeared to be higher than those with lower self-perception of health.

Depression and anxiety levels are negatively correlated with the successful rate of RTW. As the intensity of depression and anxiety increases, the successful rate of RTW of injured workers will decrease. Marhold's group (2002) conducted 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 encourage injured workers to RTW.

Psychological impairment can be a significant factor in limiting RTW. A delay in return to normal function is found associated with poor psychosocial functioning (Atroshi, et al., 2002). A prolonged absence from the workplace has adverse effect on mental and physical health (Franche et al., 2002).

Another study done by Giezen, Bouter, & Nijhuis (2000) shows that sick leave among employees with chronic low back pain is more related to psychosocial and economic factors and less related to physical factors like activities of daily living (ADL) capacity, radiating pain, physical requirements in the job, or the labor sector in which the person is employed, for example, construction. Bernacki (2004) has also

highlighted 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.

Previous studies conducted in US indicate that only 37 percent of injured workers with spinal cord injuries return to gainful employment, often to a less physical-demanding job (Tomassen, Post & Van Asbeck, 2000). Although there is no statistical report on the rate of RTW after work injury in Hong Kong, there should be a similar trend. A recent local study conducted by Cheng and Li (2005) reported that psychosocial factors influence the rehabilitation outcome and the success of reintegration into competitive employment. The study also found that those workers who lived with their spouse and/or children tended to have a higher anxiety level than those who lived alone or with parents or friends. When a worker lost his or her job because of injury, a high level of psychological stress would be perceived by the worker as well as by the family members. Previous studies also show that a high anxiety level at the time of injury as well as during rehabilitation has a negative impact on the rate of RTW after the injury (Vingilis et al., 1996). The more supportive the family members are to the workers, the better the outcome of RTW

may be. On the other hand, if the family members are not supportive, the worker will undergo extreme stress to cope with both the physical impairment as well as the tension with the spouse or other family members.

It is also found that some workers after injuries may be deprived of social interactions. Prior to their injury, they could have a strong social bonding at the work place. However, after the injuries, they are often left at home or attending therapy sessions while their friends and colleagues would be at work during the day. Thus, they are deprived of their own social life. This may at times trigger the anxiety and they might also become depressed (Cheng & Li, 2005)

2.5. Review of Theoretical Frameworks on Return–to-Work

Since there are so many factors affecting an injured worker in RTW, it is deemed necessary to review various models of vocational rehabilitation and to explore how a theoretical model could be formulated to explain how these factors will affect the injured workers' RTW. With the formulation of the theoretical framework, different evaluation and intervention strategies would then be developed. The following review describes different theoretical frameworks in vocational rehabilitation.

2.5.1. Supportive Competitive Employment Model

Hill (1988) proposed a Supported Competitive Employment Model which aims at providing individualized and intensive assistance to clients in the competitive employment including job placement, job-site assessment and training and long-term follow-along support.

2.5.2. Individual Placement and Support Model

Bond (1998) proposed the Individual Placement and Support Model focusing on integrating work settings and time-unlimited support which aims competitive employment as the goal with rapid job search and continuous assessment (Drake, Becker, Clark & Muesser, 1999). Unlike the Supportive Competitive Employment Model, this model focuses more on job placement rather than training. Schultz et al. (2004) also suggested an RTW model for people with occupational low back disability. The key psychosocial predictors identified in this model are expectations on recovery, perception of health change, occupational stability, skill discretion at work, co-worker support, and the response from workers' compensation system and employer to the disability which covers some of the internal and external psychosocial factors. Among the models described above, the target behavior, resume employment, plays a crucial role.

However, individual's readiness to RTW is found to play a crucial role in predicting injured workers' success in resuming a worker's role (Franche & Krause, 2002). RTW involves changes, both psychologically and behaviorally. These changes form a complicated process which requires a complete different perspective to study. The Stages of Change Model (Prochaska, DiClemente & Norcross, 1992) provides a theoretical framework of such process of changes.

2.5.3. Stages of Change Model

Kalil, Schweingruber, and Seefeldt (2001) found that cognitive and emotional factors such as the level of depressive symptoms, attitudes toward work, and perceived risks associated with RTW are significantly related to employment success. The study by Kalil, et al. (2001) gives credence on studying return–to-work from a social cognitive perspective. Thus, this session has two major purposes, 1) to present the theoretical conceptualization of the Stage of Change Model in RTW, and 2) to describe the development of the Lam Assessment on Stages of Employment Readiness (LASER), which was adapted from Prochaska's model of Stages of Change (Prochaska, DiClemente & Norcross, 1992). Along with the report, we present preliminary results on LASER's psychometric properties and discuss its potential use in RTW.

The Stages of Change Model proposed by Prochaska, DiClemente & Norcross ,(1992) offers a theoretical model to capture the changes of people going through the process, from not acknowledging the problem itself, to changing their own behaviors such as addiction, weight reduction, etc. This suggests a possible framework of exploring the process of RTW of injured workers. This model suggests that the changing process varies at different stages. Cognitive and experiential processes, which involve considerations of pros and cons of change, are more salient in the early stages of change, and behavioral processes become increasingly important and frequent during later stages (Velicer, DiClemente, Prochaska & Brandenburg, 1985). These provide the preliminary framework of studying the mechanism of how people change from one behavior to another. Later, Prochaska, DiClemente and Norcross (1992) suggested that efficient behavioral change depends on doing the right things (processes) at the right time (stages), which is important to assess the stage of an individual's stages for change and to match interventions accordingly. Various studies have been conducted for testing this stages of change model and it has been widely used in different aspects, including arthritis self-management (Keefe, et al., 2000), management of addictive behaviors such as smoking cessation (Pallonen, et al., 1998) and weight control (Greene, et al.,

1994).

According to this model, any type of behavioral change would have five stages which are connected to one another in a spiral manner. They are namely pre-contemplation, contemplation, preparation, action, and maintenance. Pre-contemplation stage is signified by individuals not having intention to change in the foreseeable future. Behaviorally, they may feel that they are being "forced or coerced" to change and express a desire to change the environment or the system, not themselves (McConnaughy, DiClemente, Prochaska & Velicer, 1989). Contemplation stage is when the individuals are more aware of the problem and begin to consider the prospects of change, but have not made a commitment to change. It is common that they seesaw and weigh the pros and cons of such change. The preparation stage is that the individuals intend to change in the near future but have not taken the action successfully in the past. Moreover, they may have made efforts to change, but have yet to reach the criterion of it. In the action stage, the individuals are involved in overt modification of the problem behavior, and hence ready to change. In the maintenance stage, the individuals put efforts to consolidate the gains, prevent relapse, and continue their changed behavior.

McConnaughy et al. (1983) developed the first stage of change measure on a group of subjects undergoing psychotherapy in order to measure the change constructs of those subjects. The Stages of Change Questionnaire (SCQ) is a 32 self-rated items instrument which contains four subscales: pre-contemplation, contemplation, action, and maintenance. These four subscales are shown to generate major and minor stage of change profiles of the subjects. Later, in a replication study conducted by McConnaughy et al. in 1989, a similar four-subscale structure is maintained. Different from the previous study, a new "contemplation" profile is identified to indicate a stage representing individuals who start to consider changing but yet to commit or to take any action. Blias and Rossi (1992) compared and synthesized five studies reporting cluster profiles of the SCQ across four problematic areas, namely psychotherapy, adolescent cigarette smoking acquisition, alcoholism treatment, and sun exposure. In two of the four problematic areas, ten stages of change cluster profiles are identified. Lam, et al. (1988) further adapted the SCQ and developed the Change Assessment Questionnaire (CAQ) for use on a group of clients with acute traumatic brain injuries. Lam, Chan and McMahon (1991) found that the CAQ possesses similar factorial structure to those reported by McConnaughy et al. (1989). With the research and applications of stages of change model (Prochaska, DiClemente & Norcross, 1992) on different target groups, this model is

further studied on workers' readiness on RTW. Clients' readiness to work has to be considered because rehabilitation professionals are likely to underserve or disserve the majority of their clients in either ways as they usually enter job services at various stages of readiness to work (Lam, 1997). Some clients are interested while others may be indifferent to the idea of work.

The stages of change model (Prochaska, DiClemente & Norcross, 1992) can be used as a theoretical framework to look at the structure of people's intention to change. It shows a schema of the stages of change from Pre-contemplation, Contemplation, Preparation, and Action to Maintenance. The parallel model for stages of work readiness proposed by Lam (1997) and the Readiness for Change Model to the Behavior of Returning to Work proposed by Franche and Krause (2002) later provide more specific insight of RTW readiness of injured workers. The Parallel Model (Lam, 1997) breaks down the readiness into five stages according to Prochaska's (1992) stages of change model, namely Indifferent stage (Pre-contemplation), Decision stage (Contemplation), Readiness stage (Preparation), Placement stage (Action stage) and Retention stage (Maintenance). The Readiness for Change Model (Franche & Krause, 2002), in addition to Prochaska's (1992) stages of change model, includes three defining dimensions of change, namely decisional balance,

self-efficacy and change process. By identifying workers' readiness to RTW, interventions can be more specific and targeted on the psychological aspects developed from the injuries which prevent them from RTW (Lam, 1997). For example, workers at Pre-contemplation stage can be enhanced to Contemplation stage by consciousness raising, i.e. increasing in providing information about individuals' relationship with desire and abilities to work, and bibliotherapy, i.e. providing clients with exposure to people with similar problems. Workers at Contemplation stage can be enhanced to Preparation stage by self-reevaluation to provide clients more clear picture of his/her feelings and facts of RTW. Workers at Preparation stage can be enhanced to Action stage by job readiness skill training and case management.

2.5.4. Stages of Employment Readiness

With the success in application to those clients with traumatic brain injuries undergoing rehabilitation, the stage of change model is further utilized on people who are unemployed (Lam, 1997) and renamed as Stage of Employment readiness. Lam further found out that most of the vocational rehabilitation services adopted a systematic decision of treatment, allowing little flexibility in matching clients' readiness. There was a lack of valid and reliable instrument to measure the readiness towards RTW among the injured workers, despite of their disabilities. In fact, clients

at different stages of readiness, especially in Pre-contemplation stage cannot get maximum benefit from job services to help them to get back to work (Lam, 1997).

2.5.5. The Proposed New Return-to-Work Model for Injured Workers

As pointed out above, RTW is influenced by various social, psychological, human capital and economic factors. Without a theoretical framework to guide the research, the field faces challenges to further understand this complicated process. To address this problem, this paper attempts to offer a conceptual model, the Stages of Change Model (Prochaska, DiClemente & Norcross, 1992), in understanding the motivation for behavior change within a social cognitive context. A Return-to-Work (RTW) Model for Injured Workers is therefore proposed in this study based on the Stages of Change model (Prochaska, DiClemente & Norcross, 1992) and the parallel model for stages of work readiness (Lam, 1997). This model assumes that injured workers make their decisions on RTW based on their readiness towards it. Their work readiness is contributed by both workers' internal and external factors. The internal factors include workers' self-perceived health status, self-perceived capacity, pain and their social functioning. At the same time, workers' readiness is also affected by other external factors such as their progress on employees' compensation (loss of earning capacity), their financial status, job market, and the job demand. Their

stages of change of work readiness, in assumption, are the most dominant factors among other contributing factors. Figure 1 shows the graphical presentation for this model.

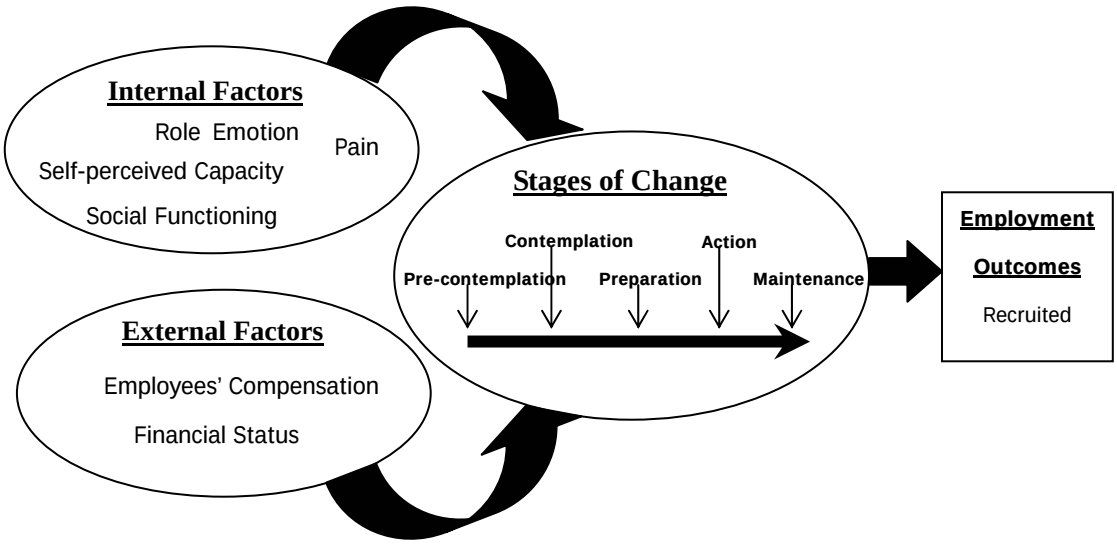

Figure 1. The proposed Return-to-Work Model for Injured Workers

Based on the above model, it can be explained that subjects at different stages of work readiness are believed to have great differences in their job seeking motivation and behavior. For example, subjects at the pre-contemplation stage would not consider RTW at all, i.e. no motivation nor any action on job seeking. Subjects at the Contemplation stage would demonstrate motivation in job seeking to certain extent. However, they had not taken any action such as sending application form or letter, calling employers, etc. Their determination to RTW would be much higher than those in the pre-contemplation stage. Hence, such differences in job seeking motivation and behavior will affect their employment outcome.

Meanwhile, workers' readiness is continuously influenced by their internal and external factors. For external factors, the majority of them such as employees' compensation and their financial constraints would not be alleviated in short-term. However, some of the internal factors can be alleviated and the injured workers would progress to more active stage such that they can pursue job seeking. One of the examples is the relief of anxiety that the injury will occur again once resuming to previous work. Therefore, these workers can increase the chance of gainful employment by involving them more in job seeking and job interviews.

The RTW Model may become a valid and reliable model to describe the work readiness among injured workers. The feedback or insight of RTW from a psychological readiness perspective and subjects' readiness on seeking re-employment is believed to have potential contribution on their RTW process.

Through identification of the work readiness of injured workers using a standardized method, rehabilitation professionals can have a deeper understanding of the major psychosocial factors affecting workers' RTW and hence can provide appropriate intervention programmes or therapies to enhance the outcomes of RTW. Meanwhile, this study helps formulate a more comprehensive psychosocial profile of injured workers and their work readiness. The vocational rehabilitation programme will then focus more on the preparation of the workers to go back to work force. Intervention strategies can be more tailor-made according to their work readiness. To further test the feasibility of the model from RTW perspective, the Lam Assessment of Stages of Employment Readiness (LASER), a questionnaire validated by Lam in 1997, is chosen to specifically measure industrially injured clients' readiness to work. In this way, the worker's work readiness will be easily screened and identified at the very early stage of rehabilitation. In this way, workers can be provided with appropriate interventions such that their rate of RTW can be improved.

2.6. Evaluation of Work Readiness among Injured Workers

2.6.1. Assessment of Work Capacity

In the past, the evaluation of work readiness is based on the functional capacity evaluation (FCE), assessment on other physical parameters such as grip strength, lifting and transfer, quantitative work evaluation system such as the use of VALPAR or BTE work simulator. However, based on our previous review, it has been found that although all these physical parameters could help to identify whether the injured workers can meet their job demands, they are not the key predictors of workers' RTW. In addition, in the physical evaluation it takes tremendous amount of time to complete each standardized test procedure and the equipment for assessment is often very expensive. In some of the rehabilitation settings, it is not easy to afford equipping the standardized assessment tools such as VALPAR work components. In some of the circumstances, workers may not exert his maximum effort on the assessment, thus the validity of some vocational assessment tools remains questionable. Moreover, these vocational assessment tools often emphasize on assessment of physical capacity without focusing on the psychosocial factors affecting RTW. The vocational rehabilitation professionals are keen to explore other evaluation tools which serve as a good predictor for RTW. There should be some other assessment tools that can address the work readiness of injured workers incorporating physical, psychosocial

and psychological aspects of the workers.

2.6.2. Lam Assessment of Stages of Employment Readiness (LASER)

The Lam Assessment of Stages of Employment Readiness (LASER) was subsequently developed in 1997, based on the parallel model for stages of work readiness (Lam, 1997). It was designed to assess the progress of workers' RTW. The LASER contains 14 items which consist of statements representing constructs of the pre-contemplation (6 statements), contemplation (4 statements) and action stages (4 statements). The workers are requested to rate each item on a five-point Likert Scale with "1" indicating strongly disagree to "5" indicating strongly agree. The scores are then added and allocated under different sub-scores representing the corresponding stages which form a continuous measure. The highest sub-score will represent subject's tendency towards corresponding stage. Subjects at the pre-contemplation stage do not see unemployment as a problem and are often neither interested in returning to work nor believe that they can work. Subjects at the contemplation stage begin to consider pros and cons of working, but they have not yet decided to engage in job seeking activities. Subjects at the action stage decide to work and engage in behaviors to increase the probability of being hired. Since the LASER was developed for an American sample group, its psychometric properties

and its utility with Chinese injured workers warrant further investigation.

Furthermore, a previous study on the differences between Chinese and Western counterparts in employment seeking behaviors reported that Chinese had a stronger tendency to take initiatives and engagement in such action (Westwood & Lok, 2003).

2.6.3. Psychosocial Assessments

Some rehabilitation professionals adopt the use of some psychological and psychosocial test batteries such as the State Trait test of anxiety, Becker Depression Scale to evaluate the psychological status of injured workers. Some may measure the general health status using the Short-Form 36 (SF-36). However, these test batteries often focus to measure one factor only without looking at how these factors ultimately affect the injured workers' readiness to RTW. It is often not easy to do these test scores to make logical predictions on their outcomes of RTW. There remains a strong need to use a simple assessment tool to screen and predict the workers' RTW.

2.7. Purposes of Study

The aims of the study therefore are to validate the LASER into the Chinese version and to find out the psychometric properties of the tool in assessment of work readiness among the injured workers. The study also aims to identify psychosocial factors that influence on the work readiness of the workers as well as their outcomes of RTW.

This study is divided into two stages serving two major purposes. The first is to translate the LASER into the Chinese version (C-LASER) and to collect evidence of its psychometric properties in particularly content-related and construct validity. The test-retest reliability of the C-LASER is also estimated. The results of this study provide the basis for using the C-LASER in exploring how useful the stages of change of workers for describing injured workers' behavior in the RTW process.

The second stage of this study is to test the importance of different psychosocial factors including readiness of stages of change in influencing the returning to work status of a group of workers who are injured at work and out of job for a prolonged period of time (such as two years).

Chapter 3

Validation of the Chinese Lam Assessment of Stages of Employment Readiness

3.1. Introduction

This research was divided into two phases of study. The first phase of the study was to validate the Chinese version of LASER (C-LASER) and to find out its psychometric properties among the injured workers. The second phase of the study was to capture the changes of subjects' stages of change towards RTW using C-LASER, their self-rated health conditions, and the employment status among the subjects along the programme after joined the same training and placement group. This chapter describes phase I of the study.

3.2. Methodology

The validation of the C-LASER was composed of an expert panel review and a field test. The expert panel reviewed collected evidence of content-related validity as it is most commonly used for questionnaires (Portney & Watkins, 2000). The field test collected data for testing the test-retest reliability, and construct (using factor analysis) and predictive validity of the revised C-LASER (Portney & Watkins, 2000).

3.2.1. Expert Panel

Sampling

Seven rehabilitation practitioners with experiences working with injured workers were recruited as members in an expert review panel. There were six occupational therapists working in hospital settings and one social worker working in non-government organization with a mean experience of 9.1 years (S.D. =4.1). In Hong Kong, most of the vocational rehabilitation services are provided by occupational therapists. Social workers are involved in job placement and looking after the psychosocial perspectives of workers after the injuries instead of rehabilitation counselors in the United States. Therefore, these two professions were selected in the expert panel to review the content of the C-LASER.

Data Collection

The LASER was directly translated into written Chinese by a qualified bilingual translator using the Emics and Etics approach. The panel was then requested to review the equivalence and clarity of the Chinese translation of the LASER. This was followed by evaluating the relevance and representation of the test content. First, they had to review the translation of LASER in terms of its equivalence and clarity. Second, they had to review its content-related validity in terms of its

relevance, which refers to the exploration of the conceptual equivalence of the translated version with consideration of cultural relevance as well, and the representativeness, which refers to the test assessing what it claims to measure (Anchor & Felicetti, 1999) (Figure 2). Two review forms were developed with Figure 2 to facilitate the work of the panel members with description and explanation of the above concepts. There were a total of 14 items of which the members were to rate on a five-point Likert scale with "1" representing "mostly disagree" to "5" representing "mostly agree".

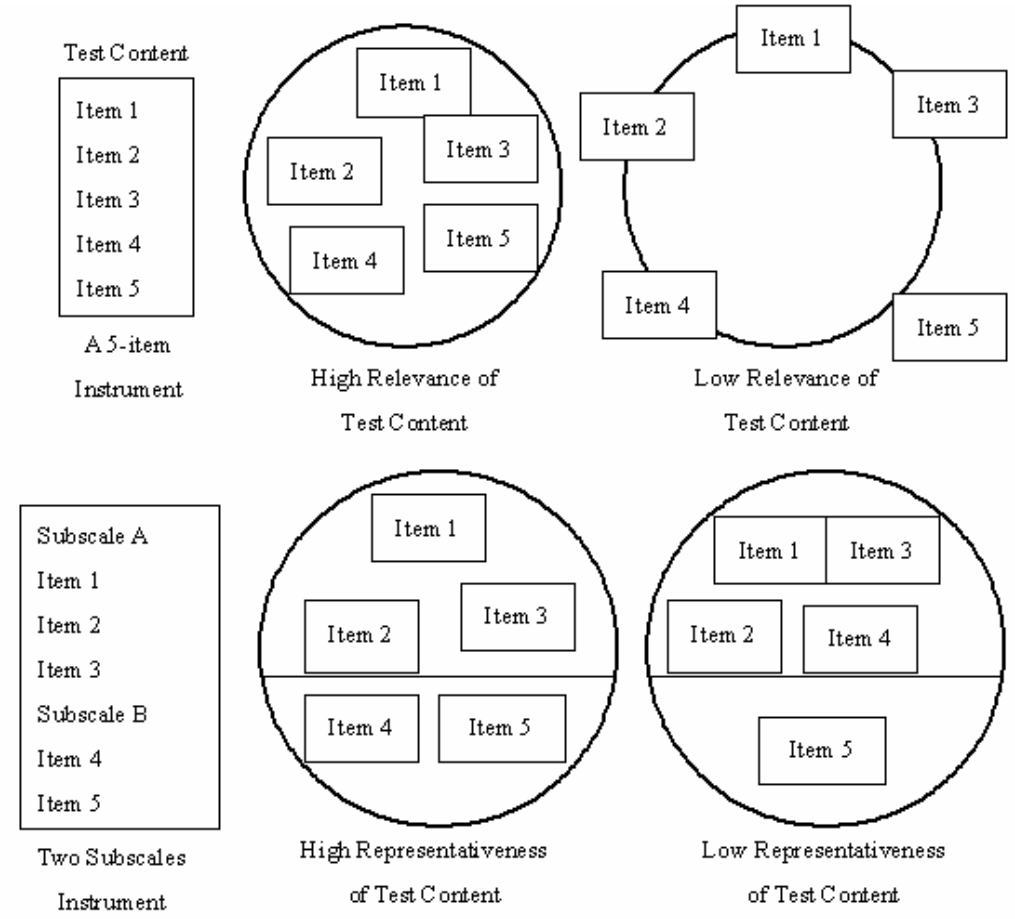

Figure 2. Diagrammatic illustration of relevance and representativeness of test content (Anchor & Felicetti, 1999)

Data Analysis

Ratings of the translation and content-related validity were reviewed by their modes. Comments were reviewed for items with ratings ranging from neutral or negative, i.e. mode of 3 or below.

3.2.2. Field Test

The draft version of C-LASER was modified according to the comments gathered from the two panels. A field test was then conducted to find out the test-retest reliability, construct and predictive validity of the revised C-LASER. Construct validity would reflect C-LASER's ability to measure the concept of work readiness, while predictive validity would reflect C-LASER's ability to serve as a valid predictor of some future criterion (Portney & Watkins, 2000).

Sampling

Convenient sampling method was used to recruit the subjects through the Hong Kong Workers' Health Centre. Inclusion criteria included subjects were aged between 20 to 65 years old, subjects had to finish conventional rehabilitation services and they were unable to resume previous job. Exclusion criteria included those with previous history of psychiatric illness, and low-back symptoms due to tumor,

infection, systemic inflammation, cauda equine syndrome and fracture.

Data Collection

All the subjects had completed the conventional rehabilitation programme in hospital settings in Hong Kong before they joined this RTW programme and were referred by doctors, occupational therapists, physiotherapists or social workers. The C-LASER was administered to the subjects at the time when the subjects joined the RTW program. Besides, 2 questions on subjects' self-perceived efficacy and confidence on RTW in a scale from 1 to 10, and Short Form 36 (SF-36) were also administered. The sequence of the tests was randomized to avoid any potential order effects which might limit the results. The C-LASER was conducted during the briefing session of the RTW programme and on admission to the programme in order to collect evidence of test-retest reliability of the instrument. The number of days between the two administrations of C-LASER ranged from 7 to 14, while no treatment was provided between the two assessment occasions to avoid any effect during the waiting period.

Data Analysis

Evidence of test-retest reliability was established using ICC (1, 2). Item

difficulties and item discriminative indices of the C-LASER were explored using item analysis. Factor analysis using principal component analysis with Varimax rotation was used for field test results in order to confirm the factor loading of items of C-LASER on their corresponding sub-scores. Cronbach's alpha was used for evidence of internal consistency of each of the sub-scores from factor analysis. Further cluster analysis with Ward's method would be used for exploration of subjects' sub-scores distribution. By doing the cluster analysis, subjects could be allocated accordingly by their C-LASER sub-scores distribution for further analysis. Then, multivariate analysis and further univariate analysis were used for analysis of group effect and between-subject effect among the clusters. Pearson correlation was used for analysis of relationships between subject's demographic characteristics and their stage sub-scores.

3.3. Results

A total of 90 subjects (R^2=*0.3*, k=5, power=0.8, df_{res}=60) volunteered to join the study. Among them, there were 38 female (42.2%) and 52 male (57.8%). Their mean age was 42.1 years (S.D.=9.7). Thirty of them (33.3%) had 1 to 6 years of education, 27 (30.0%) have 7 to 9 years and another 33 (36.7%) had 10 years or above. Thirty-two subjects (35.6%) suffered from low-back pain, 22 (24.4%) suffered from upper-limb traumatic injuries, 13 (14.4%) suffered from lower-limb traumatic injuries, 11 (12.8%) suffered from repetitive strain injuries and 12 (13.8%) have other types of injuries such as head injuries, chest injuries, etc. Eighteen subjects (20%) have their loss of earning capacity assessed by Labour Department and their mean loss of earning capacity as assessed was 15.6% (S.D.=23.3) with their previous mean monthly income of HK$11,906.3 (S.D.=6,378.19).

3.3.1. Expert Panel

The panel members assigned either “4” (agree) or “5” (mostly agree) ratings on the translation to nine out of the 14 items. There are four items which received a “3” (neutral) rating and one item which received a “2” (disagree) rating. The comments of the panel members indicated that the major concerns were with the clarity of the direct translation of the term “leave me alone” and interpretation of the phrases

“nothing I can do” and “I think I should” in Chinese with items 8, 9 and 12. These items were subsequently modified according to the recommendations offered by the panel members in terms of its clarity of direct translation. For item 8, the statement “I guess being out of work is not good, but there is *nothing I can do* about it right now.” was translated as “雖然我覺得無工做是不太好，但現在我是無能爲力。”; for item 9, the statement “I know I need to get a job and really *think I should* work on finding one.” was translated into “我知我需要搵一份工，我亦認爲我必須努力搵工。”; and for item 12, the statement “All this talk about work is boring. Why can’t people just leave me alone?” was translated into “所有這些關於搵工的問題都好悶，爲什麼不讓我自己一個人靜一靜？”. The evaluation of the content relevance and representativeness was rated with either “4” or “5”, representing “agree” and “mostly agree” on their representativeness and hence no further modifications of the item contents was needed.

3.3.2. Item Analysis

Item analysis revealed item difficulty indices ranged from 0.42 to 0.92 with items 3, 9 and 14 having difficulty indices at 0.92, 0.88 and 0.88 respectively, while item discriminative indices ranged from 0.17 to 0.58 with items 3 and 9 having discriminative indices at 0.17 (Table 1), representing C-LASER having moderate

difficulty and moderate discriminative ability, indicating that C-LASER could only fairly discriminate subjects' opinions. Both items 3 and 9 represented the Contemplation stage while item 14 represented the Pre-contemplation stage of C-LASER. Test and retest reliability was estimated by correlating the scores on the two consecutive administrations of the C-LASER to the same group of subjects. The reliability coefficients (intra-class correlation, ICC) on the item scores of the 14 items ranged from 0.55 to 0.79 (Table 2). There were a total of three items: 7, 10 and 12 representing items of Pre-contemplation stage, which had ICC values lower than 0.60, indicating that these items had fair test-retest reliability.

Table 1. Item difficulty and item discriminative index of the C-LASER items.

Items	**Item Difficulty Index**	**Discrimination Index**
Item 1. (Contemplation)	0.75	0.50
Item 2. (Action)	0.67	0.50
Item 3. (Contemplation)	0.92	0.17
Item 4. (Pre-Contemplation)	0.71	0.50
Item 5. (Action)	0.79	0.42
Item 6. (Contemplation)	0.63	0.58
Item 7. (Pre-Contemplation)	0.73	0.46
Item 8. (Pre-Contemplation)	0.42	0.33
Item 9. (Contemplation)	0.88	0.17
Item 10. (Pre-Contemplation)	0.65	0.38
Item 11. (Action)	0.73	0.38
Item 12. (Pre-Contemplation)	0.63	0.42
Item 13. (Action)	0.77	0.46
Item 14. (Pre-Contemplation)	0.88	0.25

Table 2. Test-retest reliability coefficients of C-LASER.

Items	Intraclass coefficients (ICC)	*p*-value	95% C.I.
Item 1.	0.79	0.002	0.404 – 0.925
Item 2.	0.74	0.005	0.283 – 0.909
Item 3.	0.77	0.002	0.370 – 0.920
Item 4.	0.70	0.01	0.154 – 0.893
Item 5.	0.64	0.03	-0.010 – 0.872
Item 6.	0.69	0.01	0.129 – 0.890
Item 7.	0.59	0.04	-0.148 – 0.855
Item 8.	0.69	0.01	0.129 – 0.890
Item 9.	0.72	0.008	0.211 – 0.900
Item 10.	0.59	0.04	-0.130 – 0.857
Item 11.	0.73	0.007	0.240 – 0.904
Item 12.	0.55	0.06	-0.252 – 0.842
Item 13.	0.63	0.03	-0.020 – 0.871
Item 14.	0.60	0.04	-0.108 – 0.860

3.3.3. Factor Analysis

Factor analysis using principal component analysis with Varimax rotation was used to test the grouping of the C-LASER 14 items. The results indicated a two-factor solution which accounted for 47.7% of the total variance (Table 3). Factor 1 items (n=8) represented those on contemplation and action stages. In contrast, factor 2 items (n=6) appeared to represent those on the pre-contemplation stage. The internal consistency estimated by Cronbach's Alpha for factor 1 items was 0.85 and that for factor 2 items was 0.69.

Table 3. Factor Analysis using Principal Component Analysis with Varimax Rotation (n=90).

Items	**Factors**	
	Factor 1	Factor 2
Item 1.	0.77	-0.20
Item 2.	0.83	<0.001
Item 3.	0.44	-0.45
Item 4.	-0.16	0.72
Item 5.	0.81	-0.12
Item 6.	0.70	-0.13
Item 7.	-0.22	0.74
Item 8.	-0.44	0.12
Item 9.	0.35	-0.49
Item 10.	<0.001	0.54
Item 11.	0.55	-0.12
Item 12.	<0.001	0.40
Item 13.	0.77	-0.26
Item 14.	-0.26	0.77

3.3.4. Cluster Analysis and Multivariate Analysis

Cluster analysis using Ward's method was employed to further test the usefulness of the C-LASER subscales. The results suggested a two-cluster solution based on the factor sub-scores. Summary of the two clusters was attached in Appendix IV. Fifty-four subjects (60.0%) were found in cluster 1 and 36 (40.0%) were found in cluster 2. No significant difference was revealed in the demographic characteristics between the two cluster groups such as gender (chi-square, p=0.43), age (F[1,85]=3.69, p=0.06), educational level (chi-square, p=0.58) and types of injury (chi-square, p=0.20).

Multivariate analysis of variance was conducted to compare the differences in factor sub-scores between the two clusters. Significant group effects were identified. Subjects classified under cluster 1 had significantly higher sub-scores on factor 1 with items representing contemplation and action stages, while they had lower sub-scores on factor 2 than their cluster 2 counterparts (Pillai's Trace, F[2,87]=61.15, p<0.001). It appeared that in terms of RTW readiness, cluster 1 described the characteristics of subjects who were more ready for action, i.e. to seek employment, and cluster 2 showed the characteristics of pre-contemplators, i.e. not ready to seek employment.

Further multivariate analysis of variance was then conducted to compare the differences in SF-36 sub-scores between the two clusters. Significant group effects were identified of which subjects classified under cluster 1 (Ready for Actioners) had significantly higher SF-36 sub-scores than those under cluster 2 (Precontemplators) (Pillai's Trace, $F[9,78]=2.38$, $p=0.02$). Further univariate analysis using Bonferroni correction for adjustment of type I error (alpha=0.05/9=0.006) revealed significant differences in physical functioning ($F[1,86]=9.87$, $p=0.002$), bodily pain ($F[1,86]=9.22$, $p=0.003$) and social functioning sub-scores ($F[1,86]=15.87$, $p<0.001$) between the two cluster groups, with subjects in cluster 1 demonstrating better scores in all the above three aspects. Multivariate analysis of variance of subjects' self-reported confidence and self-reported advocacy in job seeking also showed statistically significant results which subjects in cluster 1 (Ready for Actioners) showed higher scores in both questions than those in cluster 2 (Precontemplators) ($F[2,84]=13.53$, $p<0.001$). The subjects in the cluster 1 (Ready for Actioners) had a marginally better RTW outcome (within 6-months after conduction of assessment) (53.7%) when compared to those of the cluster 2 (Precontemplators) (38.9%) (Chi-square, $p=0.17$) provided that subjects in both clusters underwent a same RTW programme.

3.4. Discussion

The subscale scores of C-LASER are found be represented by two C-LASER profiles. This is different from the test structure of the original LASER, which has three distinct factors (McConnaughy et al., 1989, Lam, 1997). The first factor combines the items which are originally grouped under the contemplation and action subscales. The second factor includes items which are under the pre-contemplation subscale. The workers from the “ready for action” or “Ready for Actioners” group are found to have significantly higher self-perceived physical function, less pain and higher social function than those in the “pre-contemplation” or “Precontemplaters” group. The former group of workers also has higher confidence and advocacy in job seeking. However, the workers in the ready for action group have only marginally better outcome in RTW when compared to the workers in the pre-contemplation group.

The lack of significant differences of employment outcomes may be due to external socio-economic factors that these injured workers face. During the period of data collection, Hong Kong faced the challenges of the SARS episodes not only causing deaths and posing severe medical threats on the people of Hong Kong, but also affecting the economy of the society. In that year (2003), the rate of

unemployment has gone up to the highest since 1997. It had a strong impact on all workers, in particular, after their work injuries. Thus, even though these workers are more ready to return to the work force, the external environment was not as favorable. However, this study is focused more on the internal factors affecting injured workers' return to work. Their stage of work readiness is thought to be one of the major indicators for successful RTW.

The difference in the test structures between the Chinese and original versions of LASER can be explained in two aspects: the concept of readiness among Chinese workers, and differences in subjects' characteristics between the present and previous studies.

The most significant finding in this study is the confirmation of the two-factor solution in the stage of work readiness model which is different from the original structure. The combined contemplation and action stages together with the pre-contemplation stage of work readiness are found to be the two key constructs among the Chinese injured workers. This can be attributable to the fact that Chinese workers place extreme high values on work and that once the workers have resolved their psychological and psychosocial problems that affect their work readiness, they

will reach the contemplation stage and right away, they will take action to search for jobs. The previous description of subjects in the contemplation stage stated that the subjects appear to realize the needs for RTW but have not taken any action to engage in job seeking. However, in this combined contemplation and action stage, the Chinese injured workers seem to show faster responses in getting onto the action stage and that the discrimination of the two stages is not distinct.

From the cultural perspective, it may be explained by the fact that most injured workers are the breadwinners in the family. Although the compensation system after work injuries may be able to support their living for a period of time, these workers still need to resolve the financial problems at home in the long run. Therefore, once they have reached the contemplation stage, it is quite straight forward that they will move towards the action stage.

In addition, it is often the pride of a man to be able to resume his productive role in the family. This is supported by a study conducted by Westwood and Lok (2003) that workers in Hong Kong are found to have a strong tendency to seek for an employment when they are out of job. Their initiatives and engagement in job search are largely from the income generated from work and the immediate sense of

success and well being. Westwood and Lok also reveal that workers in Beijing also share these characteristics. Other studies reveal that the termination of benefits gaining from the workers' compensation system is found to be related to workers' RTW after injuries (Berglind & Gerner, 2002). In other words, injured workers are more likely to take actions on job seeking, and hence RTW, when the workers' compensation benefits run out (Huang, Liao & Chang, 1998). In our local system, the compensation stipulated by the Labour Department may not be sufficient to cover the long-term expenses except for those workers who are involved in medico-legal claims, as the process of compensation may last from 3 to 7 years. For these categories of workers, their successful rate of RTW is more affected by the court settlement.

From our study, around 20 percent of our subjects had applied for the medical assessment board of which the results concluded the workers' compensation process. Most of the subjects are receiving monthly allowance from the insurance which they are not "urgent" financially to seek for employment. Yet, once the medical assessment is complete, their compensation will be settled and they will have to plan for their RTW.

Despite the variation in settlement of compensation, subjects categorized under the Group 1 cluster still have a relatively better RTW outcome than those in Group 2. Subjects in Group 1 cluster have higher scores on the "contemplation and action" subscales which suggest that these subjects tend to consider the ways and engage more in job seeking and RTW activities even though they have their monthly allowance from workers' compensation. This can further substantiate the importance of factor sub-scores while identifying those injured workers who are more ready to RTW.

The design of this study will not enable us to further differentiate to what extent the high work value of Chinese workers influencing the C-LASER subscale scores and their RTW after injuries. However, it can provide a positive indication for intervention especially on subjects' physical functioning, pain management and social functioning as shown from the results that these are some of the key factors affecting workers' work readiness.

There is a possibility that those injured workers are initially not ready mainly because of the pain coping and psychological concerns and stress. Results reveal that high "precontemplation" subscale score is associated with lower physical and

social functioning, higher pain intensity, and lower confidence and self advocacy in job seeking. Once this has been alleviated, they then will move into the action stage more quickly. These characteristics are previously reported to be important for lowering the readiness of RTW. For instance, patients with traumatic brain injuries and unemployed tend to have more anxiety and depressive symptoms (Franulic, Carbonell, Pinto & Sepulveda, 2004), and higher intensity of pain would affect subjects' emotional distress (Todd, Iezzi & Lafreniere, 1996). The results obtained in this study therefore are consistent with those reported in previous studies. This indicates the need to manage pain not just physiologically, but psychologically and behaviorally, which might alter cognitive appraisals of pain and loss, and improve coping styles (Gatchel, Adams, Polatin & Kishino, 2002).

It is, however, surprising to find that human capital factors, such as age and educational level do not associate with the "pre-contemplation" versus "contemplation and action" effect. Previous studies suggest that workers who are younger and with higher educational level will have a better chance of returning to work. Those aged between 25 to 49 years are found to have better chance of RTW when compared to those who aged 49 years and above (Barlow et al. 2003, Watson et al. 2004). Younger subjects are also more motivated than the older ones and, are more

welcomed from the labor market (Anema et al., 2002). Majority of the subjects in this study are at their middle age and their educational levels are quite comparable. For the age factor, majority of the subjects in this study are at their middle age. The restricted range in age would lower the power of the analysis. For the educational level factor, the subjects in the combined "contemplation and action" group appear to have a higher level of educational (40.7% versus 30.6% for the 10 years or above group) than the "pre-contemplation" group. However, due to the comparatively small size (n=54 and n=36), this factor does not reach a statistical significance level. Based on the results of this study, human capital factors seem to have no effect on subjects' readiness towards RTW.

Therefore, stages of employment readiness, together with subjects' perceived physical and social functioning, and pain intensity, seem to be salient factors in determining RTW of injured workers among other factors. However, there are external factors which might affect the injured workers' success in RTW such as the economy of the society, the types and nature of work in demands. These are some of the external factors that seem to be beyond our control. Yet, with appropriate training and intervention, those workers who are less ready to RTW due to various physical, psychosocial or psychological factors could be trained more ready to RTW.

Further confirmatory study should increase the sample size in order to increase the power of the analysis. Further study should also focus on differentiating the effects of workers' culture and workers' compensation system on modulating their behavior on RTW.

The internal consistency of the combined "contemplation and action" subscale yields a satisfactory Cronbach alpha. In contrast, the internal consistency of the pre-contemplation subscale is rather low (ICC=0.69). This indicates that the consistency associated with the items in pre-contemplation stage is low. The concept of "action-oriented" as perceived by subjects as mentioned before may contribute as subjects tend to have higher consistency on contemplation and action items, rather than those on pre-contemplation. The test-retest reliability of 11 items is somewhat satisfactory. There are three items: 7, 10 and 12 which are under the pre-contemplation subscale and have relatively low ICC indexes. From our experience, the subjects appear to have a tendency to be perceived as "positive" and "motivated". This could be attributable to the fact that Chinese are conscious with "self-respect" and "saving face". These behaviors would be less consistent, thus resulting in lower test and retest reliability and relatively low internal consistency of pre-contemplation stage. C-LASER is useful for distinguishing stages of readiness

to work among injured workers. The subscale scores of the C-LASER are also found useful for differentiating workers for more suitable intervention. Further studies should focus on illustration of item statements to improve cultural relevance and further exploration of perception on work readiness by Chinese counterparts.

The C-LASER is found to identify the readiness of employment of injured workers as represented by two factor sub-scores. The concept of being breadwinners in the family for Chinese people may explain the combination of contemplation and action stages sub-scores. Further confirmations from the results that most of the subjects have their monthly allowance from the insurance while compensating their financial needs but still want to seek employment for those “ready for actions” are indicated. Possible factors that may affect their readiness such as pain coping and psychosocial concerns are discussed. However, factors that affecting subject’s readiness towards employment and the process of change of their readiness are still not able to be identified from this phase of study. Phase II (Chapter 4) of this study will explore how different psychosocial factors including readiness of stage of change will influence the RTW status of a group of workers who are injured at work and out of job for a prolonged period of time.

Chapter 4

Psychosocial Aspects of Injured Workers' Return-to-Work

4.1. Introduction

After validation of the C-LASER as measurement of the stage of work readiness for injured workers, phase II of this study was implemented to investigate the work readiness of injured workers who could successfully RTW and who could not find a job in order to verify the RTW Model. The change of work readiness among injured workers before and after a systematic RTW programme was also measured using the C-LASER so as to find out the relationship between work readiness and other physical and psychosocial factors among the individuals.

Phase II of the study was comprised of a field test of injured workers who joined the same training and placement group of the RTW programme, but with different results of employment, i.e., employed and not employed. Three assessments were conducted on the subjects at different stages of their RTW programme, in order to capture the changes of subjects' work readiness, their self-rated health condition, and employment status before and after the RTW programme. The change of work readiness between the employed group and the unemployed group would then be

compared and discussed in this chapter. The theoretical assumption is that subjects in the employed group would be more ready to RTW as measured by C-LASER, while subjects in the unemployed group were less ready to RTW.

4.2. Methodology

Sampling

A total of 75 subjects were recruited from a local non-government agency called the Hong Kong Workers' Health Centre (HKWHC). The centre was a voluntary organization established to provide various support services for workers. Subjects were recruited using convenience sampling method. All subjects recruited had received and completed conventional rehabilitation services in the hospitals or rehabilitation centers after their injuries. Then, they were referred by their case medical officers or rehabilitation therapists to the centre if they were unable to return to previous work and needed further assistance in job searching. These workers would be invited to join an RTW programme organized by a team of rehabilitation professionals including social workers, occupational therapists and psychologists. The programme was specially designed for those injured workers who were unable to return to previous work and had both underlying psychological and psychosocial problems related to their injuries. In order to evaluate the effectiveness of this

programme, a randomized, controlled, single-blind experimental study was adopted in the center which was described in another study. Inclusion criteria included subjects should be aged between 20 to 65 years, had to finish conventional rehabilitation services and they were unable to resume previous job. Exclusion criteria included those with previous history of psychiatric illness, and low-back symptoms due to tumor, infection, systemic inflammation, cauda equine syndrome and fracture.

The Return to work (RTW) Programme

The RTW programme consisted of individual and group training (Training Session) together with job placement services (Placement Session). Individual training included individual counseling and work preparation in order to facilitate subjects to prepare RTW in terms of psychosocial aspects, which is based on Lam's Parallel Model for Stages of Work Readiness (1997). Group training included pain management, stress management, work adjustment and psychosocial adjustment which provide subjects with knowledge, skills and support of RTW. After the three-week individual and group training, job placement services would be provided for another three weeks. Job placement services included job seeking and job interviewing skills training, job vacancy information sharing and on-going job seeking support. The aim of the RTW programme was to resolve the psychosocial problems

encountered by injured workers after their injuries, such as anxiety, stress, chronic pain and poor concept of general health. The ultimate goal was to help the injured worker to be more ready to RTW.

Instrumentation

In order to compare the work readiness in relation to other physical and psychosocial factors among the individual workers, a number of instruments were selected for assessment of subjects as described below:

a. Physical Capacity

The perceived physical capacity was assessed using Spinal Function Sort (SFS). It was to quantify the individual's perception of his or her ability to perform work tasks that involved the use of the spine in various ways (Matheson & Matheson, 2000). Subjects' perceived household tasks handling capacity was also assessed using Loma Linda University Medical Centre Activity Sort (LLUMC) (WEST, 1986).

b. Readiness towards RTW

The readiness to RTW was assessed using C-LASER. It was designed based on the Stages of Change model (Prochaska, DiClemente & Norcross, 1992) and the

Parallel Model for Stages of Work Readiness (Lam, 1997). The three stages of changes as described by Lam (1997) were included, namely Pre-contemplation, Contemplation and Action. A recent local study indicated that injured workers with high sub-scores on Contemplation and Action stages had higher readiness on job seeking than those with higher sub-scores on Pre-contemplation stage (Chan et al., 2005).

c. Psychological Functions

Subjects' level of anxiety and mental stress was assessed using the Chinese State Trait Anxiety Inventory (C-STAI) as it correlated significantly with other measures of psychological well-being (Shek, 1993).

d. Self Perceived General Health

The perceived general health status was assessed using Short-Form 36 (SF-36). It consisted of 36 items, capturing most of the important concepts of health-related quality of life in which the translated Chinese version was found to be equivalent in concepts to the original version (Lam, Gandek, Ren & Chan, 1998).

Data Collection

A comprehensive assessment was conducted with the subjects on three different occasions in order to capture the changes of subjects' stages of change towards RTW, their self-rated health condition, and employment status. The first assessment was conducted before they joined the RTW Programme in order to capture the baseline information of subjects. The second assessment was conducted after they completed the training session of the programme as post-test assessment of intervention effectiveness. The third assessment was conducted after they had completed both the training session and the placement session of RTW Programme to capture their employment status. By capturing and analyzing subjects' changes of their stages of change and other variables, one could then identify the differences between those who successfully RTW and those who did not. Figure 3 shows the flow of the assessment.

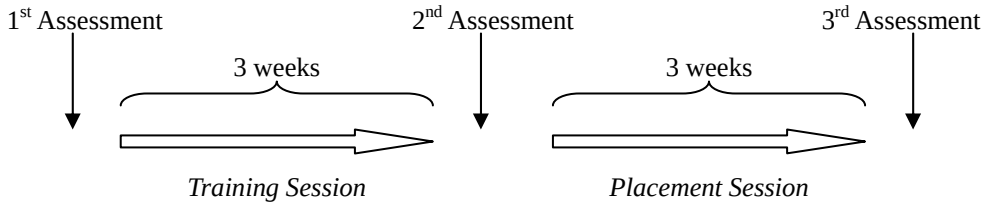

Figure 3. Flow of Phase II Assessment

The assessment was comprised of an interview, together with four self-rated instruments including Spinal Function Sort (SFS), LLUMC Activity Sort (LLUMC), the Chinese version of Lam Assessment of Stages of Employment Readiness (C-LASER), Chinese State Trait Inventory (C-STAI) and Short Form 36 (SF-36) to be completed by the subjects. The interview was to collect subjects' personal data including previous job history, family status, etc. The assessment procedures took around one hour to complete. Subjects' employment status was monitored and recorded within 6 months after the third assessment was performed.

Data Analysis

Subjects' employment status was recorded six months after the completion of the RTW programme. Stepwise logistic regression was done for predicting variables with subjects' RTW outcome. Cluster analysis with Ward's method was used to differentiate subjects based on their C-LASER factor sub-scores. Multivariate analysis was done to compare subjects' characteristics, factor sub-scores and their scoring on particular instruments based on results of cluster analysis to see how these variables would contribute to the C-LASER factor sub-scores. Univariate analysis was further done to analyze subjects' scoring on particular instruments.

4.3. Results

4.3.1. Comparison between C-LASER Factor Sub-scores and Return-to-Work Status

Stepwise logistic regression was done for predicting variables with subjects' RTW outcome. Results for first assessment showed a model with a correct classification rate of 73.0% (Table 4). The variables retained in the model were factor 1 sub-score (Contemplation and Action stages), social functioning and role emotional of SF-36. Subjects with higher scores on above items would have better RTW outcome than those with lower scores. Logistic regression of second assessment showed a model with a correct classification of 66.7%. Factor 1 sub-score (Contemplation and Action stages) was retained in the model. Subjects with higher scores on factor 1 had better RTW outcome than those with lower scores. Logistic regression of third assessment showed a model with a correct classification of 65.3%. Factor 1 sub-score (Contemplation and Action stages) and LLUMC were retained in the model. Subjects with better self-rated factor 1 sub-score and LLUMC would have better RTW outcome than those with lower scores.

Table 4. Stepwise logistic regression for predicting variables on return-to-work outcome under different assessment occasions.

Assessment	***B***	**SE**	***p*-value**
1st assessment			
SF-36: Role Emotional	-0.964	0.303	0.001
SF-36: Social Functioning	0.671	0.224	0.003
C-LASER Factor 1 (Cont. & Action)	-0.166	0.085	0.05
Constant	4.746	2.496	0.057
2nd assessment			
C-LASER Factor 1 (Cont. & Action)	-0.131	0.062	0.034
Constant	4.059	1.978	0.040
3rd assessment			
C-LASER Factor 2 (Pre-Cont.)	0.210	0.086	0.015
LLUMC	0.012	0.005	0.017
Constant	-3.669	1.214	0.003

Further cluster analysis with Ward's method was used to differentiate subjects into different clusters based on their C-LASER factor sub-scores in three assessment occasions separately. Results suggested two-cluster solutions based on the factor sub-scores in all three assessment occasions. Multivariate analysis of variance was then conducted to compare the differences in factor sub-scores between the two clusters. Significant group effects were identified. Subjects classified under cluster 1 had significantly higher sub-scores on factor 1 with items representing contemplation and action stages, while they had lower sub-scores on factor 2 than their cluster 2 counterparts in all three assessment occasions. Subjects in the cluster 1 had marginally better RTW outcome, as recorded within 6 months after the first assessment, when compared to that of cluster 2. Further repeated measure (Table 5) showed significant group effects on C-LASER factor sub-scores where subjects in cluster 1 tended to have their factor 2 sub-scores decreased throughout the three occasions while subjects in cluster 2 tended to have their factor 2 sub-scores increased ($F[2,72]=6.48$, $p=0.003$). However, no significant effect was shown with factor 1 sub-scores.

Table 5. Comparison on C-LASER factor sub-scores and return-to-work outcome by factor sub-scores under different assessment occasions as differentiated by cluster analysis.

Assessment	**1st assessment**	**2nd assessment**	**3rd assessment**
Multivariate analysis of C-LASER factor sub-scores			
F-value	57.91	96.36	52.42
p-value	<0.001	<0.001	<0.001
Return-to-work within 6 months after 1st assessment occasion			
Return-to-work outcome of Cluster 1	65.2%	73.7%	57.4%
Return-to-work outcome of Cluster 2	48.1%	46.4%	42.9%
Chi-square *p*-value	0.17	0.04	0.26

4.3.2. Comparison between Different Factors and C-LASER Factor Sub-scores

Multivariate analysis of variance was then conducted to compare the differences in SFS, LLUMC, C-STAI and SF-36 sub-scores between the two clusters on three assessment occasions. Significant group effects were identified for the first ($F[12,61]=4.32$, $p<0.001$) and third ($F[12,62]=2.30$, $p=0.02$) assessment occasions, while marginal group effect was identified for the second assessment occasion ($F[12,62]=1.56$, $p=0.13$). In general, subjects who were classified under cluster 1 had higher SFS and SF-36 sub-scores but lower LLUMC and C-STAI sub-scores than those under cluster 2.

For the first assessment, further univariate analysis using Bonferroni's correction for adjustment of type I error (alpha=0.05/12=0.004) revealed significant differences in role physical ($F[1,72]=8.99$, $p=0.004$), bodily pain ($F[1,72]=16.46$, $p<0.001$), vitality ($F[1,72]=14.96$, $p<0.001$) and social functioning ($F[1,72]=10.59$, $p=0.002$) sub-scores of SF-36 between the two cluster groups. No significant differences were revealed in the demographic characteristics between the two cluster groups such as gender (chi-square, $p=0.52$), age ($F[1,71]=2.77$, $p=0.10$), educational level (chi-square, $p=0.73$) and types of injury (chi-square, $p=0.51$). Summary of results of the two clusters was attached in Appendix V.

For the second assessment, further univariate analysis using Bonferroni's correction for adjustment of type I error (alpha=0.05/12=0.004) revealed significant differences in physical functioning (F[1,73]=10.57, p=0.002) and role physical (F[1,73]=12.35, p=0.001) sub-scores of SF-36 between the two cluster groups. No significant differences were revealed in the demographic characteristics between the two cluster groups such as gender (chi-square, p=0.75), age (F[1,71]=0.96, p=0.33), educational level (chi-square, p=0.69) and types of injury (chi-square, p=0.55). Summary of the results of the two clusters was attached in Appendix VI.

For the third assessment, further univariate analysis using Bonferroni's correction for adjustment of type I error (alpha=0.05/12=0.004) revealed significant differences in physical functioning (F[1,73]=9.06, p=0.004), role physical (F[1,73]=12.19, p=0.001) and role emotional (F[1,73]=18.65, p<0.001) sub-scores of SF-36 between the two cluster groups. No significant differences were revealed in the demographic characteristics between the two cluster groups such as gender (chi-square, p=0.46), age (F[1,71]=0.23, p=0.64), educational level (chi-square, p=0.66) and types of injury (chi-square, p=0.49). Summary of the results for the two clusters was attached in Appendix VII.

4.4. Discussion

Results obtained suggest that C-LASER factor sub-scores are one of the important factors in predicting subjects' RTW status, while their RTW statuses are affected by their readiness towards RTW. Several psychosocial factors are identified such as perceived physical functioning, bodily pain and social functioning which might affect the subjects' readiness to RTW.

Factor 1 sub-scores retained from logistic regression on all three assessment occasions indicate that it is an important variable in predicting their employment outcomes. Subjects with higher factor 1 sub-scores (higher scores on Contemplation and Action stages) have higher tendency towards employment compared with those with lower factor 1 sub-scores. Followed by cluster analysis, there are differences among clusters differentiated by means of their factor 1 sub-scores.

Subjects who have higher factor 1 sub-scores, and are regarded as "ready for action" group, are found to have significantly higher confidence and advocacy in job seeking. They also have higher perceived physical function, less pain and higher social functioning (Chan et al., 2005.). Their chances of employment will then increase as their increased frequency of job seeking behavior as well as their

demonstration of higher self confidence during interview which would be much appreciated by the interviewers. Selander et al. (2002) found that the severity of disability and pain were key elements to affect injured worker's RTW. Subjects with more severe pain, disability, and with complex medical history would have a lower chance to RTW.

In order to further investigate the contribution of work readiness on subjects' psychosocial readiness towards progression of stages of RTW, Franche and Krause's model of readiness for RTW following injury or illness (2002) has divided the progress into three different aspects: decisional balance, self-efficacy and process of change. In regards to subjects' decisional balance, they have to weigh the pros and cons of returning to work during the intervention. Those who have higher sub-scores in factor 1 weigh more pros than cons of returning to work such as to regain their self-esteem, to reassure their return of physical capacity and to resume their role as either the bread-winner or income generator, etc. They also treat the cons as challenges rather than obstacles with more positive thinking. And in regards to their self-efficacy, those with higher factor 1 sub-scores, are found to have higher self-efficacy towards RTW especially in terms of job seeking (Chan et al., 2005). Their higher confidence in engaging in returning-to-work can facilitate them to further

test their actual ability. In other words, they are more willing to "step-out" from injured-person role to working-person role, providing them more chances of exposure to working environment. Finally, in regards to their process of change, they share their desires, worries and feelings towards RTW during the process of intervention, which is named by Franche and Krause (2002) as "Experiential Change". Subjects having higher Factor 1 sub-scores would have better awareness and have higher intention to resume employment such that they are more ready in job seeking throughout the process.

However, all the subjects would have different intrinsic values on RTW during the process of intervention. Factor 1 sub-scores, therefore, would be one of the predictive factors to show the extent of change in order to actively involve in job seeking. This is further confirmed by the significant differences in employment outcome of the second assessment representing the time when subjects finish their intensive training session within the programme that successful subjects tend to score higher scores in Factor 1 sub-score, demonstrating higher tendency to Contemplation and Action stages. In addition, with the alignment of subjects' experiential changes, they would actively involve in actual job seeking activities and work trial, which is named as "Behavioral Change" (Franche & Krause, 2002). The success in

"Experimental Change" would help subjects to be more adaptive to the "Behavioral Change", thus, affecting their successful chance in job seeking.

Although C-LASER factor sub-scores are important factors in predicting subjects' RTW status, their self-perceived physical capacity and pain seem to be the two main factors to discriminate the ready and not-ready groups as shown from the multivariate analysis. Self-perceived physical capacity is found as one the primary recovery outcome measure for subjects with low back pain by Oleske et al. (2000). Subjects with higher self-perceived capacity can fulfill a wider range of job demands, especially with those requiring more physically. The relatively low perceived work capacity is also believed to be related to the relatively high pain intensity (Gibson & Strong, 1996) as shown from the results. It is one of the important variables for consideration in the perceived capacity for work-related tasks in persons (Gibson & Strong, 1996). Subjects who are not able to cope with their pain effectively can hardly adapt to the actual work environment with consistent requirement of their physical capacity. In fact, the more they can cope with the pain, the longer they can sustain in the work force. Therefore, there is a burning need to manage pain not just physiologically, but psychologically and behaviorally, which may alter cognitive appraisals of pain and loss, and improve coping styles (Gatchel, Adams, Polatin &

Kishino, 2002).

Other SF-36 factors such as role emotional and social functioning also have positive effect on the work readiness. Deficits of psychosocial functioning are found associated with delay in return to normal function (Atroshi et al., 2002). Subjects who can adjust their emotions during the process can get support from either their families, friends and provide them with positive mind towards job seeking.

The concept of secondary loss (Gatchel, Adams, Polatin & Kishino, 2002) can plausibly explain the contribution of role emotional and social functioning. The secondary loss, as defined, is a subsequent loss developed from its primary loss. For example, an injured worker might have limited career choice (secondary loss) after the injury (primary loss). Secondary loss can create impact on their psychological well-being and functioning. Most of the injured workers with chronic pain and physical limitations may be particularly vulnerable to the rippling effects of the losses of health and well-being. Secondary loss compounds relationship loss and employment loss with affective consequence (Gatchel, Adams, Polatin & Kishino, 2002). Relationship loss for subjects with work injury includes loss of the life role as income generator to the family, loss of the social role with colleagues and

employers and even diminished as a person, which happens especially when subjects go from being relatively autonomous to dependent, from vigorous health to chronic disability and fatigue, and from social engagement to isolation. Employment loss includes partial loss of earning capacities, loss of potential to get employed due to possible discrimination and rejection from employers as the employers may feel that there are chances of re-injuries again for the same worker. These losses may hinder extensively their process of RTW in which early intervention should be considered, such as psychosocial education, building-up relationship with employers. Factors sub-scores of C-LASER can be used for interpretation in predicting subjects' RTW status, where subjects who are more "ready for action" will have significantly higher confidence and advocacy in job seeking. Meanwhile, their readiness is much affected by their psychosocial factors such as their decisional balance, self-efficacy and process of change. Self-perceived physical capacity and pain, and subjects' secondary loss from work injury seem to affect their readiness.

Results identified can substantiate the RTW Model for Injured Workers as proposed in this study. Subjects' stages of employment readiness, especially their factor 1 sub-scores (Contemplation and Action) can first identify their tendency towards returning to work. Meanwhile, internal factors such as social functioning,

their self-perceived physical functioning and their role emotion can further affect their decision on getting into action for returning employment. Finally, external factors such as their progress on workers' compensation and their financial situation can create certain deviation during the process. However, subjects' stage of employment readiness is still one of the dominating factors.

Chapter 5

Conclusion

5.1 Work Related Injuries and Rehabilitation

Despite of the increased awareness of occupational health and safety, work related injuries still remain a significant problem in a society. Past studies indicated that only a small percentage of injured workers return to gainful employment but often to a less demanding job (Sufka et al, 1998). Many factors were revealed to affect the likelihood of return to work, including social, psychological, human capital and economic factors (Tomasen, Post & Van Asbeck, 2000; Van der Giezen, Bouter & Nijhuis, 2000). Among them, individual's readiness to return to work appeared to play a crucial role in predicting injured workers' success to resume the work role (Lam, McMahon, Priddy & Gehred-Schultz, 1988; Van der Giezen, Bouter & Nijhuis, 2000).

5.2. Validation of the C-LASER

This study was designed to validate the Chinese version of Lam Assessment of Stage of Employment Readiness (LASER) to measure the stage of change of work readiness among injured workers in Hong Kong. The Stage of Change Model offers a theoretical framework for understanding people's intention to change. The Lam

Assessment of Stages of Employment Readiness (LASER) was developed to measure one's psychological readiness to return to work after an extended period of unemployment due to disability.

The current results indicated that the C-LASER had satisfactory psychometric properties in terms of test-retest reliability, internal consistency and the content validity as described in the phase I of the study. The study also found out the two-factor solution based on the Stage of Work Readiness model proposed by Lam (1988). Most workers were clustered to the contemplation-action stage or the pre-contemplation stage. As discussed earlier, the two factor solution appeared to form the constructs of the work readiness model among the Chinese injured workers.

After the verification of the constructs in the work readiness model, the predictive property of the C-LASER was further verified in the phase II of the study. Workers with higher scores in the contemplation and action stages appeared to be more enthusiastic towards resuming work. Their self perception on their health conditions also appeared higher when compared to the subjects with lower scores. There was a higher percentage of successful RTW among this group of workers, though statistically, this was not proven in this study.

5.3. Significance of the Study

Previous vocational training programme focuses a lot on the physical rehabilitation among injured workers emphasizing a lot on work assessment, evaluation, hardening and conditioning from the physical perspective. Yet, it has also been shown that most of the workers demonstrated difficulties to resume to their previous jobs due to psychological stress, psychosocial or other economic factors.

Therefore, this study attempted to find out a more objective method of evaluating the work readiness of injured workers. The stage of work readiness is governed by the internal factors such as self perceived health conditions, perceived pain level and stress level. This study has shred light on the practice of vocational rehabilitation services for injured workers that these psychosocial factors should be addressed in order to have successful RTW. The application of C-LASER for assessment on injured workers will also help to identify workers' readiness to RTW. If they are found not ready, further assessments would be adopted to find out the underlying factors affecting the work readiness. Thus, appropriate intervention could be implemented earlier such that early RTW could be made successful. The C-LASER is a user-friendly assessment tool that can be implemented very easily on workers to provide early screening and identification of their work readiness after the work

injuries.

This study also found out that psychosocial factors, namely self-perceived general health, perceived pain and the stress level could be the main sources of failure to RTW. The concept of secondary loss and the client's adjustment and adaptation to the bodily changes could plausibly explain their differences in readiness towards RTW.

5.4. Implications for Further Studies

Though the C-LASER is found to be a useful instrument for distinguishing stages of readiness toward work among injured workers, further studies are warranted to improve cultural relevance of items and further exploration of perception on work readiness by Chinese counterparts. Cultural characteristics of Chinese clients also warrant further attention in developing effective treatments to match the specific needs of Chinese rehabilitation clients. The utility of the C-LASER with clients in different special populations could be explored (e.g., clients with psychiatric disabilities) to further establishing generalizability of the instrument in vocational rehabilitation.

5.5. Limitations of the Study

This study was conducted on a group of subjects recruited from a workers Health Center. There may be bias of the sampling methods on the profile of the injured workers. Thus, the generalization power of the study to injured workers population remains questionable. In addition, the statistical power and sample size were not calculated prior to the study due to the lack of pilot study to estimate the sample size. This can be shown by the insignificant difference between the contemplation-action workers and the pre-contemplation workers on their employment outcomes after six months of assessment. If the sample size could be increased, the results might reflect the significance.

In addition, the study was conducted during the period of SARS episode in Hong Kong. Most of the workers were unemployed in 2003 and 2004. The highest impact was on those who worked on the manually labouring jobs and servicing jobs in the market. The injured workers were mainly engaged in these two categories of job types. Thus, the employment outcomes were extremely low. Thus the predictability of the C-LASER was severely affected by the economic downturn of the HK Society.

Other limitations included the limited sampled workers for testing the utility of

C-LASER as they had already completed the course of vocational rehabilitation. It would be desirable to measure the work readiness prior to the vocational training that they received at the hospitals. In this way, perhaps earlier identification of the psychosocial factors such as stress, pain and anxiety could be realized by using C-LASER and that appropriate intervention could be conducted.

Further studies are also suggested to investigate the cultural characteristics of Chinese subjects for development of effective measurements and treatments to match the specific needs of Chinese rehabilitation clients.

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Appendix I. Consent Form

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）即時開始三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爲敏感的問題。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。

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：＿＿＿＿＿＿＿＿

Appendix II. Lam Assessment of Stages of Employment Readiness (English)

First Name: _____ Gender: ❑ Male ❑ Female Today's Date:_____

Date of Birth: _____

This questionnaire is to help us better understand your needs. Each statement describes how a person might feel when starting a job service program. Please indicate the level of agreement you have with each statement. In each case, make your choice in terms of how you feel right now, not what you have felt in the past or would like to feel.		 **Strongly Disagree**	 **Disagree**	 **Un-decided**	 **Agree**	 **Strongly Agree**
1.	I think I *might* be ready to look for some kind of job.					
2.	I am *doing* something to get ready to look for a job.					
3.	It *might be* worthwhile to work on finding a job.					
4.	I am *not able* to work. I do not see why I have to be here.					
5.	I am finally *doing something* about finding a job.					
6.	I have *been thinking* that it might be time for me to find a job.					
7.	Getting myself ready to find a job is pretty much a waste of time because I can't work anyway.					
8.	I guess being out of work is not good, but there is *nothing I can do* about it right now.					
9.	I know I need to get a job and really *think I should* work on finding one.					
10.	People tell me that I should get a job, but I don't think so.					
11.	Anyone can talk about wanting to find a job, but I am *actually doing* something about it.					
12.	All this talk about work is boring. Why can't people just leave me alone?					
13.	I am *actively doing* something to find a job.					
14.	It's pretty much a waste of time getting ready to find a job because I really don't want to work.					

Appendix III. Chinese Lam Assessment of Stages of Employment Readiness

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。請在適當的方格用剔號（✓）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.	我覺得我已經準備好去搵一份工作。					
2.	我正開始行動去準備搵工。					
3.	我認爲花功夫在搵工上是值得的。					
4.	我根本無工作能力，我不明白爲何要參加這計劃。					
5.	我終於開始爲搵工做一些功夫。					
6.	我想現在是我搵工的適當時機。					
7.	我根本沒有工作能力，所以爲自己做好準備去搵工是浪費時間的。					
8.	雖然我覺得無工做是不太好，但現在我是無能爲力。					
9.	我知我需要搵一份工，我亦認爲我必須努力搵工。					
10.	其他人告訴我應該要搵工，但我並不同意。					
11.	任何人都可以口講自己想搵工，但我就不同，我實際上正在努力搵工。					
12.	所有這些關於搵工的問題都好悶，爲什麼不讓我自己一個人靜一靜？					
13.	我正在積極地搵工。					
14.	我根本不想返工，爲搵工做準備工夫根本是浪費時間。					

Appendix IV. Demographic characteristics of the subjects classified under two clusters (Chapter 3).

Items	**Clusters**	
	Cluster 1 (n=54)	Cluster 2 (n=36)
Sex (F:M)	21 : 33	17 : 19
Mean Age	43.7 (SD=10.2)	39.7 (SD=8.4)
Educational Level	31.5% (1 to 6 years)	36.1% (1 to 6 years)
	27.8% (7 to 9 years)	33.3% (7 to 9 years)
	40.7% (10 years or above)	30.6% (10 years or above)
Successful Employment Rate within 6 months	53.7%	38.9%
Factor 1 Sub-score	33.1 (SD=3.4)	28.4 (SD=4.2)
Factor 2 Sub-score	11.7 (SD=2.5)	17.5 (SD=3.0)
SF-36 Physical Functioning	22.6 (SD=4.5)	19.6 (SD=4.1)
SF-36 Role Physical	5.2 (SD=1.4)	4.7 (SD=1.0)
SF-36 Bodily Pain	6.2 (SD=1.8)	5.0 (SD=1.7)
SF-36 General Health	16.0 (SD=3.4)	15.1 (SD=3.0)
SF-36 Vitality	13.6 (SD=5.1)	12.3 (SD=4.1)

Items	**Clusters**	
	Cluster 1 (n=54)	Cluster 2 (n=36)
SF-36 Social Functioning	6.3 (SD=1.7)	4.9 (SD=1.7)
SF-36 Role Emotional	4.0 (SD=1.2)	3.8 (SD=1.1)
SF-36 Mental Health	17.8 (SD=5.8)	16.4 (SD=5.7)
SF-36 Reported Health Condition	2.7 (SD=1.3)	2.7 (SD=1.1)
Self-reported confidence in job seeking (1-10)	7.50 (SD=2.11)	4.97 (SD=2.36)
Self-reported advocacy in job seeking (1-10)	5.77 (SD=2.29)	4.31 (SD=2.29)

Appendix V. Demographic characteristics of the subjects classified under two clusters, first assessment (Chapter 4).

Items	**Clusters**	
	Cluster 1 (n=23)	Cluster 2 (n=51)
Sex (F:M)	13 : 10	17 : 34
Mean Age	46.5 (SD=10.5)	43.1 (SD=8.6)
Educational Level	33.3% (1 to 6 years)	35.3% (1 to 6 years)
	28.6% (7 to 9 years)	37.3% (7 to 9 years)
	38.1% (10 years or above)	27.4% (10 years or above)
Successful Employment Rate within 6 months	65.2%	48.1%
Factor 1 Sub-score	34.0 (SD=3.2)	29.4 (SD=3.2)
Factor 2 Sub-score	10.3 (SD=2.4)	15.6 (SD=2.8)
SFS	119.2 (SD=39.0)	104.6 (SD=50.5)
LLUMC	44.4 (SD=34.8)	76.5 (SD=55.7)
C-STAI	53.5 (SD=11.4)	55.9 (SD=10.1)
SF-36 Physical Functioning	23.4 (SD=4.1)	20.8 (SD=4.2)
SF-36 Role Physical	5.8 (SD=1.7)	4.8 (SD=1.1)

Items	**Clusters**	
	Cluster 1 (n=23)	Cluster 2 (n=51)
SF-36 Bodily Pain	7.1 (SD=1.7)	5.3 (SD=1.7)
SF-36 General Health	17.0 (SD=2.6)	14.7 (SD=3.6)
SF-36 Vitality	15.5 (SD=4.3)	11.5 (SD=4.2)
SF-36 Social Functioning	7.0 (SD=1.6)	5.7 (SD=1.7)
SF-36 Role Emotional	4.6 (SD=1.4)	3.8 (SD=1.1)
SF-36 Mental Health	19.9 (SD=6.0)	17.1 (SD=5.3)
SF-36 Reported Health Condition	2.4 (SD=1.2)	2.4 (SD=1.2)
Self-reported confidence in job seeking (1-10)	8.1 (SD=2.0)	5.6 (SD=2.1)
Self-reported advocacy in job seeking (1-10)	6.1 (SD=2.7)	4.9 (SD=2.3)

Appendix VI. Demographic characteristics of the subjects classified under two clusters, second assessment (Chapter 4).

Items	**Clusters**	
	Cluster 1 (n=19)	Cluster 2 (n=56)
Sex (F:M)	7 : 12	23 : 33
Mean Age	45.7 (SD=8.2)	43.7 (SD=9.7)
Educational Level	42.1% (1 to 6 years)	32.1% (1 to 6 years)
	26.3% (7 to 9 years)	37.7% (7 to 9 years)
	31.6% (10 years or above)	30.2% (10 years or above)
Successful Employment Rate within 6 months	73.7%	46.4%
Factor 1 Sub-score	38.1 (SD=2.1)	30.0 (SD=2.2)
Factor 2 Sub-score	11.1 (SD=3.0)	13.9 (SD=2.8)
SFS	138.8 (SD=25.6)	109.4 (SD=49.1)
LLUMC	27.2 (SD=31.0)	60.8 (SD=54.1)
C-STAI	51.5 (SD=12.6)	53.8 (SD=11.2)
SF-36 Physical Functioning	24.2 (SD=3.0)	20.8 (SD=4.3)
SF-36 Role Physical	5.9 (SD=1.5)	4.7 (SD=1.3)

Items	**Clusters**	
	Cluster 1 (n=19)	Cluster 2 (n=56)
SF-36 Bodily Pain	7.0 (SD=1.9)	5.8 (SD=1.6)
SF-36 General Health	16.0 (SD=3.3)	15.0 (SD=3.0)
SF-36 Vitality	15.3 (SD=4.5)	13.0 (SD=4.1)
SF-36 Social Functioning	6.8 (SD=1.9)	5.9 (SD=1.7)
SF-36 Role Emotional	4.6 (SD=1.3)	3.8 (SD=1.0)
SF-36 Mental Health	19.5 (SD=6.7)	17.8 (SD=5.7)
SF-36 Reported Health Condition	3.0 (SD=1.3)	2.6 (SD=1.2)
Self-reported confidence in job seeking (1-10)	7.8 (SD=2.5)	6.1 (SD=1.6)
Self-reported advocacy in job seeking (1-10)	6.9 (SD=2.1)	5.4 (SD=1.9)

Appendix VII. Demographic characteristics of the subjects classified under two clusters, third assessment (Chapter 4).

Items	**Clusters**	
	Cluster 1 (n=54)	Cluster 2 (n=21)
Sex (F:M)	23 : 31	7 : 14
Mean Age	44.3 (SD=9.8)	43.3 (SD=8.1)
Educational Level	36.5% (1 to 6 years)	30.0% (1 to 6 years)
	30.8% (7 to 9 years)	45.0% (7 to 9 years)
	32.7% (10 years or above)	25.0% (10 years or above)
Successful Employment Rate within 6 months	57.4%	42.9%
Factor 1 Sub-score	33.9 (SD=3.6)	27.0 (SD=5.5)
Factor 2 Sub-score	11.9 (SD=2.5)	16.8 (SD=3.0)
SFS	125.7 (SD=48.3)	95.2 (SD-44.7)
LLUMC	51.2 (SD=53.2)	79.4 (SD=57.3)
C-STAI	52.2 (SD=10.1)	58.3 (SD=7.7)
SF-36 Physical Functioning	22.9 (SD=4.8)	19.3 (SD=4.1)
SF-36 Role Physical	5.6 (SD=1.7)	4.3 (SD=0.7)

Items	**Clusters**	
	Cluster 1 (n=54)	Cluster 2 (n=21)
SF-36 Bodily Pain	6.2 (SD=2.0)	5.0 (SD=1.3)
SF-36 General Health	15.9 (SD=3.0)	14.0 (SD=2.5)
SF-36 Vitality	13.5 (SD=4.8)	11.6 (SD=3.0)
SF-36 Social Functioning	6.3 (SD=1.5)	5.3 (SD=1.4)
SF-36 Role Emotional	4.3 (SD=1.2)	3.1 (SD=0.3)
SF-36 Mental Health	17.9 (SD=5.7)	15.8 (SD=3.7)
SF-36 Reported Health Condition	2.9 (SD=1.3)	2.5 (SD=1.0)
Self-reported confidence in job seeking (1-10)	6.0 (SD=2.3)	4.9 (SD=2.5)
Self-reported advocacy in job seeking (1-10)	5.6 (SD=2.2)	4.6 (SD=2.5)